APPENDIX 2A

AGENCY AUTHORITY

JOINT EXERCISE OF POWERS AGREEMENT

establishing the

SALINAS VALLEY BASIN GROUNDWATER SUSTAINABILITY AGENCY

JOINT EXERCISE OF POWERS AGREEMENT

establishing the

SALINAS VALLEY BASIN GROUNDWATER SUSTAINABILITY AGENCY

THIS JOINT EXERCISE OF POWERS AGREEMENT ("Agreement') establishing the Salinas Valley Basin Groundwater Sustainability Agency ("Agency") is made and entered into as of 12/22/16 ("Effective Date"), by and among the public agencies listed on the attached Exhibit "A" (collectively "Members" and individually "Member") for the purpose of forming a Groundwater Sustainable Agency ("GSA") and achieving groundwater sustainability in the Salinas Valley Groundwater Basin.

RECITALS

WHEREAS, in the fall of 2014 the California legislature adopted, and the Governor signed into law, three bills (SB 1168, AB 1739, and SB 1319) collectively referred to as the "Sustainable Groundwater Management Act" ("SGMA"), that initially became effective on January 1, 2015, and that has been amended from time-to-time thereafter; and

WHEREAS, the stated purpose of SGMA, as set forth in California Water Code section 10720.1, is to provide for the sustainable management of groundwater basins at a local level by providing local groundwater agencies with the authority, and technical and financial assistance necessary, to sustainably manage groundwater; and

WHEREAS, SGMA requires the designation of Groundwater Sustainability Agencies ("GSAs") for the purpose of achieving groundwater sustainability through the adoption and implementation of Groundwater Sustainability Plans ("GSPs") or an alternative plan for all medium and high priority basins as designated by the California Department of Water Resources; and

WHEREAS, SGMA requires that the Basin have a designated GSA by no later than June 30, 2017, and an adopted GSP by no later than January 31, 2020, if a high or medium priority basin in critical overdraft, and no later than January 31, 2022, if a high or medium priority basin; and

WHEREAS, SGMA authorizes a combination of local agencies to form a GSA by entering into a joint powers agreement as authorized by the Joint Exercise of Powers Act (Chapter 5 of Division 7 of Title 1 of the California Government Code) ("Act"); and

WHEREAS, each Member is a local agency, as defined by SGMA, within that portion of the Salinas Valley Groundwater Basin ("Basin" and as more fully described below) within Monterey County, which is designated basin number 3-004 in Department of Water Resources Bulletin No. 118 (update 2016), and consisting of seven sub-basins plus that portion of the Paso Robles sub-basin within Monterey County (but not including the adjudicated portion of the

Seaside sub-basin), each of which is designated as either a high or medium priority basin, and one of which (the 180/400 ft. aquifer) is designated in critical overdraft; and

WHEREAS, the Members are therefore authorized to create the Agency for the purpose of jointly exercising those powers granted by the Act, SGMA, and any additional powers which are common among them; and

WHEREAS, the Members, individually and collectively, have the goal of cost effective sustainable groundwater management that considers the interests and concerns of all beneficial uses and users of groundwater within and adjacent to the Basin; and

WHEREAS, the Members hereby enter into this Agreement to establish the Agency to serve as a GSA for the Basin and undertake the management of groundwater resources pursuant to SGMA; and

WHEREAS, the Members intend to cooperate with adjacent GSAs such as any GSA formed over a portion of the Paso Robles sub-basin (3-04.06) within San Luis Obispo County, and the Pajaro Valley Water Management Agency; and

WHEREAS, the Members intend to study the potential for state legislation to, among other amendments, amend the WRA Act to modify the governance structure of the WRA in a form similar to the governance of the Agency established herein and to establish that agency as the statutorily designated GSA for the Basin, or establish a new entity to be so designated;

NOW THEREFORE,

In consideration of the matters recited and the mutual promises, covenants, and conditions set forth in this Agreement, the Members hereby agree as follows:

Article I: Definitions

Section 1.1 – Definitions.

As used in this Agreement, unless the context requires otherwise, the meaning of the terms hereinafter set forth shall be as follows:

(a) "Act" means the Joint Exercise of Powers Act, set forth in Chapter 5 of Division 7 of Title 1 of the California Government Code, sections 6500, *et seq*., as may be amended from time-to-time.

(b) "Agreement" means this Joint Exercise of Powers Agreement establishing the Salinas Valley Basin Groundwater Sustainability Agency.

(c) "Agency" means the Salinas Valley Basin Groundwater Sustainability Agency, which is a separate entity created by this Agreement pursuant to the provisions of the Act and SGMA.

(d) "Agricultural Directors" means the four Directors representing agricultural interests, as more fully set forth in rows (f) – (i) of Exhibit B of this Agreement.

(e) "Agricultural Association" means the Salinas Basin Agricultural Water Association.

(f) "Alternate Director" means an Alternate Director appointed pursuant to Section 6.6 of this Agreement.

(g) "Appointing Authority" means the entity authorized to appoint Primary and Alternate Directors pursuant to Sections 6.2, 6.3 and 6.6 of this Agreement and as identified in Exhibit B to this Agreement.

(h) "Basin" means that portion of the Salinas Valley Groundwater Basin, newly designated no. 3-004 in the Department of Water Resources' Bulletin No. 118 (update 2016), within the County of Monterey and that includes the following sub-basins: 1) 180/400 Foot Aquifer (No. 3-004.01); 2) East Side Aquifer (3-004.02); 3) Forebay Aquifer (3-004.04); 4) Upper Valley Aquifer (3-004.05); 5) Langley Area (3-004.09); 7) the newly designated Monterey sub-basin (3-004.10); and, 8) the portion of the Paso Robles Area (3-004.06) in Monterey County; but not including that portion of the Seaside Area that has been adjudicated, all as their boundaries may be modified from time to time through the procedures described in California Water Code section 10722.2 or by the Department of Water Resources under its separate authority, and not including any other area for which a GSA has been established pursuant to SGMA.

(i) "Board of Directors" or "Board" means the governing body of the Agency as established by Section 6.1 of this Agreement.

(j) "Brown Act" means the California Open Meeting Law, Government Code section 54950 *et seq.*

(k) "Bylaws" means the bylaws adopted by the Board of Directors pursuant to Section 6.8 of this Agreement to govern the day-to-day operations of the Agency.

(l) "Cause" means a conviction of a crime i) of moral turpitude, or ii) involving fraud, misrepresentation, or financial mismanagement, or iii) a finding by an administrative body or agency, or a court of law, that the person has violated any conflict of interest provision of federal, state or local law.

(m) "City Selection sub-Committee" means a subcommittee of the Monterey County City Selection Committee, established by Government Code section 50270 et seq, and consisting of the mayors of the following cities: Gonzales, Soledad, Greenfield, and King City.

(n) "County" means the County of Monterey.

(o) "CPUC" means the California Public Utilities Commission.

(p) "CPUC Regulated Water Company" means an investor owned water company operating in the Basin that has been granted a certificate of public convenience and necessity by the CPUC and is regulated by the CPUC.

(q) "Determination Date" means the date on which the Agency votes to notify the State of its intent to become a GSA as provided in Water Code sections 10723 (a) and (b).

(r) "Director" or "Directors" means Primary and Alternate Directors as set forth in Section 6.6 of this Agreement.

(s) "Director Position(s)" means those eleven Board positions, singularly or plural, established pursuant to Section 6.1 of this Agreement.

(t) "Disadvantaged Community" means a disadvantaged community or economically distressed area as those terms are defined in Water Code section 79702 (as may be amended from time-to-time) within the Basin.

(u) "Effective Date" means the date by which two Members have executed this Agreement which date shall be set forth in the introductory paragraph of this Agreement.

(v) "Fiscal Year" means that period of 12 months beginning July 1 and ending June 30 of each calendar year.

(w) "Groundwater Sustainability Agency" or "GSA" has the meaning set forth in California Water Code section 10721(j).

(x) "Groundwater Sustainability Plan" or "GSP" has the meaning set forth in California Water Code section 10721(k).

(y) "GSA Eligible Entity or Entities" means those entities eligible to become a GSA pursuant to SGMA.

(z) "Initial Board" means the initial Board of Directors established pursuant to Section 6.2, below.

(aa) "Initial Contribution" means the required contribution of Members as set forth in Section 10.4 of this Agreement.

(bb) "Local Agency" or "Local Agencies" has the meaning set forth in California Water Code Section 10721(n).

(cc) "Local small water system" means a system for the provision of piped water for human consumption that serves at least two, but not more than four, service connections, including any collection, treatment, storage, and distribution facilities under control of the operator of such system which are used primarily in connection with such system, and any collection or pretreatment storage facilities not under the control of the operator which are used primarily in connection with such system; it does not include two or more service connections, which supply dwelling units occupied by members of the same family, on one parcel, all as set forth in Monterey County Code section 15.04.020 (g).

(dd) "Majority Vote" means the affirmative vote of six Directors then present and voting at a meeting of the Board.

(ee) "Member" or "Members" means the GSA Eligible Entities listed in the attached Exhibit "A" that have executed this Agreement, including any new Members that may subsequently join this Agency with the authorization of the Board, pursuant to Section 5.2 of this Agreement.

(ff) "Mutual Water Company" has the meaning set forth in Corporations Code section 14300.

(gg) "Permanent Board" means the permanent Board of Directors established pursuant to Section 6.3 of this Agreement.

(hh) "Permanent Director" means a Director appointed to the Permanent Board.

(ii) "Permanent Director Position" means a Director Position on the Permanent Board.

(jj) "Primary Director" means a Primary Director appointed pursuant to Sections 6.4 of this Agreement.

(kk) "Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. A public water system includes the following: (1) Any collection, treatment, storage, and distribution facilities under control of the operator of the system that are used primarily in connection with the system, (2) Any collection or pretreatment storage facilities not under the control of the operator that are used primarily in connection with the system, or (3) Any water system that treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption, all as set forth in Health and Safety Code section 116275 (h).

(ll) "South County Cities" means the cities of Gonzales, Soledad, Greenfield and King City.

(mm) "State" means the State of California.

(nn) "State Small Water System" means a system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year, as set forth in California Health and Safety Code section 116275 (n).

(oo) "Super Majority Vote" means the affirmative vote of eight Directors then present and voting at a meeting of the Board.

(pp) "Super Majority Plus Vote" means the affirmative vote of eight Directors then present and voting at a meeting of the Board but including the affirmative vote of three of the Agricultural Directors.

(qq) "Sustainable Groundwater Management Act" or "SGMA" means the comprehensive groundwater legislation collectively enacted and referred to as the "Sustainable Groundwater Management Act" as codified in California Water Code Sections 10720 *et seq.* and as may be amended from time-to-time.

(rr) "WRA" means the Water Resources Agency of the County of Monterey.

Unless otherwise indicated, all statutory references are to the statutory codes of the State.

Article II: The Agency

Section 2.1 – Agency Established.

There is hereby established a joint powers agency known as the Salinas Valley Basin Groundwater Sustainability Agency. The Agency shall be, to the extent provided by law, a public entity separate from the Members of this Agreement.

Section 2.2 – Purpose Of The Agency.

The purpose of Agency is to cooperatively carry out the requirements of SGMA including, but not limited to, serving as the GSA for the Basin and developing, adopting and implementing a GSP that achieves groundwater sustainability in the Basin, all through the exercise of powers granted to a GSA by SGMA and those powers common to the members as provided in the Act.

Article III: Term

Section 3.1 – Term.

This Agreement shall become operative on the Effective Date. Subject to the terms of Sections 11.6, 11.7 and 11.8, below, this Agreement shall remain in effect unless terminated pursuant to Section 11.10, below.

Article IV: Powers

Section 4.1 – Powers.

The Agency shall possess the ability to exercise those powers specifically granted by the Act, SGMA, and the common powers of its Members related to the purposes of the Agency, including, but not limited to, the following:

a) To designate itself the GSA for the Basin pursuant to SGMA.

b) To adopt rules, regulations, policies, bylaws and procedures governing the operation of the Agency and the adoption and implementation of the GSP.

c) To develop, adopt and implement a GSP for the Basin pursuant to SGMA.

d) To retain or employ consultants, advisors, independent contractors, agents and employees.

e) To obtain legal, financial, accounting, technical, engineering, and other services needed to carry out the purposes of this Agreement.

f) To conduct studies, collect and monitor all data related and beneficial to the development, adoption and implementation of the GSP for the Basin.

g) To perform periodic reviews of the GSP including submittal of annual reports.

h) To register and monitor wells.

i) To issue revenue bonds or other appropriate public or private debt and incur debts, liabilities or obligations.

j) To levy taxes, assessments, charges and fees as provided in SGMA or as otherwise provided by law.

k) To regulate and monitor groundwater extractions as permitted by SGMA, provided that this provision does not extend to a Member's operation of its system to distribute water once extracted or otherwise obtained, unless and to the extent required by other laws now in existence or as may otherwise be adopted.

l) To establish and administer projects and programs for the benefit of the Basin.

m) To cooperate, act in conjunction, and contract with the United States, the State, or any agency thereof, counties, municipalities, special districts, groundwater sustainability agencies, public and private corporations of any kind (including without limitation, investor-owned utilities), and individuals, or any of them, for any and all purposes necessary or convenient for the full exercise of the powers of the Agency.

n) To accumulate operating and reserve funds and invest the same as allowed by law for the purposes of the Agency.

o) To apply for and accept grants, contributions, donations and loans under any federal, state or local programs for assistance in developing or implementing any of its projects or programs in connection with any project untaken in the Agency's name for the purposes of the Agency.

p) To acquire by negotiation, lease, purchase, construct, hold, manage, maintain, operate and dispose of any buildings, property, water rights, works or improvements within and without the respective jurisdictional boundaries of the Members necessary to accomplish the purposes describe herein.

q) To sue or be sued in its own name.

r) To invest funds as allowed by law.

s) Any additional powers conferred under SGMA or the Act, or under applicable law, insofar as such powers are needed to accomplish the purposes of SGMA, including all powers granted to the Agency under Article 4 of the Act which are in addition to the common powers of the Members, including the power to issue bonds or otherwise incur debts, liabilities or obligations to the extent authorized by the Act or any other applicable provision of law and to pledge any property or revenues of the rights thereto as security for such bonds and other indebtedness.

t) Any power necessary or incidental to the foregoing powers in the manner and according to the procedures provided for under the law applicable to the Members to this Agreement and to perform all other acts necessary or proper to fully carry out the purposes of this Agreement.

Section 4.2 – Exercise Of Powers.

In accordance with Section 6509 of the Act, the foregoing powers shall be subject to the restrictions upon the manner of exercising such powers pertaining to the County.

Section 4.3 – Water Rights And Consideration Of All Beneficial Uses And Users Of Groundwater In The Basin.

As set forth in Water Code section 10723.2 the GSA shall consider the interests of all beneficial uses and users of groundwater in the Basin, as well as those responsible for implementing the GSP. Additionally, as set forth in Water Code section 10720.5(a) any GSP adopted pursuant to this Agreement shall be consistent with Section 2 of Article X of the California Constitution and nothing in this Agreement modifies the rights or priorities to use or store groundwater consistent with Section 2 of Article X of the California Constitution, with the exception that no extraction of groundwater between January 1, 2015 and the date the GSP is adopted may be used as evidence of, or to establish or defend against, any claim of prescription. Likewise, as set forth in Water Code section 10720.5(b) nothing in this Agreement or any GSP adopted pursuant to this Agreement determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights.

Section 4.4 – Preservation Of Police Powers.

Nothing set forth in this Agreement shall be deemed to modify or otherwise limit a Member's police powers in any way, or any authority to regulate groundwater under existing law or any amendment thereto.

Article V: Membership

Section 5.1 – Members.

The Members of the Agency shall be the entities listed on the attached Exhibit A so long as their membership has not been withdrawn or terminated pursuant to the provisions of Article XI of this Agreement. GSA Eligible Entities shall have until the Determination Date to execute this Agreement and pay their Initial Contribution, and become Members. Any GSA Eligible Entity that has not executed this Agreement and paid their Initial Contribution by the Determination Date shall be subject to the process described in Section 5.2, below, to become a Member.

Section 5.2 – New Members.

New Members may be added to the Agency by the unanimous vote of all other Members so long as: 1) the new Member is a GSA Eligible Entity; and, 2) the new Member agrees to or has met any other conditions that the existing Members may establish from time-to-time.

Once an application is approved unanimously by the existing Members the attached Exhibit A shall be amended to reflect the new Member.

Article VI: Directors And Officers

Section 6.1 – Board Of Directors.

The Agency shall be governed and administered by an eleven (11) member Board of Directors which is hereby established. All voting power of the Agency shall reside in the Board.

Section 6.2 – Initial Board of Directors.

An Initial Board shall be composed of the Director Positions with the qualifications and Appointing Authority as described in Exhibit B. The nominating groups identified in Section 6.5, below, may, but are not required to, provide nominations to the relevant Appointing Authority for the Initial Board; however, any such nomination must be received by the respective Appointing Authority no later than January 31, 2017. If such nominations are received no later than the time specified the Appointing Authorities shall follow the respective procedures for appointment to the Permanent Board set forth in Section 6.5, below. If such nominations are not received by the time specified, the Appointing Authority may make appointments to the Initial Board as it determines in its sole discretion.

The Initial Board shall serve only until September 30, 2017, at which time a Permanent Board shall be appointed as described below.

Section 6.3 – Permanent Board.

Subject to the Appointment and Nominating procedures set forth in Section 6.5, below, beginning on October 1, 2017, a Permanent Board shall be established consisting of the Director Positions with the qualifications and Appointing Authority as described in Exhibit B. With the exception of the CPUC Regulated Water Company Director Position, each Permanent Director Position shall have a term consisting of three (3) years and shall hold office until their successor is appointed by their Appointing Authority and the Agency has been notified of the succession. The terms of Permanent Director Positions shall be staggered, with Director Positions identified in rows (a), (c), (f), (h) and (j) of exhibit C serving three (3) year terms from initial appointment, and those identified in rows (b), (d), (g), (i), and (k) serving two (2) year terms from initial appointment, and thereafter serving three (3) year terms. The CPUC Regulated Water Company Director Position shall serve a term of two (2) years, and a Director shall hold office until their successor is appointed and the Agency has been notified of the succession. Notwithstanding the actual date of their initial appointment, for purposes of establishing the terms of Permanent Directors such initial appointment shall be deemed to have commenced on the July 1 preceding such initial appointment, and the terms of Directors shall thereafter commence on July 1 of the respective appointing year. Each Director Position shall require an affirmative appointment by the Appointing Authority for every term.

Section 6.4 – General Qualifications.

a) Each Director, whether on the Initial Board or Permanent Board, must have the following general qualifications:

i. General education and/or knowledge, interest in and experience relating to the control, storage, and beneficial use of groundwater.

ii. General understanding and knowledge of the Basin and all its beneficial users.

iii. Working knowledge and understanding of how to develop strategic plans, policies, programs, and financing/funding mechanisms.

iv. Genuine commitment to collaboratively work together to (i) achieve groundwater sustainability through the adoption and implementation of a GSP for the Basin, and all its beneficial uses; and (ii) provide for the ongoing sustainable management of the Basin.

v. General knowledge and understanding of one or more of the different facets (administration, financial, legal, organizational, personnel, etc.) needed for a successful and productive organization.

vi. Ability to commit the time necessary, estimated at a minimum 15-20 hours per month, to responsibly fulfill their commitment to the organization. This includes, but is not limited to: (i) Board meetings, (ii) Board training, (iii) analyzing financial statements and technical reports, (iv) reviewing Board documents before Board meetings, (v) attending Board meetings, and (vi) serving on committees to which they are assigned.

vii. A permanent resident within the Basin, or a representative of an agency with jurisdiction, or a business or organization with a presence, within the Basin.

b) Nominating groups and Appointing Authorities, as described in Section 6.5, should endeavor to avoid nominating or appointing a person to a Director Position that, because of his or her employment or other financial interest, is likely to be disqualified from a substantial number of decisions to be made by the Board on the basis of conflict-of-interest requirements.

Section 6.5 – Appointments and Nominations for Director Positions on the Permanent Board.

The appointment and nominating process for each Primary and Alternate Director Positions on the Permanent Board shall be as follows:

a) City of Salinas Director Position.

The City of Salinas shall appoint the Director Position listed in Row (a) of Exhibit B, the specific qualifications of such Director Position to be at the discretion of the City of Salinas.

b) South County Cities Director Position.

The Director Position listed in Row (b) of Exhibit B shall be filled by a representative from one of the four cities listed therein. The City Selection sub-Committee shall determine which city shall be the Appointing Authority for each term of the Director Position. The specific qualifications of such Director Position shall be at the discretion of that city designated the Appointing Authority. If the City Selection sub-Committee cannot reach agreement on a city to be the Appointing Authority for this Director Position, the County Board of Supervisors shall decide which city shall be the Appointing Authority.

c) Other GSA Eligible Entity Director Position.

i. Representative of the entities listed on Exhibit C shall be eligible to participate in the nominating process for the Other GSA Eligible Entity Director Position listed in Row (c) of Exhibit B.

ii. The representatives collectively by agreement among themselves shall make nominations to the Appointing Authority for the persons to fill both the Primary and Alternate Director Positions when the term of such position are expiring or are vacant.

iii. The representatives shall nominate one or more persons to fill both the Primary and Alternate Director Positions. If more than one person is nominated the representatives shall indicate the preferred nominee.

iv The Appointing Authority shall appoint the nominee (if only one) or appoint from among the nominees; the Appointing Authority may reject a nominee only for Cause. If the representatives cannot or do not forward any nominations the Appointing Authority shall make the appointment based upon its own determination.

v. The representatives may also advise the Appointing Authority regarding the removal of their nominee from the Director Positions for Cause. If the Appointing Authority determines that Cause exists such Director shall be removed and a new Director appointed to fill out the remaining term of the removed Director. The representatives may also request that their nominee in the Director Position be removed for any reason or no reason. If such request is made the Appointing Authority shall remove the Director and a new Director appointed to fill out the remaining term of the removed Director.

vi. From time-to-time entities may ask to be removed from Exhibit C. If such request is made the Appointing Authority shall notify the other Members and the Board, and Exhibit C shall be modified accordingly.

vii. From time-to-time other entities may request to be included on Exhibit C. The then-existing representatives shall inform the Appointing Authority if such requests are acceptable. If accepted by the representatives the Appointing Authority shall notify the other Members and the Board, and Exhibit C shall be modified accordingly.

d) Disadvantaged Community, or Public Water System Systems, including Mutual Water Companies serving residential customers, Director Position.

i. Representative of the entities listed on Exhibit D shall be eligible to participate in the nominating process for the Disadvantaged Community, or Public Water System Systems, including Mutual Water Companies serving residential customers, Director Position listed in Row (d) of Exhibit B.

ii. The representatives by agreement among themselves shall collectively make nominations to the Appointing Authority for the persons to fill both the Primary and Alternate Director Positions when the term of such positions are expiring or are vacant.

iii. The representatives shall nominate one or more persons to fill both the Primary and Alternate Director Positions. If more than one person is nominated the representatives shall indicate the preferred nominee.

iv. The Appointing Authority shall appoint the nominee (if only one) or appoint from among the nominees; the Appointing Authority may reject a nominee only for Cause. If the representatives cannot or do not forward any nominations the Appointing Authority shall make the appointment based upon its own determination.

v. The representatives may also advise the Appointing Authority regarding the removal of their nominee from the Director Positions for Cause. If the Appointing Authority determines that Cause exists such Director shall be removed and a new Director appointed to fill out the remaining term of the removed Director. The representatives may also request that their nominee in the Director Position may be removed for any reason or no reason. If such request is made the Appointing Authority shall remove the Director and a new Director appointed to fill out the remaining term of the removed Director.

vi. From time-to-time entities may ask to be removed from Exhibit D. If such request is made the Appointing Authority shall notify the other Members and the Board, and Exhibit D shall be modified accordingly.

vii. From time-to-time other entities may request to be included on Exhibit D. The then-existing representatives shall inform the Appointing Authority if such requests are acceptable. If accepted by the representatives the Appointing Authority shall notify the other Members and the Board, and Exhibit D shall be modified accordingly.

e) CPUC Regulated Water Company Director Position.

i. Representative of the entities listed on Exhibit E must meet the requirements of Section 1.1 (o) and shall be eligible to participate in the nominating process for the CPUC Regulated Water Company Director Position listed in Row (e) of Exhibit B.

ii. The representatives by agreement among themselves shall collectively make nominations to the Appointing Authority for the persons to fill both the Primary and Alternate Director Positions when the term of such position are expiring or are vacant.

iii. The representatives shall nominate one or more persons to fill both the Primary and Alternate Director Positions. If more than one person is nominated the representatives shall indicate the preferred nominee.

iv The Appointing Authority shall appoint the nominee (if only one) or appoint from among the nominees; the Appointing Authority may reject a nominee only for Cause. If the representatives cannot or do not forward any nominations the Appointing Authority shall make the appointment of an employee or agent of a CPUC Regulated Water Company listed on Exhibit E based upon its own determination.

v. The representatives may also advise the Appointing Authority regarding the removal of their nominee from the Director Position for Cause, although such authority to remove shall rest solely with the Appointing Authority.

vi. From time-to-time entities may ask to be removed from Exhibit E. If such request is made the Appointing Authority shall notify the other Members and the Board, and Exhibit E shall be modified accordingly.

vii. From time-to-time other entities may request to be included on Exhibit E. The then-existing representatives shall inform the Appointing Authority if such requests are acceptable. If accepted by the representatives the Appointing Authority shall notify the other Members and the Board, and Exhibit E shall be modified accordingly.

f) Agriculture Director Positions.

i. The Agricultural Association shall be eligible to participate in the nominating process for the Agriculture Director Positions listed in Rows (f) – (i) of Exhibit B. The Agricultural Association shall be solely responsible for its membership.

ii. The Agricultural Association shall make nominations to the Appointing Authority for the persons to fill each Primary and Alternate Director Position when the terms of such positions are expiring or are vacant.

iii. The Agricultural Association shall nominate at least two persons to fill each Director Position; the Agricultural Association shall indicate the preferred nominee for each Director Position.

iv The Appointing Authority shall appoint from among the nominees for each Director Position; the Appointing Authority may reject a nominee only for Cause. If the Agricultural Association cannot or does not forward any nominations the Appointing Authority shall make the appointment based upon its own determination.

v. The Agricultural Association may also advise the Appointing Authority regarding the removal of a nominee from a Director Position for Cause. If the Appointing Authority determines that Cause exists such Director shall be removed and a new Director appointed to fill out the remaining term of the removed Director. The Agricultural Association may also request that their nominee in a Director Position may be removed for any reason or no reason. If such request is made the Appointing Authority shall remove the Director and a new Director appointed to fill out the remaining term of the removed Director.

g) Environment Director Position.

i. Representative of the entities listed on Exhibit F shall be eligible to participate in the nominating process for the Environment Director Position listed in Row (j) of Exhibit B.

ii. The representatives by agreement among themselves shall collectively make nominations to the Appointing Authority for the persons to fill both the Primary and Alternate Director Positions when the term of such positions are expiring or are vacant.

iii. The representatives shall nominate at least two persons to fill both the Primary and Alternate Director Positions and the representatives shall indicate the preferred nominee.

iv The Appointing Authority shall appoint from among the nominees; the Appointing Authority may reject a nominee only for Cause. If the representatives cannot or do not forward any nominations the Board shall solicit applications from interested persons. At an open public meeting, the Board shall select qualified applicants whose names shall be forwarded to the Appointing Authority. The Board may indicate a preferred nominee. The Appointing Authority shall make the appointment from the list of candidates in its sole discretion. If the Board cannot, or does not, forward a list of candidates, the Appointing Authority shall make the appointment based upon its own determination.

v. The representatives may also advise the Appointing Authority regarding the removal of their nominee from the Director Position for Cause. If the Appointing Authority determines that Cause exists such Director shall be removed and a new Director appointed to fill out the remaining term of the removed Director. The representatives may also request that their nominee in the Director Position may be removed for any reason or no reason. If such request is made the Appointing Authority shall remove the Director and a new Director appointed to fill out the remaining term of the removed Director.

vi. From time-to-time entities may ask to be removed from Exhibit F. If such request is made the Appointing Authority shall notify the other Members and the Board, and Exhibit F shall be modified accordingly.

vii. From time-to-time other entities may request to be included on Exhibit F. The then-existing representatives shall inform the Appointing Authority if such requests are acceptable. If accepted by the representatives the

Appointing Authority shall notify the other Members and the Board, and Exhibit F shall be modified accordingly.

h) Public Member Director Position.

i. The Public Member Primary and Alternate Director Positions listed in Row (k) of Exhibit B shall be filled by application to the Board when the term of such position is expiring or is vacant.

ii. Board staff shall process the applications to an open and public meeting of the Board.

iii. At the public hearing, the Board shall select the qualified applicants whose names shall be forwarded to the Appointing Authority. The Board may indicate a preferred nominee.

iv The Appointing Authority shall appoint from among the nominees in its sole discretion. If the Board cannot or does not forward any nominations the Appointing Authority shall make the appointment based upon its own determination.

v. The Board may also advise the Appointing Authority regarding the removal of the Public Member Director for Cause, although such authority to remove shall rest solely with the Appointing Authority.

Section 6.6 – Primary Directors And Alternates.

Subject to the Appointing and Nominating procedures set forth in Section 6.5, above, each Appointing Authority shall appoint one Primary Director and one Alternate Director for each Director Position. With the exception of the Chairperson and Vice-Chairperson duties as more fully described in Section 6.7, below, the Alternate Director shall serve and assume the rights and duties of the Primary Director when the Primary Director is unable to attend or participate in a Board meeting. Unless appearing as a substitute for a Primary Director, Alternate Directors shall have no vote, and shall not participate in any discussions or deliberations of the Board, but may appear at Board meetings as members of the public. The Primary and Alternate Directors may be removed by their Appointing Authority only for Cause only upon the recommendation of or consultation with the nominating body for that Director Position, or upon the request of the nominating body for that Director Position. In the event that a Primary or Alternate Director is removed from their position, that Director Position shall become vacant and the Appointing Authority for that Director Position shall appoint a new Primary or Alternate Director pursuant to the provisions of Section 6.5 who shall fill the remaining term of that Director Position. In the event that a Director resigns from a Director Position, the Board shall notify the nominating body for that Director Position and the Appointing Authority for that Director Position shall appoint a new Primary or Alternate Director pursuant to the provisions of Section 6.5 who shall fill the remaining term of that Director Position.

Section 6.7 – Officers Of The Board.

a) Designation.

Officers of the Board shall consist of a Chairperson and Vice-Chairperson who shall be selected from the Primary Directors. The Chairperson shall preside at all meetings of the Board. Notwithstanding the appointment of an Alternate Director for the Chairperson, the Vice-Chairperson shall perform the duties of the Chairperson in the absence or disability of the Chairperson; however, the Alternate Director may otherwise attend and participate in the meeting as a substitute for the absent Primary Director. The Chairperson and Vice-Chairperson shall exercise and perform such other powers and duties as may be assigned by the Board. In the absence of both the Chairperson and Vice-Chairperson, and notwithstanding the appointment of an Alternate Director for the Director Position serving as Vice-Chairperson, the Board shall elect a Chairperson Pro-Tem from the Primary Directors to preside at a meeting; however, the Alternate Director for the Vice-Chairperson may otherwise attend and participate in the meeting as a substitute for the absent Primary Director.

b) Election.

The Board shall elect officers at the initial meeting of the Board, described in Section 7.1, below. The Primary Director appointed by the City of Salinas shall be designated as the Chairperson Pro Tem to convene and preside at the initial meeting of the Board, described in Section 7.1, until a Chairperson is elected by the Board. The Chairperson so elected shall serve in such capacity until June 30 of the succeeding calendar year. Thereafter, the Board shall annually elect the officers of the Board from the Primary Directors. Officers of the Board shall hold office for a term of one year commencing on July 1 of each calendar year and they may serve for multiple consecutive terms. Officers of the Board may be removed and replaced at any time, with or without cause, by a Majority Vote. In the event that an officer loses their position as a Primary Director, that officer position shall become vacant and the Board shall elect a new officer from existing Primary Directors to serve the remaining officer term.

Section 6.8 – Bylaws.

The Board shall adopt Bylaws governing the conduct of meetings and the day-to-day operations of the Agency on or before the first anniversary of the Effective Date.

Section 6.9 – Official Seal And Letterhead.

The Board may adopt, and/or amend, an official seal and letterhead for the Agency.

Section 6.10 – Conflict of Interest.

Directors shall be subject to the provisions of the California Political Reform Act, California Government Code section 81000 et seq, and all other laws governing conflicts of interests. Directors shall file the statements required by Government Code section 87200, et seq.

Article VII: Board Meetings And Actions

Section 7.1 – Initial Meeting.

The initial meeting of the Board shall be held at either the County Board of Supervisors chambers, located at 168 W. Alisal Street in Salinas, or at the Salinas City Council chambers, located at 200 Lincoln Avenue in Salinas within thirty days (30) days of the Effective Date of this Agreement. The date and time of the meeting shall be prominently publicized and noticed in addition to any requirements of the Brown Act in an effort to maximize public participation.

Section 7.2 – Regular Meeting Schedule.

At its initial meeting, and annually before July 1 of each calendar year thereafter, the Board shall establish a schedule of regular meetings, including time and place, at a location overlying the Basin. The Board may vote to change the regular meeting location, time and place, and may call special or emergency meetings, provided that the new, special or emergency meeting location remains at a place overlying the Basin, unless otherwise authorized by the Brown Act.

Section 7.3 – Principal Office.

At its initial meeting the Board shall establish a principal office for the Agency, which shall be located at a place overlying the Basin. The Board may change the principal office from time to time as the Board sees fit so long as that principal office remains at a location overlying the Basin.

Section 7.4 – Conduct Of Board Meetings.

Meetings of the Board of Directors shall be noticed, held, and conducted in accordance with the provisions of the Brown Act and such By-laws as the Board may adopt that are consistent with the Brown Act.

Section 7.5 – Quorum.

A quorum of the Board shall consist of a majority of the Director Positions.

Section 7.6 – Voting.

Each Director Position shall have one vote. In all cases, when a quorum is present, a Majority Vote shall be required to conduct business, unless a Super Majority Vote or a Super Majority Plus Vote is required.

Section 7.7 – Super Majority Vote Requirement.

Items that require a Super Majority Vote include the following unless otherwise required by law:

a) Approval of a GSP;

b) Amendment of budget and transfer of appropriations;

c) Withdrawal of Members pursuant to Section 11.6 (d); and,

d) Termination of Members pursuant to Section 11.7 (c).

Section 7.8 – Super Majority Plus Vote Requirement.

Items that require a Super Majority Plus Vote include the following unless otherwise required by law:

a) Decisions to impose fees not requiring a vote of the electorate or property owners;

b) Proposals to submit to the electorate or property owners (as required by law) decisions to impose fees or taxes; and

c) Limitations on well extractions (pumping limits).

Section 7.9 – Conflict Of Interest Code.

At the initial meeting of Board, the Board shall begin the process for adoption and filing of a Conflict of Interest Code pursuant to the provisions of the Political Reform Act of 1974 (Government Code section 81000 et seq.).

Article VIII: Board Committees

Section 8.1 – Committees Of The Board.

a) Board Committees.

The Board may from time-to-time establish one or more standing or ad hoc committees consisting of Directors to assist in carrying out the purposes and objects of the Agency, including but not limited to a Budget and Finance Committee, Planning Committee, and an Executive Committee. The Board shall determine the purpose and need for such committees. Meetings of standing committees shall be subject to the requirements of the Brown Act.

b) Advisory Committee.

The Board shall establish an advisory committee consisting of Directors and non-Directors. The advisory committee shall be designed to ensure participation by and input to the Board of those constituencies set forth in Water Code section 10723.2 whose interests are not directly represented on the Board. The Board shall determine the number and qualifications of committee members.

Article IX: Operations And Management

Section 9.1 – Initial Administrative And Legal Services.

One or more of the Members shall provide initial administrative, legal and other support services to the Agency at no charge until the appointment of the Permanent Board as provided in Section 6.3, above. The Members shall collectively determine which of the Members shall provide such services.

Section 9.2 – Contracting Administrative And Legal Services.

The Agency may engage one or more Members to provide administrative or legal services following the conclusion of the initial administrative and legal services described in Section 9.1 of this Agreement, on terms and conditions acceptable to the Board. Any Member so engaged shall have such responsibilities as are set forth in the contract for such Member's services.

Section 9.3 – Executive Director.

The Agency may appoint an Executive Director from time-to-time under terms and conditions to be determined by the Board. The Executive Director shall report to and serve at the pleasure of the Board. The Executive Director shall be responsible for the general administration of the Agency, the preparation and implementation of a GSP, and such other duties as may be determined by the Board. If the Board has contracted for administrative services as described in Section 9.2, above, and appoints an Executive Director, the Executive Director shall be responsible for the oversight and control of such contracted administrative services pursuant to the policies and directives established by the Board.

Section 9.4 – Legal Counsel And Other Officers.

a) General Counsel

The Agency may appoint a General Counsel from time-to-time under terms and conditions to be determined by the Board. The General Counsel shall report to and serve at the pleasure of the Board. The General Counsel shall be responsible for the general oversight of the Agency's legal affairs, including litigation. The Board may contract with other counsel for specialized legal services under the supervision of the General Counsel.

b) Treasurer and Auditor

The City of Salinas shall serve as the initial Treasurer and Auditor for the Agency upon its formation, and shall discharge the duties set forth in Sections 6505 and 6505.5 of the Act. Subsequent to formation of the Agency, the Board may appoint a separate Treasurer or separate Auditor pursuant to Section 6505.6 of the Act, and those officers shall discharge the duties set forth in Sections 6505 and 6505.5 of the Act, respectively. The Board may change such Auditor or Treasurer from time-to-time provided such chance is consistent with the Act.

c) Custodian of Property

The Public Works Director of the City of Salinas ("PW Director") shall serve as the initial Custodian of the Agency's Property as set forth in Section 6505.1 of the Act upon the Agency's formation. The PW Director shall file an official bond as described in Government Code section 1450 et seq. in the amount of $50,000, the premium of which shall be paid by the Agency. Subsequent to the formation of the Agency, the Board may designate a different Custodian provided such Custodian files an official bond in an amount required by the Board.

b) Other Officers

Subject to the limits of the Agency's approved budget, the Board may establish other officer positions and appoint and contract for the services of such other officers as it may deem necessary or convenient for the business of the Agency, all of whom shall serve at the pleasure of the Board.

Section 9.5 – Employees.

Subject to the limits of the Agency's approved budget, the Agency may hire employees to discharge the duties and responsibilities of the Agency, subject to the general oversight and control of the Executive Director.

Section 9.6 – Independent Contractors.

Subject to the limits of the Agency's approved budget, the Board may contract for the services of such consultants, advisers and independent contractors as it may deem necessary or convenient for the business of the Agency.

Article X: Financial Provisions

Section 10.1 – Fiscal Year.

The Fiscal Year of the Agency shall be July 1 – June 30.

Section 10.2 – Establishment Of Funds.

The Board shall establish and maintain such funds and accounts as may be required by generally accepted government accounting practices. The Agency shall maintain strict accountability of all funds and report all receipts and disbursements of the Agency on no less than a quarterly basis.

Section 10.3 – Budgets.

a) Initial Budgets

The initial budget of the Agency for the Fiscal Year ending June 30, 2017, shall not exceed $50,000. The budgets of the Agency for Fiscal Years 2017 – 2018 and 2018 – 2019 shall not exceed $1,100,000 each unless otherwise agreed to by the unanimous vote of the Members as described in Section 10.4, below.

b) Regular Budgets

Beginning for Fiscal Year 2019 – 2020, no later than sixty (60) days prior to the end of each Fiscal Year, the Board shall adopt a budget for the Agency for the ensuing Fiscal Year. The Board may authorize mid-year budget adjustments, as needed by Super Majority Vote.

Section 10.4 – Initial Contributions.

a) Fiscal Years 2017 – 2018 and 2018 - 2019

In order to provide the necessary capital to initially fund the Agency during Fiscal Year 2017 - 2018, the Members identified below shall each provide the listed Initial Contribution to the Agency's Treasurer/Auditor no later than July 7, 2017:

1) County:	$670,000
2) WRA:	$ 20,000
3) City of Salinas:	$330,000
4) City of Gonzales:	$ 20,000
5) City of Soledad:	$ 35,000
6) City of Greenfield:	$ 35,000
7) City of King:	$ 30,000
8) Castroville CSD	$ 20,000

In order to provide the necessary capital to fund the Agency during Fiscal Year 2018 – 2019, the Members identified below shall each provide the listed Initial Contribution to the Agency's Treasurer/Auditor no later than July 6, 2018:

1) County:	$670,000
2) WRA:	$ 20,000
3) City of Salinas:	$330,000
4) City of Gonzales:	$ 20,000
5) City of Soledad:	$ 35,000
6) City of Greenfield:	$ 35,000
7) City of King:	$ 30,000
8) Castroville CSD	$ 20,000

b) Additional Initial Contributions

New Members not listed above executing this Agreement no later than the Determination Date shall pay a minimum Initial Contribution of twenty thousand dollars ($20,000) per year for the two fiscal years. New Members not listed above executing this Agreement after the

Determination Date shall pay a minimum Initial Contribution of fifty thousand dollars ($50,000) per year for the two fiscal years.

Should the Board determine that additional funding for each of Fiscal Years 2017 – 2018 and 2018 – 2019 is necessary for Agency operations the Board shall adopt a resolution requesting each of the Members to consider additional funding and demonstrating in detail 1) the need for the funding, and 2) the purposes for which the additional funding will be utilized. Such requested funding shall be in the same proportion as the Initial Contributions set forth in Section 10.4 (a) unless the Members unanimously agree otherwise.

Upon receipt of the resolution requesting additional funding representatives of the Members may meet and confer regarding the request; however, each Member shall consider and act upon the request no later than 30 (thirty) days following the adoption of the resolution by the Board.

c) Reimbursement of Initial Contributions

To the extent the Agency is able to secure other funding sources, and to the extent permitted by law, the Agency shall reimburse these Initial Contributions to the Members on a proportionate basis in relation to their cumulative Initial Contributions to the Agency.

Section 10.5 – Payments To The Agency.

All costs and expenses of the Agency may be funded from: (i) voluntary contributions from third parties; (ii) grants; (iii) contributions from Members from time to time to supplement financing of the activities of the Agency; (iv) advances or loans from the Members or other sources; (v) bond revenue; and, (vi) taxes, assessments, fees and/or charges levied by the Agency under the provisions of SGMA or as otherwise authorized by law.

Section 10.6 – Directors' Stipends and Expenses.

Directors shall be eligible to receive a stipend in the amount of $ 100 for each Board meeting actually attended plus mileage to and from Board meetings. In addition, Directors shall be reimbursed for the actual and necessary expenses incurred in the discharge of their duties pursuant to an adopted Board policy. Directors are not required to accept the stipend or mileage, or expenses, and may decline the same by written notice to the Board.

Article XI: Relationship Of Agency And Its Members

Section 11.1 – Separate Entity.

In accordance with Sections 6506 and 6507 of the Act, the Agency shall be a public entity separate and apart from the Members.

Section 11.2 – Liabilities.

In accordance with Section 6507 of the Act, the debt, liabilities and obligations of the Agency shall be the debts, liabilities and obligations of the Agency alone and not of its Members. The Members do not intend hereby to be obligated either jointly or severally for the debts, liabilities or obligations of the Agency, except as may be specifically provided for in California Government Code Section 895.2 as amended or supplemented.

Section 11.3 – Insurance.

The Agency shall procure appropriate policies of insurance providing coverage to the Agency and its Directors, officers and employees for general liability, errors and omissions, property, workers compensation, and any other coverage the Board deems appropriate. Such policies shall name the Members, their officers and employees as additional insureds.

Section 11.4 – Indemnity.

Funds of the Agency may be used to defend, indemnify, and hold harmless the Agency, each Member, each Director, and any officers, agents and employees of the Agency for their actions taken within the course and scope of their duties while acting on behalf of the Agency. To the fullest extent permitted by law, the Agency agrees to save, indemnify, defend and hold harmless each Member from any liability, claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, including attorney's fees and costs, court costs, interest, defense costs, and expert witness fees, where the same arise out of, or are attributable in whole or in part, to negligent acts or omissions of the Agency or its employees, officers or agents or the employees, officers or agents of any Member, while acting within the course and scope of an Member relationship with the Agency. Notwithstanding the foregoing, the sole negligence, gross negligence, or intentional acts of any Member is exempted from this Section 11.3 - Indemnity.

Section 11.5 – Agreements With Members

The Agency intends to carry out activities in furtherance of its purposes consistent with the powers established by this Agreement and with the participation of all Members. Notwithstanding the foregoing, the Board shall have the authority to approve any agreements with one or more Members in order to further the purposes of the Agency, including, but not limited to, the commencement of a condemnation action within the jurisdictional boundary of the agreeing Member or Members.

Section 11.6 – Withdrawal Of Members.

a) Any Member shall the have the ability to withdraw by providing ninety (90) days written notice of its intention to withdraw. Said notice shall be given to the Board and to each of the other Members. If such Member is an Appointing Authority, the Member's withdrawal shall not be effective unless and until the non-withdrawing Members agree to an amendment to this

Agreement providing for the composition of and appointment to the Board.

b) A Member shall not be fiscally liable for any contribution to an adopted budget provided that the Member provides written notice ninety (90) days prior to the adoption of the budget of its intention to withdraw.

c) In the event of a withdrawal, this Agreement shall continue in full force and effect among the remaining members as set forth in Section 11.8, below.

d) Notwithstanding the foregoing, Members shall not have the ability to withdraw if there is outstanding bonded debt or other long term liability of the Agency unless and until it is determined by the Board by Super Majority Vote that the withdrawal of the Member shall not adversely affect the ability of the Agency to perform its financial obligations pursuant to the bonded debt or other liability. The Board shall communicate its finding to the non-withdrawing Members who may approve the withdrawal by unanimous vote.

Section 11.7 – Termination Of Members.

a) As an alternative to pursuing litigation against a Member for failure to meet its funding obligations set forth in this Agreement or as may be adopted by the Board from time to time, the Board may vote to terminate such Member. The Board shall transmit its determination to the Members who may approve the termination by unanimous vote of the Members not proposed to be terminated. If such Member is an Appointing Authority, the Member's termination shall not be effective unless and until the non-terminated Members agree to an amendment to this Agreement providing for the composition of and appointment to the Board.

b) In the event of a termination, this Agreement shall continue in full force and effect among the remaining members as set forth in Section 11.8, below.

c) Notwithstanding the foregoing, Members may not be terminated if there is outstanding bonded debt or other long term liability of the Agency unless and until it is determined by the Board by Super Majority Vote that the termination of the Member shall not adversely affect the ability of the Agency to perform its financial obligations pursuant to the bonded debt or other liability. The Board shall communicate its finding to the Members who may approve the termination by unanimous vote of the Members not proposed to be terminated.

Section 11.8 – Continuing Obligations: Withdrawal Or Termination.

a) Provided that at least two Members remain, the withdrawal or termination of one or more Members shall not terminate this Agreement or result in the dissolution of the Agency; this Agreement shall remain in full force and effect among the remaining Members; and the Agency shall remain in operation.

b) Except as provided in Section 11.6 (b), any withdrawal or termination of a Member shall not relieve the Member of its financial obligations under this Agreement in effect prior to the effective date of the withdrawal or termination.

Section 11.9 – Disposition Of Money Or Property Upon Board Determination Of Surplus.

Upon determination by the Board that any surplus money is on hand, such surplus money shall be returned to the then existing Members in proportion to their cumulative contributions to the Agency, or such surplus money may be deposited in a Board designated reserve account. Upon determination by the Board that any surplus properties, works, rights and interests of the Agency are on hand, the Board shall first offer any such surplus for sale to the Members and such sale shall be based on highest bid received. If no such sale is consummated, the Board shall offer the surplus properties, works, rights and interests of the Agency for sale in accordance with applicable law to any governmental agency, private entity or persons for good and adequate consideration.

Section 11.10 – Termination And Dissolution.

a) Mutual Consent

i) Except as otherwise provided in this Section 11.10 (a), this Agreement may be terminated and the Agency dissolved at any time upon the unanimous approval of the Members provided that provision has been made by the Members for the payment, refunding, retirement, or other disposition of any bonded debt or other long term liability in the name of the Agency.

ii) Upon Dissolution of the Agency, each then existing Member shall receive a proportionate share, based upon the cumulative contributions of all then remaining Members, of any remaining assets after all Agency liabilities and obligations have been paid in full. The distribution of remaining assets may be made "in kind" or assets may be sold and the proceeds thereof distributed to the Members. The Agency shall remain in existence for such time as is required to determine such distribution, and the Board, or other person or entity appointed by the Members, shall be responsible for its determination. Such distribution shall occur within a reasonable time after a decision to terminate this Agreement and dissolve the Agency has been approved by the Members. No former Member that previously withdrew or was terminated as of the effective date of the decision to terminate this Agreement and dissolve the Agency shall be entitled to a distribution upon dissolution.

b) Insufficient Members

Subject to the provisions of Sections 11.6 and 11.7, should Members either be terminated or withdraw such that only one Member remains, this Agreement shall terminate and the Agency dissolved. In such event the last remaining Member shall be entitled to all assets of the Agency.

c) Failure to be Financially Sustainable

In the event that the Agency does not take the necessary actions to create a sustainable revenue stream necessary to fully finance its operating budget by the end of Fiscal Year 2018 – 2019 this Agreement shall terminate and the Agency shall be dissolved, unless otherwise agreed to by amendment to this Agreement approved unanimously by all then-existing Members. In the event of such termination and dissolution, the process of dissolution shall begin on July 1, 2019, and proceed as set forth in Section 11.10 (a) (ii), above.

d) Legislative Determination

Should the State adopt legislation specifying that the Basin should be managed by a statutorily designated entity this Agreement shall terminate and the Agency shall be dissolved upon such terms and conditions as the legislation may designate. Upon such dissolution, the assets and liabilities of the Agency shall be disposed of in the manner specified by the legislation. If the legislation does not so specify, the assets and liabilities of the Agency shall be disposed of in the manner provided in Section 11.10 (a), above.

Article XII: Miscellaneous Provisions

Section 12.1 – Complete Agreement.

The foregoing constitutes the full and complete Agreement of the Members. This Agreement supersedes all prior agreements and understandings, whether in writing or oral, related to the subject matter of this Agreement that are not set forth in writing herein.

Section 12.2 – Amendment.

This Agreement may be amended from time-to-time by the unanimous consent of the Members, acting through their governing bodies. Such amendments shall be in the form of a writing signed by each Member.

Section 12.3 – Successors And Assigns.

The rights and duties of the Members may not be assigned or delegated without the written consent of all other Members. Any attempt to assign or delegate such rights or duties in contravention of this Agreement shall be null and void. Any assignment or delegation permitted under the terms of this Agreement shall be consistent with the terms of any contracts, resolutions or indentures of the Agency then in effect.

This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the Members hereto. This section does not prohibit a Member from entering into an independent agreement with another person, entity, or agency regarding the financing of that Member's contributions to the Agency or the disposition of proceeds, which that Member receives under this Agreement so long as such independent agreement does not affect, or purport to affect, the rights and duties of the Agency or the Members under this Agreement.

Section 12.4 – Dispute Resolution.

In the event there are disputes and/or controversies relating to the interpretation, construction, performance, termination, breach of, or withdrawal from this Agreement, the Members involved shall in good faith meet and confer within twenty-one (21) calendar days after written notice has been sent to all the Members. In the event that the Members involved in the dispute ("Disputing Members") are not able to resolve the dispute through informal negotiation, the Disputing Members agree to submit such dispute to formal mediation before litigation. If Disputing Members cannot agree upon the identity of a mediator within ten (10) business days after a Disputing Member requests mediation, then the non-Disputing Members shall select a mediator to mediate the dispute. The Disputing Members shall share equally in the cost of the mediator who ultimately mediates the dispute, but neither of the Disputing Members shall be entitled to collect or be reimbursed for other related costs, including but not limited to attorneys' fees. If mediation proves unsuccessful and litigation of any dispute occurs, the prevailing Member shall be entitled to reasonable attorneys' fees, costs and expenses in addition to any other relief to which the Member may be entitled. If a Disputing Members refuses to participate in mediation prior to commencing litigation, that Member shall have waived its right to attorneys' fees and costs as the prevailing party.

Section 12.5 – Execution In Parts Or Counterparts.

This Agreement may be executed in parts or counterparts, each part or counterpart being an exact duplicate of all other parts or counterparts, and all parts or counterparts shall be considered as constituting one complete original and may be attached together when executed by the Members hereto. Facsimile or electronic signatures shall be binding.

Section 12.6 – Member Authorization.

The governing bodies of the Members have each authorized execution of this Agreement, as evidenced by their respective signatures below.

Section 12.7 – No Predetermination Or Irrevocable Commitment of Resources.

Nothing herein shall constitute a determination by the Agency or any Members that any action shall be undertaken or that any unconditional or irrevocable commitment of resources shall be made, until such time as the required compliance with all local, state, or federal laws, including without limitation the California Environmental Quality Act, National Environmental Policy Act, or permit requirements, as applicable, have been completed.

Section 12.8 – Notices.

Notices authorized or required to be given pursuant to this Agreement shall be in writing and shall be deemed to have been given when mailed, postage prepaid, or delivered during working hours to the addresses set forth for each of the Members hereto on Exhibit "A" of this Agreement, or to such other changed addresses communicated to the Agency and the Members in writing.

Section 12.9 – Severability And Validity Of Agreement.

Should the participation of any Member, or any part, term or provision of this Agreement, be decided by the courts or the legislature to be illegal, in excess of that Member's authority, in conflict with any law of the State, or otherwise rendered unenforceable or ineffectual, the validity of the remaining portions, terms or provisions of this Agreement shall not be affected thereby and each Member hereby agrees it would have entered into this Agreement upon the same remaining terms as provided herein.

Section 12.10 – Singular Includes Plural.

Whenever used in this Agreement, the singular form of any term includes the plural form and the plural form includes the singular form.

IN WITNESS WHEREOF, the Members hereto, pursuant to resolutions duly and regularly adopted by their respective governing boards, have caused their names to be affixed by their proper and respective officers as of the day and year so indicated.

COUNTY OF MONTEREY

By Jane B Parker

Chair of the Board of Supervisors

Dated: 12-22-16

APPROVED AS TO FORM

CHARLES J. MCKEE, County Counsel

By

LESLIE J. GIRARD

WATER RESOURCES AGENCY OF THE COUNTY OF MONTEREY

By

Chair ~~of the~~ Board of Supervisors of the Water Resources Agency

Dated: 1-31-2017

APPROVED AS TO FORM

CHARLES J. MCKEE, County Counsel

By

CITY OF SALINAS

By____________________

Mayor

Dated: ____________________

Section 12.10 – Singular Includes Plural.

Whenever used in this Agreement, the singular form of any term includes the plural form and the plural form includes the singular form.

IN WITNESS WHEREOF, the Members hereto, pursuant to resolutions duly and regularly adopted by their respective governing boards, have caused their names to be affixed by their proper and respective officers as of the day and year so indicated.

COUNTY OF MONTEREY

By____________________________________
Chair of the Board of Supervisors

Dated: ____________________________

APPROVED AS TO FORM

CHARLES J. MCKEE, County Counsel

By____________________________________

WATER RESOURCES AGENCY OF THE COUNTY OF MONTEREY

By____________________________________
Chair of the Board of Supervisors of the Water Resources Agency

Dated: ____________________________

APPROVED AS TO FORM

CHARLES J. MCKEE, County Counsel

By____________________________________

CITY OF SALINAS

By____________________________________
Mayor

Dated: 12-20-16

APPROVED AS TO FORM

CHRISTOPHER CALLIHAN, City Attorney

By Chris J. Call

CITY OF SOLEDAD

By____________________________________
Mayor

Dated: ___________________________

APPROVED AS TO FORM

___________________, City Attorney

By____________________________________

CITY OF GONZALES

By____________________________________
Mayor

Dated: ___________________________

APPROVED AS TO FORM

___________________, City Attorney

By____________________________________

CITY OF GREENFIELD

By____________________________________
Mayor

Dated: ___________________________

APPROVED AS TO FORM

CHRISTOPHER CALLIHAN, City Attorney

By_______________________________

CITY OF SOLEDAD

By_______________________________
Mayor

Dated: 03/03/17

APPROVED AS TO FORM

Michael Rodriquez, City Attorney

By_______________________________

CITY OF GONZALES

By_______________________________
Mayor

Dated: ____________________

APPROVED AS TO FORM

____________________, City Attorney

By_______________________________

CITY OF GREENFIELD

By_______________________________
Mayor

Dated: ____________________

CITY OF GONZALES

By Maria Orozco
Maria Orozco, Mayor

Dated: 2/21/17

APPROVED AS TO FORM

By
Michael F. Rodriquez, City Attorney

Dated: 2-21-2017

APPROVED AS TO FORM

__________________, City Attorney

By______________________________

CITY OF KING

By______________________________
Mayor

Dated: 3-24-2017

APPROVED AS TO FORM

__________________, City Attorney

By 3-24-2017

CASTROVILLE COMMUNITY SERVICES

By______________________________
Chair of the Board of Directors

APPROVED AS TO FORM

__________________, District Counsel

MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

By______________________________
Chair of the Board of Directors

APPROVED AS TO FORM

__________________, Agency Counsel

APPROVED AS TO FORM

_______________, City Attorney

By_______________________________

CITY OF KING

By_______________________________
Mayor

Dated: ______________________

APPROVED AS TO FORM

_______________, City Attorney

By_______________________________

CASTROVILLE COMMUNITY SERVICES

By_______________________________
Chair of the Board of Directors

APPROVED AS TO FORM

District Counsel

APPROVED AS TO FORM

____________________, City Attorney

By______________________________________

CITY OF KING

By______________________________________
Mayor

Dated: ______________________________

APPROVED AS TO FORM

____________________, City Attorney

By______________________________________

CASTROVILLE COMMUNITY SERVICES

By______________________________________
Chair of the Board of Directors

APPROVED AS TO FORM

____________________, District Counsel

MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

By Gloria De La Rosa
Chair of the Board of Directors

APPROVED AS TO FORM

Robert R. Wellington, Agency Counsel

EXHIBIT A

MEMBERS

COUNTY OF MONTEREY
County Administrative Officer
168 W. Alisal St., Salinas, CA 93901

WATER RESOURCES AGENCY OF MONTEREY COUNTY
General Manager

CITY OF SALINAS
City Manager

CITY OF SOLEDAD
City Manager

CITY OF GONZALES
City Manager

CITY OF GREENFIELD
City Manager

CITY OF KING (KING CITY)
City Manager

CASTROVILLE COMMUNITY SERVICES DISTRICT
General Manager

EXHIBIT B

BOARD OF DIRECTORS

	Director	Representing	Specific Qualifications	Appointing Authority
a)	City of Salinas.	City of Salinas.	To be determined by the Appointing Authority.	Salinas City Council.
b)	South County Cities.	Cities of Gonzales, Soledad, Greenfield, and King City.	To be determined by the Appointing Authority.	Appropriate City Council as recommended by the City Selection sub-Committee.
c)	Other GSA Eligible Entity.	GSA Eligible Entities but not including the cities of Salinas, Gonzales, Soledad, Greenfield or King City.	Must be a representative of a GSA Eligible Entity but not including the cities of Salinas, Gonzales, Soledad, Greenfield or King City.	Monterey County Board of Supervisors.
d)	Disadvantaged Community, or Public Water System, including Mutual Water Companies serving residential customers.	Unincorporated Disadvantaged Communities, or Public Water Systems, including Mutual Water Companies serving residential customers only.	Must be a resident of a Disadvantaged Community in the unincorporated area, or a representative Public Water System, including Mutual Water Companies serving residential customers only.	Castroville Community Services District.
e)	CPUC Regulated Water Company.	CPUC Regulated Water Companies in the Basin.	Must be a representative of a CPUC Regulated Water	Salinas City Council.

			Company.	
f)	Agriculture.	Agricultural interests.	Must be an individual that is: 1) engaged in, and derives the majority of his or her gross income or revenue from, commercial agricultural production or operations; or 2) designated by an entity this is engaged in commercial agricultural production or operations, and the individual derives the majority of his or her gross income or revenue from agricultural production or operations, including as an owner, lessor, lessee, manager, officer, or substantial shareholder of a corporate entity.	Monterey County Board of Supervisors.
g)	Agriculture.	Agricultural interests.	Same as (f).	Monterey County Board of Supervisors.
h)	Agriculture.	Agricultural interests.	Same as (f).	Monterey County Board of Supervisors.
i)	Agriculture.	Agricultural interests.	Same as (f).	Monterey County Board of Supervisors.
j)	Environment.	Environmental users and interests.	Must be a representative of an	Monterey County

			established environmental organization that has a presence or is otherwise active in the Basin.	Board of Supervisors.
k)	Public Member.	Interests not otherwise represented on the Board.	A rural residential well owner; an industrial processor; a Local Small or State Small Water System; or other mutual water company.	Monterey County Board of Supervisors.

EXHIBIT C

OTHER GSA ELIGIBLE ENTITY DIRECTOR POSITION NOMINATING GROUP

COUNTY OF MONTEREY

WATER RESOURCES AGENCY OF MONTEREY COUNTY

MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

EXHIBIT D

DISADVANTAGED COMMUNITY, OR PUBLIC WATER SYSTEM, INCLUDING MUTUAL WATER COMPANIES SERVING RESIDENTIAL CUSTOMERS DIRECTOR POSITION NOMINATING GROUP

CASTROVILLE COMMUNITY SERVICES DISTRICT (Group Contact)
Eric Tynan, General Manager
11499 Geil St.
Castroville, CA 95012
(831) 633-2560 phone
(831) 633-3102 fax
info@castrovillecsd.org

ENVIRONMENTAL JUSTICE COALITION FOR WATER

SAN JERARDO COOPERATIVE

SAN ARDO WATER DISTRICT

SAN VICENTE MUTUAL WATER COMPANY

EXHIBIT E

CPUC REGULATED WATER COMPANY DIRECTOR POSITION NOMINATING GROUP

ALISAL WATER CORPORATION DBA ALCO WATER SERVICE (Group Contact)
Thomas R. Adcock, President
249 Williams Road
Salinas, CA 93905
831-424-0441 phone
831-424-0611 fax
tom@alcowater.com

CALIFORNIA WATER SERVICE COMPANY

EXHIBIT F

ENVIRONMENT DIRECTOR POSITION NOMINATING GROUP

SUSTAINABLE MONTEREY COUNTY

LEAGUE OF WOMEN VOTERS OF MONTEREY COUNTY

LANDWATCH MONTEREY COUNTY

FRIENDS AND NEIGHBORS OF ELKHORN SLOUGH

CALIFORNIA NATIVE PLANT SOCIETY, MONTEREY CHAPTER

TROUT UNLIMITED

SURFRIDERS

THE NATURE CONSERVANCY

CARMEL RIVER STEELHEAD ASSOCIATION

This space is reserved for the County Clerk's Filing Stamp

MONTEREY HERALD

Published by The Monterey Herald
P.O. Box 271 • Monterey, California 93942
(831) 726.4382

MONTEREY COUNTY
Account No. 3774937
MAIS CARROLL COMMUNICATIONS COORDINATOR
168 W. ALISAL ST
SALINAS, CA 93901

Legal No. 0005925831
Notice of Public Hearing

Ordered by:

PROOF OF PUBLICATION

STATE OF CALIFORNIA
County of Monterey

I am a citizen of the United States and a resident of the County aforesaid. I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of The Monterey Herald, a newspaper of general circulation, printed and published daily and Sunday in the City of Monterey, County of Monterey, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Monterey, State of California; that the notice, of which the annexed is a printed copy (set in type not smaller than 6 point), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

03/29/17, 04/05/17

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Executed on 04/05/2017 at Monterey, California.

Danielle Landaker

Signature

NOTICE OF PUBLIC HEARING TO CONSIDER FORMATION OF A GROUNDWATER SUSTAINABILITY AGENCY

Salinas Valley Basin Groundwater Sustainability Agency

Notice is hereby given that the Salinas Valley Basin Groundwater Sustainability Agency ("SVBGSA") will hold a public hearing regarding the adoption of a Resolution of Intent to form a Groundwater Sustainability Agency as set forth in the Sustainable Groundwater Management Act, Part 2.74 of Division 6 of the California Water Code (commencing with Section 10720). The boundaries of the proposed GSA are the boundaries of the Salinas Valley Groundwater Basin (Basin no. 3-004), as described in California Department of Water Resources Bulletin 118 (2016 update). The public hearing is for the purpose of reviewing and providing explanation of the proposal, and allowing public input on the formation of the proposed GSA.
The public hearing will be held on the following date and time, and at the following location:

Thursday, April 13, 2017
4 p.m.
City of Salinas City Council Chambers (Rotunda)
200 Lincoln Avenue, Salinas, CA 93901

Disability-related modification or accommodation, including auxiliary aids or services, may be requested by any person with a disability who requires a modification or accommodation in order to participate in the meeting. Requests should be referred to the city clerk's office at 200 Lincoln Avenue, Salinas, 758-7381, as soon as possible but by no later than 5 p.m. of the last business day prior to the meeting. Hearing impaired or tty/tdd text telephone users may contact the city by dialing 711 for the California Relay Service (CRS) or by telephoning any other service providers' CRS telephone number.

Publish: March 29; April 5 2017

PROOF OF PUBLICATION

STATE OF CALIFORNIA
County of Monterey

This space is for the county clerk's filing stamp

No:

I am a citizen of the United States and a Resident of the County aforesaid: I am Over the age of eighteen years and not a Party to or interested in the above-Entitled matter. I am the principal clerk of the printer of <u>The King City Rustler, Greenfield News, Soledad Bee, and Gonzales Tribune</u> newspapers of general Circulation by The Superior Court of the County of Monterey, State of California: that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspapers and not in any supplement thereof on the following dates, to wit:

3/29 , 4/05/2017

I certify (or declare) under penalty of perjury that the forgoing is true and correct.

Executed on: 4/05/2017

At King City, California

O. Johnson

CHELSEA JOHNSON, OFFICE ASSISTANT

IN THE SUPERIOR COURT of the STATE OF CALIFORNIA
in and for the County of Santa Cruz

CERTIFICATE OF PUBLICATION

Ad No.: 13806

STATE OF CALIFORNIA
COUNTY OF SANTA CRUZ } ss

I, **Alanna Anderson,**
hereby certify that the **Watsonville Register Pajaronian**, a newspaper of general circulation, within the provisions of the government code of the State of California, printed and published in the City of Watsonville, County of Santa Cruz, State of California; that I am the principal clerk of the printer of said newspaper; that the

Legal Notice: NOTICE OF PUBLIC HEARING TO CONSIDER FORMATION OF A GROUNDWATER SUSTAINABILITY AGENCY

of which the annexed clipping is a true printed copy was published in said newspaper on the following dates, to wit:

March 30, 2017
April 6, 2017

I certify under penalty of perjury that the foregoing is true and correct, at Watsonville, California, on the

April 6, 2017

Alanna Anderson

Alanna Anderson, Legal Clerk

[redacted]

"Proof of Publication must be filed with the County Clerk's Office within 30 days of the last publication date, pursuant to Civil Code Section 2466."

Before the Board of Directors of the
Salinas Valley Basin Groundwater Sustainability Agency

Resolution No. 2017-003
Resolution authorizing the Submission to the)
state Department of Water Resources a Notice)
of Intent to form a Groundwater Sustainability)
Agency for the Salinas Valley Groundwater)
Basin)

WHEREAS, in the fall of 2014 the California legislature adopted, and the Governor signed into law, three bills (SB 1168, AB 1739, and SB 1319) collectively referred to as the "Sustainable Groundwater Management Act" ("SGMA"), that initially became effective on January 1, 2015, and that has been amended from time-to-time thereafter; and,

WHEREAS, the stated purpose of SGMA, as set forth in California Water Code section 10720.1, is to provide for the sustainable management of groundwater basins at a local level by providing local groundwater agencies with the authority, and technical and financial assistance necessary, to sustainably manage groundwater; and,

WHEREAS, SGMA requires the designation of Groundwater Sustainability Agencies ("GSAs") for the purpose of achieving groundwater sustainability through the adoption and implementation of Groundwater Sustainability Plans ("GSPs") or an alternative plan for all medium and high priority basins as designated by the California Department of Water Resources ("DWR"); and,

WHEREAS, SGMA requires that a basin have a designated GSA by no later than June 30, 2017, and an adopted GSP by no later than January 31, 2020, if a high or medium priority basin in critical overdraft, and no later than January 31, 2022, if a high or medium priority basin; and,

WHEREAS, SGMA authorizes a combination of local agencies to form a GSA by entering into a joint powers agreement as authorized by the Joint Exercise of Powers Act (Chapter 5 of Division 7 of Title 1 of the California Government Code) ("Act"); and,

WHEREAS, the Salinas Valley Basin Groundwater Sustainability Agency ("Agency") is such a joint powers authority and formed effective December 22, 2016, for the purpose of being the GSA for the Salinas Valley Groundwater Basin ("Basin"); and,

WHEREAS, notice of a public hearing was published as required by SGMA and Government Code section 6066 in the Monterey Herald on March 29 and April 5, 2017; and,

WHEREAS, the Agency opened the required public hearing on April 13, 2017, and continued the hearing to April 20, 2017; and,

WHEREAS, the Agency conducted the public hearing on April 20, 2017; and

WHEREAS, the County of Monterey submitted a notice of intent to be the GSA for the Monterey sub-basin of the Basin, and has been declared by the State Water Resources Control Board to be the exclusive GSA for that sub-basin effective April 4, 2017; and

WHEREAS, it was the express intent of the County that the GSA responsibilities for the Monterey sub-basin be transferred or assumed by the Agency; and

WHEREAS, the Agency is committed to the sustainable management of groundwater within the Basin, and all of its sub-basins and aquifers; and,

WHEREAS, it would be in the best interests of the residents, businesses, interested parties and stakeholders in the Basin for the Agency to be designated the exclusive GSA for the Basin (but not including the area within the jurisdictional boundaries of the Marina Coast Water District, the City of Greenfield, or the adjudicated Seaside sub-basin); NOW, THEREFORE,

BE IT RESOLVED, by the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency as follows:

1. The above recitals are true and correct.

2. The Agency hereby elects to be the Groundwater Sustainability Agency for the Salinas Valley Groundwater Basin within the County of Monterey, but not including the area within the jurisdictional boundaries of the Marina Coast Water District and the City of Greenfield, or the adjudicated Seaside sub-basin.

3. Staff is authorized and directed to submit to the Department of Water Resources a Notice of Intent to be a Groundwater Sustainability Agency in form and substance substantially similar to Attachment A, attached hereto, together with any modifications as may have been directed by the Board of Directors at the public hearing.

4. Staff is authorized and directed to take such other and further actions as may be necessary or appropriate to implement the intent and purposes of this Resolution.

PASSED AND ADOPTED on this 20th day of April, 2017, by the following vote, to-wit:

AYES: Board Members: Alejo, Calcagno, Granillo, McHatten, Pereira, Secondo, and Chair Gunter

NOES: Board Members: LeNeve, Moitoso (Alternate), McIntyre, and Stefani

ABSENT: None

I, Patricia M. Barajas, Salinas City Clerk and Interim Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, hereby certify that the foregoing is the true original resolution of said Board of Directors duly adopted and entered in the minutes thereof for the meeting on April 20, 2017.

Dated: April 21, 2017

MONTEREY HERALD

Published by The Monterey Herald
P.O. Box 271 • Monterey, California 93942
(831) 726.4382

This space is reserved for the County Clerk's Filing Stamp

MARINA COAST WATER DISTRICT
Account No. 2141283
11 RESERVATION RD
MARINA, CA 93933

Legal No. 0005797267
Notice of Public hearing

Ordered by:

PROOF OF PUBLICATION

STATE OF CALIFORNIA
County of Monterey

I am a citizen of the United States and a resident of the County aforesaid. I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of The Monterey Herald, a newspaper of general circulation, printed and published daily and Sunday in the City of Monterey, County of Monterey, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Monterey, State of California; that the notice, of which the annexed is a printed copy (set in type not smaller than 6 point), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

08/19/16, 08/26/16

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Executed on 08/26/2016 at Monterey, California.

Danielle Landaker

Signature

NOTICE OF PUBLIC HEARING
Marina Coast Water District

Notice is hereby given that Marina Coast Water District (MCWD) will hold a public hearing regarding the adoption of a Resolution of Intention to form one or two Groundwater Sustainability Agencies (GSAs) as outlined in the California Water Code, Part 2.74, Sustainable Groundwater Management Act, Section 10723. The proposed GSA boundaries would encompass all of MCWD's water service areas within the Seaside Area Subbasin and the Corral de Tierra Subbasin of the Salinas Valley Groundwater Basin, excluding that portion of MCWD's service area within the Adjudicated Seaside Groundwater Basin. If the non-adjudicated portions of the Seaside Area Subbasin and of the Corral de Tierra Subbasin remain separate subbasins, then the formation of two GSAs will need to be considered. The public hearing is intended to review, provide explanation of, and allow for public input on the formation of one or two GSAs by MCWD within the proposed boundaries.

The public hearing for the proposed formation of one or two GSAs shall be held at the following
date, time, and place:
Tuesday, September 6, 2016, at 7:00 pm
Marina City Council Chambers,
211 Hillcrest Avenue, Marina, CA 93933

If you need special assistance to participate in this public hearing, please contact MCWD at (831) 384-6131. Notification 48 hours prior to the hearing will enable the District to make reasonable arrangements to ensure accessibility to this public hearing. [28 CFR 35.102-35.104 ADA Title II]

FOR ADDITIONAL INFORMATION CONTACT:
Keith Van Der Maaten, General Manager
Marina Coast Water District
11 Reservation Road, Marina, CA 93933
(831)384-6131
or kvandermaaten@mcwd.org

Publish: Aug. 19, 26, 2016

September 6, 2016

Resolution No. 2016-54
Resolution of the Board of Directors
Marina Coast Water District

Election to Become the Exclusive Groundwater Sustainability Agency
Within Portions of Two Subbasins

RESOLVED by the Board of Directors ("Directors") of the Marina Coast Water District ("District"), at its regular meeting duly called and held on September 6, 2016, at 211 Hillcrest Avenue, Marina, California, as follows:

Recitals

A. The Sustainable Groundwater Management Act of 2014, Water Code Sections 10720 – 10736.6 ("SGMA") was signed into law on September 16, 2014; and,

B. SGMA gives local agencies, such as the District, additional authorities and powers to manage groundwater in a sustainable manner and allows for limited state intervention when those local agencies fail to comply with SGMA's requirements; and,

C. SGMA requires that each California Department of Water Resource ("DWR")-designated groundwater subbasin be managed by a single Groundwater Sustainability Agency ("GSA") or by a combination of GSAs and that such management be implemented pursuant to an approved Groundwater Sustainability Plan ("GS Plan"), or multiple coordinated GS Plans, as the case may be; and,

D. Water Code Section 10723(a) authorizes any local agency with a service area overlying a groundwater subbasin or portion thereof to establish itself as the GSA for its service area; and,

E. Water Code Section 10721(j) defines a GSA as one or more local agencies that implement the provisions of SGMA; and,

F. The District's Central Marina and Ord Community water service areas overly portions of the Seaside Area, Corral de Tierra, and 180/400 Foot Aquifer Subbasins of the Salinas Valley Groundwater Basin; and,

G. The District's Ord Community water service area is within a portion of the Adjudicated Seaside Groundwater Basin and is also within a portion of the statutory boundaries of the Monterey Peninsula Water Management District (MPWMD); and,

H. Water Code Section 10723(c)(2) designates the MPWMD as the exclusive groundwater management area within MPWMD's statutory boundaries unless MPWMD elects to opt out of being the exclusive groundwater management agency for that area; and,

I. By MPWMD Resolution No. 2016-01, the MPWMD Board of Directors elected to opt out of being the exclusive groundwater management agency for that portion of MPWMD situated north of the Adjudicated Seaside Groundwater Basin; and,

J. District staff is proposing that the District become the GSA for (1) that portion of the District's Central Marina water service area within the Seaside Area Subbasin of the Salinas Valley Groundwater Basin and (2) that portion of the District's Ord Community water service area north of the Adjudicated Seaside Groundwater Basin within Seaside Area Subbasin, which shall collectively be referred to as the "Marina Area of the Seaside Area Subbasin" and as shown on the map attached hereto as Exhibit "A"; and,

K. District staff is separately proposing that the District become the GSA for that portion of the District's Ord Community water service area within the Corral de Tierra Subbasin, which shall be referred to as the "Ord Area of the Corral de Tierra Subbasin" as shown on the map attached hereto as Exhibit "B"; and,

L. Establishing the District as the GSA for the Marina Area of the Seaside Area Subbasin and separately for the Ord Area of the Corral de Tierra Subbasin will enable the District to prepare and implement a Groundwater Sustainability Plan for those respective areas; and,

M. The District is committed to sustainable management of its groundwater resources; and,

N. Adoption of this Resolution does not constitute a "project" under California Environmental Quality Act Guidelines Section 15378(b)(5), including organizational and administrative activities of government, because there would be no direct or indirect physical change in the environment; and,

O. Prior to adopting a resolution of intent to establish the District as the GSA for the respective areas, Water Code Section 10723 requires a local agency to hold a public hearing, after publication of notice pursuant to California Government Code Section 6066, on whether or not to adopt a resolution to establish a GSA; and,

P. Pursuant to Government Code Section 6066, notices of a public hearing on whether or not to adopt a resolution to establish one or two GSAs were published on August 19, 2016 and August 26, 2016; and,

Q. On September 6, 2016, the District held a public hearing regarding adoption of a resolution to establish the District as the GSA for for the Marina Area of the Seaside Area Subbasin and separately for the Ord Area of the Corral de Tierra Subbasin as shown on the Exhibit "A" and Exhibit "B" maps, which maps exclude that portion of MCWD's Ord Community service area within the Adjudicated Seaside Groundwater Basin and exclude that portion of its service areas within the 180/400 Foot Aquifer Subbasin; and,

R. It would be in the best interest of the District for it to become the exclusive GSA for that portion of its service areas shown respectively on the Exhibit "A" and Exhibit "B" maps; and,

S. DWR has proposed that the Marina Area of the Seaside Area Subbasin and that portion of the Corral de Tierra Subbasin outside of the Adjudicated Seaside Groundwater Basin be merged into a new subbasin named the "Monterey Subbasin", but that basin boundary modification is not yet finalized so the District's service areas within the Seaside Area Subbasin and the Corral de Tierra Subbasin must be treated separately; and,

T. The District has opposed the proposed merger because it is contrary to the basin boundary modification requested by MPWMD, which the District supported, but the District desires to avoid any delays in processing the District's GSA formation notifications should the new combined Monterey Subbasin go into effect.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. All the recitals in this Resolution are true and correct and the Board of Directors so finds, determines, and represents.

2. The District hereby elects to become the exclusive GSA (a) for the Marina Area of the Seaside Area Subbasin and (b) separately for the Ord Area of the Corral de Tierra Subbasin as shown respectively on the attached Exhibit "A" and Exhibit "B" maps, which are incorporated herein by reference.

3. District staff is hereby directed and authorized to provide separate notices of this election to become the exclusive GSA (a) for the Marina Area of the Seaside Area Subbasin and (b) for the Ord Area of the Corral de Tierra Subbasin to DWR in the manner required by law.

4. Should the new Monterey Subbasin go into effect, then the Board of Directors requests DWR to automatically convert the District's two separate GSA formation notifications into a single notification to form an exclusive GSA for one combined area in order to avoid delay in processing the District's GSA election.

PASSED AND ADOPTED on September 6, 2016, by the Board of Directors of the Marina Coast Water District by the following roll call vote:

Ayes:	Directors	Shriner, Lee, Moore, Gustafson
Noes:	Directors	None
Absent:	Directors	None
Abstained:	Directors	None

Howard Gustafson, President

ATTEST:

Keith Van Der Maaten, Secretary

CERTIFICATE OF SECRETARY

The undersigned Secretary of the Board of the Marina Coast Water District hereby certifies that the foregoing is a full, true and correct copy of Resolution No. 2016-54 adopted September 6, 2016.

Keith Van Der Maaten, Secretary

Before the Board of Supervisors in and for the County of Monterey, State of California

Resolution No. 19-430	)
Approving the formation of a Groundwater Sustainability Agency Pursuant to Water Code Section 10724 for a portion of the 180/400 Foot Aquifer Subbasin, commonly referred to as the CEMEX property, and authorizing the filing of Groundwater Sustainability Agency Formation information and documents with the Department of Water Resources (DWR); and B) finding that this action is not a project under CEQA pursuant to section 15379 of Title 14 of the California Code of Regulations	)

WHEREAS, on September 16, 2014, Governor Jerry Brown signed into law the Sustainable Groundwater Management Act ("SGMA"), which became effective on January 1, 2015, and which has been amended since that time;

WHEREAS, the intent of SGMA is to, among other things, provide for the sustainable management of medium and high-priority groundwater basins, to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide local agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater at the local level;

WHEREAS, SGMA requires the formation of one or more groundwater sustainability agencies ("GSAs") in a basin that will develop one or more groundwater sustainability plans ("GSPs") to sustainably manage groundwater in the basin;

WHEREAS, for any groundwater basin or subbasin designated pursuant to Water Code Section 10720.7 as being subject to critical conditions of overdraft, a GSP or GSPs must be adopted covering the entire basin or subbasin by January 31, 2020, to avoid being designated as a probationary basin by the State Water Resources Control Board ("SWRCB");

WHEREAS, if two or more GSAs attempt to form for the same area of a basin, the Department of Water Resources ("DWR") and/or the SWRCB may find that overlap exists in the area, and that any such unresolved overlap creates an unmanaged area;

WHEREAS, in situations where an unmanaged area exists in a basin after July 1, 2017, Water Code section 10724 authorizes the county within which the unmanaged area lies to become the GSA for the area;

WHEREAS, the area depicted in **Exhibit A** is located within the County of Monterey ("County") and includes Monterey County Assessor Parcel Numbers 203-011-001, 203-011-019, 203-011-020;

WHEREAS, the area depicted in **Exhibit A** lies within the 180/400- Foot Aquifer Subbasin depicted on **Exhibit B** ("180/400 Subbasin");

WHEREAS, the 180/400 Subbasin is located within the County;

WHEREAS, the 180/400 Subbasin has been designated as being subject to critical conditions of overdraft;

WHEREAS, on April 27, 2017, DWR posted the Salinas Valley Basin Groundwater Sustainability Agency's ("SVBGSA") GSA notice to become the GSA for the entire 180/400 Subbasin (including the area depicted in **Exhibit** A), excluding a small area covered by a GSA notice filed by Marina Coast Water District ("MCWD") for which MCWD is the exclusive GSA;

WHEREAS, on April 26, 2018, DWR posted the City of Marina's ("Marina") GSA notice to become the GSA for the area depicted in **Exhibit A**;

WHEREAS, DWR takes the position that there is overlap in the 180/400 Subbasin for the area depicted in **Exhibit A** created by the GSA notice filed by the SVBGSA and the GSA notice filed by Marina, and that such overlap creates an unmanaged area;

WHERAS, the overlap was caused by Marina's late filed notice for the area in Exhibit A, and the overlap would not exist but for Marina's filing;

WHEREAS, SVBGSA is a joint powers authority and a separate legal entity from the County and while the County is a voting member of the SVBGSA, the County represents only one (1) vote out of the eleven (11) member Agency;

WHEREAS, the SVBGSA's action to establish its jurisdictional boundaries, including the area in Exhibit A, predated Marina's filing by approximately one (1) year; and, there is no evidence that either the County or SVBGSA intentionally caused the overlap.

WHEREAS, the SVBGSA and Marina have not resolved the overlap created by their filings for the area depicted in Exhibit A;

WHEREAS, the County finds that it is in the best interest of the County and the 180/400 Subbasin for the County to exercise its right under Water Code section 10724 to become the GSA for the area depicted in **Exhibit A** and for any other unmanaged areas in the 180/400 Subbasin;

WHEREAS, the SVBGSA has prepared a GSP for the entire 180/400 Subbasin, including the area depicted in **Exhibit A**, and is collecting fees under SGMA to fund SGMA implementation in the 180/400 Subbasin;

WHEREAS, after the SVBGSA GSP prepared for the 180/400 Subbasin, is finalized, the County intends to adopt this GSP for management of the area depicted in **Exhibit A**,

WHEREAS, the County intends to enter into an agreement with the SVBGSA wherein the County, as the GSA for the area depicted in **Exhibit A**, will delegate SGMA management of such areas to the SVBGSA pursuant to the SVBGSA's GSP for the entire 180/400 Subbasin;

WHEREAS, the County finds that the adoption of this Resolution, is not a project under Title 14 California Code of Regulations, section 15378 as they will not result in any reasonably foreseeable environmental impacts, and neither the County, nor any other permitting authority is divested of future discretionary review or approval of any use of the area depicted in Exhibit A as a result of these actions. Moreover, in the event that this action is determined to constitute a project under CEQA, the action(s) would be exempt from environmental review under CEQA pursuant to CEQA Guidelines 15061(b)(3), 15307, 15308 and Water Code section 10728.6.

WHEREAS, the County noticed a public hearing as required by SGMA and Government Code section 6066 on November 28, 2019, and December 5, 2019;

WHEREAS, the County held a public hearing as required by SGMA on December 11, 2019 to consider becoming the GSA for the area depicted in Exhibit A

NOW, THEREFORE, BE IT RESOLVED, by the Board of Supervisors of the County of Monterey, as follows:

Section 1. The Board hereby finds and determines that the foregoing recitals are true and correct.

Section 2. The County hereby elects pursuant to Water Code section 10724 to be the GSA for the area of the 180/400 Subbasin depicted in **Exhibit A**, which is incorporated herein.

Section 3. The CAO or his designee is hereby authorized and directed to file a notice of formation of GSA with DWR.

Section 4. The CAO or his designee is hereby authorized and directed to submit the notice of adoption of the proposed Resolution and all information required by the Sustainable Groundwater Management Act, including but not limited to, all information required under Water Code sections 10723.8, and 10724, to DWR, and to support the development and maintenance of an interested persons list as described in Water Code section 10723.4 and a list of interested parties as described in Water Code section 10723.8(a)(4).

Section 5. Staff is authorized and directed to take any such additional actions that may be necessary and appropriate to effectuate the County's decision to be the GSA for the area of the 180/400 Subbasin depicted in **Exhibit A.**

Section 6. The County finds that the adoption of this Resolution, is not a project under Title 14 California Code of Regulations, section 15378 as they will not result in any reasonably foreseeable environmental impacts, and neither the County, nor any other permitting authority is divested of future discretionary review or approval of any use of the area depicted in Exhibit A as a result of these actions. Moreover, in the event that this action is determined to constitute a project under CEQA, the action(s) would be exempt from environmental review under CEQA pursuant to CEQA Guidelines 15061(b)(3), 15307, 15308 and Water Code section 10728.6.

Section 7. This Resolution shall take effect immediately upon its adoption.

PASSED AND ADOPTED on this 11 day of December 2019, by the following vote, to

wit: AYES: Supervisors Supervisor Phillips, Adams, Alejo, Parker and Lopez

NOES: None

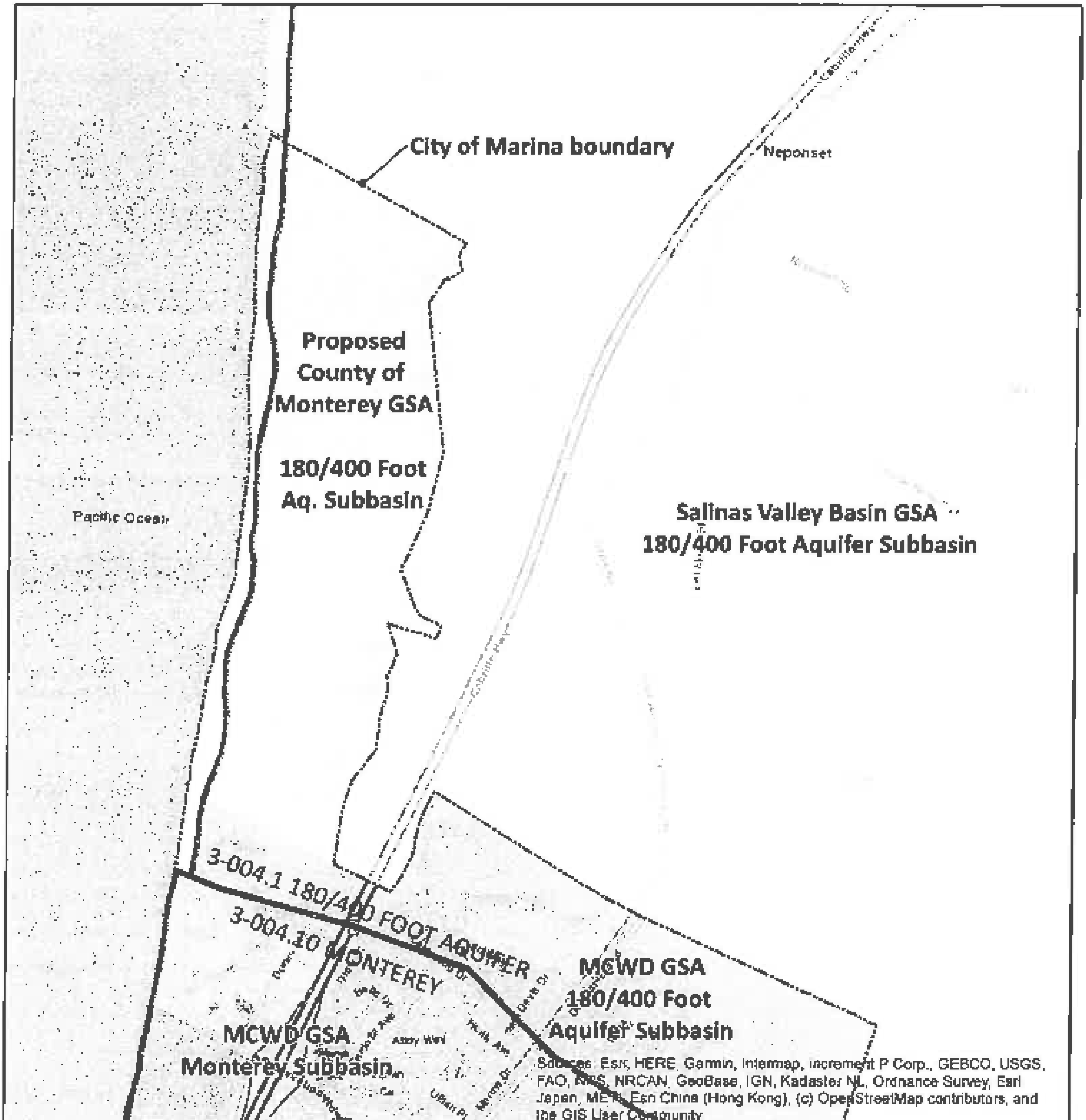
ABSENT: None

I, Valerie Ralph, Clerk of the Board of Supervisors of the County of Monterey, State of California, hereby certify that the foregoing is a true copy of an original order of said Board of Supervisors duly made and entered in the minutes thereof at page_of Minute Book 82, on December 11, 2019.

Dated: December 13, 2019
Legistar File ID No. RES 19-171

Valerie Ralph, Clerk of the Board of Supervisors
County of Monterey, State of California

By:____________________
Valerie Ralph, Clerk of the Board



Proposed County of Monterey GSA

- Groundwater Basin Boundary (DWR B118)
- Marina City Limits
- Proposed County of Monterey GSA
- Marina Coast Water District GSA
- Salinas Valley Basin GSA

N

0 0.125 0.25 0.5 Miles

1:20,000

Map date: November 25, 2019

MONTEREY COUNTY CALIFORNIA 1850

MONTEREY COUNTY
WEEKLY

668 Williams Ave
(831) 394-5656
Seaside, CA 93955

Proof of publication

State of California
County of Monterey

I am a citizen of the United States and a resident of the State of California. I am over the age of 18 years and not party to or interested in the above-entitled matter.

I am the principal clerk of *Monterey County Weekly*, a newspaper of general circulation, published weekly by Milestone Communications, Inc. in the City of Seaside, County of Monterey, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Monterey, State of California; that the notice of which the annexed is a printed copy has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates to wit.

Dec. 5, 2019

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Name....Linda S. Maceira........................

Signature.......Linda S. Maceira

Dated:.Dec. 5, 2019..Monterey, California

PUBLICATION OF SUMMARY OF PROPOSED ORDINANCE
BOARD OF SUPERVISORS
COUNTY OF MONTEREY

The Board of Supervisors of the County of Monterey has set December 10, 2019 at 10:30 a.m. at the Monterey County Government Center, Board of Supervisors Chambers, First Floor, 168 West Alisal Street, Salinas, California to consider adoption of the ordinance summarized below.

County Counsel Summary

This ordinance extends the suspension of portions of Ordinance No. 5310 until further action of the Board of Supervisors. On June 18, 2019, the Monterey County Board of Supervisors adopted Ordinance No. 5310 authorizing point-of-use (POU) and point-of-entry (POE) treatment of water to meet primary drinking water standards under certain circumstances. On August 27, 2019, the Board of Supervisors adopted a subsequent ordinance that suspended, until December 11, 2019, sections 3 and 6 and a portion of section 5 of Ordinance No. 5310 relating to utilization of POU or POE treatment by local small and state small water systems, individual lot owners within local small and state small water systems, and individual lots on private wells. This ordinance extends the suspension of those sections of Ordinance No. 5310 from December 11, 2019 until further action of the Board of Supervisors.

For additional information, contact Robin Kimball, Management Analyst at (831) 796-1297.

A certified copy of the full text of the ordinance will also be posted at the office of the Clerk of the Board of Supervisors in the Monterey County Government Center, Board of Supervisors Chambers, First Floor, 168 West Alisal Street, Salinas, California at least five days prior to the date referenced above.

DATED: 12-03-2019

Valerie Ralph
Clerk of the Board of Supervisors

MONTEREY COUNTY
WEEKLY

668 Williams Ave
(831) 394-5656
Seaside, CA 93955

Proof of publication

State of California
County of Monterey
I am a citizen of the United States and a resident of the State of California. I am over the age of 18 years and not party to or interested in the above-entitled matter.

I am the principal clerk of *Monterey County Weekly*, a newspaper of general circulation, published weekly by Milestone Communications, Inc. in the City of Seaside, County of Monterey, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Monterey, State of California; that the notice of which the annexed is a printed copy has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates to wit.

Nov. 28, Dec. 5, 2019

Notice of Public Hearing

Monterey County Board of Supervisors

NOTICE IS HEREBY GIVEN that the Board of Supervisors of the County of Monterey, State of California will hold a public hearing to consider the adoption of a Resolution of Intention to form a Groundwater Sustainability Agency (GSA) as set forth in the Sustainable Groundwater Management Act, Part 2.74 of Division 6 of the California Water Code, section 10724. The boundaries of the proposed GSA would encompass Monterey County Assessor Parcel Numbers (APN) 203-011-001; 203-011-019; 203-011-020; and portions of APN 203-011-023; 175-011-046; 175-011-031; 175-011-049; 175-011-050; and 203-011-011. The public hearing is for the purpose of reviewing and providing explanation of the proposal, and allowing public input on the formation of the proposed GSA. The public hearing will be held on Wednesday, December 11, 2019 at 10:30 a.m. in the Monterey County Board of Supervisors Chambers, County Government Center, 168 West Alisal Street, Salinas, California, at which time and place any and all interested persons may appear and be heard thereon.

Valerie Ralph

Clerk of the Board of Supervisors

Dated: November 25, 2019

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Name...Linda S. Maccira.......................

Signature....Linda S. Maccira

Dated:.Dec. 5, 2019..Monterey, California

APPENDIX 2B

COORDINATION AGREEMENT

Before the Board of Directors of the
Salinas Valley Basin Sustainable Groundwater Management Agency

Resolution No. 2017-16

Resolution approving a Coordination Agreement between Marina Coast Water District and the Salinas Valley Basin Ground Water Sustainability Agency for the management of the Monterey Subbasin.	)))

WHEREAS, the Marina Coast Water District has filed with the Department of Water Resources to become the Ground Water Sustainability Agency for the Monterey Subbasin; and,

WHEREAS, this filing has created the need for Marina Coast and the Salinas Valley Basin to coordinate management activities in the Monterey Subbasin; and

WHEREAS, the Marina Coast Water District and the Salinas Valley Basin Ground Water Sustainability Agency developed an agreement that is mutually acceptable for managing this basin; and,

WHEREAS, the proposed Coordination agreement will allow for Grant Applications that will fund Ground Water Sustainability planning in the subbasin;

NOW, THEREFORE, BE IT RESOLVED, by the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency as follows:

The above recitals are true and correct.

The attached Coordination agreement between Marina Coast Water District and the Salinas Valley Basin Ground Water Sustainability Agency is hereby approved.

The General Manager and Agency Counsel are hereby authorized and directed to take such other and further actions as may be necessary or appropriate to implement the intent and purposes of this resolution.

PASSED AND ADOPTED on this 9th day of November 2017 by the following vote, to-wit:

AYES: Directors Alejo, Brennan, Granillo, Lipe, McHatten, McIntyre, Pereira, Secondo, Stefani, and Chair Gunter

NOES: None

ABSENT: Director Calcagno

ABSTAIN: None

I, Ann Camel, Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, State of California, hereby certify that the foregoing is a true copy of an original order of said Board of Directors duly made and entered in the minutes thereof.

Dated: 11/9/17

Ann Camel, Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency,
County of Monterey, State of California

Ann Camel

PROPOSITION 1 Coordination Agreement

THIS PROPOSITION 1 COORDINATION AGREEMENT (the "Agreement") is made effective as of November 9, 2017 by the Marina Coast Water District Groundwater Sustainability Agency ("MCWD") and the Salinas Valley Basin Groundwater Sustainability Agency ("SVBGSA") regarding proposals for Sustainable Groundwater Planning ("SGWP") Grant Program funds, authorized by the Water Quality, Supply, and Infrastructure Improvement Act of 2014 ("Proposition 1") within the Monterey Subbasin and the 180/400 foot Subbasin, with reference to the following facts:

A. Eligibility criteria for Category 2 proposals for SGWP Grant Program funds, authorized by Proposition 1, only accept one application per Basin/Subbasin; and

B. An eligible agency may be part of the Proposition 1 application as a project proponent, but must identify a single entity that will act as the grant applicant and submit a basin-wide application and receive the grant on behalf of the basin; and

C. If multiple applications are received within a basin for Category 2 projects, DWR will contact the applicants and request that the Parties consolidate one single application for the basin to be submitted before the close of the open filing period; and

D. The applicant must include a Proposal level "Summary" highlighting each project contained in the Proposal and must demonstrate that it encompasses the entire basin or describes why a portion of the basin is not covered in the Proposal.

E. Applicants requesting funding for Category 2 Proposition 1 application must provide documentation of any communications with beneficial users of groundwater in the basin that may potentially be affected by implementation of the project, including, but not limited to DACs, SDACs, agricultural water users, municipal water users, wildlife refuges, or other stakeholders.

F. The Filing Period Closes November 13, 2017 for proposals for SGWP Grant Program funds; and

G. Proposition 1 requires a minimum cost share of 50% of the total project cost.

THEREFORE, in consideration of the facts recited above the Parties agree to the following with regards to Proposition 1 applications:

1. The Parties agree that MCWD shall be the Party responsible for submitting a grant application/proposal to DWR for a Category 2, Tier 2 Groundwater Sustainability Plan grant for the Monterey Subbasin and MCWD shall be the grantee if the proposal is successful. MCWD shall be responsible for the cost of preparing the grant. MCWD will coordinate with SVBGSA and obtain input from SVBGSA in preparation of the grant application/proposal for the Monterey Subbasin.

2. The Parties further agree that SVBGSA shall be the Party responsible for submitting a grant application/proposal to DWR for a Category 2, Tier 1 Groundwater Sustainability Plan grant for the 180/400 Foot Aquifer Subbasin and SVBGSA shall be the grantee if the proposal is successful. SVBGSA shall be responsible for the cost of preparing the grant. SVBGSA will coordinate with MCWD and obtain input from MCWD in preparation of the grant application/proposal for the 180/400 Foot Aquifer Subbasin.

3. A coordination committee including representatives from MCWD and SVBGSA shall be formed for each subbasin.

4. The parties agree that they shall share all data necessary to facilitate the completion of the Proposition 1 applications/proposals.

5. The Proposition 1 application for the Monterey Subbasin will include:

a) A project for the preparation of the GSP by MCWD for the Marina Subarea and the Ord Subarea, as shown on attached Exhibit "A;" and

b) A project for the preparation of a GSP by SVBGSA for the Corral de Tierra Subarea, also as shown on attached Exhibit "A".

6. The Marina, Ord and Corral de Tierra subareas shall be managed as follows:

a) If MCWD is allowed under the Sustainable Groundwater Management Act ("SGMA") to include the Ord Subarea within its Groundwater Sustainability Agency boundaries, MCWD shall manage the Marina and Ord Subareas as part of its GSA under the GSP described in Section 5 (a), above.

b) If MCWD is not allowed under SGMA to include the Ord Subarea within its Groundwater Sustainability Agency boundaries, the Ord Subarea may be designated by the SVBGSA as a Management Area within the boundaries of its GSA, and MCWD shall be allowed to manage the Ord Subarea under the GSP described in Section 5 (a), above.

c) SVBGSA shall manage the Corral de Tierra Subarea.

7. The GSP Project for the Monterey Subbasin will include review and potential refinement of the portion of the Salinas Valley Integrated Hydrologic Model ("SVIHM") that addresses the Monterey Subbasin and nearby subbasins. SVIHM is being developed by the USGS for the entire Salinas River Valley Basin.

8. MCWD will provide matching grant funds for development of the GSP and for SVIHM model review and refinement for the Marina Subarea and Ord Subarea of the Monterey Subbasin. Notwithstanding anything to the contrary, in the event MCWD is prevented from including the Ord Subarea within its GSP or the SVBGSA elects to include the Ord Subarea within its own GSP for the Monterey Subbasin, then SVBGSA shall reimburse

MCWD for all matching funds which MCWD has provided or expended proportionately for the Ord subarea after the effective date of this agreement, and SVBGSA shall be responsible for all matching funds applicable to the Ord Subarea for purposes of the SGWP Grant Program.

9. SVBGSA and MCWD may include additional project(s) in each other's grant applications for the Monterey and 180/400 Foot Aquifer Subbasins if they provide all required information in the appropriate format and demonstrate matching funds by an agreed upon timeframe.

10. The Parties acknowledge that the submission deadline for any Proposition 1 application is November 13, 2017. As such, the Parties agree to the following schedule for coordination of grant applications for the Monterey and 180/400 Foot Aquifer Subbasins:

- Proposition 1 Applicant to share draft Proposition 1 application with other Party (10/20/2017)
- Proposition 1 Applicant to receive feedback on Draft Proposition 1 application from other Party (by 10/27/2017)
- Proposition 1 Applicant to obtain complete information from other Party for any independent Projects (for which other Party is providing matching funds) for inclusion in in Draft Proposition I application (10/27/2017)
- Submit Prop 1 application to DWR by 11/13/2017

In the event either Party fails to provide any of the required information to the submitting Party by the identified dates, then this Agreement shall terminate and either Party may submit a Proposition 1 application on their own behalf, without regard to the other Party.

11. Assuming agreement is reached between the Parties regarding the Proposition 1 applications for the Monterey Subbasin and 180/400 Foot Aquifer Subbasin, the Parties will provide letters of support for each other's Proposition 1 grant applications for the 180/400 Foot Aquifer Subbasin and the Monterey Subbasin by November 3, 2017.

Agreed and acknowledged on November 21, 2017, by the signatures below:

SALINAS VALLEY BASIN
GROUNDWATER SUSTAINABILITY AGENCY

By: Gary Petersen

Title: General Manager

APPROVED AS TO FORM:

Leslie J. Girard
SVBGSA Agency Counsel

MARINA COAST WATER DISTRICT
GROUNDWATER SUSTAINABILITY AGENCY

By: Keith Van Der Maaten

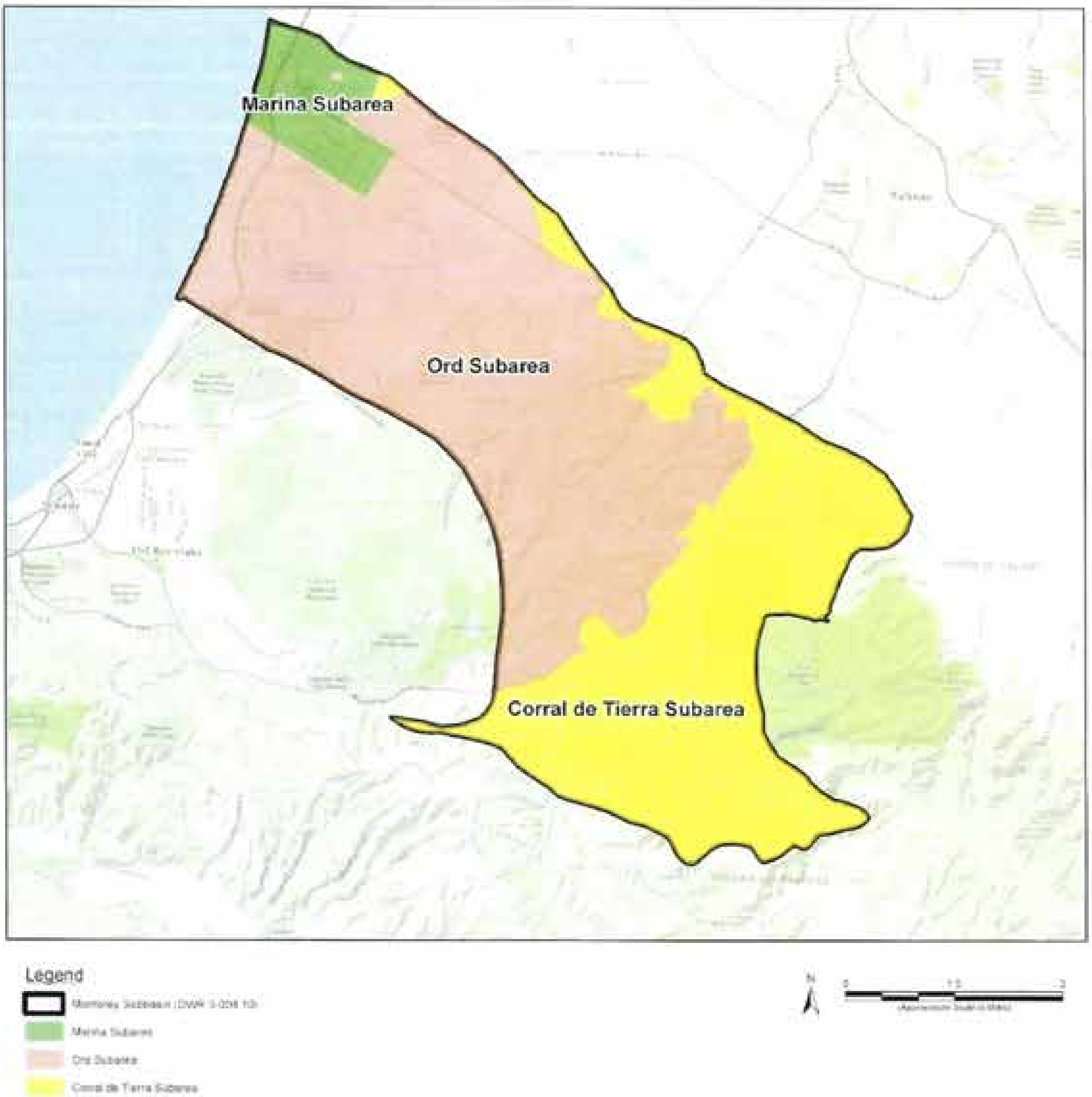
Title: General Manager

APPROVED AS TO FORM:

Roger K. Masuda

Roger K. Masuda
MCWDGSA Agency Counsel

EXHIBIT A. MONTEREY BASIN SUBAREAS



Before the Board of Directors of the
Salinas Valley Basin Sustainable Groundwater Management Agency

Resolution No. 2018-11	)
Authorizing Execution of a Framework	)
Agreement for the Monterey Basin	)
Groundwater Sustainability Plan between the	)
Marina Coast Water District Groundwater	)
Sustainability Agency and the Salinas Valley	)
Basin Groundwater Sustainability Agency	)

WHEREAS, the Sustainable Groundwater Management Act (SGMA) of 2014, Water Code Sections 10720-10736.6 was signed into law September 16, 2014; and,

WHEREAS, SGMA gives local agencies authorities and powers to manage groundwater; and,

WHEREAS, Groundwater Sustainability Plans, in conformance with SGMA, for the 180/400 Aquifer and the Monterey subbasins are required by January 31, 2020 and 2022 respectively; and,

WHEREAS, SGMA requires a coordinated Groundwater Sustainability Plan (GSP) or GSPs among or between adjacent GSAs and adjacent subbasins; and,

WHEREAS, GSP development requires collaboration amongst GSAs and other local or regional water management groups at the groundwater subbasin level and encourages collaboration across groundwater subbasin boundaries; and,

WHEREAS, the Marina Coast Water District Groundwater Sustainability Agency (MCWDGSA) and the Salinas Valley Groundwater Sustainability Agency previously entered into a Proposition 1 Coordination Agreement regarding cooperation and coordination on the application for and receipt of Proposition 1grant funds to fund the development of GSPs for the Monterey Subbasin and the 180/400 Foot Aquifer Subbasin; and,

WHEREAS, the proposed Framework Agreement's intent is that one GSP will be developed for the entire Monterey Subbasin (i.e. the Monterey Subbasin GSP), which will contain three management areas that generally encompass the Marina Subarea, the Ord Subarea (both of which are generally located north of State Route 68), and the Corral de Tierra Subarea (located generally south of State Route 68); and,

WHEREAS, the Framework Agreement clarifies that the MCWDGSA will prepare the GSP components for the Marina Management Area and the Ord Management Area, and SVBGSA will prepare the GSP components for the Corral de Tierra Management Area and the GSP for the entire 180/400 Foot Aquifer Subbasin; and,

WHEREAS, the Agreement requires the MCWDGSA and the SVBGSA to actively consult with each other and include each other for review of draft work products during the GSP development process for the 180/400 Foot Aquifer Subbasin and the Monterey Subbasin; NOW, THEREFORE,

BE IT RESOLVED, by the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, that the General Manager is hereby authorized and directed to execute the Framework Agreement for the Monterey Groundwater Basin Groundwater Sustainability Plan between the Marina Coast Water District Groundwater Sustainability Agency and Salinas Valley Basin Groundwater Sustainability Agency attached hereto as Exhibit A.

BE IT FURTHER RESOLVED, that the General Manager and Agency Counsel are hereby authorized and directed to take such further actions as may be necessary or appropriate to implement the intent and purposes of this Resolution.

PASSED AND ADOPTED on this 13th day of December 2018 by the following vote, to-wit:

AYES: Directors Alejo, Brennan, Calcagno, Granillo, Gunter, Lipe, McIntyre, Pereira, Secondo, Stefani, and Chairperson McHatten

NOES: None

ABSENT: None

ABSTAIN: None

I, Ann Camel, Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, State of California, hereby certify that the foregoing is a true copy of an original order of said Board of Directors duly made and entered in the minutes thereof.

Dated: 12/13/18

Ann Camel, Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency,
County of Monterey, State of California

Ann Camel

FRAMEWORK AGREEMENT

This Framework Agreement is made effective as of 12/13/18 by the Marina Coast Water District Groundwater Sustainability Agency (MCWD) and Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) (collectively, the "Parties") regarding Groundwater Sustainability Plan (GSP) development for the Monterey Subbasin and the 180/400 Foot Aquifer Subbasin, with reference to the following:

RECITALS

A. On September 16, 2014 Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739, known collectively as the Sustainable Groundwater Management Act (the "Act"), effective January 1, 2015; and

B. The Act was amended by Senate Bill 13, effective January 1, 2016; and

C. The legislative intent of the Act is to provide sustainable management of groundwater basins, to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide local agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater; and

D. The Act requires formation of one or more groundwater sustainability agencies ("GSAs") that will be responsible for developing a single or multiple groundwater sustainability plan ("GSP") for a groundwater basin; and

E. The purpose of this Framework Agreement is to outline the process to be used by the Parties to work collaboratively to develop one GSP for the entire Monterey Subbasin and one GSP for the entire 180/400 Foot Aquifer Subbasin (the "GSPs"). It is further intended to guide the Parties' coordination during GSP development in the Monterey Subbasin and the 180/400 Foot Aquifer Subbasin and further intended to, in part, implement the intent and purposes of the Coordination Agreement between the Parties dated November 21, 2017.

F. The Parties recognize that a detailed approach is to be developed by the Parties' technical staff under these guidelines to make sure that the elements of the GSPs are appropriately coordinated to support sustainable management.

NOW, THEREFORE, in consideration of the promises, terms, conditions and covenants contained herein, the Parties to this Agreement hereby agree as follows:

1. <u>Overarching Approach</u>. The Parties agree that one GSP will be developed for the entire Monterey Subbasin (i.e. the Monterey Subbasin GSP), which will contain three management areas that generally encompass the Marina Subarea, the Ord Subarea (both of which are generally located north of State Route 68), and the Corral de Tierra Subarea (located generally south of State

Route 68). The Parties recognize that the exact boundaries of the management areas are to be confirmed. Consistent with the Proposition 1 Grant Work Plans:

(a) MCWD GSA will prepare the GSP components for the Marina Management Area and the Ord Management Area;

(b) SVBGSA will prepare the GSP components for the Corral de Tierra Management Area.

(c) The Parties further agree that SVBGSA will prepare a GSP for the entire 180/400 Foot Aquifer Subbasin.

(d) The Parties agree that they will actively consult with each other, and include each other for review of draft work products during the GSP development process for the 180/400 Foot Aquifer Subbasin and the Monterey Subbasin.

2. Schedule. The Parties agree to develop a detailed approach and schedule for development of the GSPs. The detailed approach and schedule for the Monterey Subbasin GSP should outline the process of preparing separate and common GSP components, as well as identify the timing of data sharing and review of key work products. The detailed approach and schedule for the 180/400 Foot Aquifer should identify the process and timing of consultation and review for key work products. The Parties recognize that a successful GSP relies on involving each other for early input and providing draft work products to the other Party for timely review, and further recognize that the GSP for the 180/400 Foot Aquifer Subbasin must be filed with DWR no later than January 31, 2020, and the GSP for the Monterey Subbasin must be filed no later than January 31, 2022.

3. Coordination Committees; Stakeholder Engagement. The Parties agree to form a Steering Committee that oversees activities under this agreement. The Steering Committee shall include the General Manager and one Board Member from each Party, who will update each Party's Board of Directors. Staff and consultants from each Party may participate in the Steering Committee as necessary. In addition, the Parties agree to form a Technical Committee that consists of staff and/or technical consultants to perform activities under this agreement. The Steering Committee and Technical Committee shall each hold regular meetings pursuant to schedules described in Attachment A and may hold special meetings and workshops as necessary.

The Parties agree to work collaboratively to develop and implement stakeholder engagement plans for the GSPs and ensure regular, productive communication between the Parties, stakeholders, and stakeholder representatives. Each Party is responsible for guiding efforts within their respective plan preparation areas in both basins, e.g., MCWD for the Marina and Ord Subareas of the Monterey Subbasin, and SVBGSA for the Corral de Tierra Subarea of the Monterey Subbasin as well as the 180/400 Foot Subbasin

4. Data Management and Exchange. (a) The Parties agree to develop and maintain coordinated data management system(s) that meet the requirement California Code of Regulations (CCR) Title 23, Section 352.6, such as a single DMS or separate DMSs with coordinated schema to facilitate data sharing.

(b) Each Party shall be responsible for the collection of information to support GSP analyses within their respective plan preparation areas, including but not limited to data to support groundwater conditions assessment, hydrogeologic conceptual model development, numerical model development, and water budget analysis.

(c) The Parties agree, to the fullest extent permitted by law, to make all data necessary to facilitate development of the GSPs available to the other Party and conduct information exchange, either through a formal or informal request, in a timely fashion. To the extent it is necessary to make a written request for information to another Party, each Party shall designate a representative to respond to information requests and provide the name and contact information of the designee to the Coordination Committee. Nothing in this Agreement shall be construed to prohibit any Party from voluntarily exchanging information with any other Party by any other mechanism separate from the Coordination Committee.

(d) It is understood and agreed that a Party to this Agreement may provide the other Party with confidential information. To ensure the protection of such confidential information and in consideration of the agreement to exchange said information, appropriate arrangements may be made to restrict or prevent disclosure.

(e) It is further understood that information to be exchanged may include data obtained from the Monterey County Water Resources Agency (MCWRA) under agreements with the MCWRA. The Parties agree to make the data obtained from MCWRA available for information exchange to the extent permitted by law, and as long as provision of such exchanges follow the terms of agreement with MCWRA.

(f) The Parties agree to consider the development of a Uniform Data Sharing and Confidentiality Agreement with MCWRA so that there will be uniform rules among the three agencies as to how and what data is to be shared, what data shall be considered confidential, and how confidential data is to be secured, protected, shared, and released.

5. Water Budget. The Parties agree to prepare coordinated water budgets and basin setting information for the Monterey and 180/400 Foot Aquifer Subbasins, as required by 23 CCR 354.18. The Parties agree to work to reach consensus on inputs, assumptions, and methodology, as well as review and potential refinement of the portion of the Salinas Valley Integrated Hydrological Model that addresses the Monterey Subbasin and 180/400 Foot Aquifer Subbasins.

6. Monitoring Network. The Parties agree to develop coordinated monitoring network objectives for the Monterey and 180/400 Foot Aquifer Subbasins. The monitoring network shall facilitate the collection of data necessary to characterize groundwater and related surface water conditions and evaluate changing conditions that occur from implementation of the GSPs in each Management Area.

7. Proposition 1 Grant Administration. The Parties agree to coordinate grant administration for GSP development in the Monterey Subbasin. Pursuant to the provisions of the Proposition 1 Sustainable Groundwater Planning Grant Agreement for the Monterey Subbasin,

MCWD will submit invoices, deliverables and other grant administration materials to DWR on behalf of SVBGSA and will redistribute SVBGSA's potion of grant reimbursements to SVBGSA. However, MCWD will not be responsible for verifying the format or information within SVBGSA's submittals. SVBGSA is responsible for timely providing MCWD the information necessary for preparation of quarterly progress reports and grant completion reports.

8. Indemnification. Each Party agrees to defend, indemnify and hold harmless the other Party, and their officers, employees and agents, from against any and all demands, claims, causes of action, suits, judgements, liabilities, liens, losses, damages, expenses, fines, penalties and assessments (collectively, "damages") arising out of or related to the preparation, consideration and approval of a GSP or GSP components by the indemnifying Party for its respective management area, except in the case of a claim or litigation by one Party against the other. The Parties agree to cooperate in the defense of any claim or lawsuit arising out of such actions to the extent permitted by law.

9. Termination. Either Party by majority vote of its governing body may terminate this Framework Agreement for any reason or no reason upon at least nine (9) months' prior written notice to the other Party. Such notice may be made by personal delivery or first class U.S. Mail (postage prepaid), and shall be deemed delivered upon actual receipt of the notice by the other Party. Such notice shall be addressed to the General Manager of the non-noticing Party. Within thirty (30) days of delivery of the notice, the Steering Committee representatives shall personally meet and attempt in good faith to resolve the dispute.

Notwithstanding anything to the contrary herein, this Framework Agreement shall not be terminated (the "effective termination date") unless and until the parties shall have entered into intra-basin coordination agreements in accordance with Water Code §10727.6 and 23 CCR §357.4 for each parties' respective GSP for their respective portions of the 180/400 Foot Aquifer and the Monterey Subbasin. The intra-basin coordination agreement must address any necessary approvals resulting in grant changes from DWR as a result of changing from a single GSP for each of the sub-basins to coordinated multiple GSP's for each of the sub-basins.

Until the effective termination date, each Party shall continue to develop their respective portions of the GS Plans pursuant to the Proposition 1 Coordination Agreement. The Parties shall obtain any necessary approvals for resulting grant changes from DWR. All reimbursements required by that agreement shall be due and payable on the effective termination date.

IN WITNESS WHEREOF, MCWD and SVBGSA execute this Framework Agreement effective as of the date first written above.

Marina Coast Water District Groundwater Sustainability Agency.

By: ____________________

Date: 1/4/19

APPROVED AS TO FORM

Roger K. Masuda

Roger Masuda
MCWDGSA General Counsel

Salinas Valley Basin Groundwater
Sustainability Agency,

By: ______________________

Date:______________________

APPROVED AS TO FORM

____
Leslie J. Girard
SVBGSA General Counsel

APPROVED AS TO FORM

____
Roger Masuda
MCWDGSA General Counsel

Salinas Valley Basin Groundwater Sustainability Agency,

By: ______________________________

Date: 12/13/18

APPROVED AS TO FORM

____
Leslie J. Girard
SVBGSA General Counsel

ATTACHMENT A
Regular Committee Meeting Schedules

The Steering Committee for coordinating GSP development in the 180/400 Foot Aquifer and Monterey Subbasins will meet quarterly beginning the fourth quarter of 2018. Meetings of the Steering Committee shall be subject to the California Open Meeting Law ("Brown Act"). The first meeting of the Committee shall be called by the General Manager of the SVBGSA, who shall preside pro tem at the start of the meeting. At the initial meeting the Committee shall choose a chairperson and set a regular schedule of meetings as required by the Brown Act.

The Technical Committee will meet regularly every other month starting September 2018, exact time and location to be determined. Meetings of the Technical Committee are not subject to the Brown Act. During the Technical Committee meetings, GSA staff and technical consultants will

- Provide status update regarding work progress and schedule;
- Exchange data and information available at the time of the meeting;
- Coordinate development and review of work products; and
- Present and discuss technical topics.

November 19, 2018

Resolution No. 2018-GSA02
Resolution of the Board of Directors
Marina Coast Water District Groundwater Sustainability Agency
Authorizing the General Manager to Execute a Framework Agreement for the
Monterey Groundwater Basin Groundwater Sustainability Plan between the
Marina Coast Water District Groundwater Sustainability Agency and the
Salinas Valley Basin Groundwater Sustainability Agency

RESOLVED by the Board of Directors ("Directors") of the Marina Coast Water District Groundwater Sustainability Agency ("District"), at a regular meeting duly called and held on November 19, 2018, at 211 Hillcrest Avenue, Marina, California as follows:

WHEREAS, the Sustainable Groundwater Management Act (SGMA) of 2014, Water Code Sections 10720-10736.6 was signed into law September 16, 2014; and,

WHEREAS, the District formed Groundwater Sustainability Agencies for the Central Marina and Ord Community Service Areas in portions of the Monterey Subbasin and the 180/400 Subbasin in conformance with the SGMA; and,

WHEREAS, SGMA gives local agencies, such as the District, additional authorities and powers to manage groundwater; and,

WHEREAS, the District is committed to sustainable management of its groundwater resources; and,

WHEREAS, the Groundwater Sustainability Plans for the District GSAs in conformance with SGMA for the 180/400 Aquifer and the Monterey subbasins are required by 2020 and 2022 respectively; and,

WHEREAS, the District has commenced Groundwater Sustainability Planning and that doing so is consistent with the goals and objectives stated in the District's Strategic Plan; and,

WHEREAS, SGMA requires a coordinated a Groundwater Sustainability Plan (GSP) or GSPs among or between adjacent GSAs and adjacent subbasins; and,

WHEREAS, GSP development requires collaboration amongst GSAs and other local or regional water management groups at the groundwater subbasin level and encourages collaboration across groundwater subbasin boundaries; and,

WHEREAS, the Framework Agreement's intent is that one GSP will be developed for the entire Monterey Subbasin (i.e. the Monterey Subbasin GSP), which will contain three management areas that generally encompass the Marina Subarea, the Ord Subarea (both of which are generally located north of State Route 68), and the Corral de Tierra Subarea (located generally south of State Route 68); and,

WHEREAS, the Agreement clarifies that the MCWDGSA will prepare the GSP components for the Marina Management Area and the Ord Management Area and SVBGSA will prepare the GSP components for the Corral de Tierra Management Area and that the SVBGSA will prepare a GSP for the entire 180/400 Foot Aquifer Subbasin; and,

WHEREAS, the Agreement directs both the MCWDGSA and the SVBGSA will actively consult with each other and include each other for review of draft work products during the GSP development process for the 180/400 Foot Aquifer Subbasin and the Monterey Subbasin.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Marina Coast Water District does hereby Authorize the General Manager to execute a Framework Agreement for the Monterey Groundwater Basin Groundwater Sustainability Plan between the Marina Coast Water District Groundwater Sustainability Agency and Salinas Valley Basin Groundwater Sustainability Agency.

PASSED AND ADOPTED on Novwember 19, 2018 by the Board of Directors of the Marina Coast Water District by the following roll call vote:

Ayes:	Directors	Cortez, Lee, Shriner, Moore
Noes:	Directors	None
Absent:	Directors	Gustafson
Abstained:	Directors	None

Thomas P. Moore

Thomas P. Moore, President

ATTEST:

Keith Van Der Maaten, Secretary

CERTIFICATE OF SECRETARY

The undersigned Secretary of the Board of the Marina Coast Water District Groundwater Sustainability Agency hereby certifies that the foregoing is a full, true and correct copy of Resolution No. 2018-GSA02 adopted November 19, 2018.

Keith Van Der Maaten, Secretary

COOPERATION AGREEMENT AMONG GROUNDWATER SUSTAINABILITY AGENCIES IN THE 180/400 FOOT AQUIFER SUBBASIN

This COOPERATION AGREEMENT ("Agreement") establishing cooperation among the 180/400 Foot Aquifer Subbasin Groundwater Sustainability Agencies ("GSAs") is made and entered into and effective upon the date when the last Member signs this Agreement ("Effective Date") by and among the County of Monterey acting in the capacity of its Groundwater Sustainability Agency ("County GSA") and the Salinas Valley Basin Groundwater Sustainability Agency ("SVBGSA"). Either County GSA or SVBGSA are also referred to as a "Member" or collectively as "Members".

Recitals

WHEREAS, in 2014, the California legislature adopted, and the Governor signed into law, three bills (SB 1168, AB 1739, and SB 1319) collectively referred to as the "Sustainable Groundwater Management Act" ("SGMA"), that initially became effective on January 1, 2015, and that has been amended from time-to-time thereafter; and

WHEREAS, the stated purpose of SGMA, as set forth in California Water Code Section 10720.1, is to provide for the sustainable management of groundwater basins at a local level by providing local groundwater agencies with the authority, and technical and financial assistance necessary, to sustainably manage groundwater; and

WHEREAS, SGMA requires the designation of Groundwater Sustainability Agencies ("GSAs") for the purpose of achieving groundwater sustainability through the adoption and implementation of Groundwater Sustainability Plans ("GSPs") or an alternative plan for all medium and high priority basins as designated by the California Department of Water Resources ("DWR"); and

WHEREAS, each Member is a GSA, as defined by SGMA, duly organized and existing under and by virtue of the laws of the State of California, and each Member has water supply, water management or land use responsibilities within the 180/400 Foot Aquifer Subbasin ("Subbasin"), which is designated subbasin number _______ in the most recent edition of DWR Bulletin Number 118; and

WHEREAS, the California Department of Water Resources ("DWR") on December __, 2019 recognized County of Monterey as the exclusive GSA for an approximately 400-acre parcel within the Subbasin currently owned by RMC Pacific Materials, LLC and depicted in Exhibit __ attached hereto (the "CEMEX Site"); and

WHEREAS, the SVBGSA is the exclusive GSA for the majority of the Subbasin, excluding the CEMEX Site and one other small area, as depicted in Exhibit __ attached hereto; and

WHEREAS, SVBGSA has prepared a draft GSP for the entire Subbasin, including the CEMEX Site; and

WHEREAS, Section 10720.7 of SGMA requires all basins designated as high or medium priority basins by the DWR in its Bulletin 118 be managed under a GSP or coordinated GSPs pursuant to SGMA; and

WHEREAS, the Members have determined that the sustainable management of the Subbasin pursuant to SGMA may best be achieved through the cooperation of the Members operating through this Agreement; and

WHEREAS, the Members agree that this Agreement does not establish nor is it intended to establish a GSA; and

WHEREAS, the Members desire, through this Agreement, to enter into this Agreement for the purpose of organizing the various GSAs in the Subbasin and cooperating in the development and implementation of a single GSP for the Subbasin; and

WHEREAS, the governing board of each Member has determined it to be in the Member's best interest and in the public interest that this Agreement be executed;

NOW THEREFORE, in consideration of the matters recited and the mutual promises, covenants, and conditions set forth in this Agreement, the Members hereby agree as follows:

TERMS OF AGREEMENT

ARTICLE 1. DEFINITIONS

As used in this Agreement, unless context requires otherwise, the meanings of the terms set forth below shall be as follows:

1.1. "Agreement" means this Cooperation Agreement.

1.2. "CEMEX Site" has the meaning set forth in the recitals above.

1.3. "Committee" means any committee established pursuant to Article 8 of this Agreement.

1.4. "Coordination Agreement" means a legal agreement adopted between two or more GSAs that provides the basis for coordinating multiple GSAs or GSPs within a basin. Coordination Agreements are required if multiple GSAs in a basin prepare multiple GSPs.

1.5. "County GSA" means the County of Monterey Groundwater Sustainability Agency.

1.6. "Effective Date" means the date on which the last Member executes this Agreement.

1.7. "GSA Workgroup has the meaning set forth in Article 7 of this Agreement.

1.8. "GSA" means a groundwater sustainability agency.

1.9. "GSP" means a groundwater sustainability plan.

1.10. "Management Area" refers to an area within a basin for which a GSP may identify different minimum thresholds, measurable objectives, monitoring, or projects and management actions unique to that area based on differences in water use sector, water source type, geology, aquifer characteristics, or other factors.

1.11. “Member” means each party to this Agreement that satisfies the requirements of Article 6 of this Agreement, including any new members pursuant to Article 6 of this Agreement.

1.12. “Member’s Governing Body” means the board of directors, board of supervisors, council, trustees or other voting body that controls the individual public agencies that are Members.

1.13. “Project Agreement” has the meaning assigned to it in Article 11 of this Agreement.

1.14. “SGMA” has the meaning assigned to it in the first Recital of the Agreement.

1.15. “Specific Project” means a project undertaken by some, but not all Members, pursuant to Article 11 of this Agreement.

1.16. “SVBGSA” means Salinas Valley Basin Groundwater Sustainability Agency.

1.17. “State” means the State of California.

1.18. “Subbasin” means the 180/400 Foot Salinas Aquifer Subbasin, to reflect the most recent Bulletin 118 boundaries and as currently shown on the map attached to this Agreement as Exhibit B, which is incorporated herein by this reference. (DWR basin_____).

ARTICLE 2. PURPOSE OF THE AGREEMENT

2.1. The purposes of this Agreement are to: (a) develop, adopt, and implement a single, legally sufficient GSP for the Subbasin in order to implement SGMA requirements and achieve the sustainability goals outlined in the GSP; (b) cooperatively carry out the purposes of SGMA in the Subbasin; (c) coordinate basin-wide public involvement and stakeholder outreach and engagement in implementing the Subbasin GSP; (d) specify the terms under which County GSA designates SVBGSA to manage the CEMEX Site under SGMA and implement the SVBGSA’s GSP for the CEMEX Site, as well as the Subbasin and (e) to maintain mutual respect for the autonomy of individual Members and preservation of each Member’s separate legal authorities, powers, duties and rights as separate public agencies and GSAs, except as set forth in this Agreement.

ARTICLE 3. TERM

3.1. This Agreement shall become effective on the Effective Date and shall continue in full force and effect until terminated pursuant to the provisions of Article 13.

ARTICLE 4. PRESERVATION OF POWERS

4.1 Preservation of Powers. Each Member retains its powers granted through SGMA. Each Member reserves its rights, in its sole and absolute discretion, and all Members confirm that nothing contained herein shall:

> 4.1.1. Alter any water right, contract right, or any similar right held by any Member or any Member’s landowners or customers, or amend a Member’s water delivery practice, course of dealing, or conduct.

4.1.2. Limit or interfere with any Member's rights and authorities over its own internal matters, including, but not limited to, a Member's legal rights to surface water supplies and assets, groundwater supplies and assets, facilities, operations, water management, and water supply matters.

4.1.3. Modify or limit any Member's police powers, land use authorities, well permitting or any other authority.

ARTICLE 5. BASIN COOPERATION

5.1. Each Member recognizes the benefits of cooperation amongst the GSAs within the Subbasin and, to that end, will in good faith, and with the consent of each Member's governing body, take actions to help effect the timely adoption of a GSP for the entire Subbasin.

5.2. County GSA designates SVBGSA as the manager of the CEMEX Site for groundwater management purposes under SGMA, including the implementation and enforcement, if necessary, of the GSP. SVBGSA agrees to undertake all reasonable and necessary actions to comply with SGMA at the CEMEX Site, including taking actions to review, adopt and implement the GSP, including filing of annual reports and documents required by SGMA.

5.3. County GSA authorizes SVBGSA to exercise any and all legal authorities in compliance with applicable law for the CEMEX Site. In the event County GSA disagrees with SVBGSA's use of legal authority affecting the CEMEX Site, County may promptly, and no later than ___ days following the disputed action, provide notice of disagreement and proceed to dispute resolution in accordance with Article 9.2.

5.4. Nothing herein is intended to or shall be construed as a waiver, relinquishment, abandonment, or infringement of the legal authorities of the County GSA for the CEMEX Site, or of any other legal authority of the County of Monterey.

5.5. The Members shall, whenever and as often as reasonably requested to do so by any other Member, execute, acknowledge, and deliver or cause to be executed, acknowledged, and delivered, any and all documents and instruments as may be necessary, expedient or proper in the reasonable opinion of the requesting Member to carry out the purposes and intent of this Agreement.

ARTICLE 6. MEMBERS

6.1. Initial Members. The initial Members of this Agreement shall be the County of Monterey Groundwater Sustainability Agency and Salinas Valley Groundwater Sustainability Agency.

6.2. New Members. Additional Parties may join the Agreement and become a Member provided that the prospective new member: (a) is an established GSA in the Subbasin as provided by SGMA (Water Code §10723); (b) pays its share of all previously incurred costs, if any; (c) pays all applicable fees and charges, if any; and (d) receives unanimous consent to join from the existing Members, evidenced by the execution of a written amendment to this Agreement signed by all Members, including the new public agency.

ARTICLE 7. GSA Workgroup

7.1. Formation of the GSA Workgroup. This Agreement shall hereby establish the GSA Workgroup that will meet upon the request of any Member. Without amending this Agreement, the composition of the GSA Workgroup may be altered from time to time to reflect the withdrawal of any Member and/or the admission of any new Member. The GSA Workgroup shall consist of the following representatives, who shall be appointed in the manner set forth in Article 7:

7.1.1. One (1) representative appointed by the governing body of each Member, who shall be a member of the governing body of the Member (each, a "Member Director").

7.1.2. One (1) alternate representative appointed by the governing body of each Member, who may be a member of the governing body or designee of the Member (each, an "Alternate Member Director").

7.2. Purpose of the GSA Workgroup. The purpose of the GSA Workgroup shall be to establish: (a) a GSA cooperation forum of Member Directors; (c) a mechanism whereby Members raise, and attempt in good faith to resolve, disputes that may occur between and among Members pursuant Article 9.2 of this Agreement; and (d) if necessary, a mechanism to make advisory recommendations to the Members concerning implementation of the GSP for the CEMEX Site.

7.3. Alternate Member Directors. Alternate Member Directors shall not participate as a Member Director in any discussions or deliberations of the GSA Workgroup unless appearing as a substitute for a Member Director due to absence. If the Member Director is not present, the Alternate Member Director appointed to act in his/her place shall have the authority to act in his/her absence. Alternate Member Directors are encouraged to attend all GSA Workgroup meetings and stay informed on current issues before the GSA Workgroup.

7.4. Terms. The term for each member of the GSA Workgroup is four (4) years and these individuals may be reappointed. Each Member Director and Alternate Member Director shall serve at the pleasure of the appointing Member's governing body and may be removed from the GSA Workgroup by the appointing Member's governing body at any time. If, at any time, a vacancy occurs on the GSA Workgroup, a replacement shall be appointed by the appropriate Member to fill the unexpired term of the previous Member Director's seat pursuant to this Article 7 and within ninety (90) days of the date that such position becomes vacant.

7.5. Removal of GSA Workgroup Members. A Director who no longer meets the qualifications set forth in Article 7.1 is automatically removed from the GSA Workgroup. Upon removal of a Member Director, the Alternate Member Director shall serve as a Member Director until a new Member Director is appointed.

ARTICLE 8. OTHER COMMITTEE FORMATION

8.1. Other Committees. The GSA Workgroup may, upon unanimous vote, form additional committees to assist in the implementation of this Agreement and SGMA, including committees comprised of staff or consultant representatives from the Members. Committee meetings shall be noticed to and open to other Members.

ARTICLE 9. DECISION-MAKING AND DISPUTE RESOLUTION

9.1. Decision-making Authority. Topics where the Members desire coordinated decision-making will be considered by the GSA Workgroup, and the Member Directors will strive for unanimous recommendations that will be presented to each Member's governing body for consideration. Such topics include, but are not limited to, implementation of the GSP, including adaptive management measures, and associated financial arrangements. When unable to reach unanimous recommendations, the GSA Workgroup will outline the areas in which it does not agree, providing some explanation to inform the respective GSAs' governing bodies. The recommendations of the GSA Workgroup notwithstanding, ultimate decision-making authority for topics considered by the GSA Workgroup resides with each Member's governing body in accordance with Article 4.1.

9.2. Dispute Resolution. It is the desire of Members to informally resolve all disputes and controversies related to this Agreement, whenever possible, at the least possible level of formality and cost. If a dispute occurs, staff representatives of the disputing Members shall meet and confer in an attempt to resolve the matter. If informal resolution cannot be achieved, the matter will be referred to the GSA Workgroup for further good faith efforts to resolve the dispute. With unanimous consent, the GSA Workgroup may engage the services of a trained mediator or retain technical consultants to assist with dispute resolution. In the event the GSA Workgroup is unable to resolve the dispute, any Member may resort to available legal and equitable remedies to resolve disputes.

ARTICLE 10. MANAGEMENT AREAS

10.1. Formation of Management Areas. The Members do not, at this time, contemplate management areas. However, the Members reserve the right to amend the GSP to create Management Areas within the Subbasin. A Management Area could be defined along the boundaries of one or more Member's jurisdictional boundaries, or it could be defined along other boundaries. In accordance with SGMA, any definition of Management Areas would be for the purposes of enhancing the ability of the GSAs to achieve and maintain sustainable groundwater management in the Subbasin. If Management Areas are formed, the following shall apply:

10.1.1. Common and Management Areas Chapters. The GSP will be organized so that there are GSP chapters or sections that address issues common to all Members followed by Management Area chapters or sections that may include specific minimum thresholds, measurable objectives, monitoring protocols and projects. All chapters must be consistent with the Subbasin sustainability goals.

10.1.2. Management Area Lead Responsibilities and Coordination. Each of the Members will have the responsibility to cooperatively develop their relevant Management Area chapter(s) for inclusion into the GSP. The development of all Management Area chapters will be coordinated through the GSA Workgroup to ensure consistency and efficiency.

10.1.3. Retention of Powers Granted through SGMA. If Management Areas are formed for the CEMEX Site, County GSA shall have the sole right to: 1) approve the sections or chapters of the GSP related to Sustainable Criteria and Projects and Actions as applicable within the CEMEX Site Management Area; 2) consider the interests of beneficial uses and users as required by Water code §10723.4 and GSP regulation §354.10; and 3) exercise the powers, without limitation, conferred upon a GSA by SGMA.

10.1.4. Failure to Submit Management Area Chapter. In the event of a failure by any Member to develop and submit a Management Area chapter within the deadline set by mutual agreement, failure to comply may lead to withdrawal or termination of this Agreement pursuant to Article 13 of this Agreement, or other legal remedies available to the Members.

ARTICLE 11. SPECIFIC PROJECTS

11.1. Member Specific Projects. In addition to the general activities undertaken by all Members, any Member may initiate a Specific Project to implement or comply with SGMA or the GSP. The Member proposing a Specific Project shall provide advance notice of their intent to undertake such project to the GSA Workgroup prior to committing to the Specific Project. The other Members shall promptly and not later than (60) days later respond to the Member proposing the Specific Project with notice of intent to participate or to not participate in the Specific Project. Upon notice of intent to participate, the affected Members shall negotiate a Project Agreement as set forth in section 11.2, below. If the other Members are not interested in participating in the Specific Project, then the proposing Member may individually pursue the Specific Project pursuant to section 11.3, below.

11.2. Project Agreement. Prior to undertaking any Specific Project in Article 11.1 for which a notice to intent to participate is made, the Members electing to participate in the Specific Project shall enter into a Project Agreement. A Member may elect not to participate in a Specific Project by providing notice and not entering into the Project Agreement. Each Project Agreement shall provide the terms and conditions by which the Members that enter into the Project Agreement will participate in the Project. All assets, rights, benefits, and obligations attributable to the Specific Project shall be assets, rights, benefits, and obligations of those Members that have entered into the Project Agreement. Any debts, liabilities, obligations, or indebtedness incurred in regard to a particular Specific Project shall be the debts, liabilities, obligations, and indebtedness of those Members that have executed the Project Agreement in accordance with the terms thereof and shall not be the debts, liabilities, obligations, and indebtedness of those Members that have not executed the Project Agreement.

11.3. Specific Projects Undertaken by One Member. All assets, rights, benefits and obligations attributable to Specific Projects undertaken by one Member shall be the assets, rights, benefits and obligations of that Member. Any debts, liability, obligations, or indebtedness incurred in regard to such Specific Projects shall be the debts, liabilities, obligations and indebtedness of the Member undertaking the Specific Project.

ARTICLE 12. FINANCIAL PROVISIONS

12.1. The Members acknowledge that the cost of the GSP was previously funded in a fair and equitable manner and no party shall seek reimbursement from the other for any cost incurred for the completion of the GSP. Following GSP adoption, as needed, continuing cooperation may be funded by Member contributions. If the Members decide that cost-sharing is required for any contract or expenditure made pursuant to this Agreement, any cost-sharing allocations shall be agreed to in writing by the Members in advance of executing any contracts with consultants, vendors, or other contractors or incurring any expense. Any such contracts shall be drafted in a manner that reflects that consultants, vendors, or contractors hired to perform work under this Agreement are working on behalf of the Members and will be expected to work with the Members on a collective basis and with each Member on an individual basis, as needed.

Such contracts shall be made enforceable by the Members. The contracts shall include appropriate indemnity and insurance provisions agreed upon by the Members. In the event a Member acts as the official contracting party and executes a contract on behalf of the Members (the "Contracting Party"), the Contracting Party shall:

12.1.1. comply with all applicable local, state, and federal laws including, without limitation, the California Public Contract Code and California Labor Code;

12.1.2. provide the other Members a reasonable opportunity to review any bids received and to review and provide input on any draft contract prior to its execution;

12.1.3. not approve any change orders that increase the cost of the original contract by more than 10% without prior consultation and written consent of the other Members;

12.1.4. provide diligent oversight of the work conducted by any contractor, vendor, or consultant under contract executed pursuant to this Agreement; and

12.1.5. maintain complete, accurate, and clearly identifiable records with respect to all contracts executed, and provide to the other Members, upon reasonable request, all records, documents, reports, conclusions, work product, and other information related in any way to any contract executed on behalf of the Members pursuant to this Agreement.

ARTICLE 13. WITHDRAWAL AND TERMINATION

13.1. Withdrawal. A Member may unilaterally withdraw from this Agreement by providing notice of withdrawal, in writing, to the other Members. Notices of withdrawal submitted after the GSP has been adopted by the GSAs and transmitted to DWR shall not be effective until the Members have met, conferred and satisfactorily resolved issues associated with withdrawal to ensure that the withdrawal does not cause the Subbasin to be noncompliant with SGMA and potentially subject the Subbasin to probationary status, including, if applicable, the Members negotiating and adopting a Coordination Agreement under SGMA.

13.2. Termination of Agreement. This Agreement may be rescinded by unanimous written consent of all Members.

13.3. Right of Member in Event of Withdrawal or Termination. Upon withdrawal or termination of a Member, the Member shall be entitled to use all relevant, non-confidential data or other information developed by any Member or the Members under SGMA or used in the implementation of the GSP.

13.4. Financial Obligations. Upon withdrawal or termination of a Member, the Member shall remain responsible for any outstanding financial obligation agreed to pursuant to Article 11 or 12.

ARTICLE 14. MISCELLANEOUS

14.1. No Predetermination or Irretrievable Commitment of Resources. Nothing in this Agreement shall constitute a determination by any of its Members that any action shall be undertaken or that any unconditional or irretrievable commitment of resources shall be made, until such time as the required compliance with all local, state, or federal laws, including without limitation the California Environmental Quality Act, National Environmental Policy Act, or permit requirements, as applicable, has been completed.

14.2. Notices. Notices hereunder shall be sufficient if delivered via electronic mail, First-Class mail or facsimile transmission to the addresses as specified in Exhibit A.

14.3. Amendment. This Agreement may be amended at any time, by unanimous agreement of the Members, provided that before any amendments shall be operative or valid, they shall be in writing and signed by all Members hereto.

14.4. Agreement Complete. This Agreement constitutes the full and complete agreement of the Members. This Agreement supersedes all prior agreements and understandings, whether in writing or oral, related to the subject matter of this Agreement that are not set forth in writing herein.

14.5. Severability. If any provision of this Agreement is determined to be invalid or unenforceable, the remaining provisions will remain in force and unaffected to the fullest extent permitted by law and regulation.

14.6. Execution in Counterparts. The Parties intend to execute this Agreement in one or more counterparts each of which shall be considered an original Agreement.

14.7. Withdrawal by Operation of Law. Should the participation of any Member to this Agreement be decided by the courts to be illegal or in excess of that Member's authority or in conflict with any law, the validity of this Agreement as to the remaining Members shall not be affected thereby.

14.8. Assignment. The rights and duties of the Members may not be assigned or delegated without the written consent of all other Members. Any attempt to assign or delegate such rights or duties in contravention of this Agreement shall be null and void.

14.9. Binding on Successors. This Agreement shall inure to the benefit of, and be binding upon, the successors or assigns of the Members.

14.10. Venue. This Agreement shall be governed by and construed in accordance with the laws of the State of California, and any action related to the terms of this Agreement will be filed in Monterey County Superior Court.

14.11. GSA Status. By execution hereof, each Member represents that it is a legal entity authorized to be a Groundwater Sustainability Agency pursuant to California Water Code § 10723.

14.12. Indemnity. In lieu of the provisions of Government Code section 895.6, and pursuant to Government Code section 895.4, each Member agrees to defend, indemnify and hold harmless the other Member, and its officers, employees and agents, from any and all claims, suits, judgments, damages, penalties, costs, expenses, liabilities and losses (including without limitation, sums paid in settlement of claims, actual attorneys' fees, paralegal fees, consultant fees, engineering fees, expert fees, and any other professional fees) that arise from or are related in any way to each Member, its employees, officers, or other agents in the operation and/or performance of this Agreement; provided, however, that no Member shall indemnify or hold harmless another Member for that other Member's own negligent acts, errors, or omissions, or willful misconduct, in the operation and/or performance of this Agreement. This indemnity shall survive the termination of this Agreement and the withdrawal of any Member to this Agreement.

14.13. Joint Defense. In the event of any challenge to the Subbasin GSP as it relates to the CEMEX Site, or made subject to a claim or penalty regarding the same, the Members shall meet and confer to determine whether to further coordinate and cooperate by undertaking joint defense, including utilizing a common interest/joint defense agreement.

IN WITNESS WHEREOF, the parties hereto, pursuant to resolutions duly and regularly adopted by their respective governing boards, have caused their names to be affixed by their proper and respective officers as of the date of execution of this Agreement.

By:_______________________________ Date:_______________
Chair, County of Monterey GSA

By:_______________________________ Date:_______________
Chair, SVBGSA

APPROVED AS TO FORM AND LEGALITY

By:_______________________________ Date:_______________

By:_______________________________ Date:_______________

APPENDIX 4A

METHODOLOGY FOR IDENTIFYING POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS

INTRODUCTION

Groundwater dependent ecosystems (GDEs) within the Salinas Valley are identified in accordance with §354.16(g) of the Groundwater Sustainability Plan regulations. The procedure for identifying GDEs follows guidance developed by The Nature Conservancy (TNC) and detailed in the *Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans* report (Rohde et al., 2018). This process differentiates between indicators of Groundwater Dependent Ecosystems (iGDEs), potential Groundwater Dependent Ecosystems, and true Groundwater Dependent Ecosystems.

- iGDEs were developed by The Nature Conservancy in partnership with the California Department of Fish and Wildlife (DFW) and DWR using the best available statewide data. The iGDEs are identified using locations of springs and seeps, wetlands, and vegetation known to rely on groundwater. The Nature Conservancy also uses the term "Natural Communities Commonly Associated with Groundwater" to refer to these iGDEs.
- Potential GDE are iGDEs that, through mapping analyses, may be connected to shallow groundwater and therefore be supported by shallow groundwater.
- True GDEs are potential GDE's that have been field verified to establish that they are supported by groundwater. The methodology described herein does not identify true GDEs.

The procedure consists of the following steps:

- Review geospatial data from TNC that show indicators of groundwater dependent ecosystems (iGDEs) within the Salinas Valley
- Assess the connection to groundwater for indicators of groundwater dependent ecosystems
- Identify potential GDEs. Potential GDEs are iGDEs that might be connected to groundwater. Potential GDEs should be field verified before they are established as true GDEs.

Geospatial data showing iGDEs were downloaded from TNC's website for Natural Communities Commonly Associated with Groundwater (https://gis.water.ca.gov/app/NCDatasetViewer). The iGDEs present in the Salinas Valley include areas identified as Wetlands or GDE Vegetation. All iGDEs in the 180/400-Foot Aquifer Subbasin, as identified by TNC, are shown on Figure 4A-1.

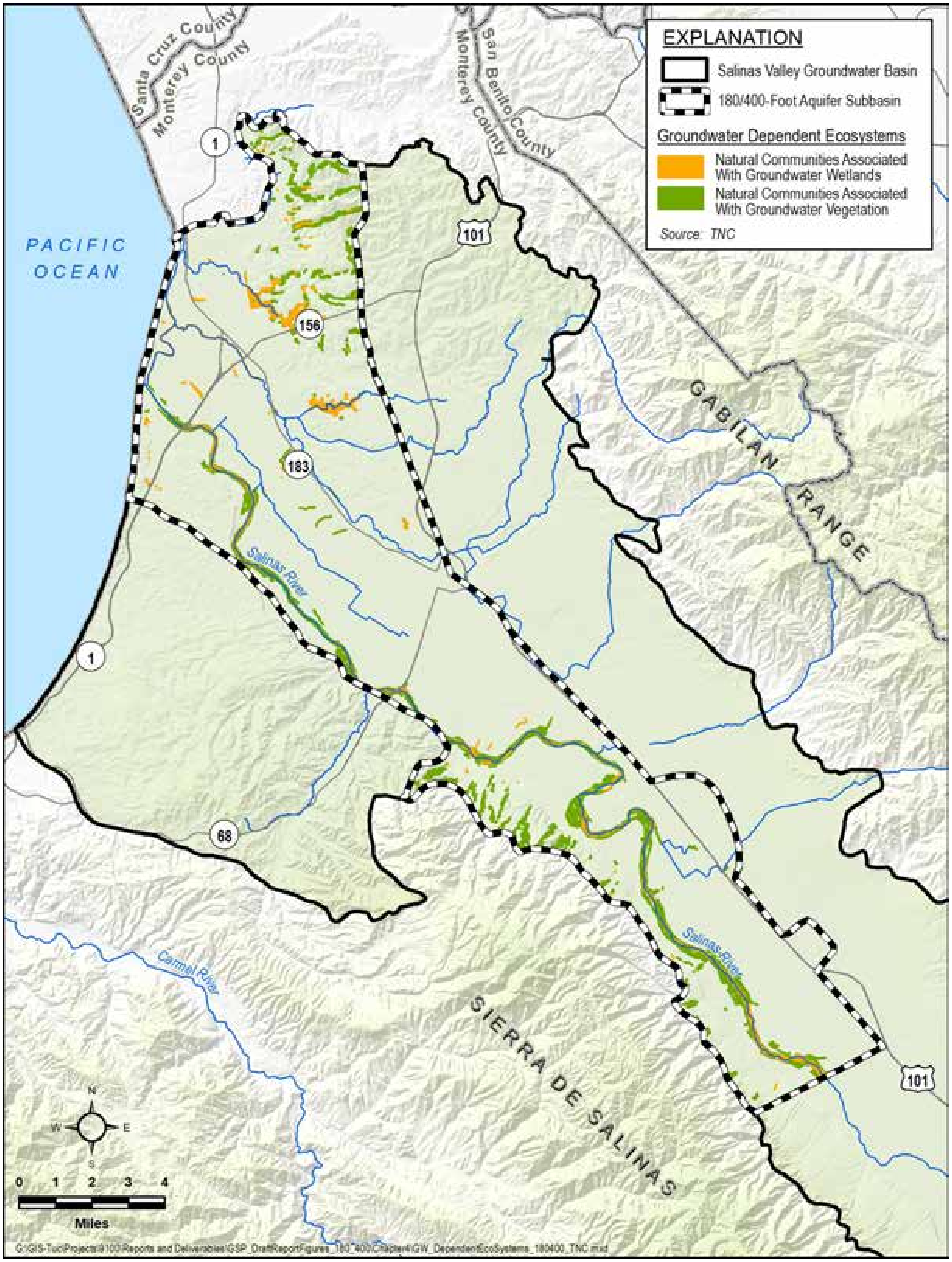


Figure 4A-1: Areas with Indicators of Groundwater Dependent Ecosystems (iGDEs) (TNC, 2018)

CRITERIA FOR CONNECTION TO GROUNDWATER

The iGDEs identified by TNC data can only be potential GDEs if they are connected to a groundwater source that supports the vegetation or wetlands. Identified iGDEs that are supported by streamflows, soil moisture, or shallow perched aquifers, rather than by a regional groundwater aquifer, are not considered potential GDEs for this report. The report by Rohde et al. (2018) provides a general list of questions, or criteria, applicable to all iGDEs for assessing connection to groundwater. These general questions are:

1. Is the iGDE underlain by a shallow unconfined or perched aquifer that has been delineated as being part of a Bulletin 118 principal aquifer in the Subbasin?
2. Is the depth to groundwater under the iGDE less than 30 feet?
3. Is the iGDE located in an area known to discharge groundwater (e.g. springs/seeps)?

Datasets used to assess the potential connection of the iGDEs to groundwater include the Monterey County surface geologic map (County of Monterey, 2007), measured and interpolated groundwater levels in the Monterey County groundwater monitoring network, and geospatial data included in the National Hydrographic Dataset (NHD) provided by the U.S. Geological Survey showing the location of mapped springs and seeps.

The datasets described above are used to assess the potential connection of iGDEs to groundwater based on the three criteria listed above. To be considered a potential GDE, the iGDEs must satisfy at least one of the three criteria described above; or the landforms around the iGDE must suggest the area could support potential GDEs. Following the suggestions in Rhode (2018), example landforms that could support potential GDEs might be mapped springs, seeps, or a break in the slope of the ground. In the absence of more formal field reconnaissance, the results of this screening level analysis only identify potential GDEs in the Subbasin. Additional field verification is necessary to definitively determine the true GDEs in the 180/400-Foot Aquifer Subbasin.

Question 1: Is the iGDE underlain by a shallow unconfined or perched aquifer that has been delineated as being part of a Bulletin 118 principal aquifer in the Subbasin?

Bulletin 118 (DWR, 2004) identifies the blue clay layer known as the Salinas Aquitard as a confining unit above the 180-Foot Aquifer. This feature is present in the lower Salinas Valley north of the town of Chualar. North of Chualar, the Salinas Valley Aquitard separates the surficial deposits from the principal aquifers. Therefore, only iGDEs overlying Quaternary alluvial units in the 180/400-Foot Aquifer Subbasin south of Chualar, are classified as potential GDEs. Figure 4A-2 shows the iGDEs associated with the shallow, unconfined Quaternary Alluvial (Qa) Aquifer.

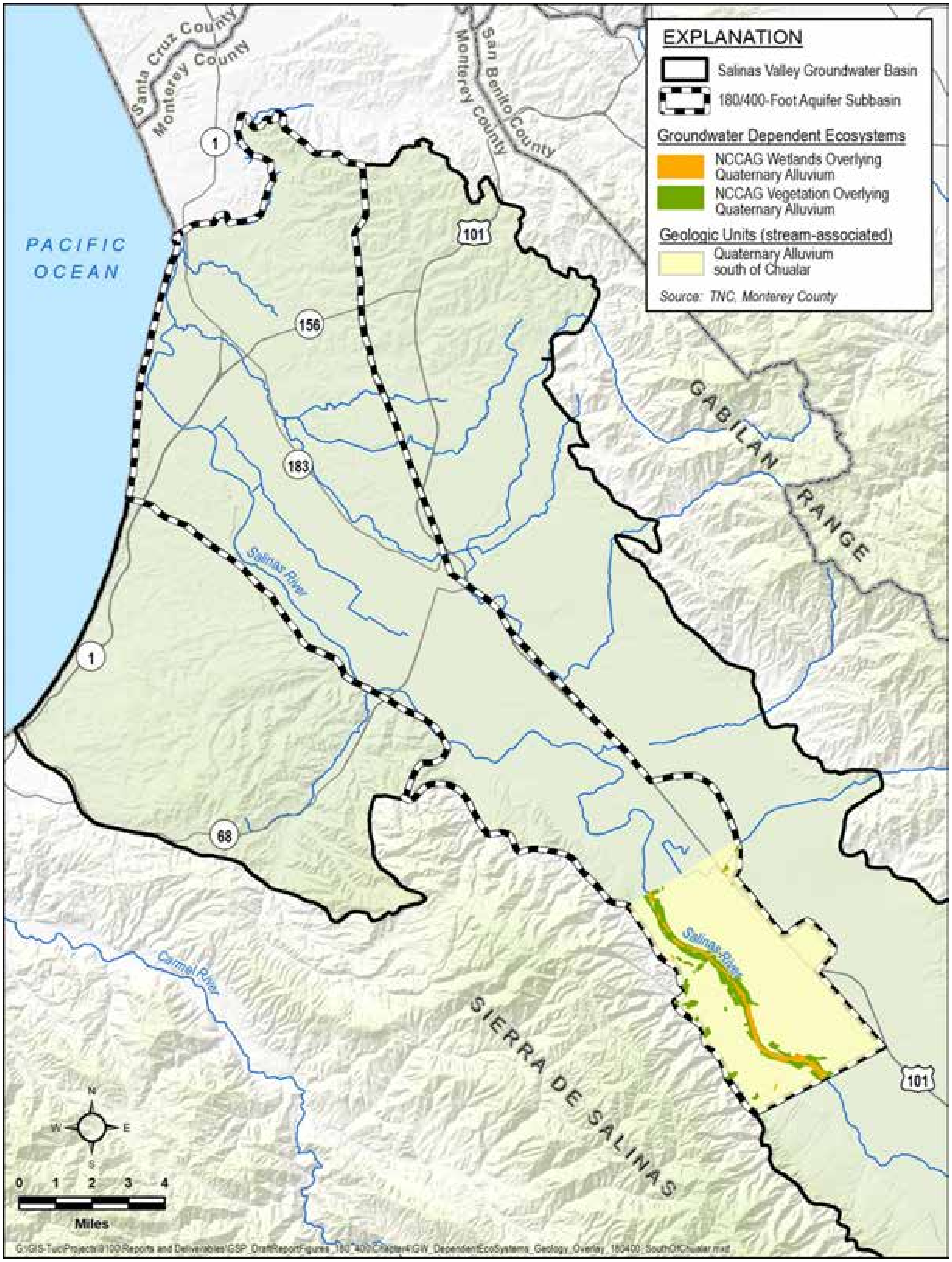


Figure 4A-2: iGDEs Associated with the Shallow, Unconfined Quaternary Alluvial (Qa) Aquifer

This criterion clearly has the potential to overestimate the number of potential GDEs in the Subbasin. The subjective assessment of what constitutes a shallow unconfined aquifer may result in identifying potential GDEs in areas that do not have the underlying groundwater to support the GDE. This emphasizes the need for field verification of the potential GDEs identified in this GSP.

Question 2: Is depth to groundwater under the iGDE less than 30 feet?

Depth to water is routinely measured by MCWRA staff within a network of monitoring wells. This analysis uses Fall 2013 depth to water data from MCWRA, where available, to interpolate a surface showing depth to water throughout the 180/400-Foot Aquifer Subbasin. Based on the measured groundwater level data and interpolation results, iGDEs overlying areas where estimated depth to groundwater is less than 30 feet are shown on Figure 4A-3.

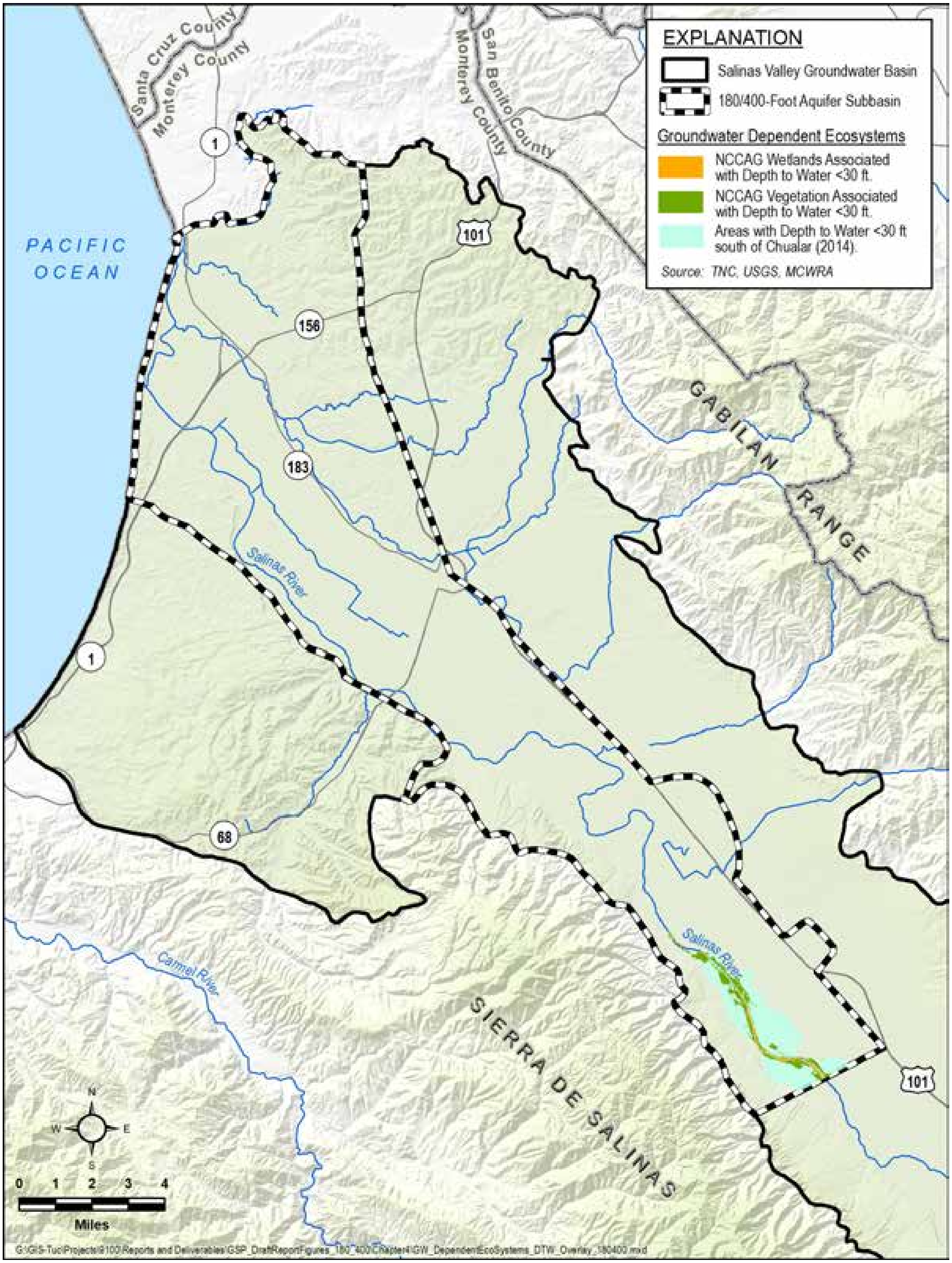


Figure 4A-3: Potential GDEs based on Depth to Groundwater Less than 30 Feet

Question 3: Is the iGDE located in an area known to discharge groundwater (e.g., springs/seeps)?

There are no springs and seeps identified by the National Hydrography Dataset (NHD) within or in the immediate vicinity of the Subbasin. Therefore, no potential GDEs in the 180/400-Foot Aquifer Subbasin are in an area known to discharge groundwater.

FINAL DELINEATION OF POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS

The final delineation of potential GDEs are the combination of all the potential GDEs identified by the three criteria listed above. A map showing the final delineated potential GDEs in the 180/400-Foot Aquifer Subbasin is shown in Figure 4A-4.

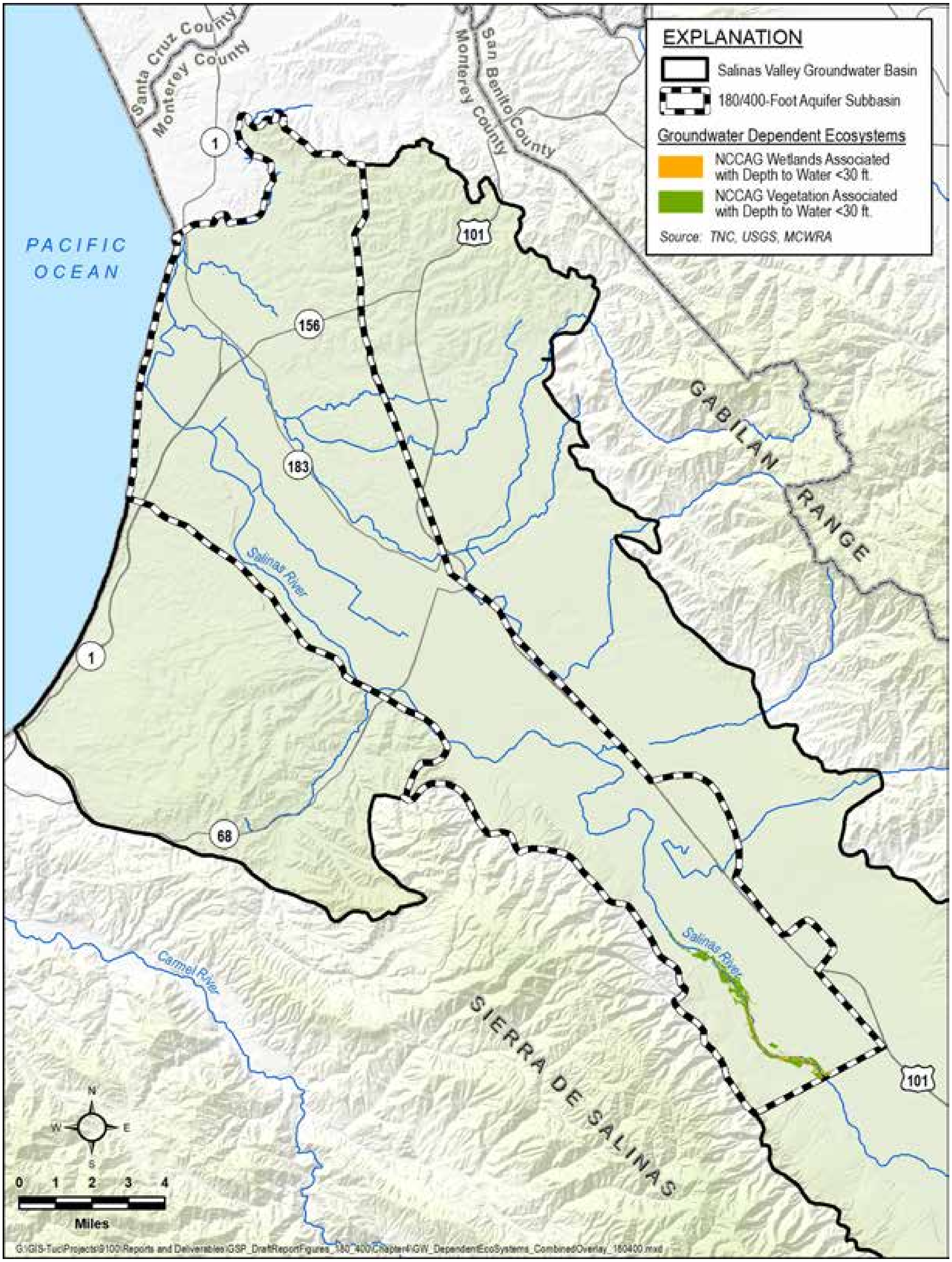


Figure 4A-4: Final Delineation of Extent of Potential GDEs

REFERENCES

Rohde, M. M., S. Matsumoto, J. Howard, S. Liu, L. Riege, and E.J. Remson, 2018, Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans: The Nature Conservancy, San Francisco, California.

California Department of Water Resources (DWR), 2004, Bulletin 118 Basin Descriptions: Salinas Valley Groundwater Basin, 180/400 Subbasin, accessed at https://water.ca.gov/Programs/Groundwater-Management/ Bulletin-118

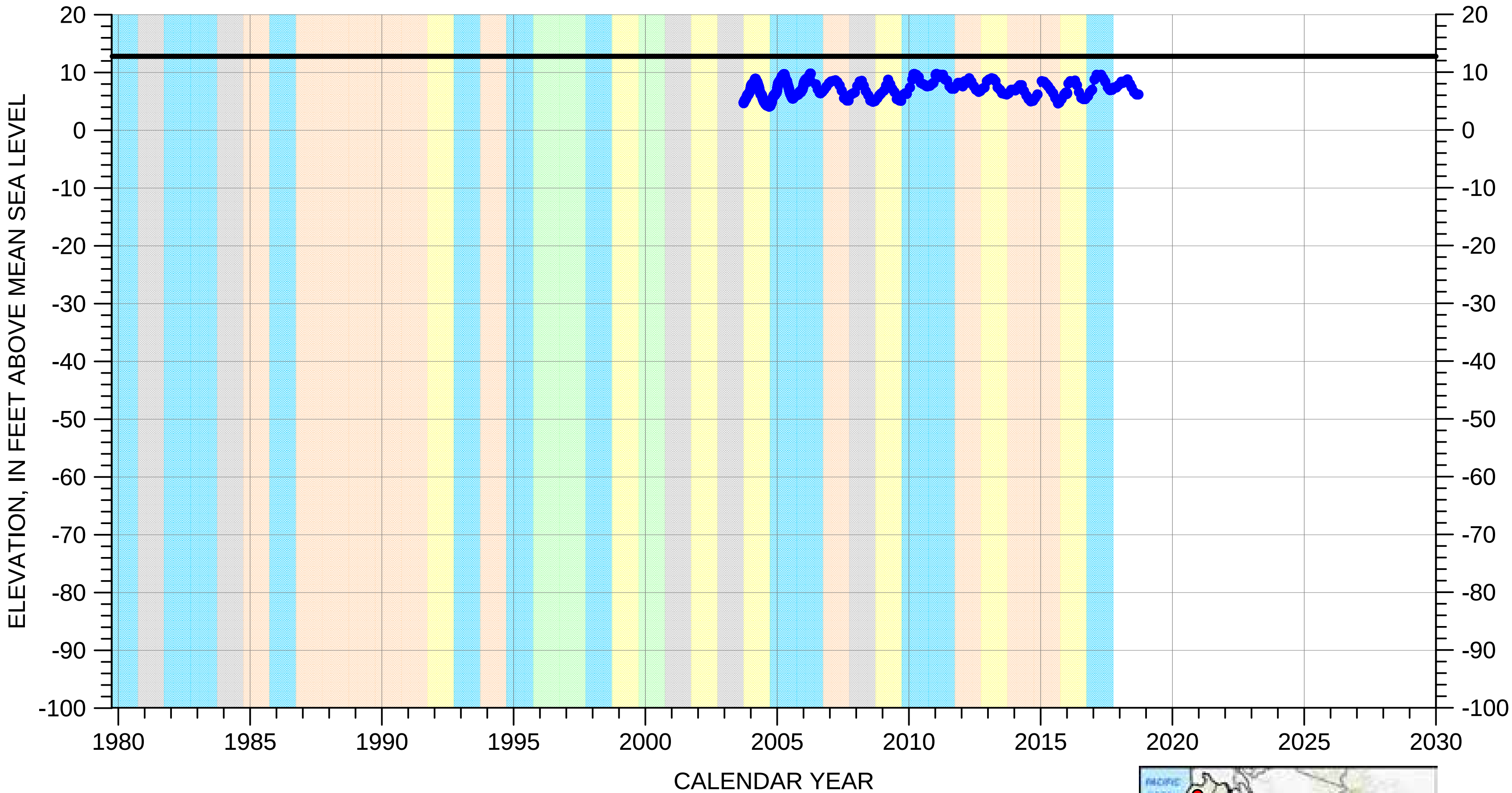
County of Monterey, Planning Department, 2007, Surface geology map, accessed at https://earthworks.stanford.edu/catalog/stanford-cm427jp1187

APPENDIX 5A

HYDROGRAPHS

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-21Q01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

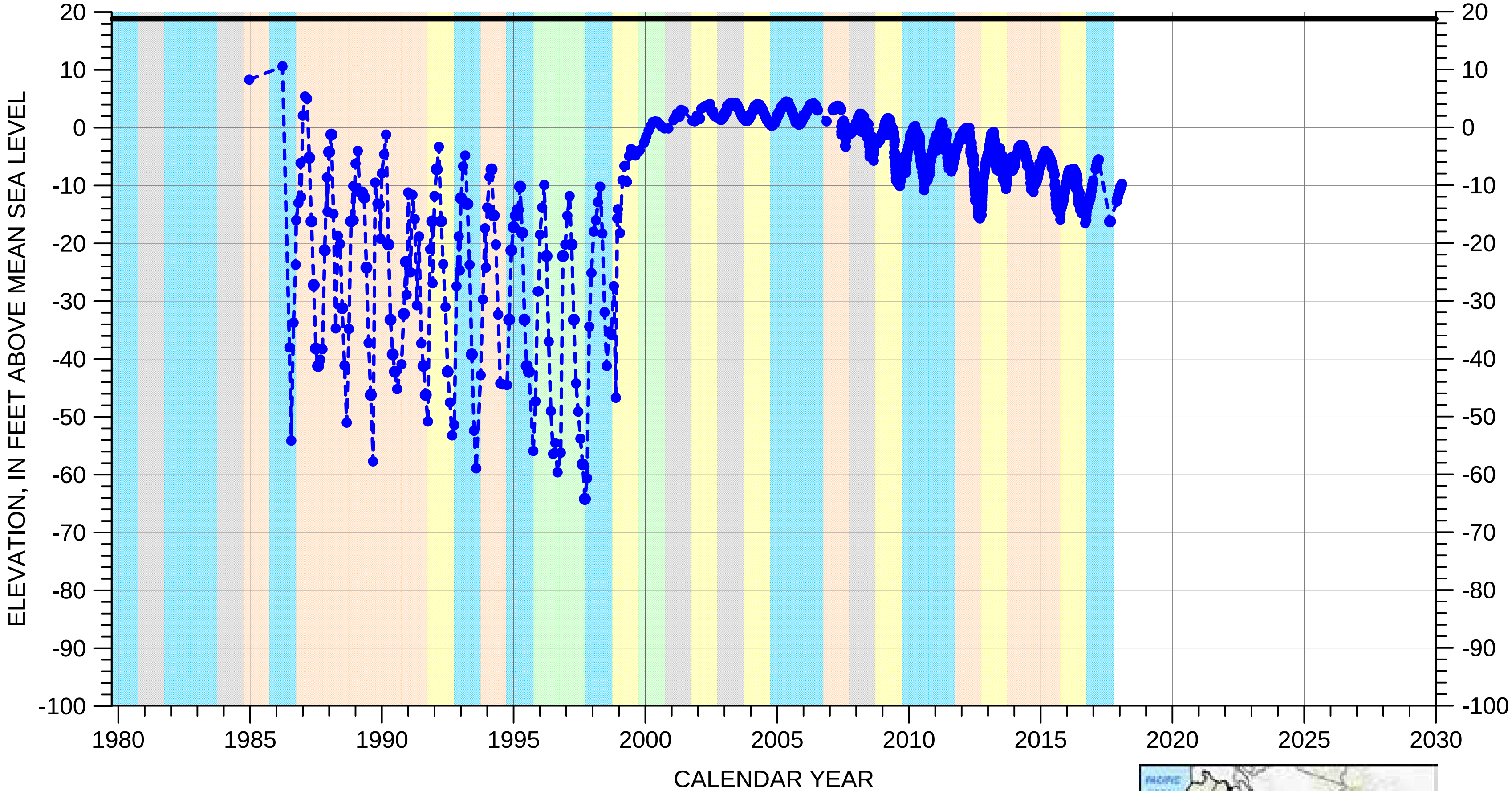
Well Depth: 157.4 feet

Screened Interval: 105-155 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY\13S_02E-21Q01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-32E05

180/400-Foot Aquifer Subbasin
(Deep Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY   DRY - NORMAL   NORMAL   WET - NORMAL   WET

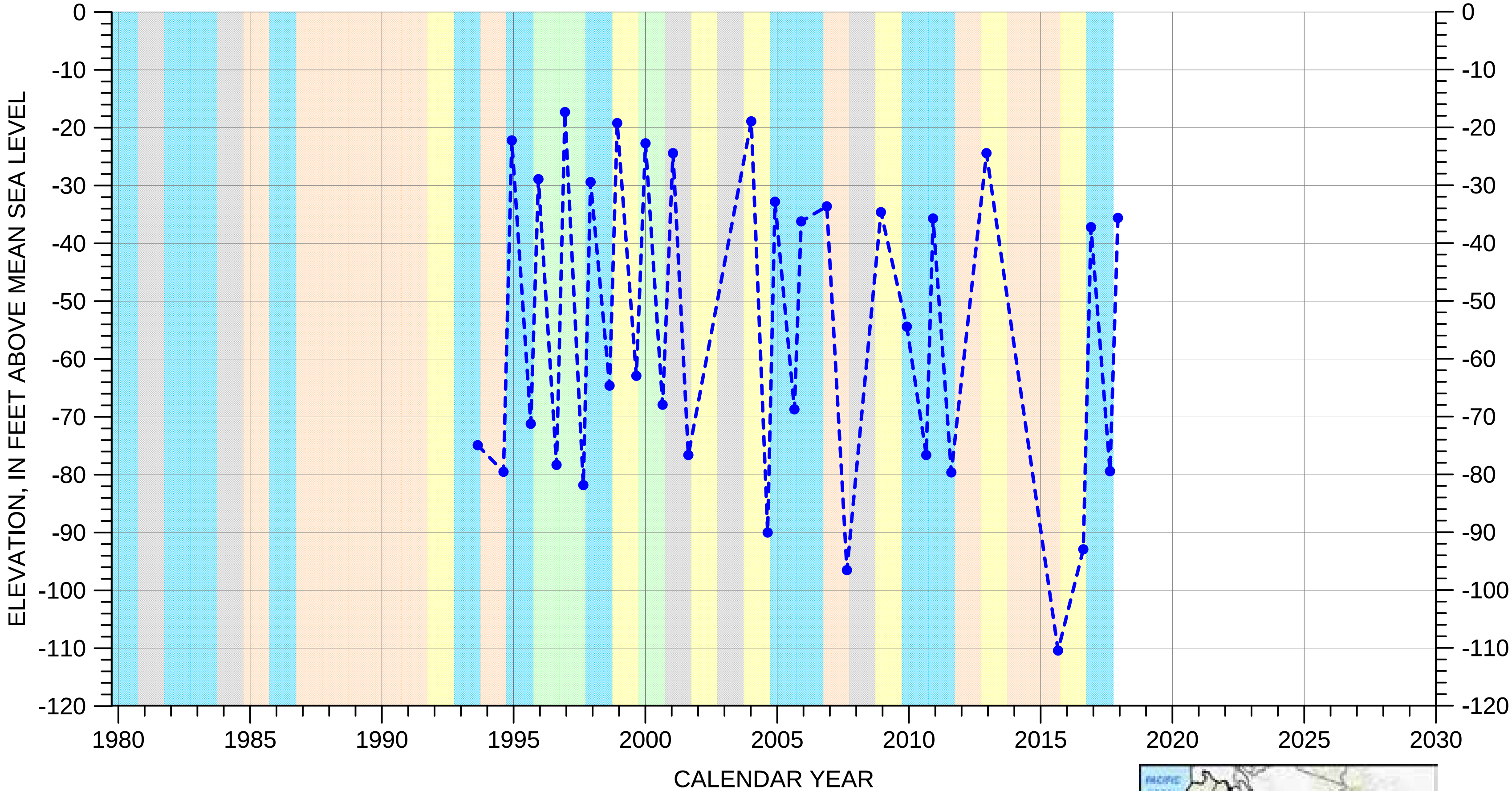
Well Depth: 1605 feet

Screened Interval: unknown

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY13S_02E-32E05.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-01C01

180/400-Foot Aquifer Subbasin



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (64.4 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

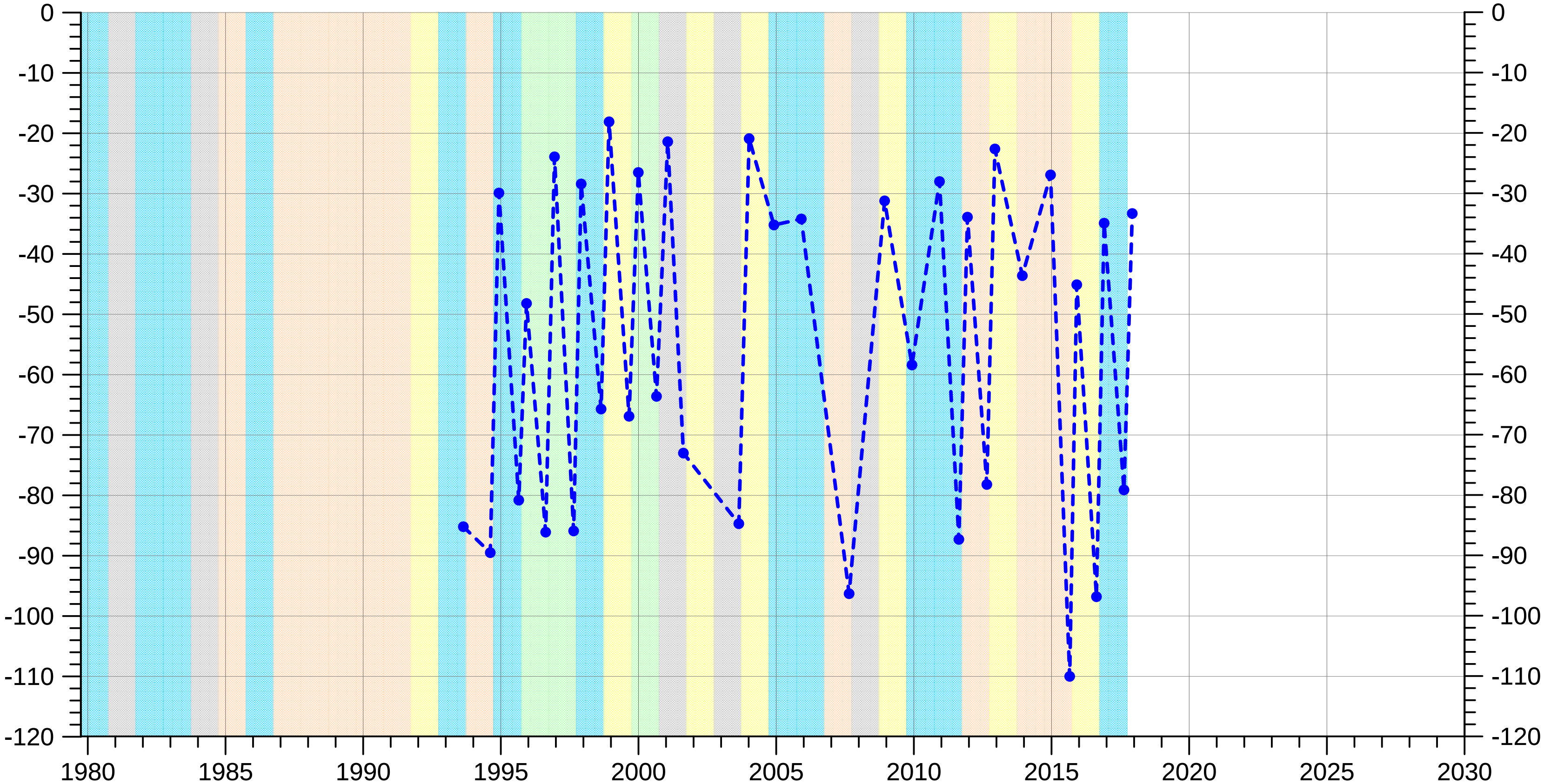
Well Depth: 591 feet

Screened Interval: 350-591 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-01C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-02A02

180/400-Foot Aquifer Subbasin



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (54.8 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

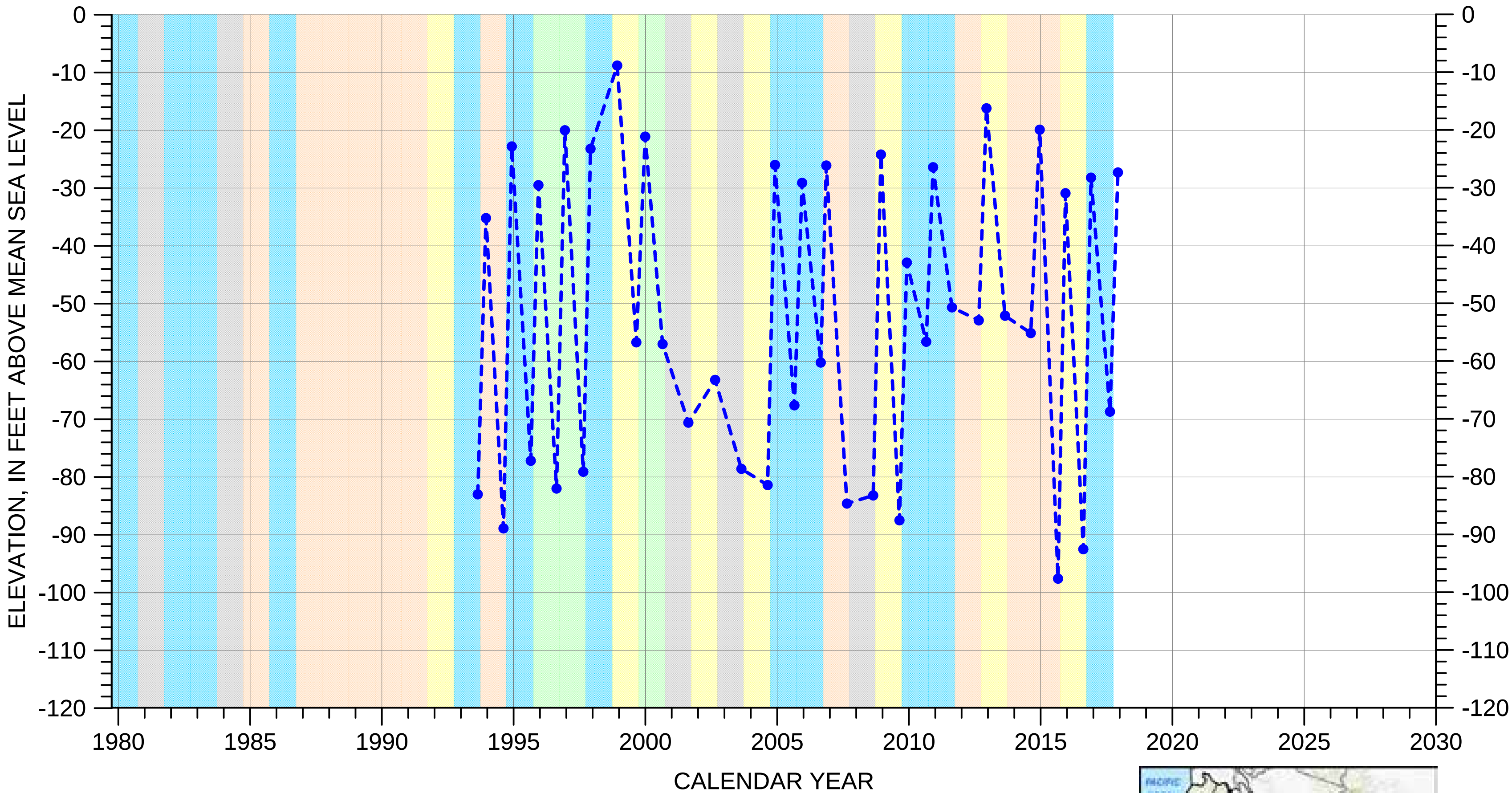
Well Depth: 810 feet

Screened Interval: 360-810 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-02A02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-02C03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (60.4 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

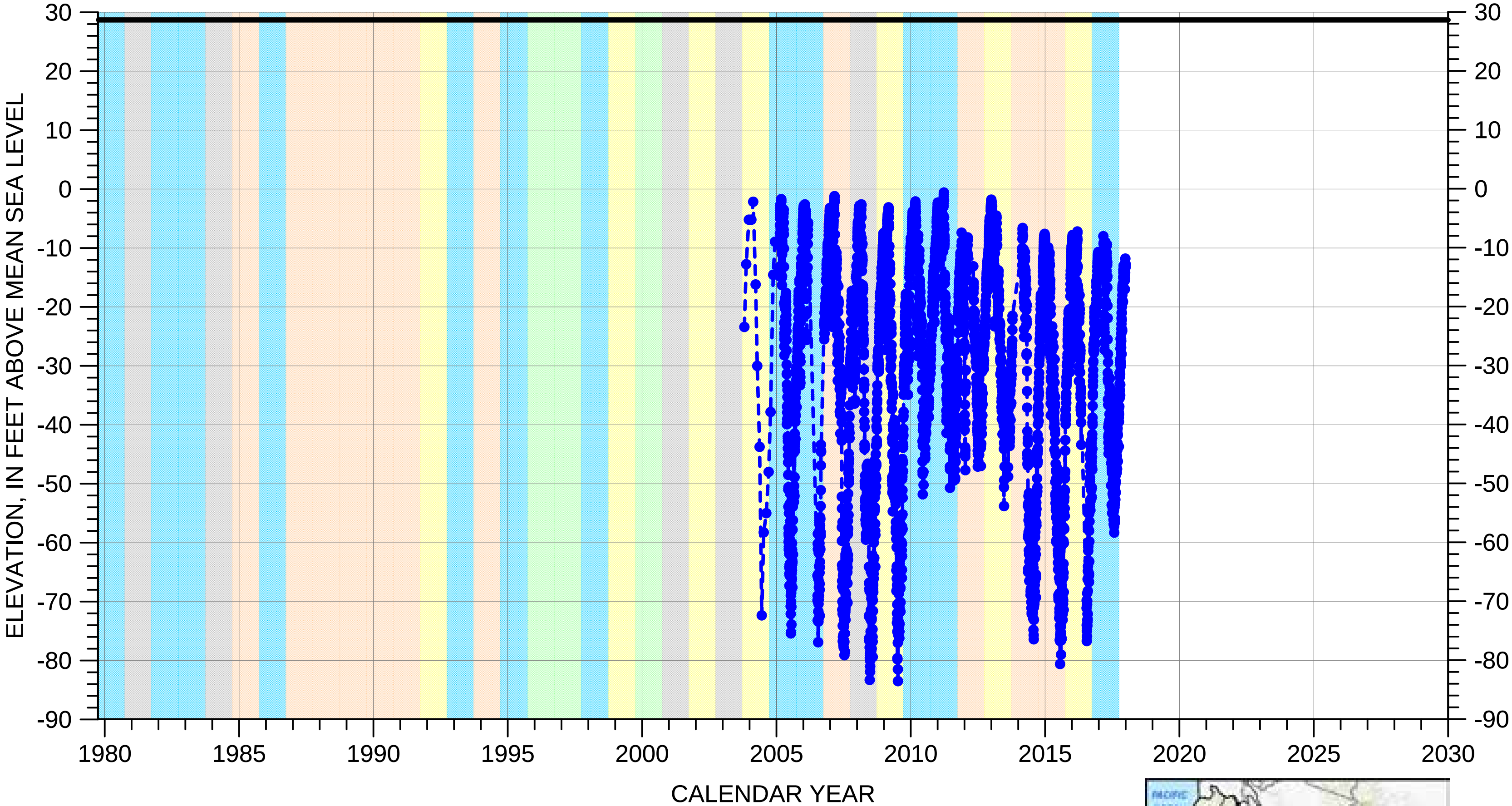
Well Depth: 835 feet

Screened Interval: 393-832 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY14S_02E-02C03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

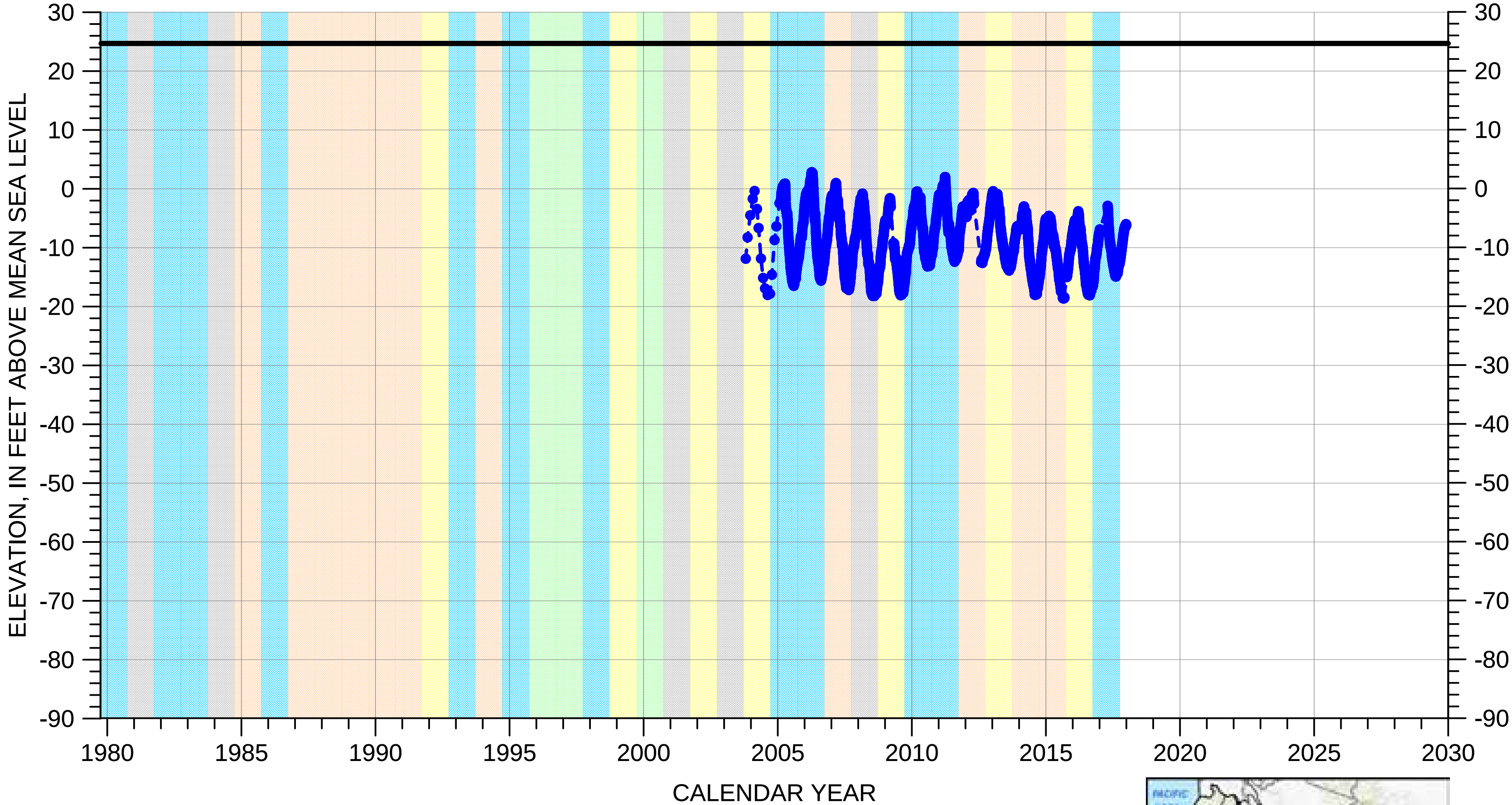
Well Depth: 455 feet

Screened Interval: 420-450 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_02E-03F03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

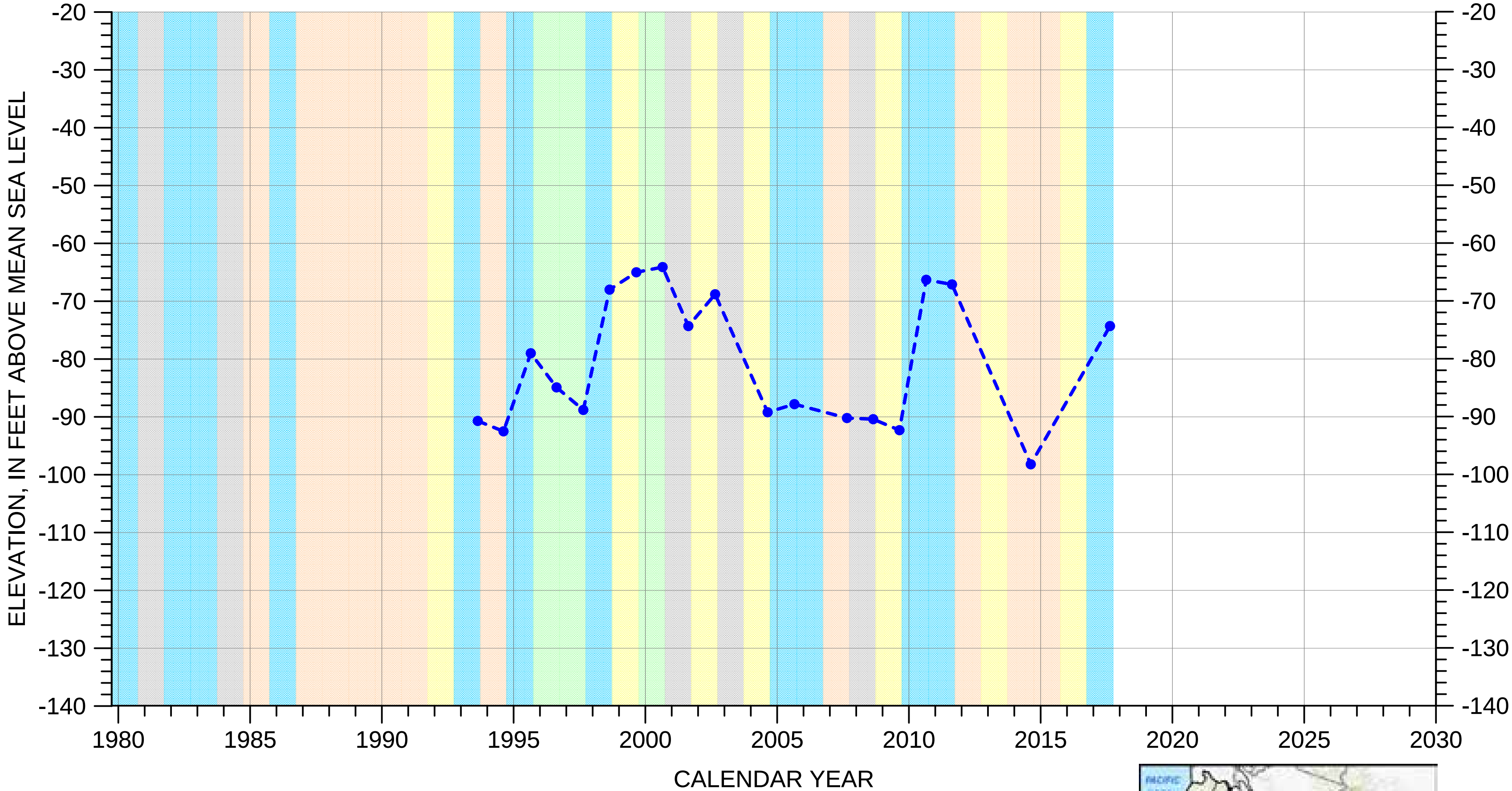
Well Depth: 205 feet

Screened Interval: 154-204 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-03F04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03H01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (41.7 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

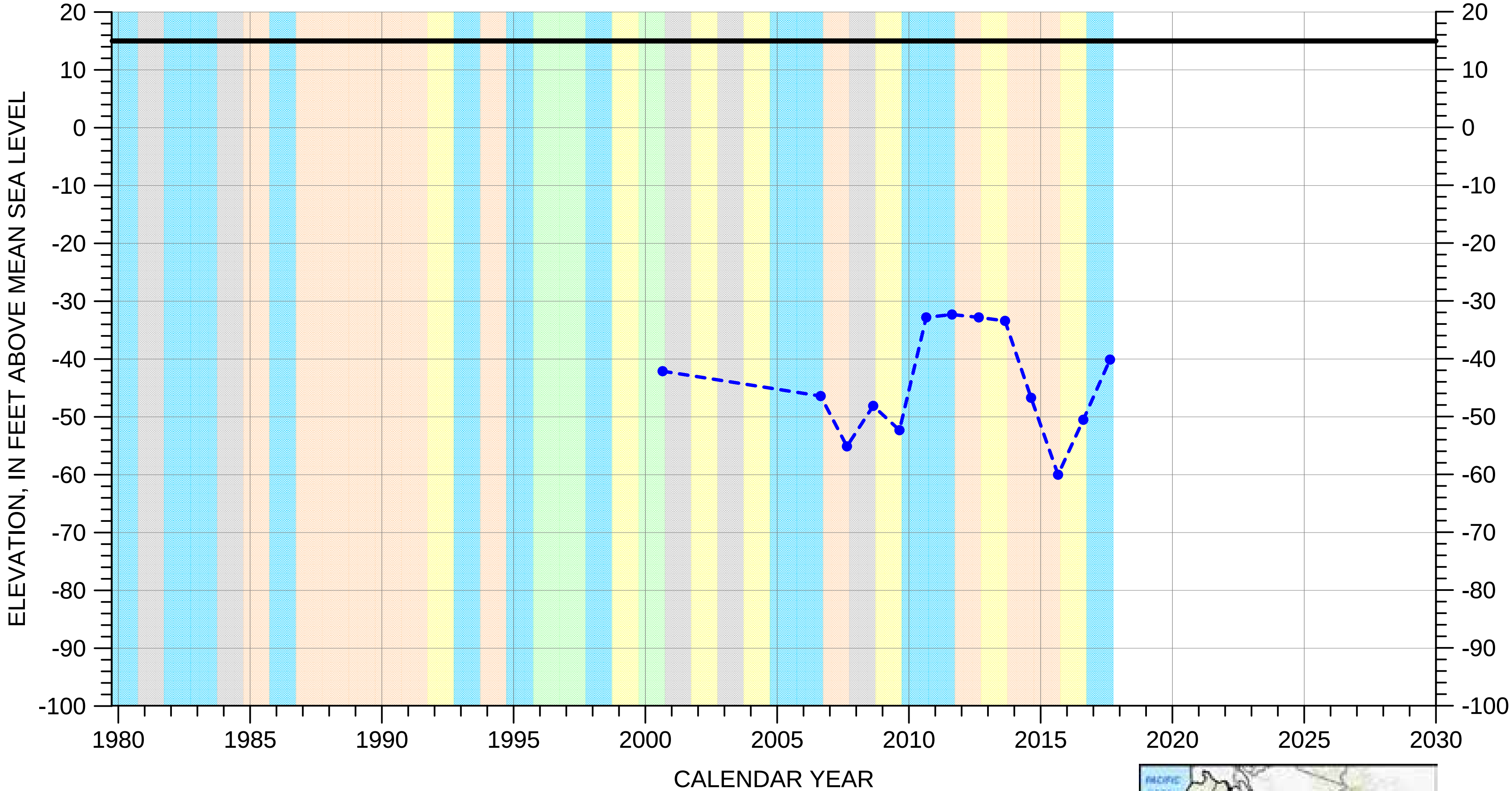
Well Depth: 800 feet

Screened Interval: 350-800 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-03H01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-04G02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_02E-04G02.grf

EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

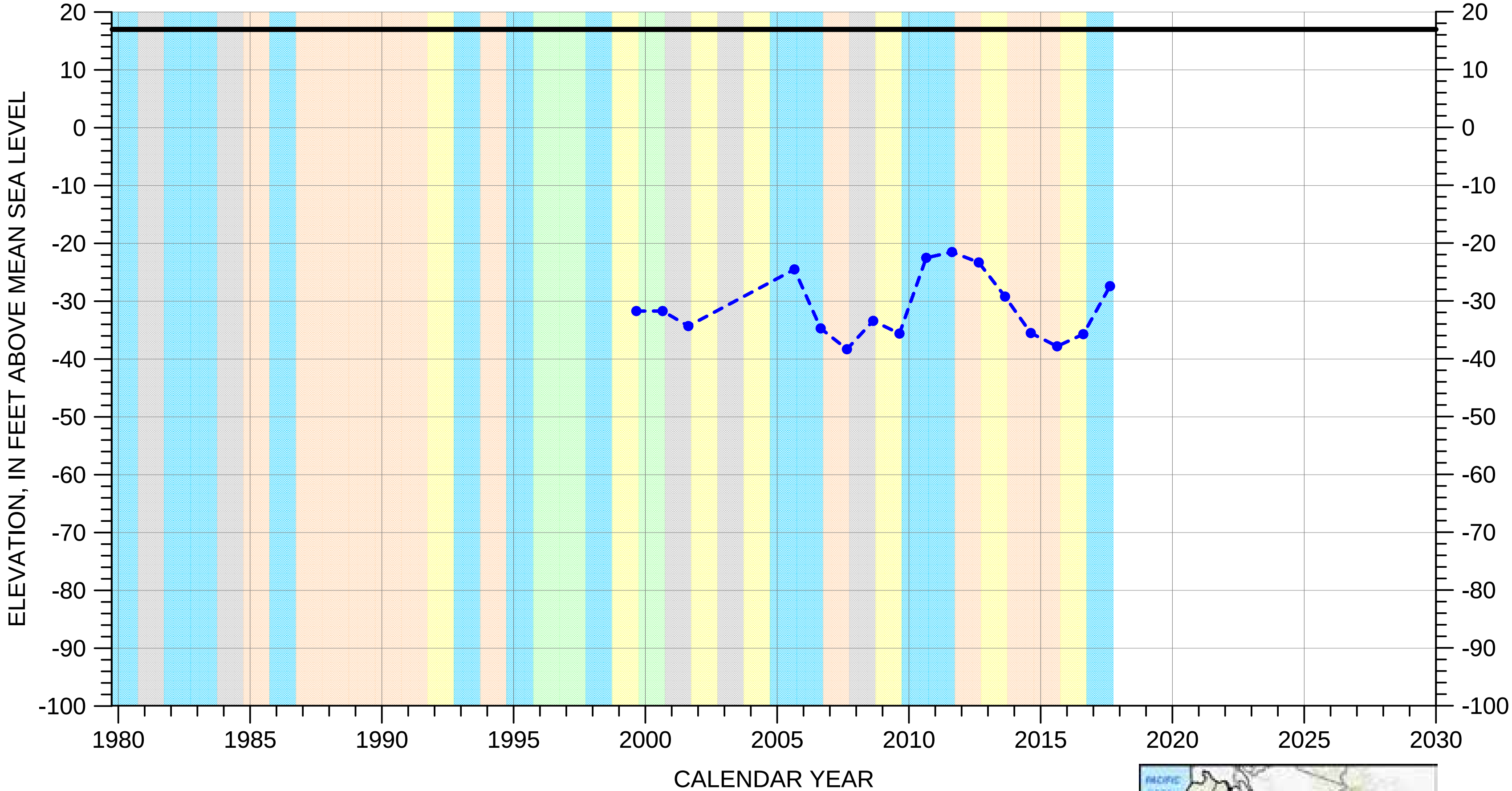
DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

Well Depth: 620 feet

Screened Interval: 370-610 feet below land surface

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-09D04

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

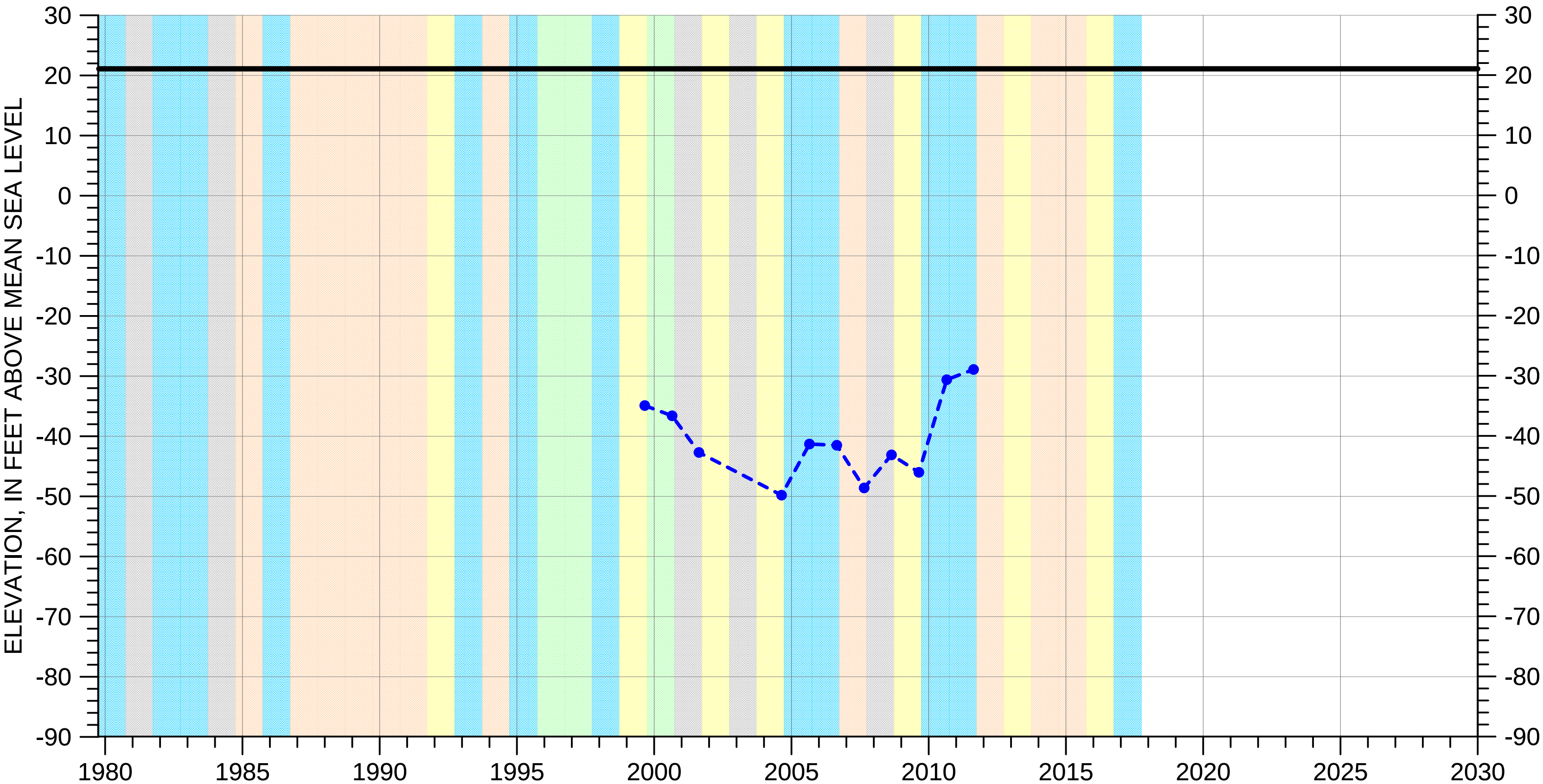
Well Depth: 610 feet

Screened Interval: 350-600 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY14S_02E-09D04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-09K02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

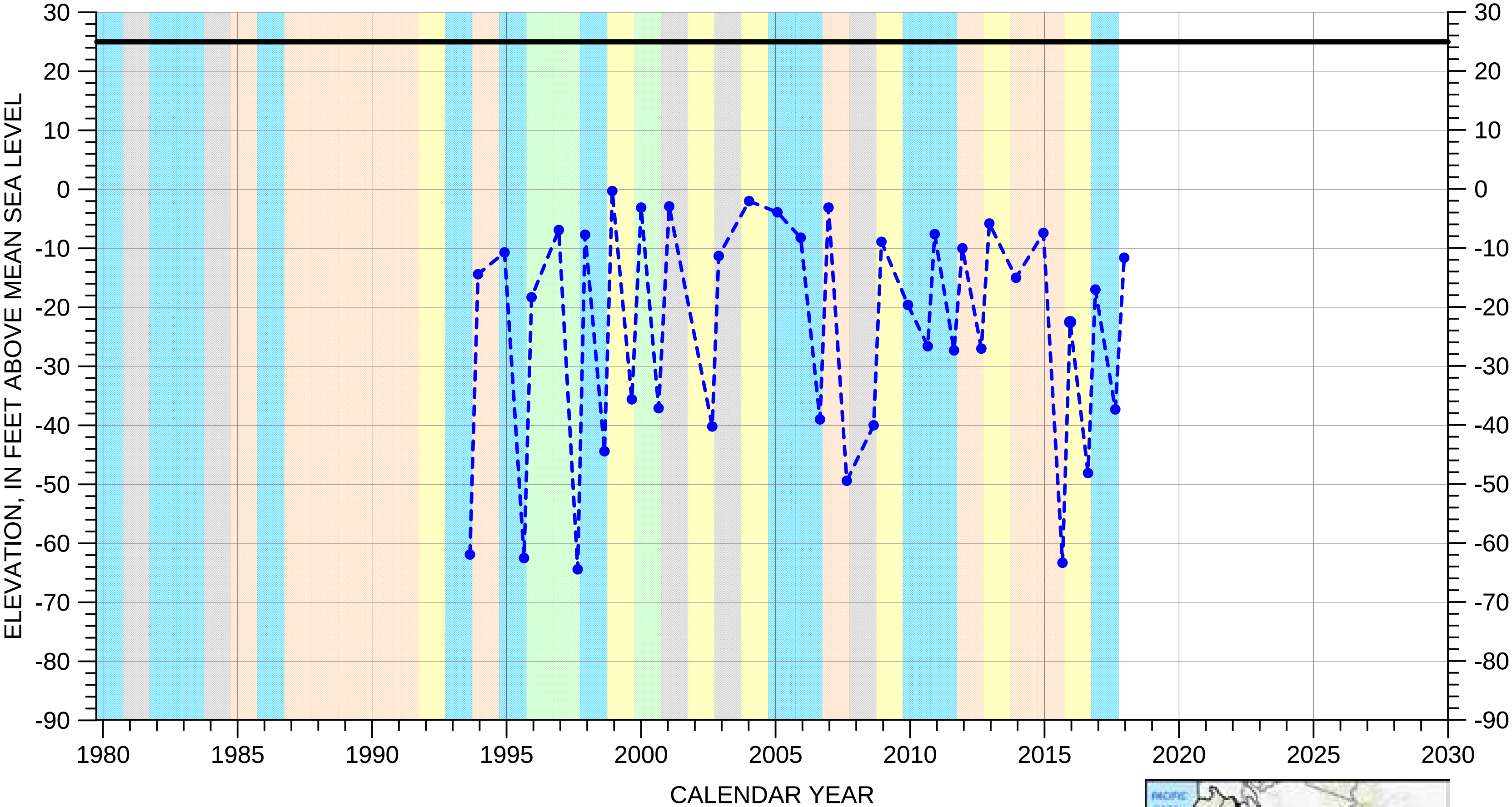
Well Depth: 610 feet

Screened Interval: 360-600 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-09K02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-10E02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

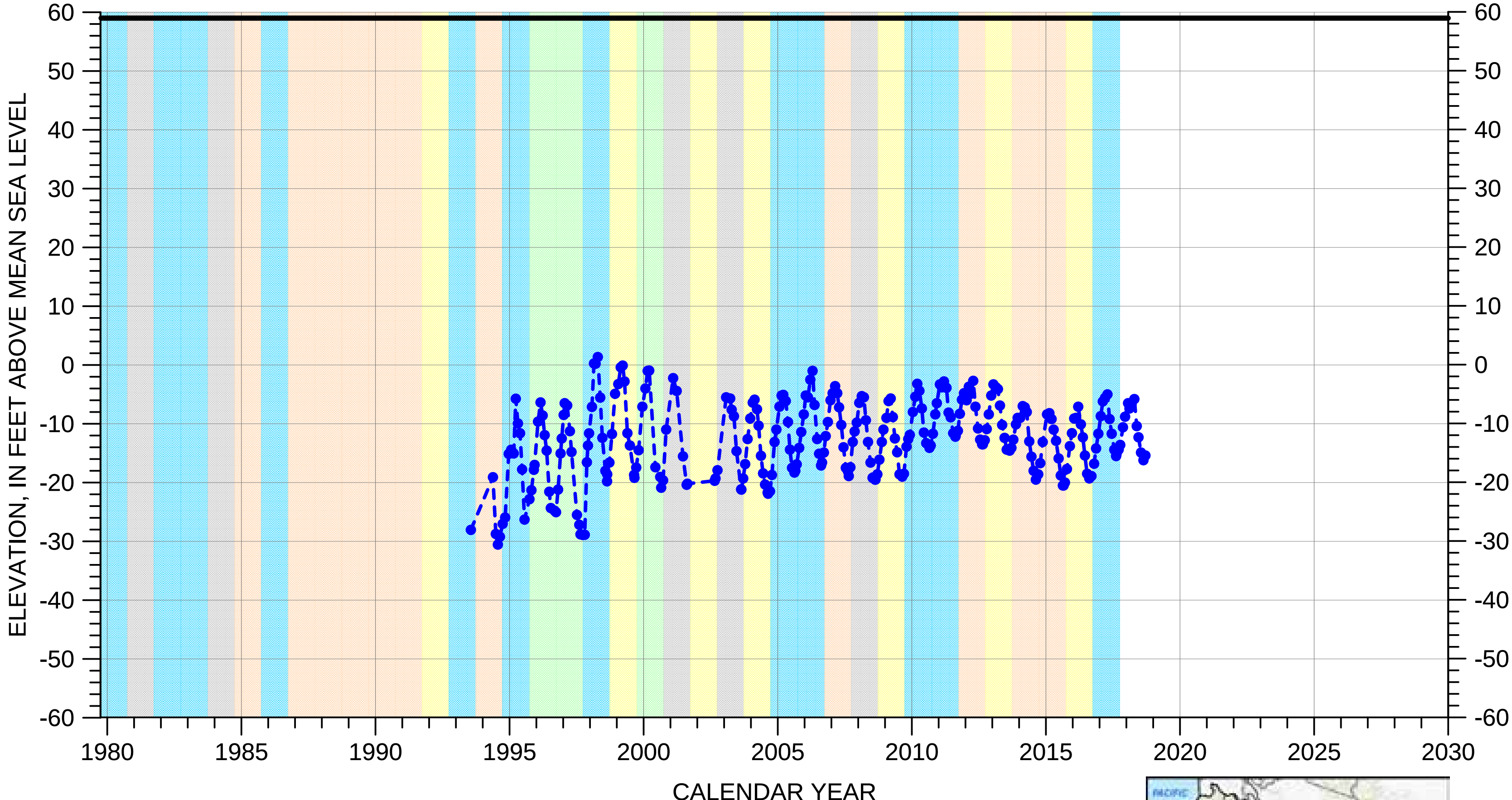
Well Depth: 717 feet

Screened Interval: 298-660 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-10E02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-11A02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

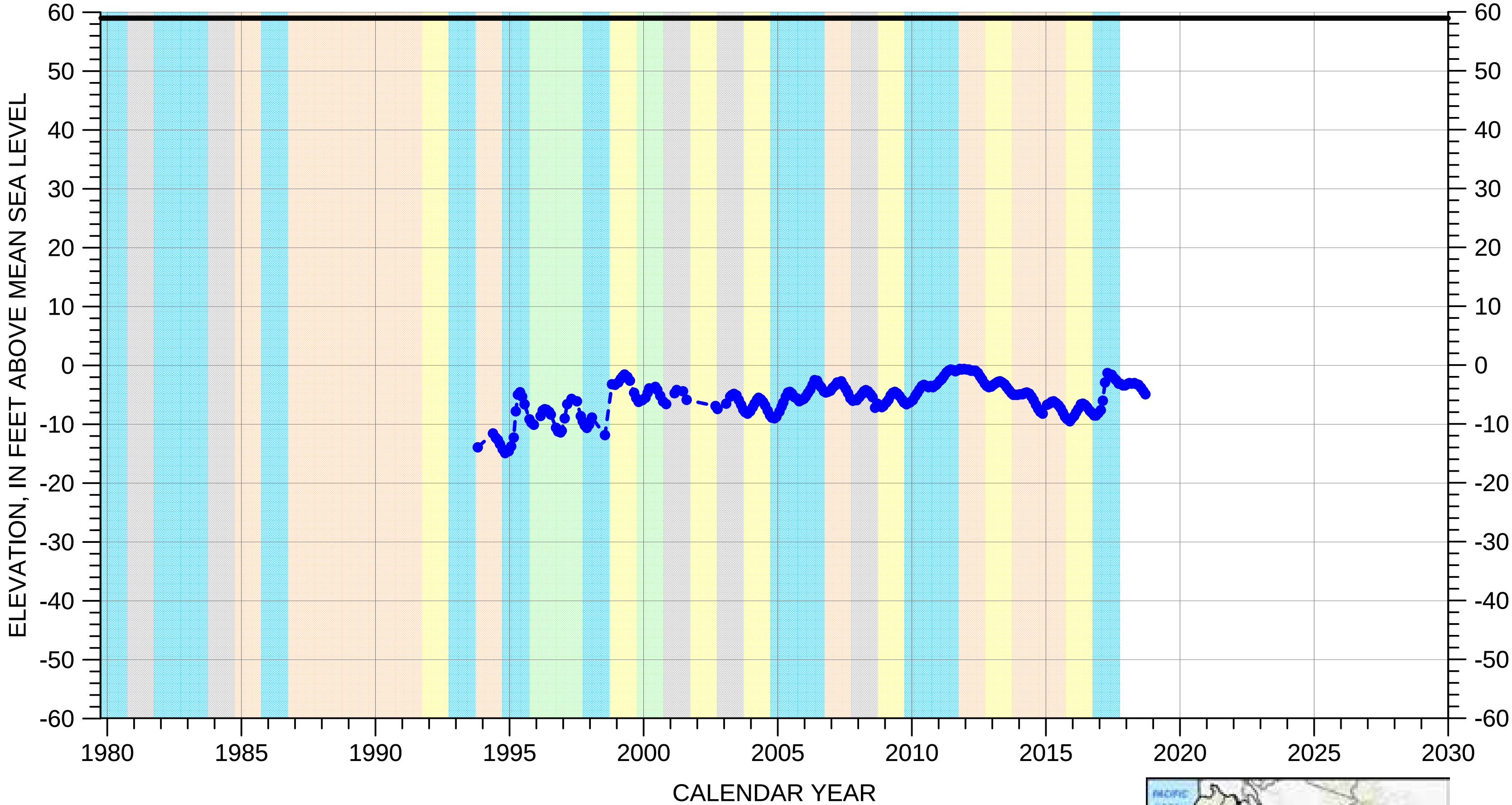
Well Depth: 250 feet

Screened Interval: 190-240 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Hydrographs_MCWRA_WY14S_02E-11A02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-11A03

180/400-Foot Aquifer Subbasin



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

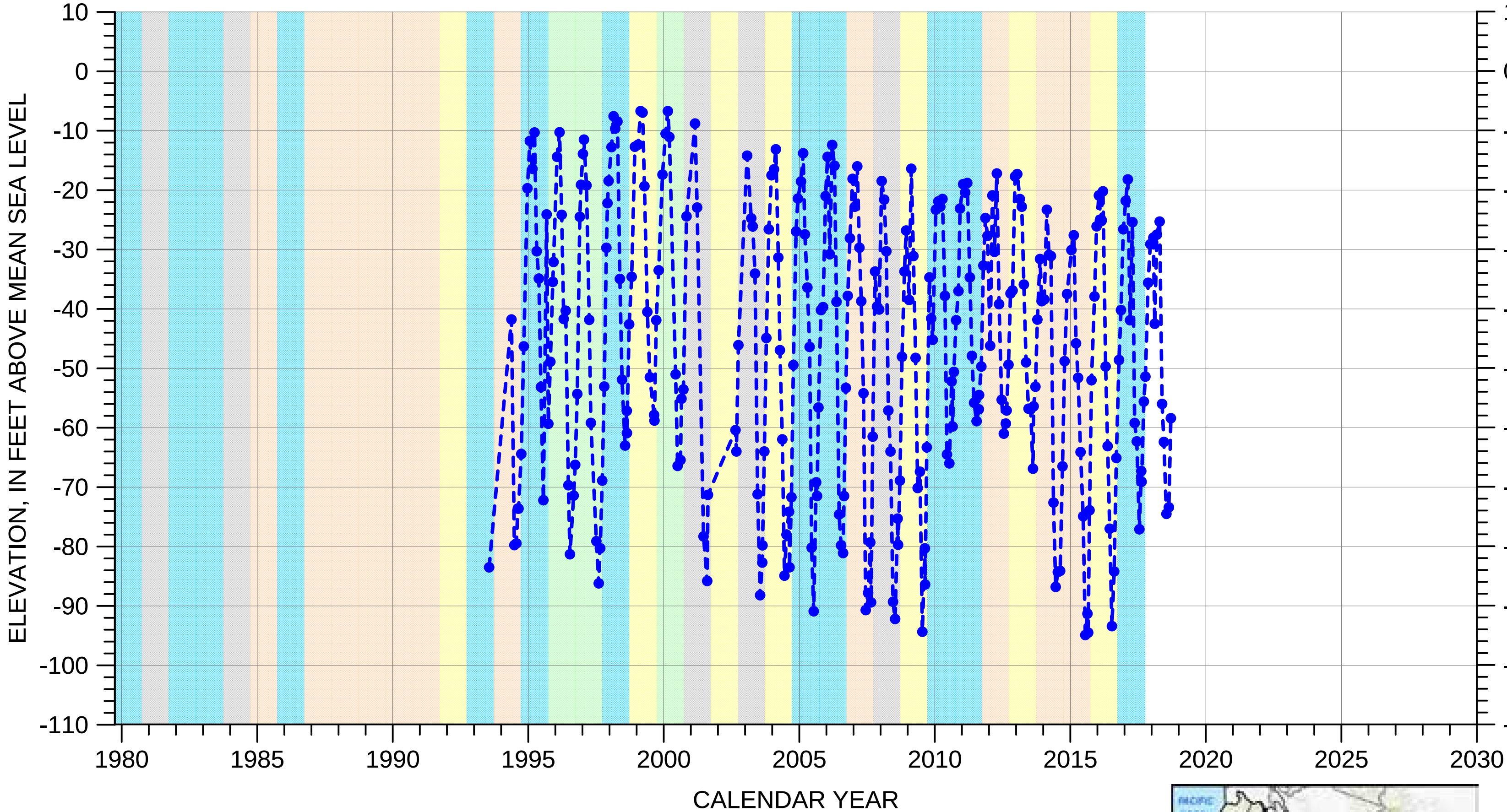
Well Depth: 100 feet

Screened Interval: 60-90 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-11A03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-11A04

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE (58.9 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

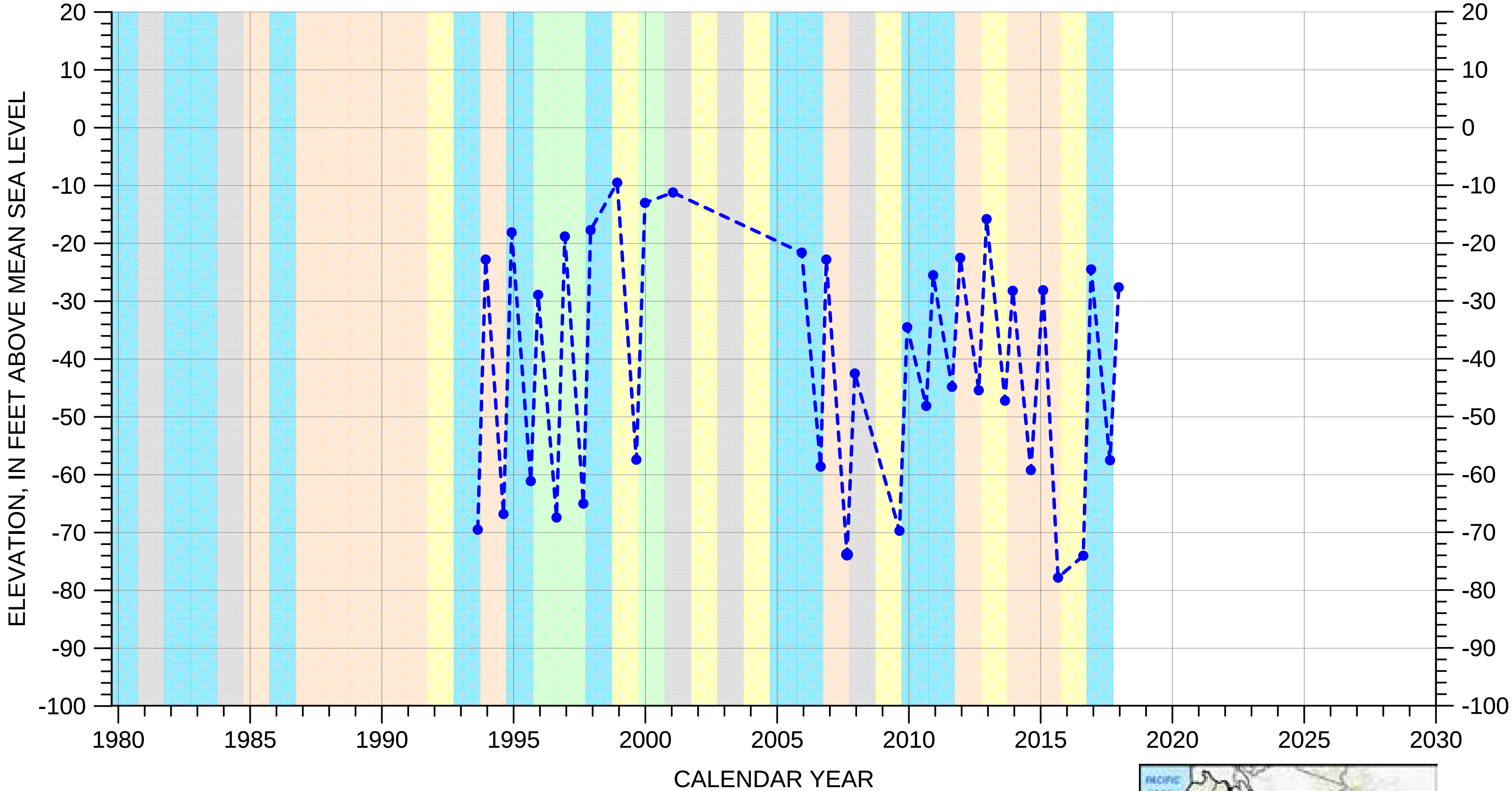
Well Depth: 490 feet

Screened Interval: 450-480 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_02E-11A04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-11M03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (41.5 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

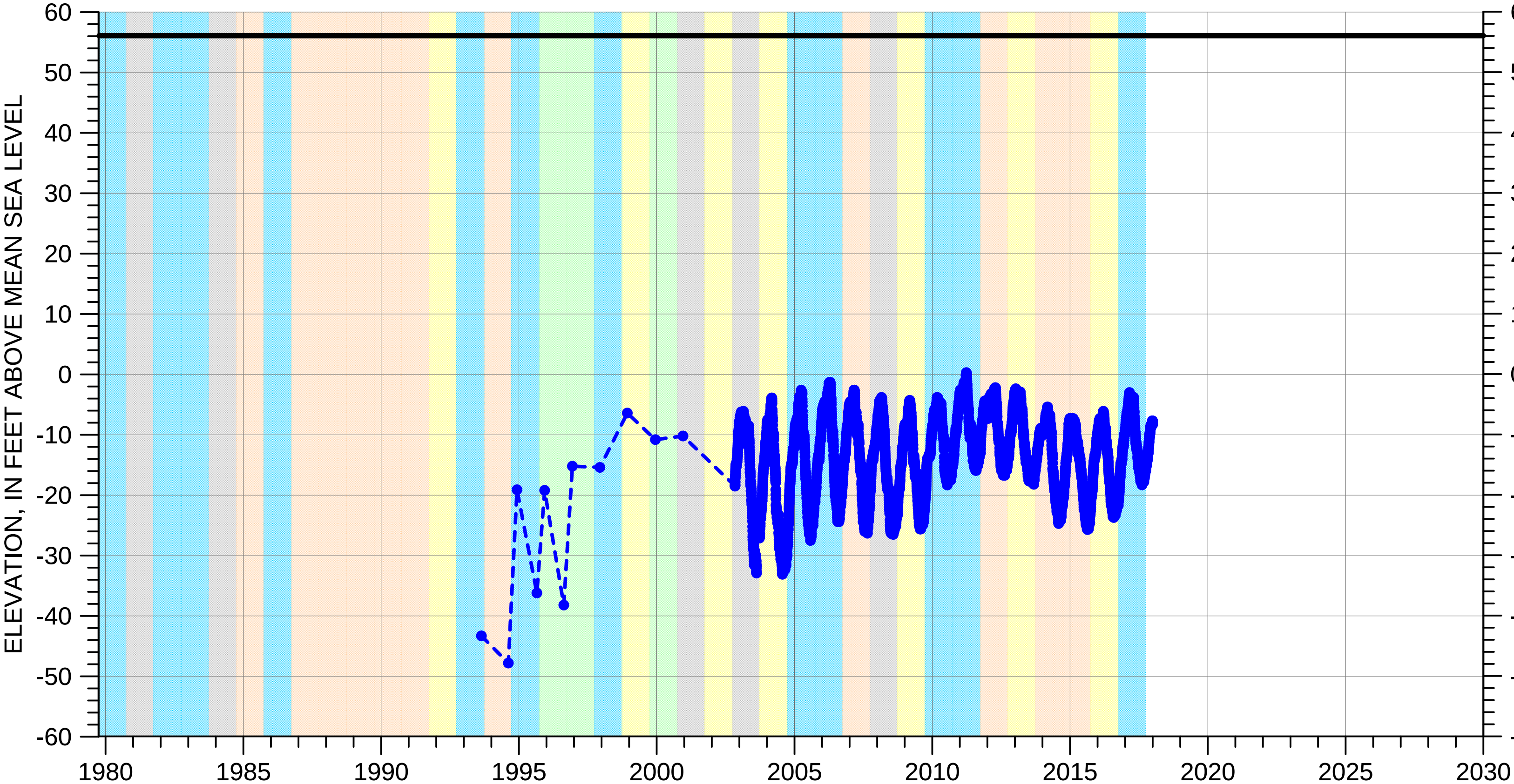
Well Depth: 660 feet

Screened Interval: 400-660 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA\Hydrographs_MCWRA_WY14S_02E-11M03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY   DRY - NORMAL   NORMAL   WET - NORMAL   WET

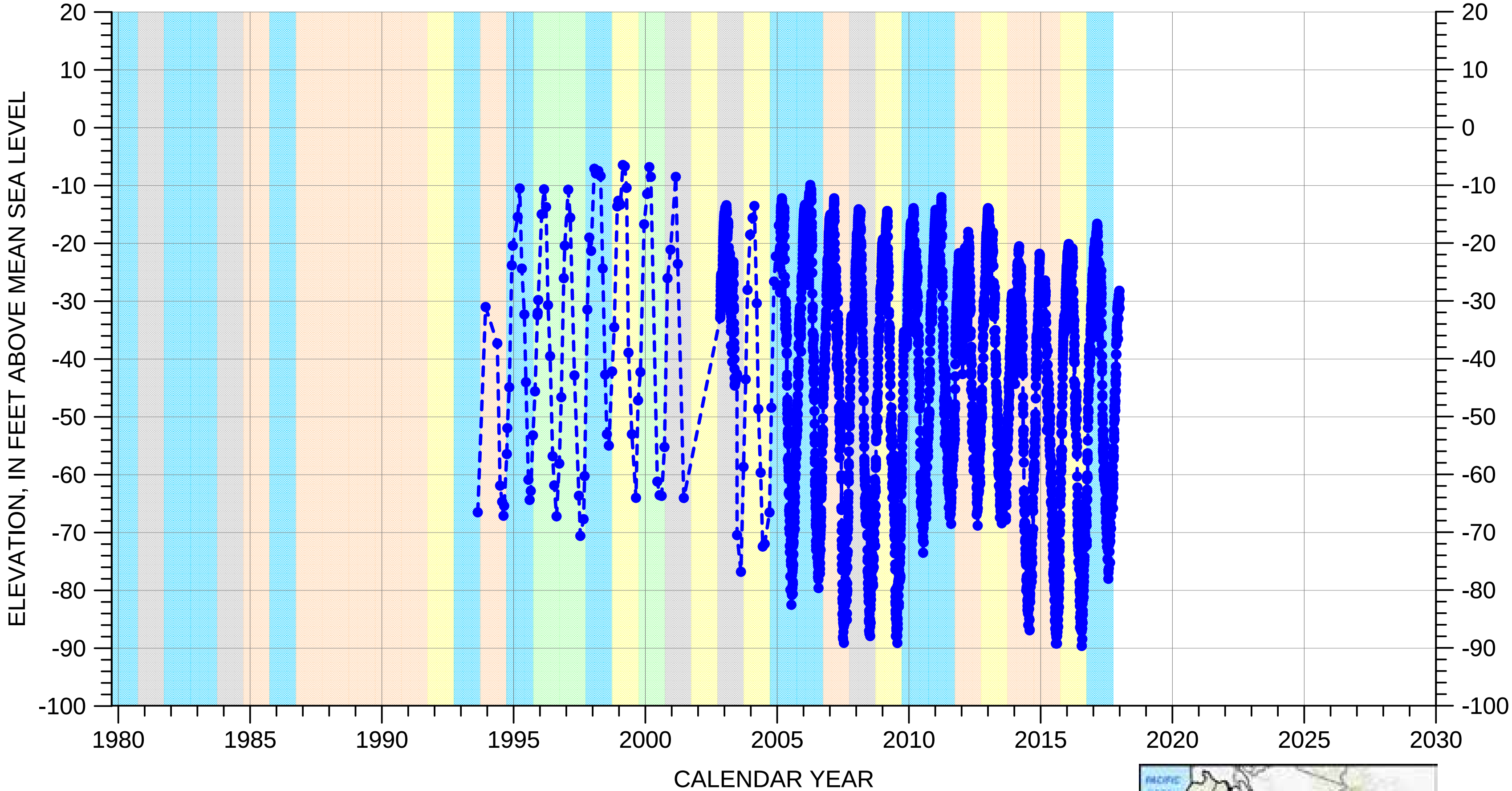
Well Depth: 265 feet

Screened Interval: 210-260 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-12B02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (56.1 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

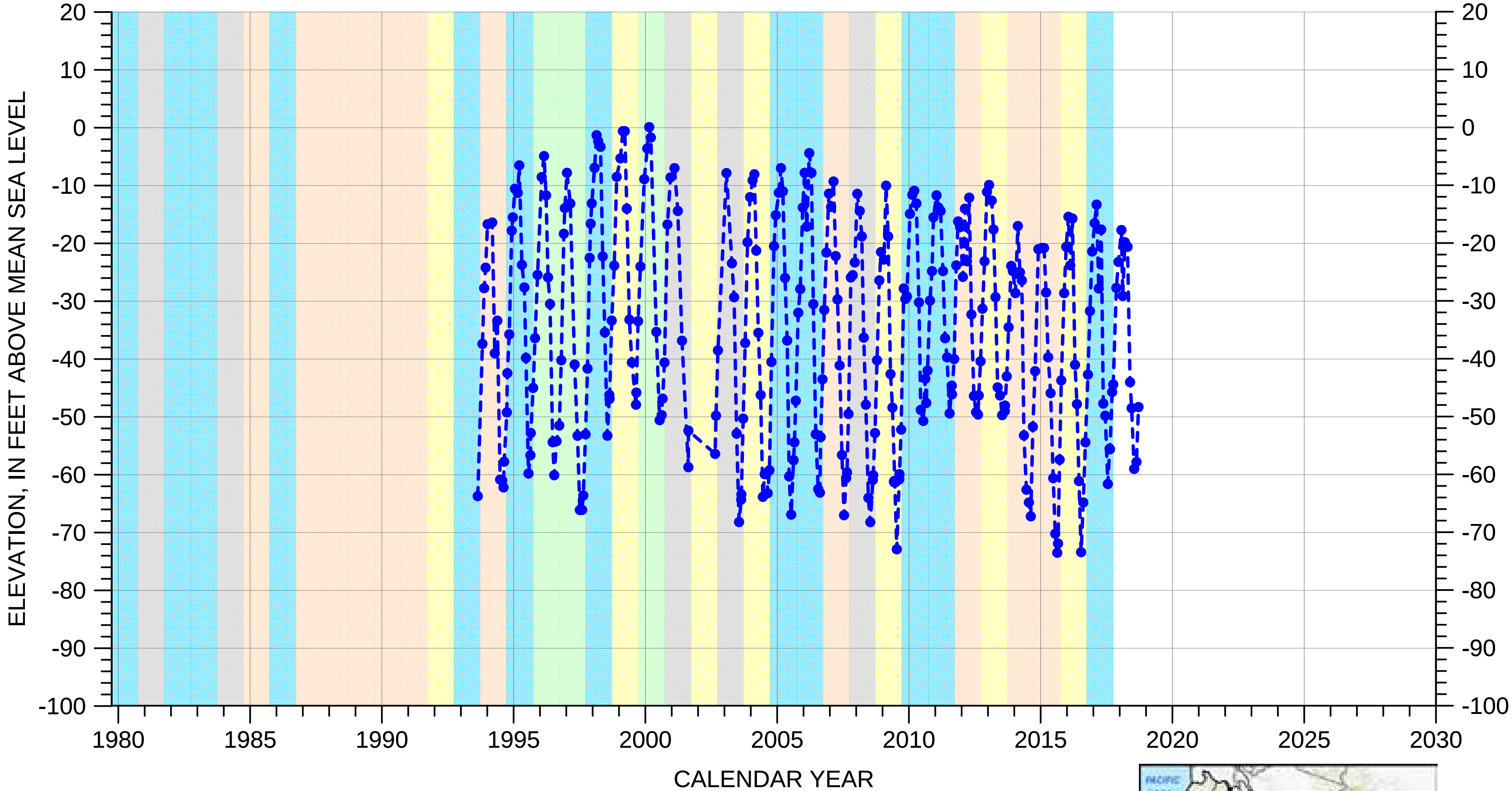
Well Depth: 390 feet

Screened Interval: 350-380 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Hydrographs_MCWRA_WY14S_02E-12B03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-13F02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (44.6 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

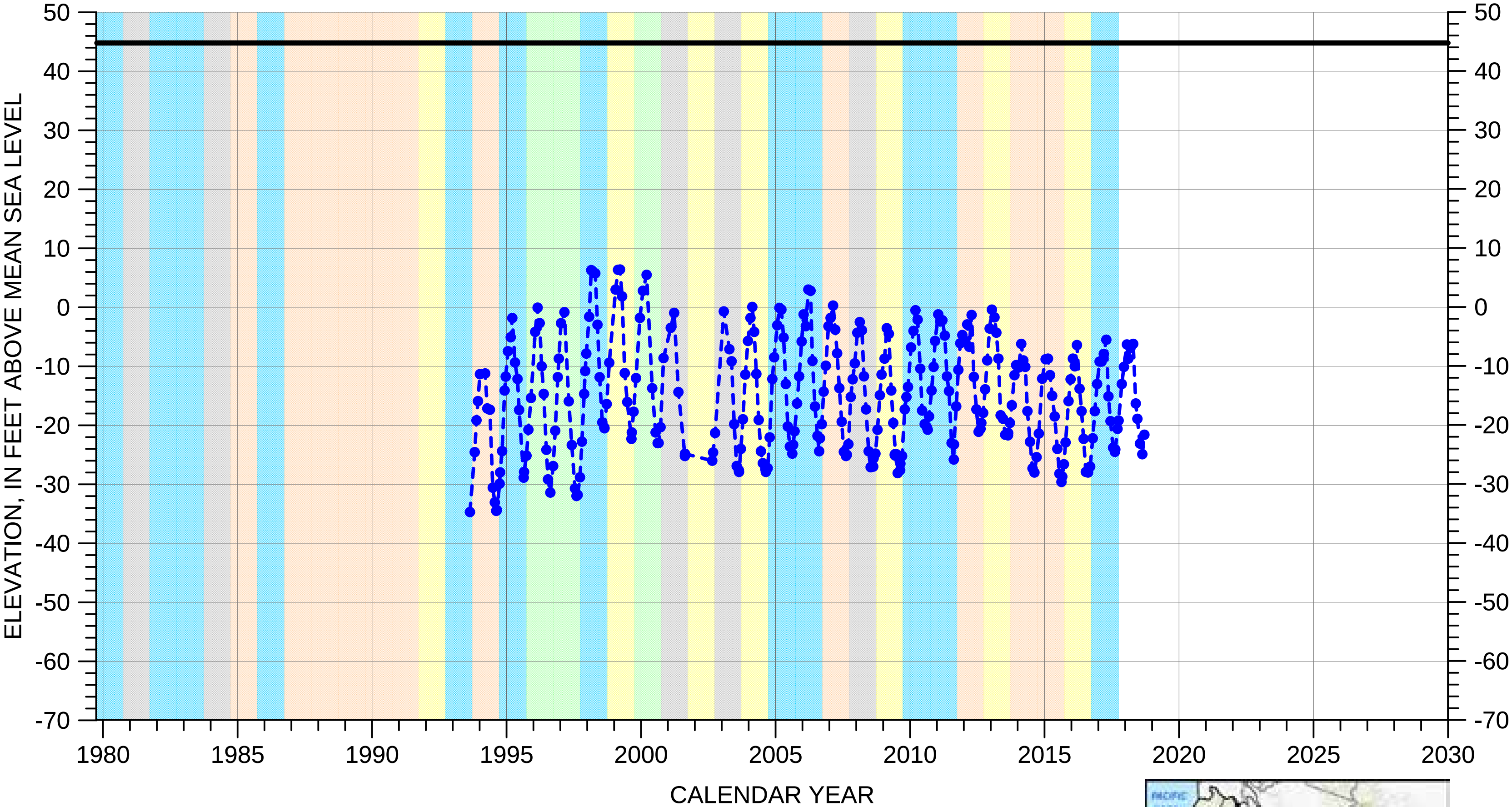
Well Depth: 480 feet

Screened Interval: 420-470 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY14S_02E-13F02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-13F03

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

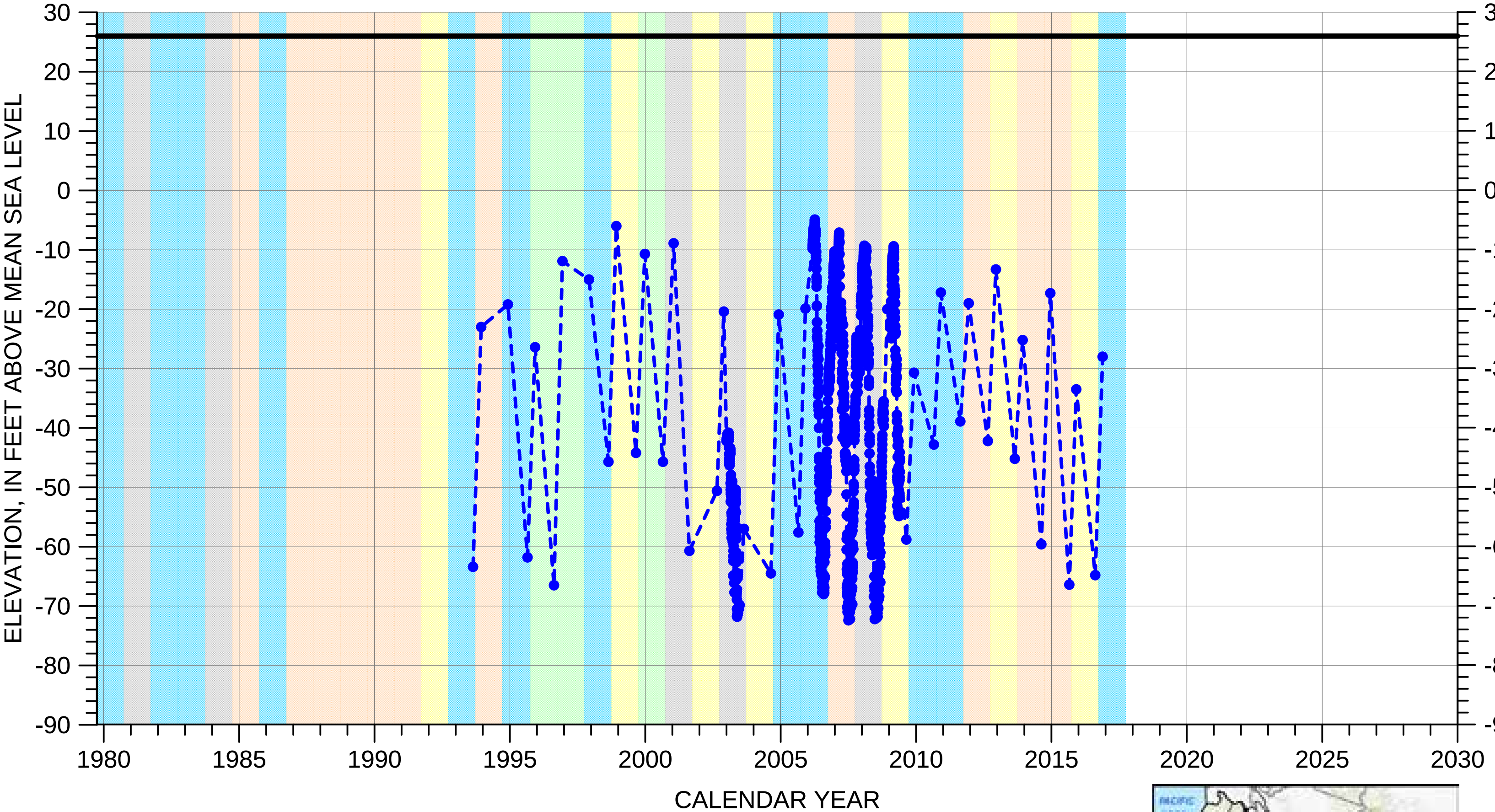
Well Depth: 280 feet

Screened Interval: 230-270 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-13F03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-14L03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

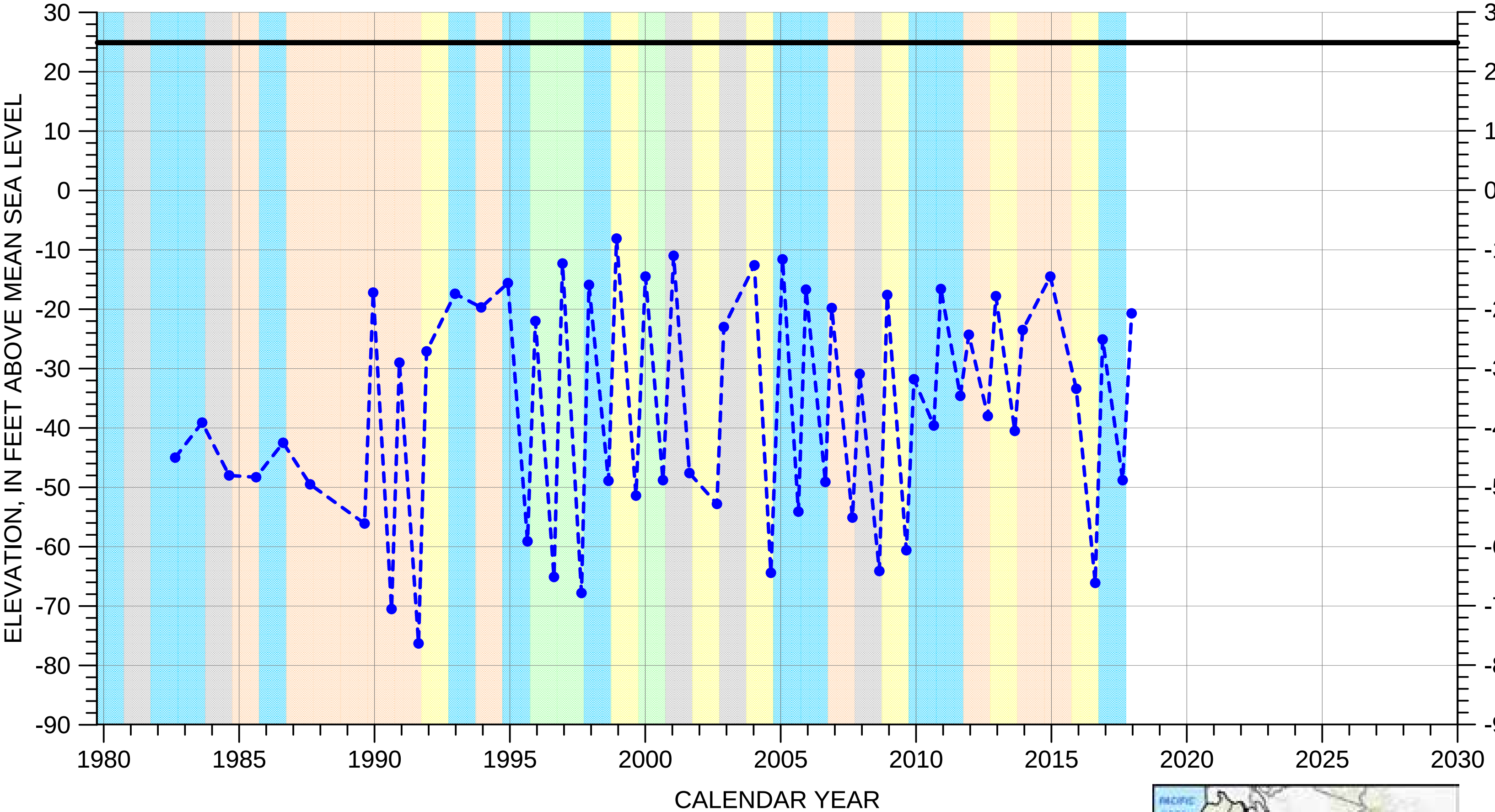
Well Depth: 612 feet

Screened Interval: 332-612 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-14L03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-15A01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY   DRY - NORMAL   NORMAL   WET - NORMAL   WET

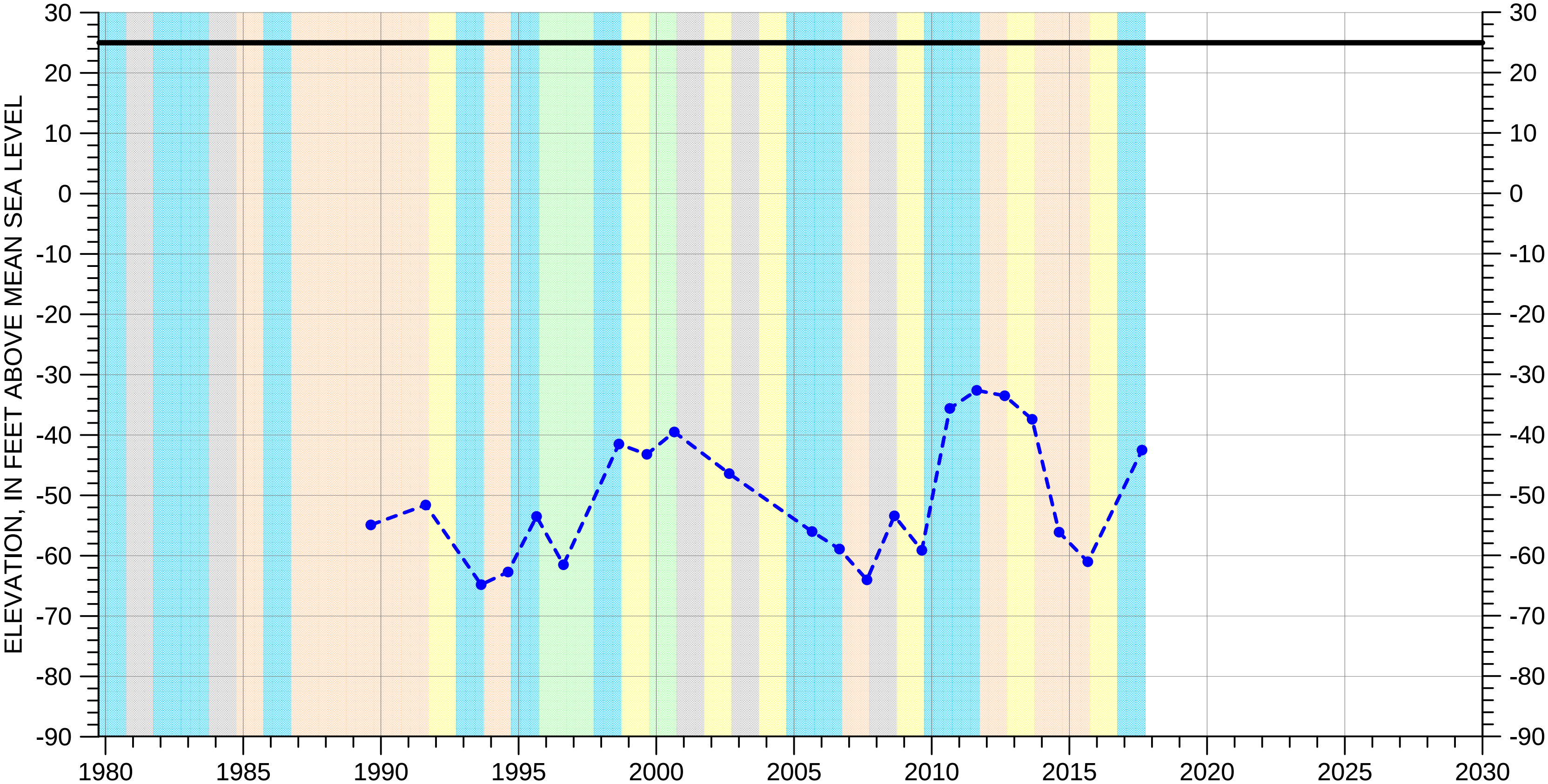
Well Depth: 623 feet

Screened Interval: 386-608 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA\Hydrographs_MCWRA_WY14S_02E-15A01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-15C02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

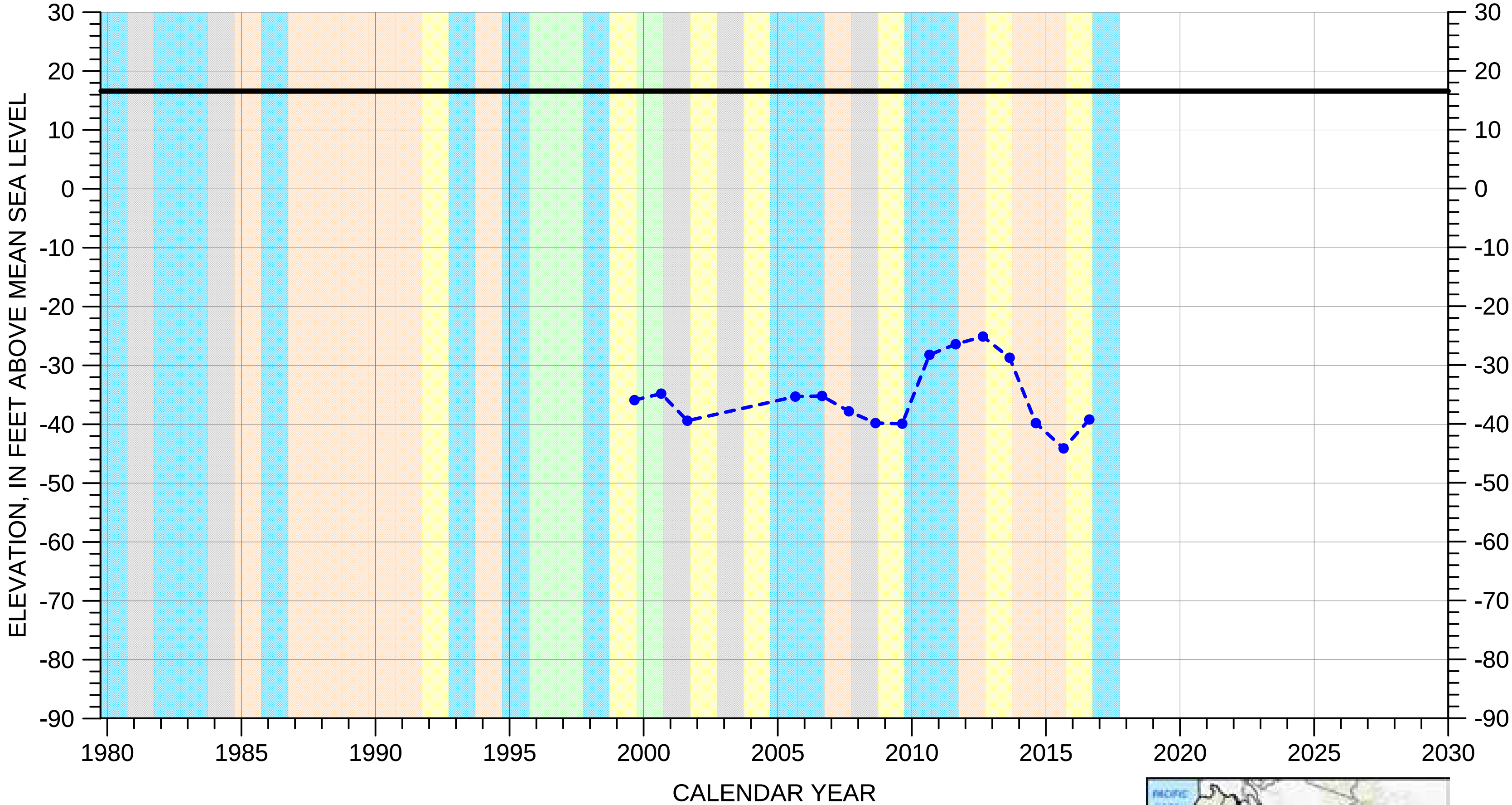
Well Depth: 550 feet

Screened Interval: 328-550 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-15C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-16G01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

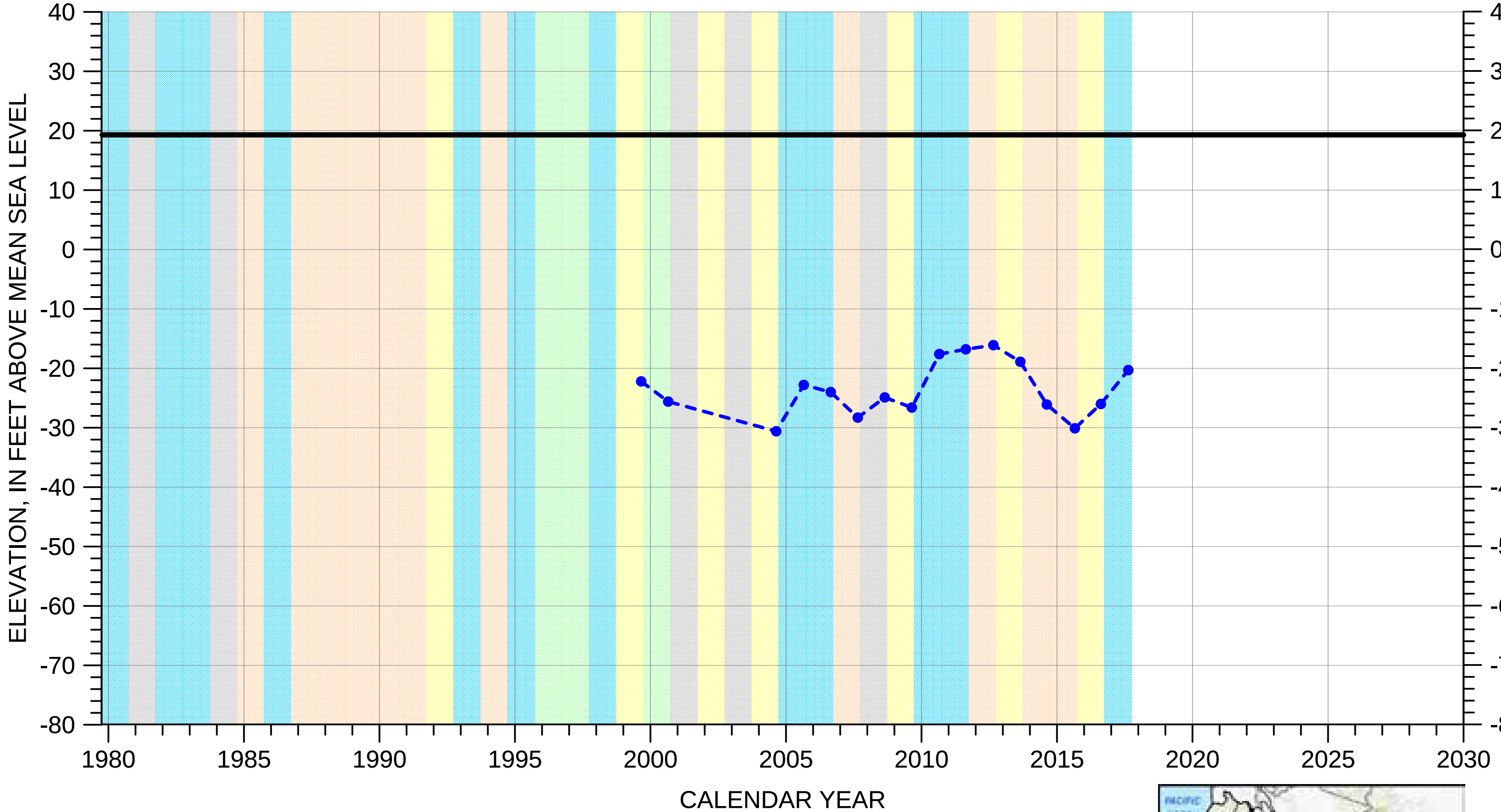
Well Depth: 610 feet

Screened Interval: 330-600 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-16G01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-17B03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

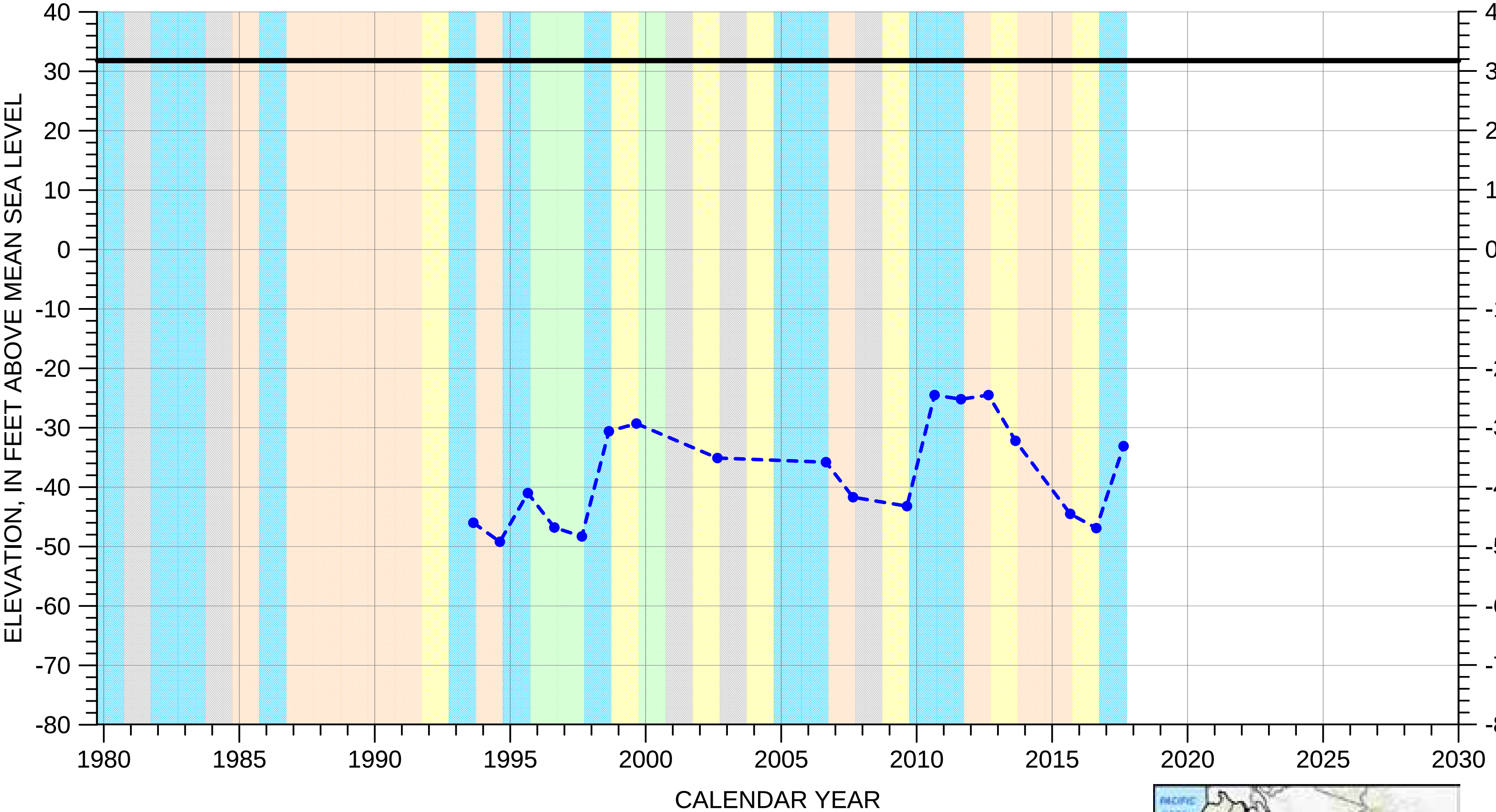
Well Depth: 615 feet

Screened Interval: 330-600 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-17B03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-22B01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

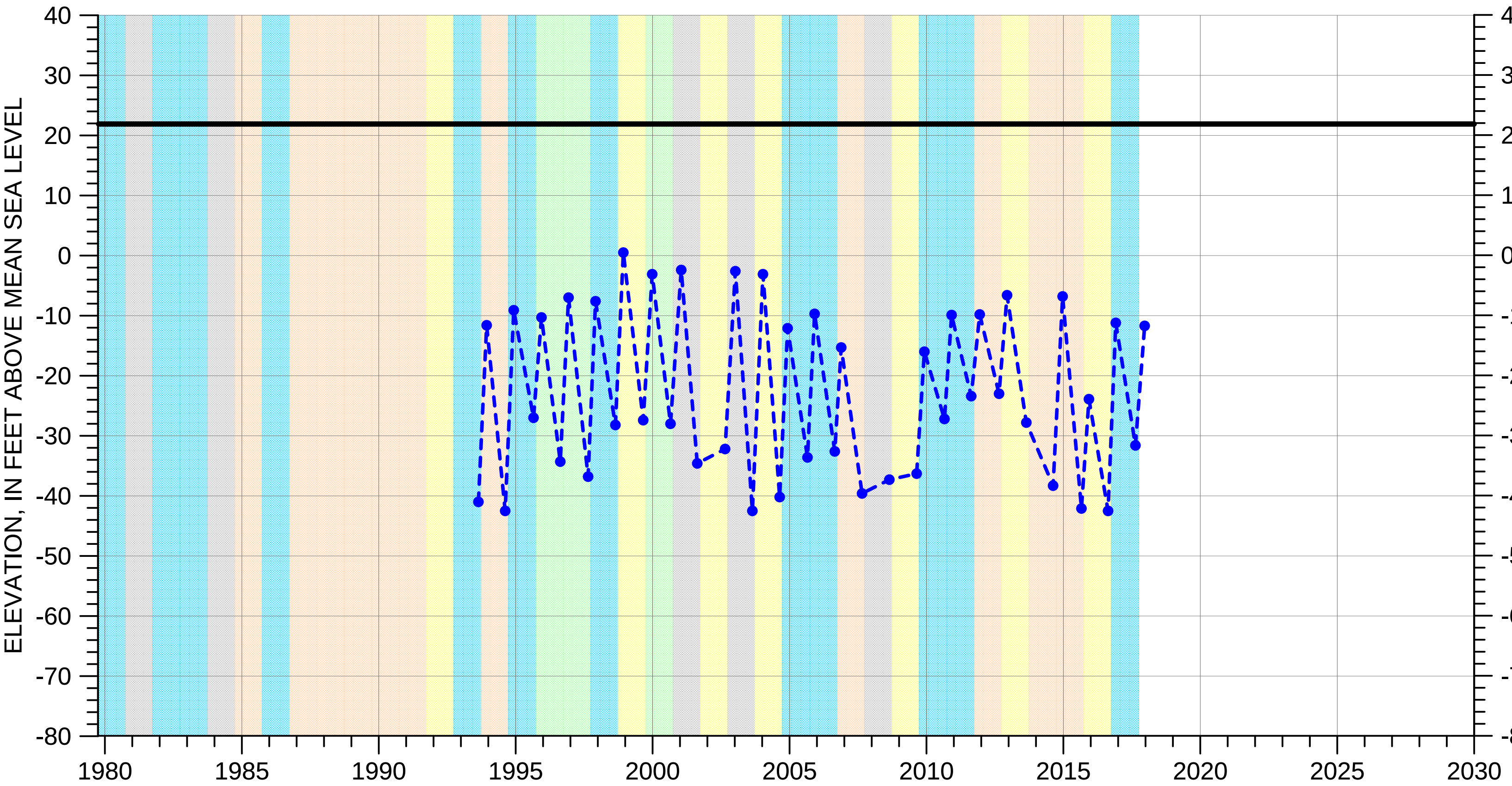
Well Depth: 670 feet

Screened Interval: 410-670 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_02E-22B01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-22L01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

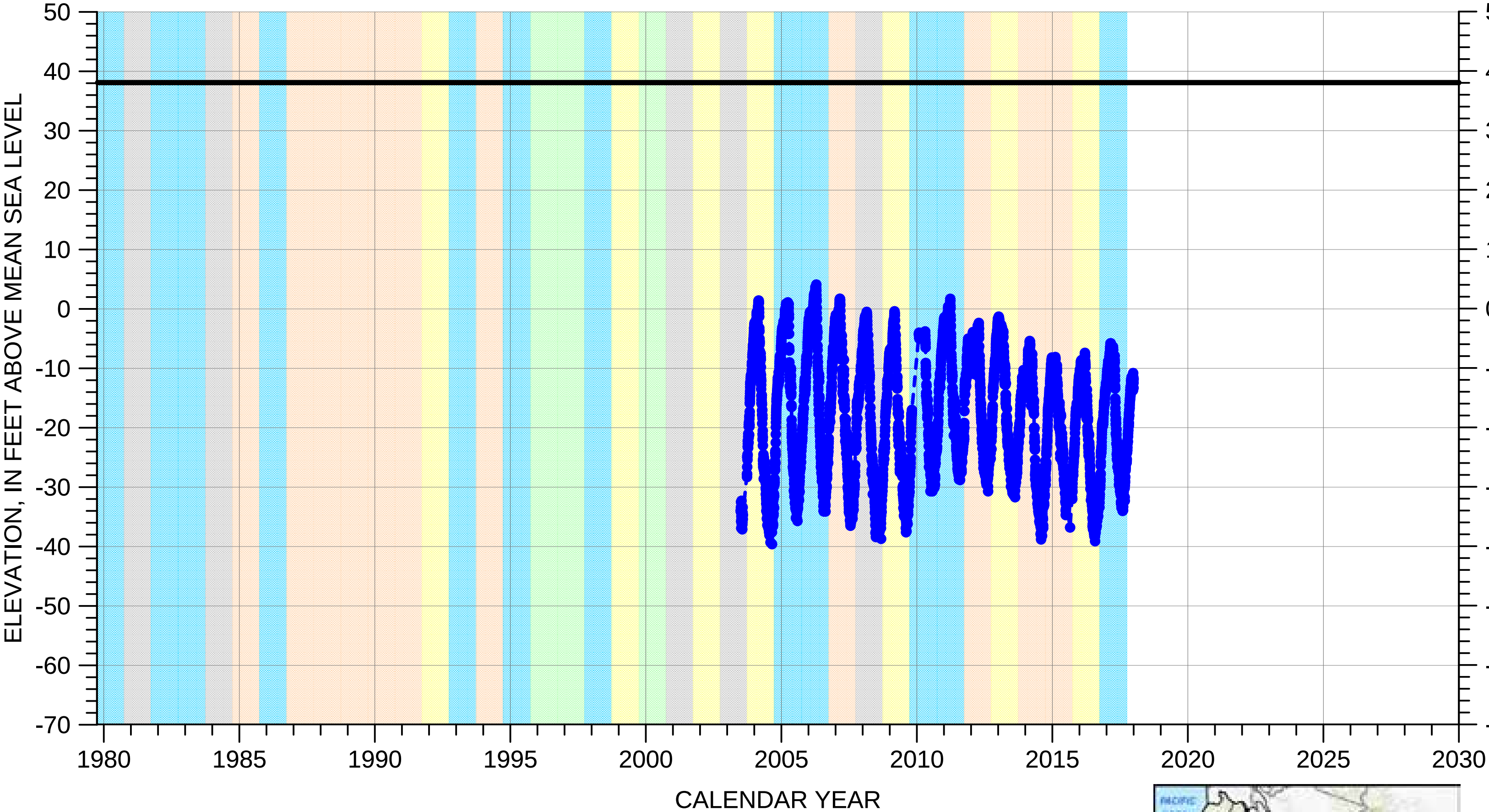
Well Depth: 680 feet

Screened Interval: 420-680 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-22L01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-26H01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

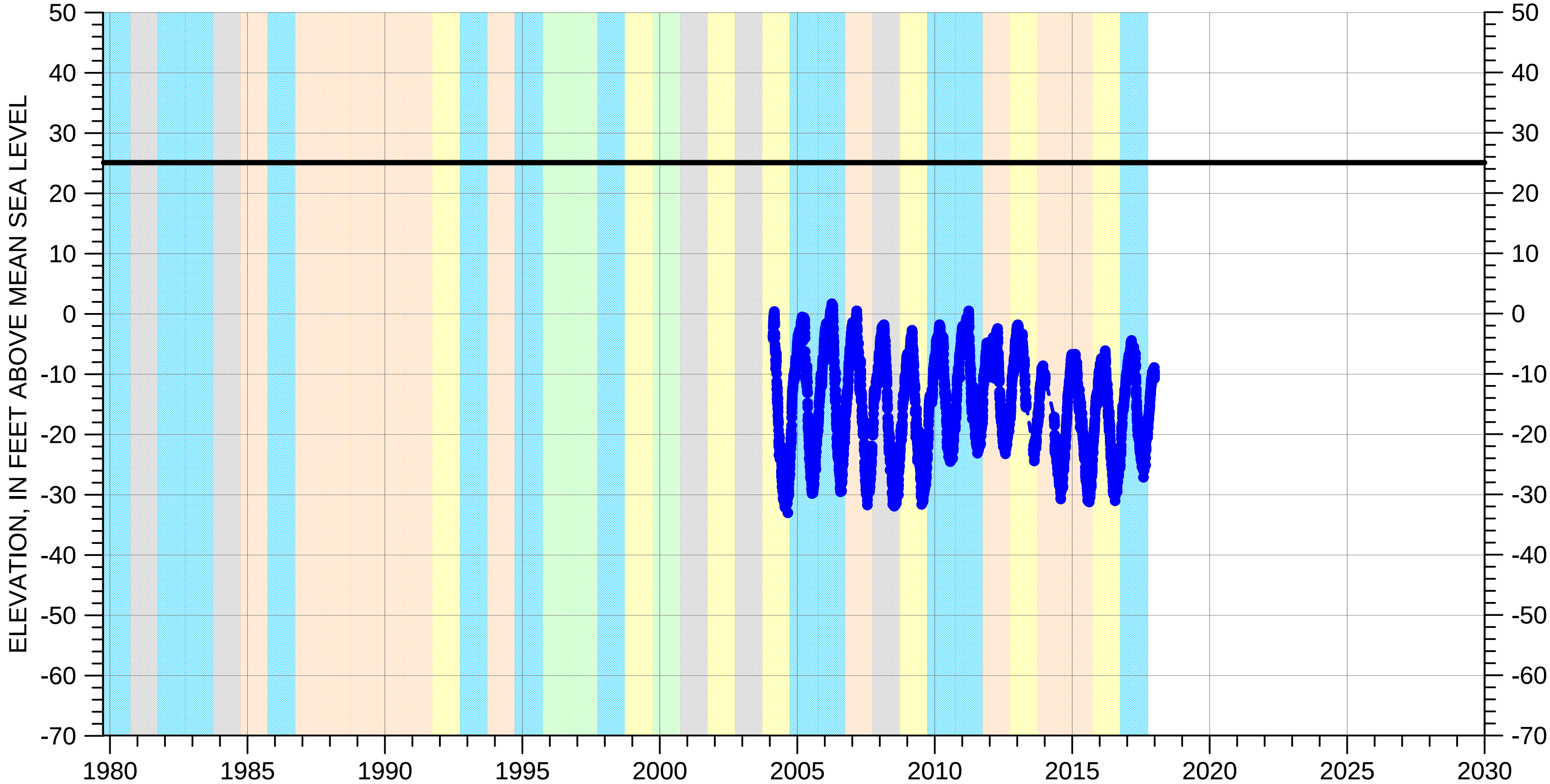
Well Depth: 339.3 feet

Screened Interval: 287-337 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_02E-26H01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-27A01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

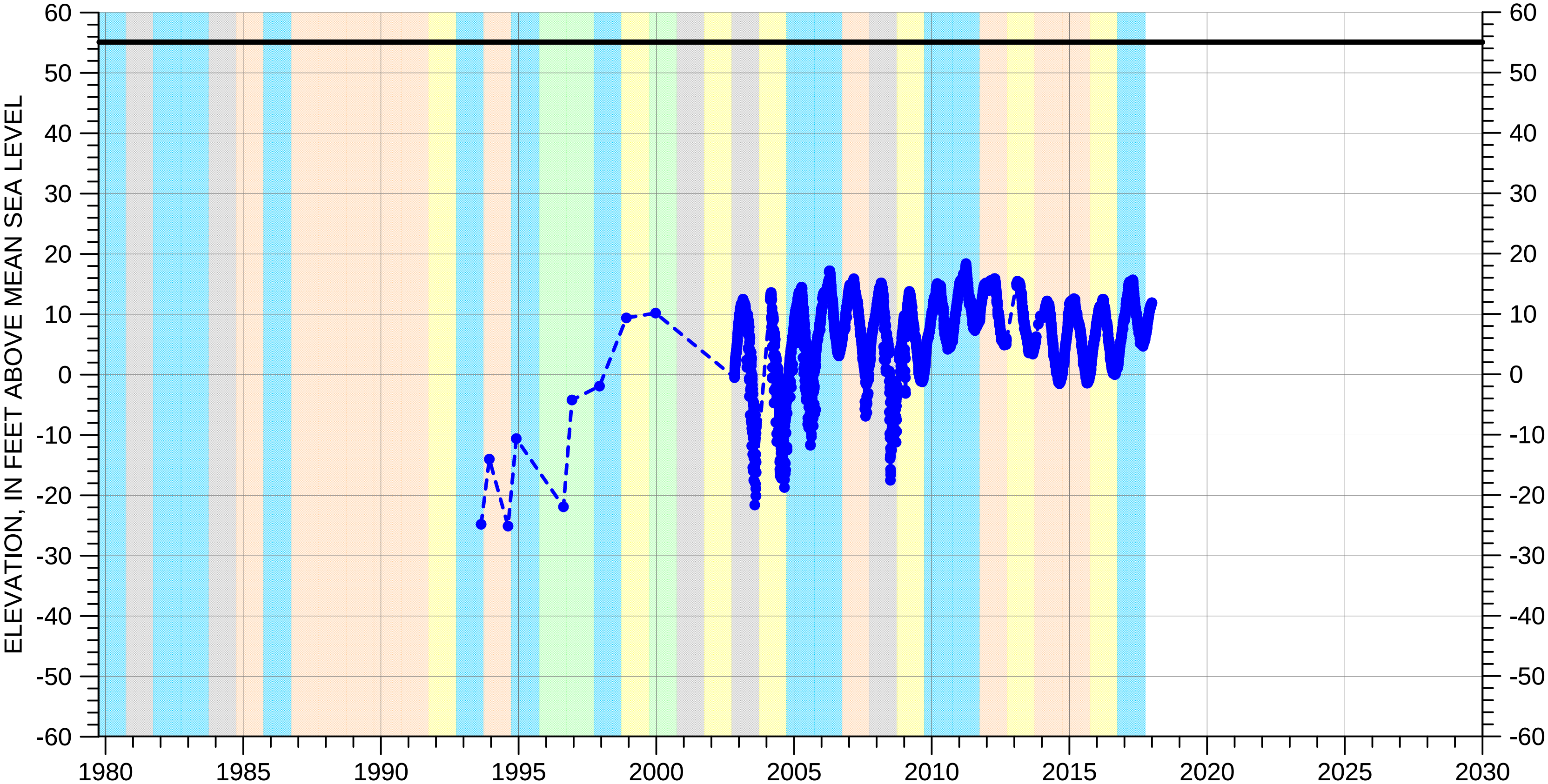
Well Depth: 292.7 feet

Screened Interval: 240-290 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_02E-27A01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY   DRY - NORMAL   NORMAL   WET - NORMAL   WET

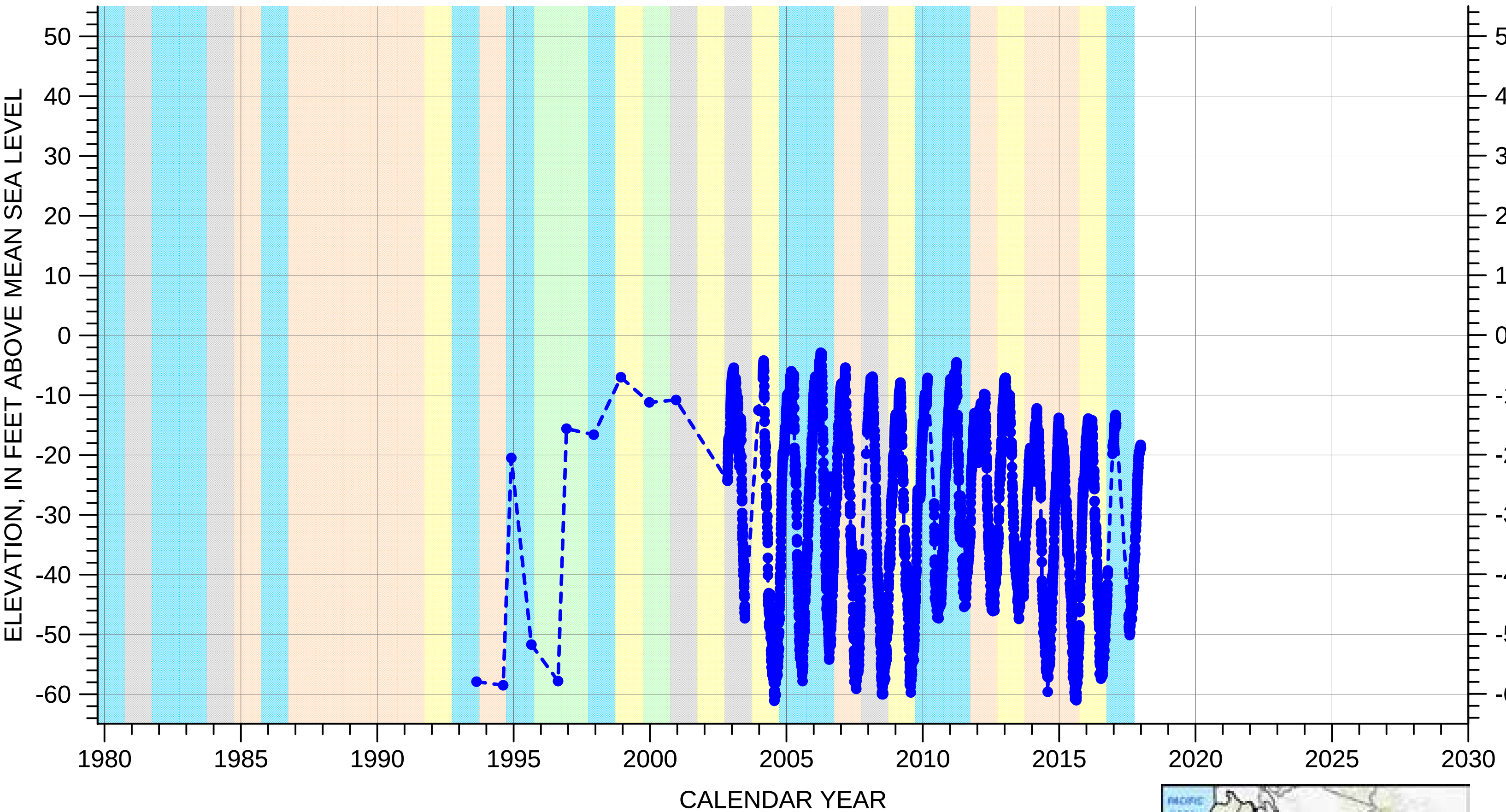
Well Depth: 225 feet

Screened Interval: 165-215 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY14S_03E-18C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (55.1 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

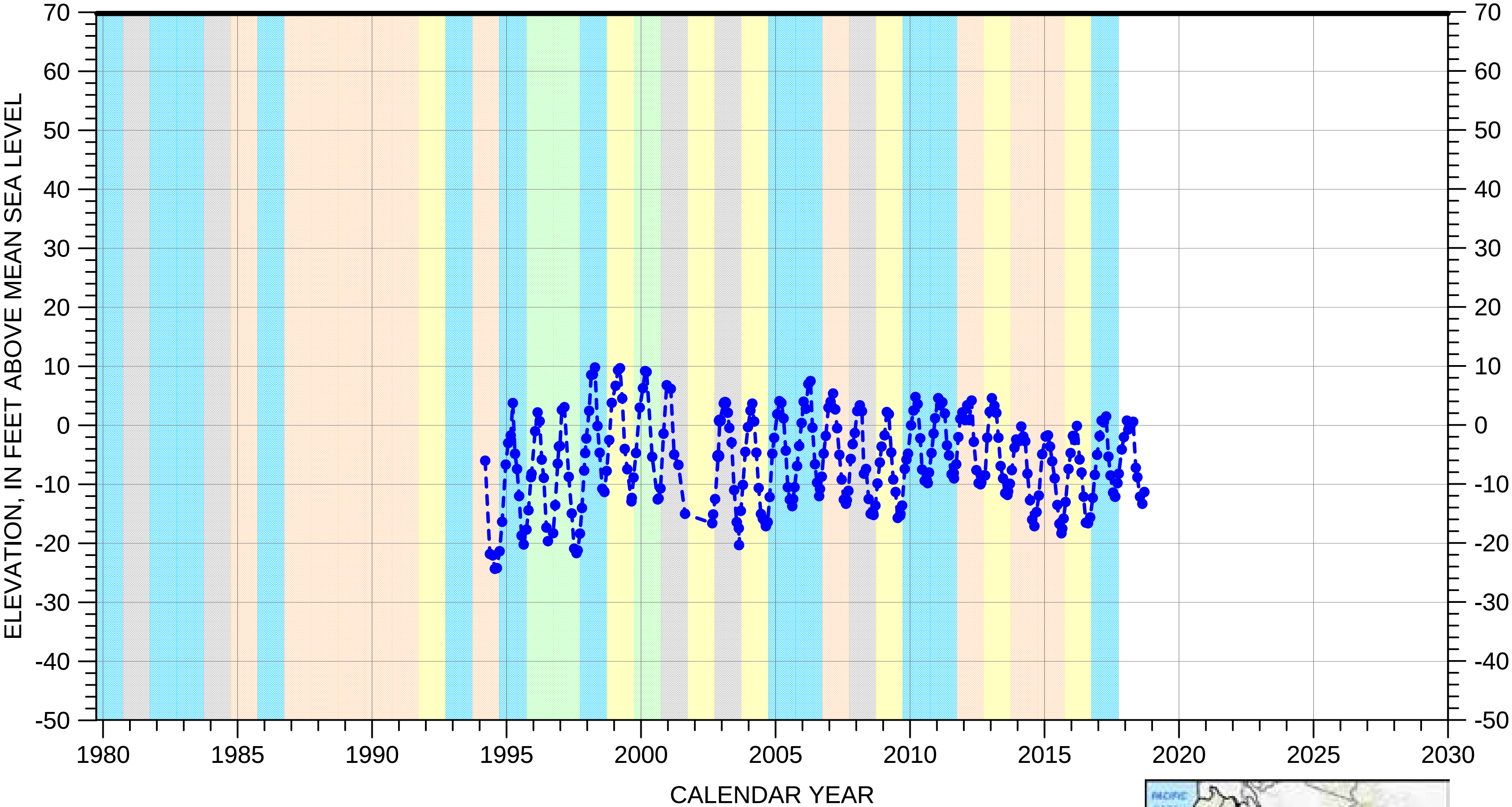
Well Depth: 395 feet

Screened Interval: 270-385 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\grf\Hydrographs_MCWRA_WY14S_03E-18C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18E03

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

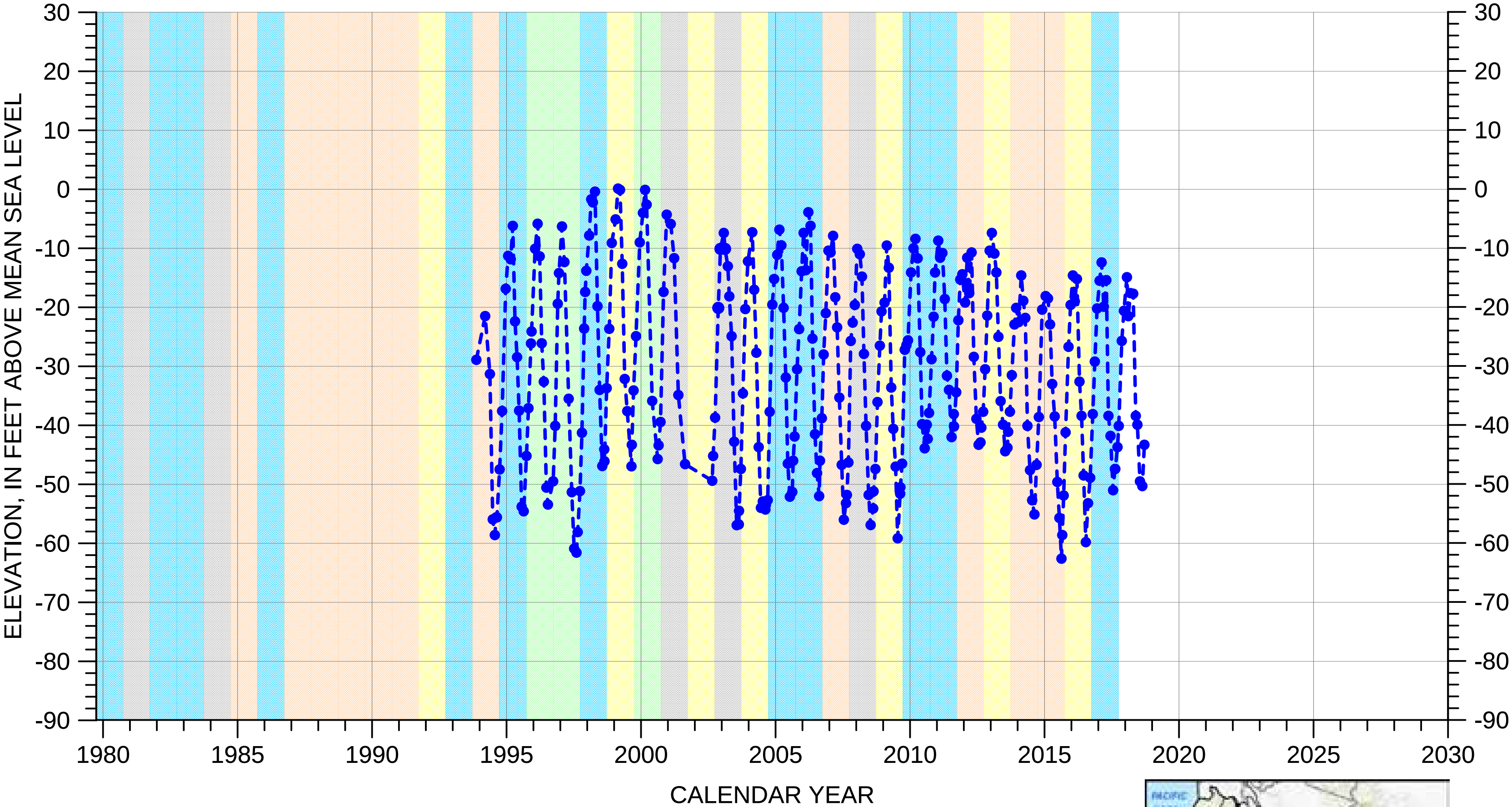
Well Depth: 260 feet

Screened Interval: 230-250 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_03E-18E03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18E04

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (69.9 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

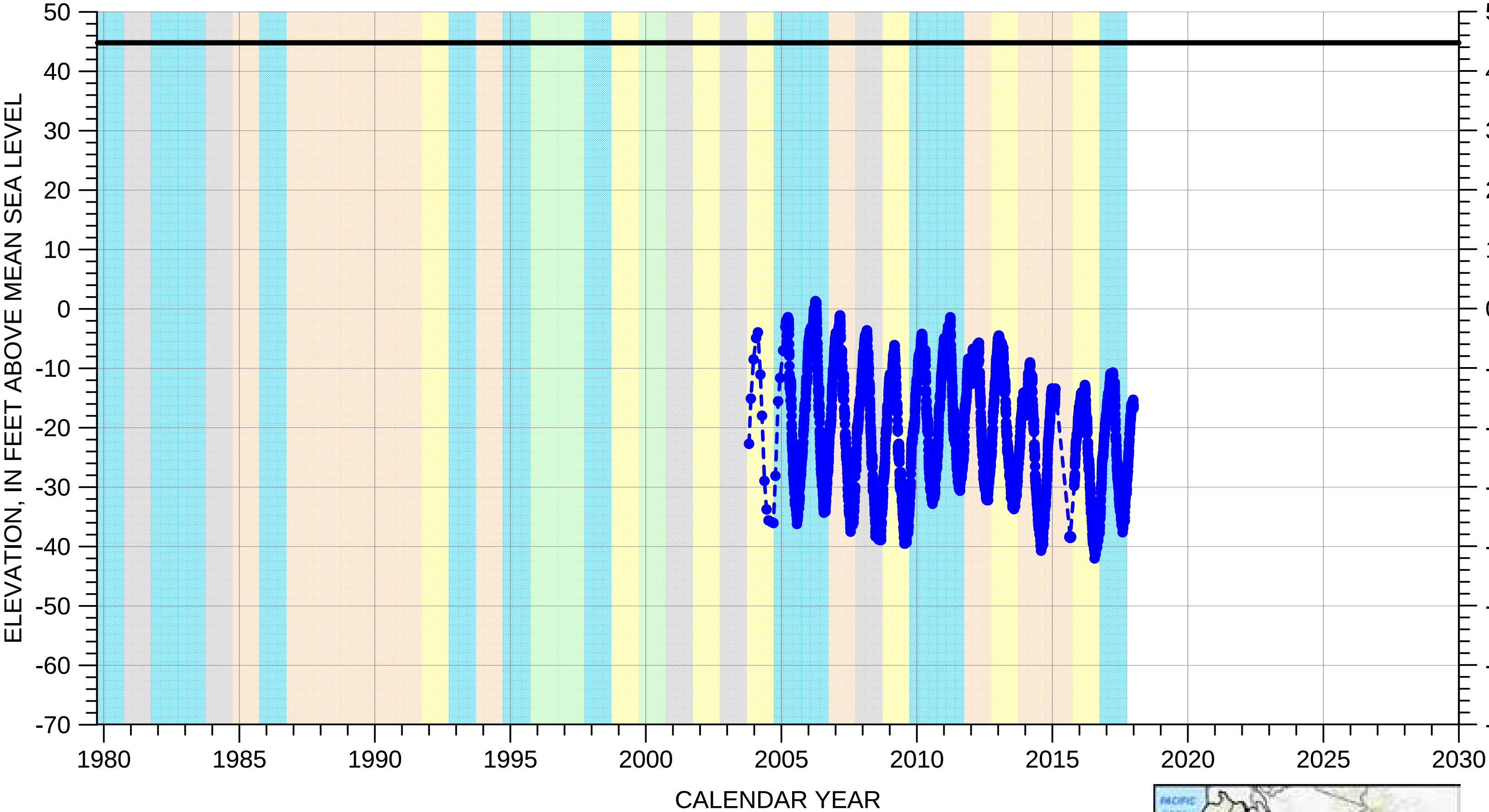
Well Depth: 495 feet

Screened Interval: 335-485 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY14S_03E-18E04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-30G08

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

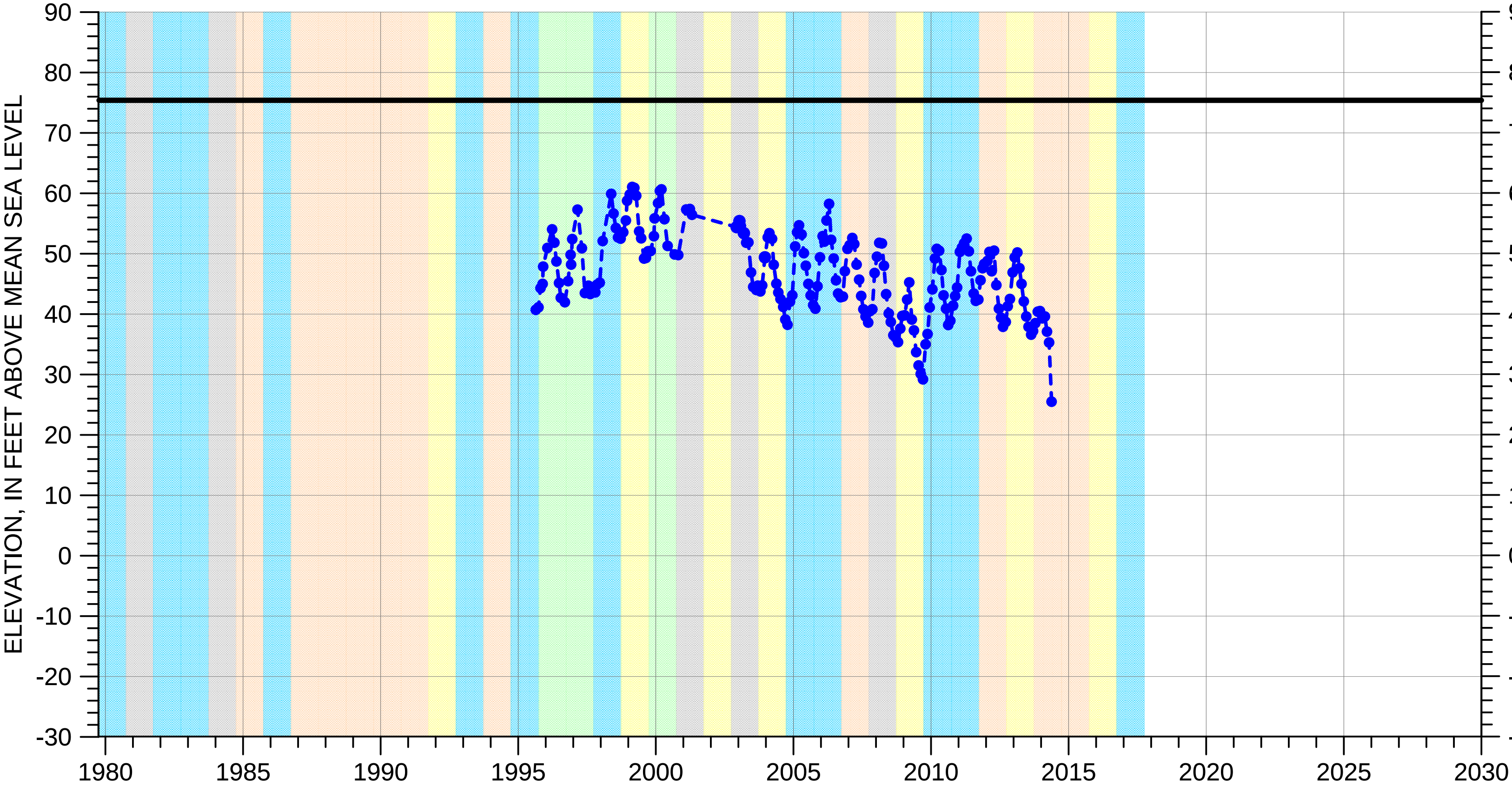
Well Depth: 293 feet

Screened Interval: 240-290 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY14S_03E-30G08.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

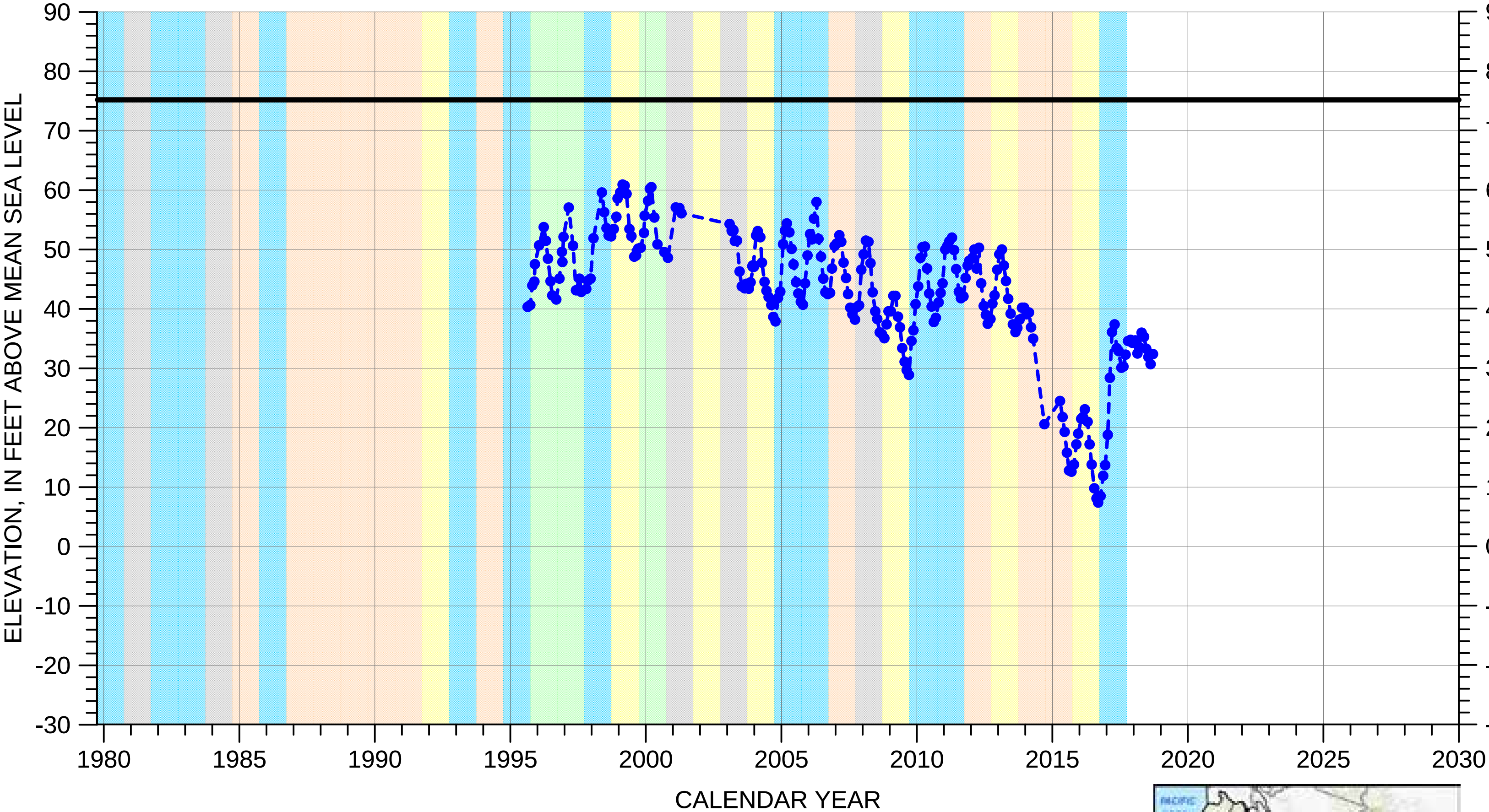
Well Depth: 130 feet

Screened Interval: 75-125 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY16S_04E-08H01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

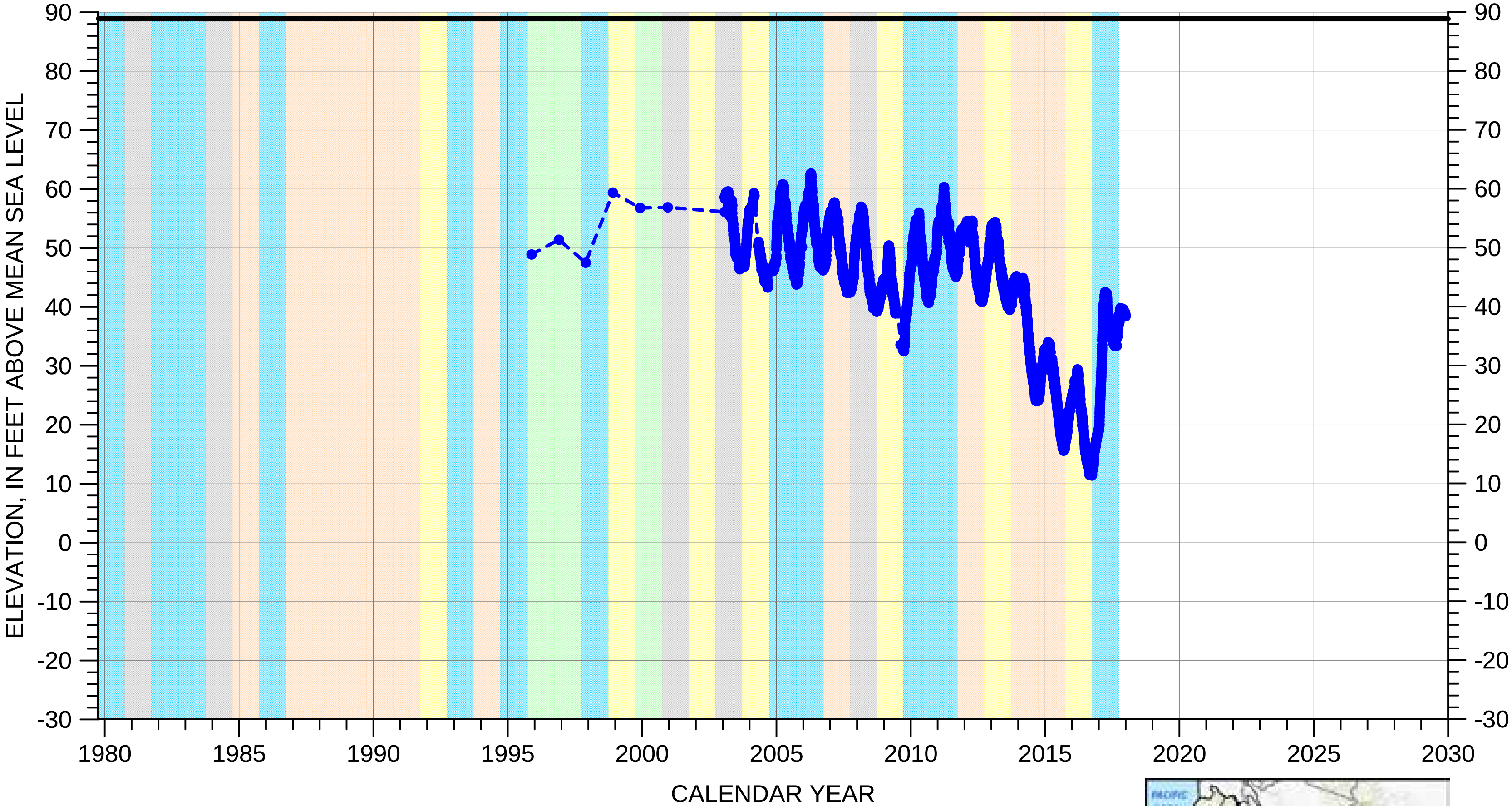
Well Depth: 295 feet

Screened Interval: 240-290 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY16S_04E-08H02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

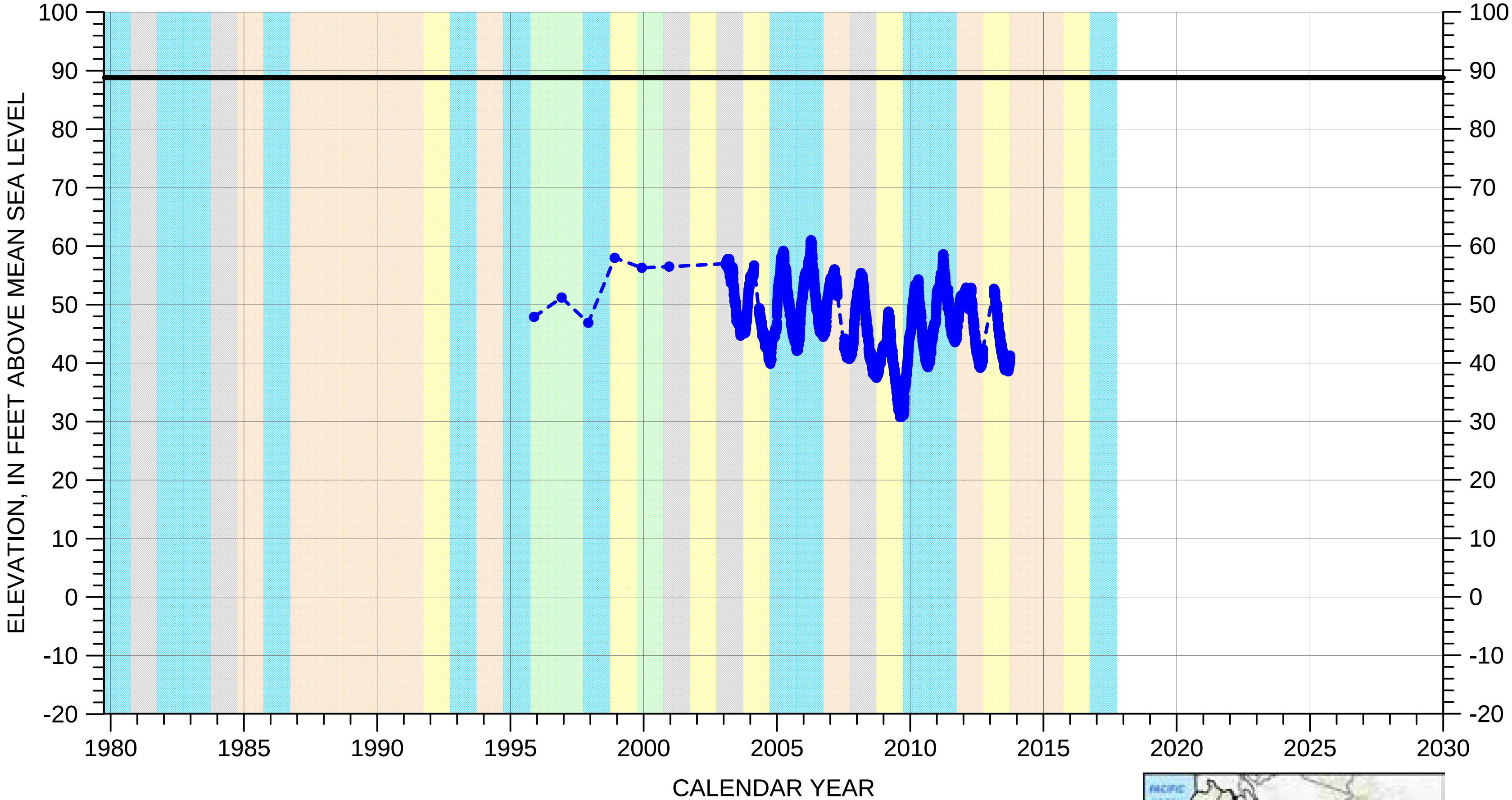
Well Depth: 295 feet

Screened Interval: 240-290 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY\16S_04E-08H03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

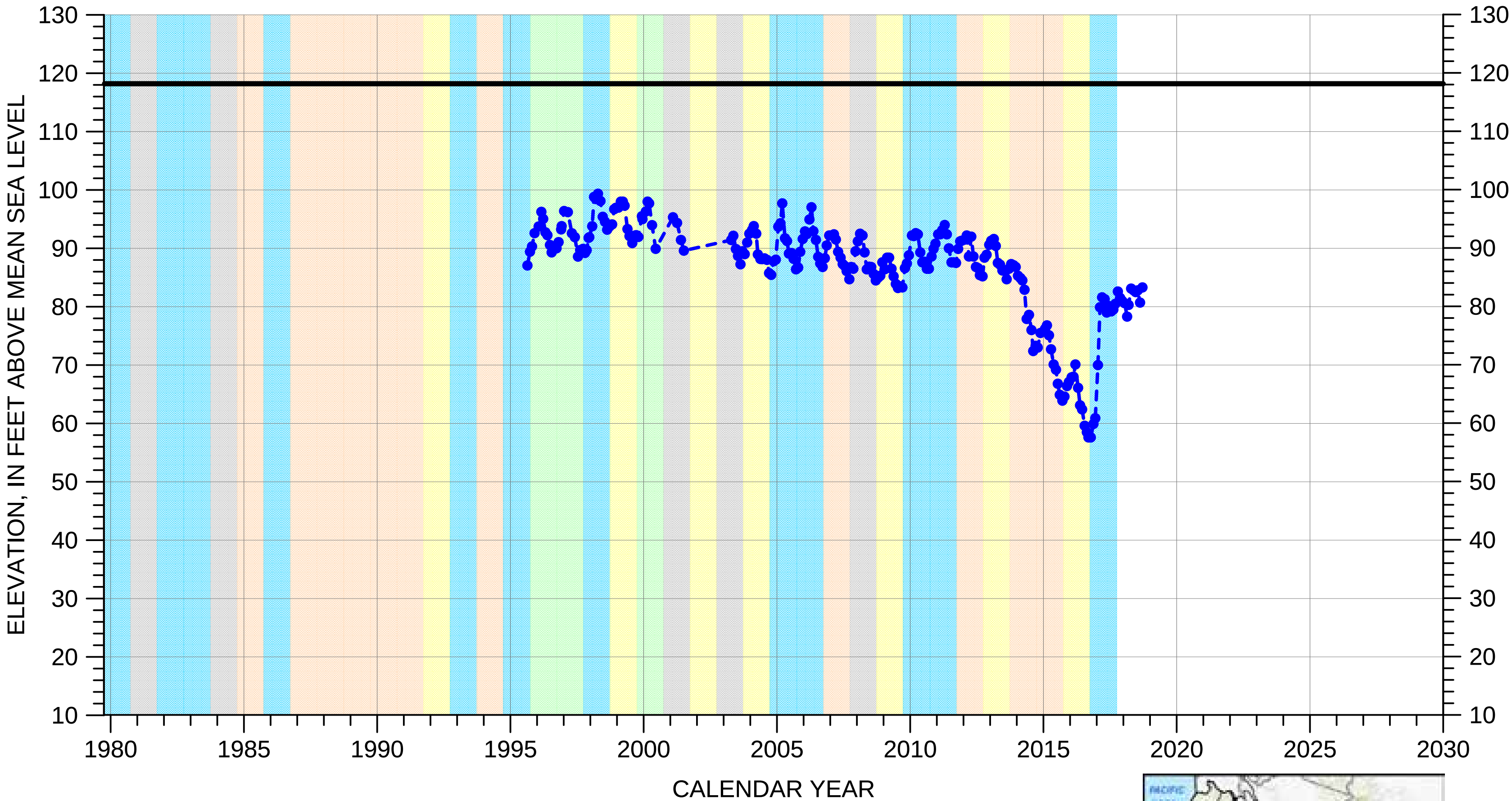
Well Depth: 140 feet

Screened Interval: 85-135 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY16S_04E-08H04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/05E-31P01

180/400-Foot Aquifer Subbasin



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

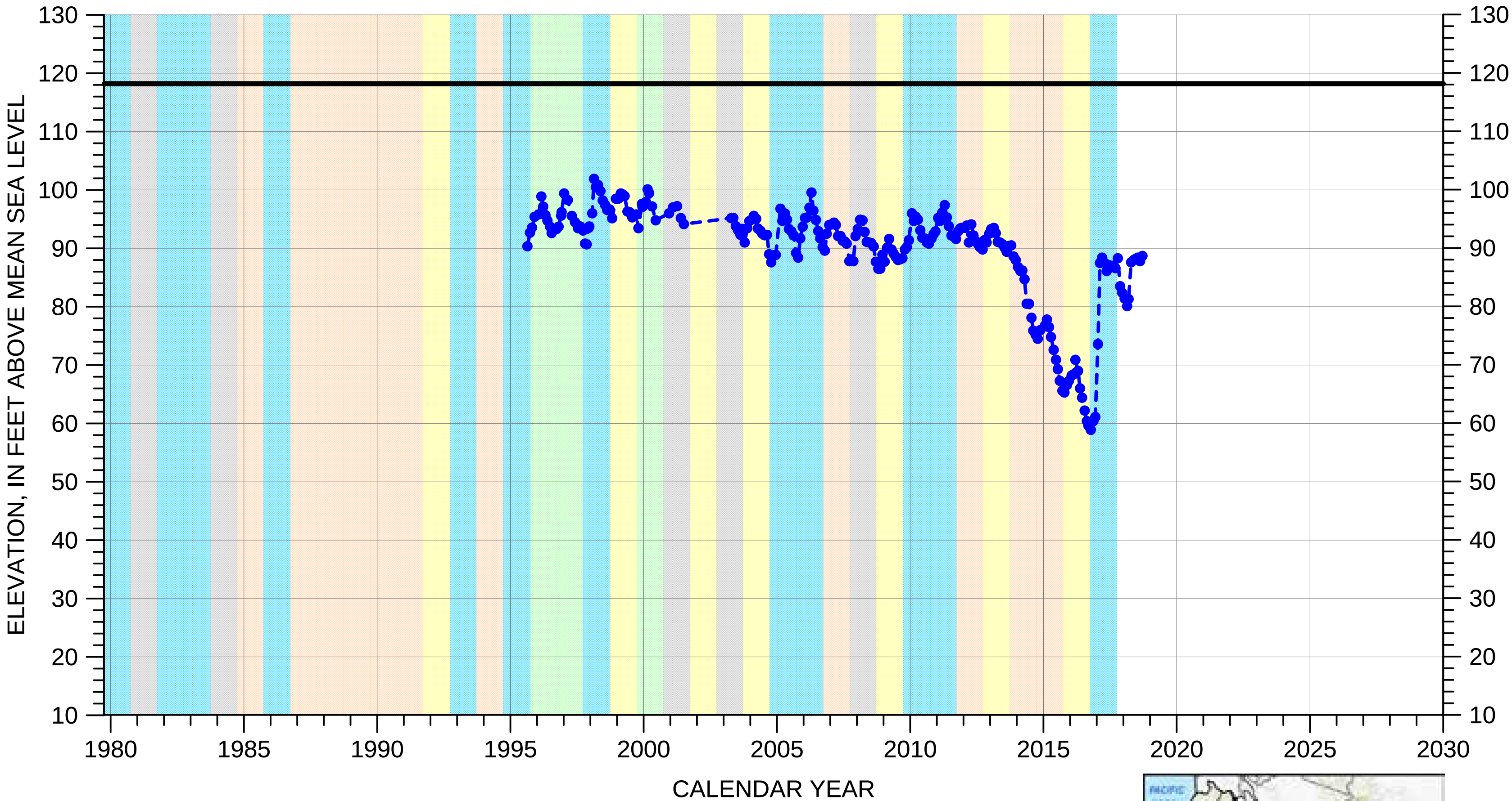
Well Depth: 300 feet

Screened Interval: 255-295 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\SalinasDroughtIndex\Hydrographs_MCWRA_WY16S_05E-31P01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/05E-31P02

180/400-Foot Aquifer Subbasin



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

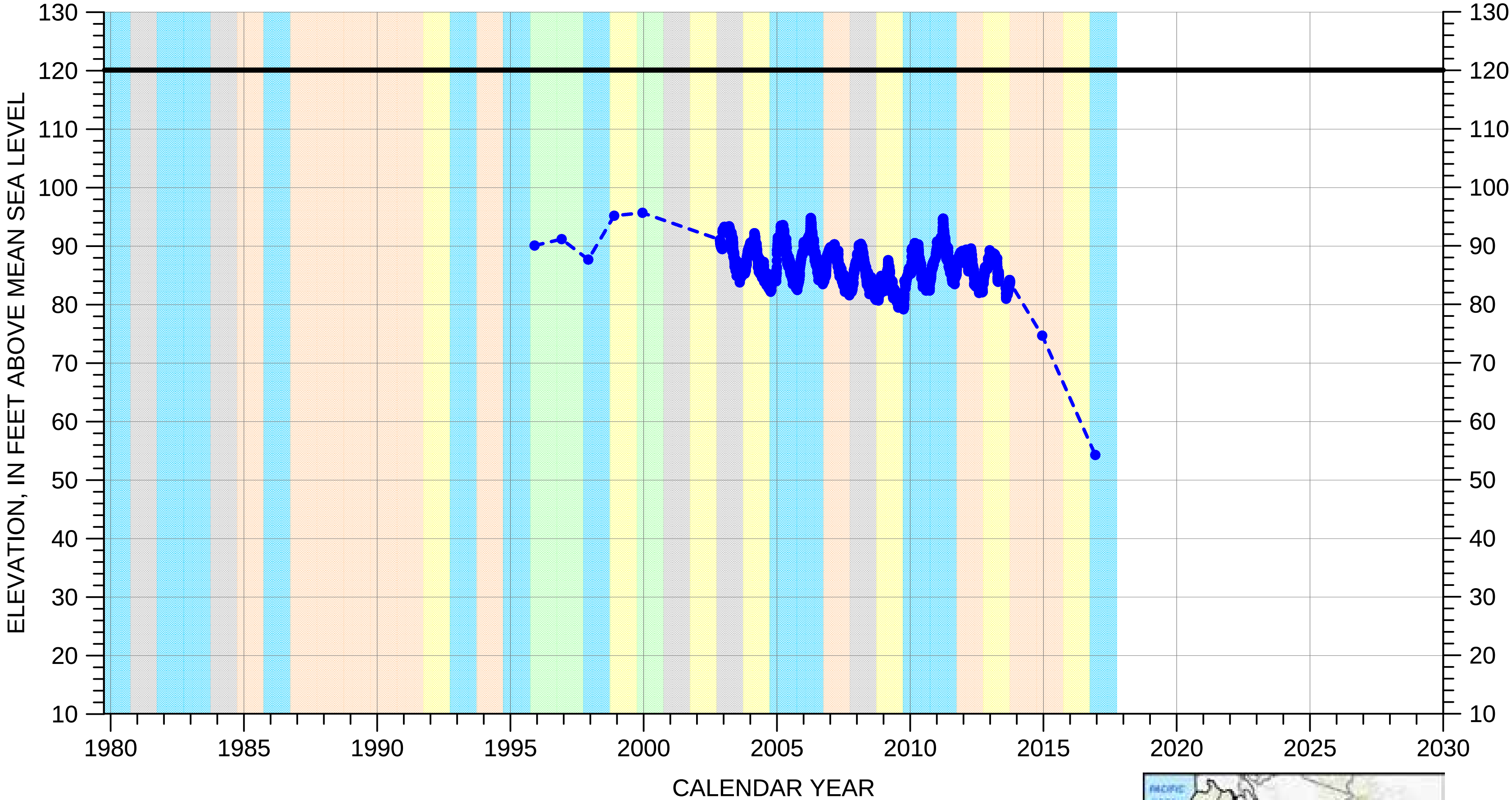
Well Depth: 115 feet

Screened Interval: 60-110 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA_WY16S_05E-31P02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY | DRY - NORMAL | NORMAL | WET - NORMAL | WET

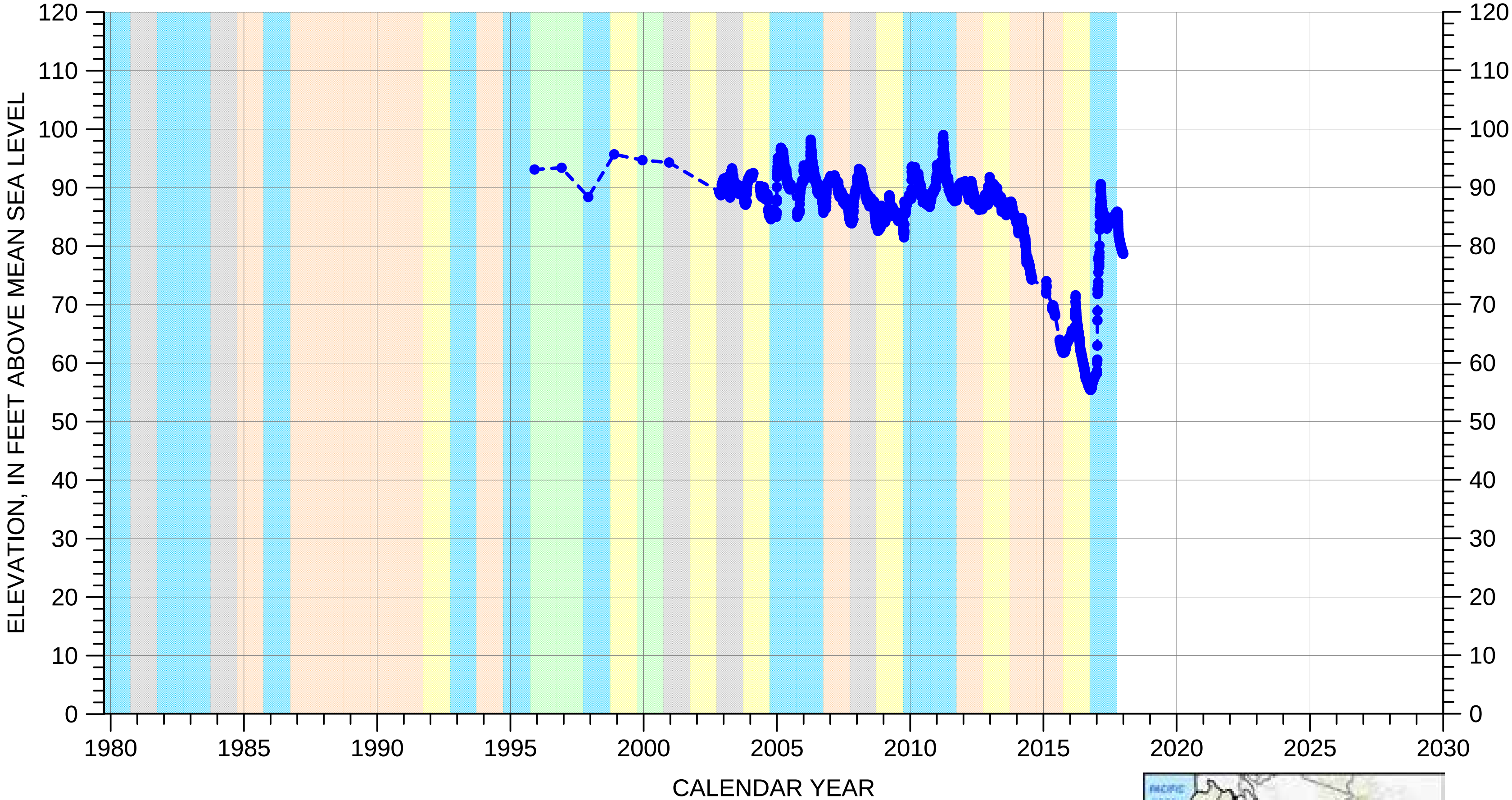
Well Depth: 290 feet

Screened Interval: 250-290 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch5_MCWRA_WY\17S_05E-06C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE (120.1 FT MSL)

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY DRY - NORMAL NORMAL WET - NORMAL WET

Well Depth: 110 feet

Screened Interval: 60-110 feet below land surface

C:\Users\jreeves\Desktop\forFieldWork\Salinas\DroughtIndex\grf\Ch5_MCWRA\Salinas\Hydrographs_MCWRA_WY\17S_05E-06C02.grf

APPENDIX 6A

Tabulated Annual Values of Components for Historical and Current Water Budgets

Year	SURFACE WATER BUDGET									
	SURFACE WATER INFLOW					SURFACE WATER OUTFLOW				
	Runoff from Precipitation (AF/yr.)	Salinas River Inflow from Forebay Subbasin (AF/yr.)	Tributary Inflows from East Side Subbasin (AF/yr.)	Irrigation Return Flow to Agricultural Drains (AF/yr.)	Total Inflow (AF/yr.)	Salinas River Direct Diversions (AF/yr.)	Salinas River Outflow to Monterey Bay (AF/yr.)	Other Outflows to Monterey Bay (AF/yr.)	Net Percolation of Streamflow to Groundwater (AF/yr.)	Total Outflow (AF/yr.)
1995	3,500	950,800	7,600	10,000	971,900	8,000	817,500	10,000	90,000	925,500
1996	600	394,600	1,800	10,000	406,900	8,000	274,400	10,000	90,000	382,400
1997	3,000	804,400	3,700	10,000	821,100	8,000	622,400	10,000	90,000	730,500
1998	9,400	1,155,600	11,800	10,000	1,186,800	8,000	1,251,400	10,000	90,000	1,359,400
1999	0	123,300	1,200	10,000	134,600	8,000	68,500	10,000	80,000	166,500
2000	1,100	269,700	2,800	10,000	283,600	8,000	209,700	10,000	80,000	307,700
2001	0	203,600	1,900	10,000	215,500	8,000	119,900	10,000	80,000	217,900
2002	200	82,900	500	10,000	93,600	8,000	0	10,000	80,000	98,000
2003	700	80,700	900	7,800	90,100	8,000	6,000	7,800	80,000	101,800
2004	200	76,400	200	9,100	85,900	8,000	3,300	9,100	76,400	96,800
2005	200	549,600	3,900	16,400	570,200	8,000	477,500	16,400	90,000	591,900
2006	200	415,700	1,800	14,900	432,600	8,000	338,000	14,900	90,000	450,900
2007	0	62,000	200	7,100	69,300	8,000	0	7,100	62,000	77,100
2008	400	139,800	1,000	8,200	149,500	8,000	57,600	8,200	80,000	153,800
2009	100	52,100	400	8,600	61,200	8,000	0	8,600	52,100	68,700
2010	300	266,100	1,500	13,400	281,400	8,000	181,500	13,400	80,000	282,900
2011	1,800	459,200	4,500	14,300	479,900	6,500	384,500	14,300	90,000	495,300
2012	0	70,500	300	7,300	78,100	7,200	0	7,300	70,500	85,100
2013	900	79,600	200	8,000	88,700	9,200	4,500	8,000	79,600	101,200
2014	0	5,000	0	5,000	10,100	8,900	0	5,000	5,000	18,900
2015	1,700	3,300	0	8,700	13,700	8,300	0	8,700	3,300	20,300
2016	3,200	10,000	100	14,400	27,700	7,600	0	14,400	10,000	32,000
2017	200	477,900	2,600	30,800	511,400	7,800	310,300	30,800	90,000	438,900
Historical Average (1995-2014)	**1,100**	**312,100**	**2,300**	**10,000**	**325,500**	**8,000**	**240,800**	**10,000**	**76,800**	**335,600**
Current Average (2015-2017)	**1,700**	**163,700**	**900**	**18,000**	**184,300**	**7,900**	**103,400**	**18,000**	**34,400**	**163,700**

Note: AF/yr. = Acre-feet per year

Year	GROUNDWATER BUDGET											Change in Storage (AF/yr.)	Seawater Intrusion (AF/yr.)
	GROUNDWATER INFLOW				GROUNDWATER OUTFLOW								
	Percolation of Streamflow (AF/yr.)	Deep Percolation of Precipitation and Excess Irrigation (AF/yr.)	Subsurface Inflows from Adjacent Subbasins (AF/yr.)	Total Inflow (AF/yr.)	Agriculture Pumping (AF/yr.)	Urban Pumping (AF/yr.)	Rural Domestic Pumping (AF/yr.)	Total Pumping (AF/yr.)	Riparian Evapo-transpiration (AF/yr.)	Subsurface Outflows to Adjacent Subbasins / Basins (AF/yr.)	Total Outflow (AF/yr.)		
1995	90,000	27,800	20,000	137,800	94,600	27,500	200	122,300	12,000	9,500	143,800	-6,100	10,500
1996	90,000	21,100	20,000	131,100	108,000	18,600	200	126,800	12,000	9,500	148,300	-17,200	10,500
1997	90,000	33,500	20,000	143,500	110,800	19,800	200	130,800	12,000	9,500	152,300	-8,900	10,500
1998	90,000	69,400	20,000	179,400	76,200	17,700	200	94,100	12,000	9,500	115,600	63,800	10,500
1999	80,000	13,100	20,000	113,100	87,600	18,800	200	106,600	12,000	9,500	128,100	-15,000	10,500
2000	80,000	19,900	20,000	119,900	84,300	20,700	200	105,200	12,000	9,500	126,700	-6,800	10,500
2001	80,000	11,700	20,000	111,700	78,900	18,400	200	97,500	12,000	9,500	119,000	-7,200	10,500
2002	80,000	14,800	20,000	114,800	89,900	20,500	200	110,500	12,000	9,500	132,000	-17,200	10,500
2003	80,000	17,500	20,000	117,500	87,700	20,800	200	108,700	12,000	9,500	130,200	-12,700	10,500
2004	76,400	19,100	20,000	115,500	91,400	20,900	200	112,500	12,000	9,500	134,000	-18,500	10,500
2005	90,000	15,600	20,000	125,600	86,800	19,100	200	106,100	12,000	9,500	127,600	-2,000	10,500
2006	90,000	12,800	20,000	122,800	82,200	18,500	200	100,900	12,000	9,500	122,400	300	10,500
2007	62,000	16,200	20,000	98,200	92,900	19,500	200	112,600	12,000	9,500	134,100	-35,900	10,500
2008	80,000	19,400	20,000	119,400	97,000	19,500	200	116,700	12,000	9,500	138,200	-18,800	10,500
2009	52,100	15,500	20,000	87,600	90,400	18,100	200	108,600	12,000	9,500	130,100	-42,500	10,500
2010	80,000	12,600	20,000	112,600	78,700	14,000	200	92,900	12,000	9,500	114,400	-1,700	10,500
2011	90,000	9,700	20,000	119,700	78,100	16,000	200	94,300	12,000	9,500	115,800	3,800	10,500
2012	70,500	13,800	20,000	104,400	85,800	16,200	200	102,200	12,000	9,500	123,700	-19,300	10,500
2013	79,600	16,500	20,000	116,100	87,800	17,100	200	105,100	12,000	9,500	126,600	-10,600	10,500
2014	5,000	18,300	20,000	43,300	90,800	17,400	200	108,400	12,000	9,500	129,900	-86,600	10,500
2015	3,300	18,900	20,000	42,200	97,700	12,900	200	110,900	12,000	9,500	132,400	-90,200	10,500
2016	10,000	18,800	20,000	48,800	89,000	19,000	200	108,200	12,000	9,500	129,700	-80,900	10,500
2017	90,000	-6,400	20,000	103,600	89,000	19,000	200	108,200	12,000	9,500	129,700	-26,100	10,500
Historical Average (1995-2014)	**76,800**	**19,900**	**20,000**	**116,700**	**89,000**	**19,000**	**200**	**108,100**	**12,000**	**9,500**	**129,600**	**-12,900**	**10,500**
Current Average (2015-2017)	**34,400**	**10,400**	**20,000**	**64,800**	**91,900**	**17,000**	**200**	**109,100**	**12,000**	**9,500**	**130,600**	**-65,800**	**10,500**

Note: AF/yr. = Acre-feet per year

2017 Deep percolation of precipitation and excess irrigation is negative due to anamalously high flows observed in agricultural drains. The flows and preciptiations are correct for this year.

Year	WATER BUDGET COMPONENTS USED TO CALCULATE DEEP PERCOLATION TO GROUNDWATER											
	PRECIPITATION				AGRICULTURAL IRRIGATION							Deep Percolation from Precipitation and Excess Irrigation (AF/yr.)
	Precipitation (inches/year)	Precipitation (AF/yr.)	Runoff from Precipitation (AF/yr.)	Precipitation Percolation to Groundwater (AF/yr.)	Agricultural Pumping (AF/yr.)	Salinas River Diversions	Recycled Water from CSIP (AF/yr.)	Total Applied Water AF/yr.	Crop Use and ET (AF/yr.)	Irrigation Return Flow to Agricultural Drains (AF/yr.)	Deep Percolation of Excess Irrigation (AF/yr.)	
1995	20.87	173,900	3,500	17,200	94,600	8,000	0	102,600	82,100	10,000	10,500	27,800
1996	12.57	118,400	600	7,900	108,000	8,000	0	116,000	92,800	10,000	13,200	21,100
1997	13.94	127,600	3,000	19,700	110,800	8,000	0	118,800	95,100	10,000	13,800	33,500
1998	29.61	246,800	9,400	61,900	76,200	8,000	3,200	87,500	70,000	10,000	7,500	69,400
1999	12.66	100,100	0	2,100	87,600	8,000	9,400	105,000	84,000	10,000	11,000	13,100
2000	14.65	114,200	1,100	9,400	84,300	8,000	10,600	102,800	82,300	10,000	10,600	19,900
2001	15.19	104,500	0	2,100	78,900	8,000	11,200	98,200	78,500	10,000	9,600	11,700
2002	3.59	80,200	200	2,600	89,900	8,000	13,100	111,000	88,800	10,000	12,200	14,800
2003	7.11	107,500	700	3,500	87,700	8,000	13,200	108,800	87,100	7,800	14,000	17,500
2004	9.99	90,200	200	5,500	91,400	8,000	14,100	113,500	90,800	9,100	13,600	19,100
2005	19.68	163,100	200	11,000	86,800	8,000	10,600	105,500	84,400	16,400	4,700	15,600
2006	15.30	135,800	200	7,400	82,200	8,000	11,100	101,300	81,000	14,900	5,300	12,800
2007	8.89	67,100	0	300	92,900	8,000	14,000	114,900	91,900	7,100	15,900	16,200
2008	8.88	82,600	400	3,800	97,000	8,000	14,000	118,900	95,100	8,200	15,500	19,400
2009	11.36	91,100	100	1,700	90,400	8,000	13,600	112,000	89,600	8,600	13,800	15,500
2010	16.93	143,800	300	6,600	78,700	8,000	10,500	97,200	77,800	13,400	6,000	12,600
2011	15.55	132,700	1,800	4,500	78,100	6,500	12,700	97,300	77,800	14,300	5,100	9,700
2012	10.36	76,400	0	0	85,800	7,200	12,900	105,800	84,700	7,300	13,800	13,800
2013	9.03	71,700	900	2,200	87,800	9,200	14,600	111,600	89,300	8,000	14,400	16,500
2014	11.68	53,700	0	0	90,800	8,900	16,500	116,200	93,000	5,000	18,300	18,300
2015	3.54	89,500	1,700	3,500	97,700	8,300	14,400	120,400	96,300	8,700	15,400	18,900
2016	10.75	139,700	3,200	11,400	89,000	7,600	12,300	108,900	87,200	14,400	7,400	18,800
2017	12.77	90,800	200	2,900	89,000	7,800	10,300	107,100	85,700	30,800	-9,400	-6,400
Historical Average (1995-2014)	**13.39**	**114,100**	**1,100**	**8,500**	**89,000**	**8,000**	**10,300**	**107,200**	**85,800**	**10,000**	**11,400**	**19,900**
Current Average (2015-2017)	**9.02**	**106,600**	**1,700**	**6,000**	**91,900**	**7,900**	**12,300**	**112,100**	**89,700**	**18,000**	**4,500**	**10,400**

Note: AF/yr. = Acre-feet per year

Year	URBAN AND DOMESTIC GROUNDWATER CONSUMPTION						GROUNDWATER INFLOW/OUTFLOW COMPONENTS				
	Rural Domestic Pumping (AF/yr.)	Urban Pumping (AF/yr.)	Urban Conveyance Loss to Groundwater (AF/yr.)	Consumption (AF/yr.)	Recycled Water to CSIP (AF/yr.)	Net Domestic and Urban Consumption (AF/yr.)	Forebay Subbasin (AF/yr.)	Monterey Subbasin (AF/yr.)	East Side/Langley Subbasin (AF/yr.)	Pajaro Valley Basin (AF/yr.)	Total Inflow Across Inland Boundaries (AF/yr.)
1995	200	27,500	2,800	24,800	0	24,900	17,000	3,000	-8,000	-1,500	10,500
1996	200	18,600	1,900	16,800	0	16,900	17,000	3,000	-8,000	-1,500	10,500
1997	200	19,800	2,000	17,900	0	18,100	17,000	3,000	-8,000	-1,500	10,500
1998	200	17,700	1,800	15,900	3,200	16,100	17,000	3,000	-8,000	-1,500	10,500
1999	200	18,800	1,900	16,900	9,400	17,100	17,000	3,000	-8,000	-1,500	10,500
2000	200	20,700	2,100	18,700	10,600	18,900	17,000	3,000	-8,000	-1,500	10,500
2001	200	18,400	1,800	16,500	11,200	16,700	17,000	3,000	-8,000	-1,500	10,500
2002	200	20,500	2,000	18,400	13,100	18,600	17,000	3,000	-8,000	-1,500	10,500
2003	200	20,800	2,100	18,700	13,200	18,900	17,000	3,000	-8,000	-1,500	10,500
2004	200	20,900	2,100	18,800	14,100	19,000	17,000	3,000	-8,000	-1,500	10,500
2005	200	19,100	1,900	17,200	10,600	17,400	17,000	3,000	-8,000	-1,500	10,500
2006	200	18,500	1,900	16,700	11,100	16,900	17,000	3,000	-8,000	-1,500	10,500
2007	200	19,500	2,000	17,600	14,000	17,800	17,000	3,000	-8,000	-1,500	10,500
2008	200	19,500	2,000	17,600	14,000	17,800	17,000	3,000	-8,000	-1,500	10,500
2009	200	18,100	1,800	16,300	13,600	16,500	17,000	3,000	-8,000	-1,500	10,500
2010	200	14,000	1,400	12,600	10,500	12,800	17,000	3,000	-8,000	-1,500	10,500
2011	200	16,000	1,600	14,400	12,700	14,600	17,000	3,000	-8,000	-1,500	10,500
2012	200	16,200	1,600	14,600	12,900	14,800	17,000	3,000	-8,000	-1,500	10,500
2013	200	17,100	1,700	15,400	14,600	15,600	17,000	3,000	-8,000	-1,500	10,500
2014	200	17,400	1,700	15,600	16,500	15,900	17,000	3,000	-8,000	-1,500	10,500
2015	200	12,900	1,300	11,600	14,400	11,900	17,000	3,000	-8,000	-1,500	10,500
2016	200	19,000	1,900	17,100	12,300	17,300	17,000	3,000	-8,000	-1,500	10,500
2017	200	19,000	1,900	17,100	10,300	17,300	17,000	3,000	-8,000	-1,500	10,500

Historical Average (1995-2014)	**200**	**19,000**	**1,900**	**17,100**	**10,300**	**17,300**	**17,000**	**3,000**	**-8,000**	**-1,500**	**10,500**
Current Average (2015-2017)	**200**	**17,000**	**1,700**	**15,300**	**12,300**	**15,500**	**17,000**	**3,000**	**-8,000**	**-1,500**	**10,500**

Note: AF/yr. = Acre-feet per year

APPENDIX 6B

Tabulated Annual Values of Components for Projected Water Budgets

Model Water Year	Net Groundwater Extraction	Net Drain Flow	Net Stream Exchange	Net Deep Percolation	Net Seawater Intrusion	Net flow from Monterey	Net flow to Eastside	Net flow from Forebay	Net flow from Langley	Net mountain front recharge	Net flow to Pajaro	Net Storage Change	Total In	Total Out	In-Out	Percent Error
1	-126,500	-3,600	72,700	-1,800	1,700	6,100	-2,900	5,000	1,500	1,700	-300	-46,600	249,300	249,000	200	0.09%
2	-116,900	-18,700	75,200	93,600	1,000	5,500	-2,000	5,100	1,500	1,600	-500	45,200	358,200	358,200	0	0.01%
3	-122,300	-9,900	78,000	19,400	1,300	6,000	-1,100	5,100	1,500	2,000	-500	-20,700	292,000	291,700	300	0.10%
4	-121,800	-10,100	80,300	28,600	1,300	6,400	-1,600	5,100	1,500	1,700	-600	-10,100	294,900	294,000	900	0.31%
5	-141,200	-4,100	53,500	6,900	2,300	8,400	-2,000	5,100	1,500	1,600	-600	-68,900	280,000	279,700	300	0.11%
6	-122,100	-12,400	88,700	77,900	1,600	7,500	-800	5,200	1,500	1,700	-600	46,900	348,000	346,600	1,400	0.39%
7	-112,500	-14,300	77,500	57,200	1,300	6,500	-1,500	5,100	1,500	1,800	-600	19,600	318,500	316,000	2,500	0.79%
8	-114,000	-6,800	75,900	20,400	1,800	7,100	-2,200	5,100	1,500	1,800	-700	-12,200	288,200	286,100	2,200	0.76%
9	-118,500	-2,200	68,100	-13,400	2,800	8,000	-2,800	5,200	1,600	1,600	-800	-53,100	246,700	244,100	2,600	1.06%
10	-141,900	-1,400	5,100	20,300	3,700	8,400	-1,400	5,100	1,600	1,700	-900	-99,200	219,200	219,600	-400	-0.18%
11	-133,400	-8,800	101,700	95,200	3,200	8,300	-300	5,300	1,600	1,500	-900	71,900	377,800	376,400	1,400	0.38%
12	-137,200	-7,400	86,600	32,000	3,100	8,600	-2,200	5,200	1,600	1,600	-800	-10,400	322,400	320,900	1,500	0.47%
13	-125,400	-7,800	82,800	46,300	3,000	8,200	-3,100	5,100	1,600	1,700	-800	11,200	318,700	318,200	600	0.18%
14	-137,200	-5,100	85,600	17,200	3,400	8,800	-3,200	5,100	1,600	1,800	-800	-26,100	304,900	301,700	3,300	1.08%
15	-107,000	-10,200	81,300	57,300	2,600	6,900	-4,000	5,000	1,600	1,700	-800	31,500	313,600	310,600	3,000	0.97%
16	-111,500	-20,500	73,800	99,400	2,100	6,100	-3,600	5,000	1,600	2,000	-700	51,800	369,600	367,700	1,800	0.50%
17	-145,000	-7,700	80,600	11,800	3,000	8,300	-2,600	5,100	1,600	2,300	-800	-44,800	311,200	309,600	1,600	0.50%
18	-125,700	-4,200	81,200	8,100	3,300	6,700	-3,200	5,100	1,600	1,800	-900	-27,100	288,400	287,500	800	0.29%
19	-118,800	-6,600	78,900	45,700	2,800	5,500	-3,900	5,000	1,600	1,700	-1,000	10,600	312,500	312,100	400	0.12%
20	-136,200	-2,700	76,100	1,300	3,200	5,700	-4,100	5,000	1,700	1,800	-1,000	-49,100	273,200	273,400	-100	-0.05%
21	-158,000	-2,100	32,200	23,700	4,000	6,400	-3,400	5,000	1,800	1,600	-900	-93,600	293,800	290,000	3,800	1.31%
22	-154,400	-1,600	10,100	42,000	4,800	6,800	100	5,000	1,900	1,900	-1,000	-84,400	265,900	265,900	0	0.00%
23	-147,300	-700	6,300	36,300	5,400	5,700	1,400	4,900	1,900	1,800	-1,100	-85,400	228,600	228,600	0	0.01%
24	-147,200	-1,300	51,900	61,000	5,700	6,600	100	4,700	1,900	1,500	-1,200	-19,100	321,100	318,300	2,700	0.85%
25	-150,100	-1,900	75,000	61,100	5,600	6,600	-2,700	4,600	1,900	1,400	-1,200	-3,300	342,000	338,500	3,500	1.04%
26	-134,200	-6,400	115,900	93,000	4,800	6,100	-5,800	4,700	1,800	1,500	-900	79,300	394,600	393,400	1,200	0.31%
27	-127,200	-1,800	74,400	19,300	4,800	4,800	-8,700	4,600	1,800	1,600	-800	-39,500	303,700	291,400	12,400	4.15%
28	-121,400	-8,000	99,600	100,000	4,000	4,900	-8,900	4,900	1,800	1,700	-800	77,000	385,800	384,900	800	0.22%
29	-129,400	-5,800	92,100	47,400	3,900	5,500	-10,400	5,000	1,700	1,800	-800	9,900	332,400	331,400	1,000	0.31%
30	-140,800	-6,800	93,600	49,800	3,900	6,400	-11,400	5,000	1,800	1,900	-800	1,800	346,600	345,900	600	0.19%
31	-99,500	-11,700	85,400	78,700	3,000	5,200	-12,700	5,000	1,700	1,900	-900	54,800	347,900	346,700	1,200	0.35%
32	-99,800	-4,500	82,200	11,800	2,700	4,700	-12,900	4,900	1,700	2,100	-800	-9,000	269,700	268,700	1,000	0.38%
33	-86,900	-8,100	77,800	54,700	2,200	3,700	-13,800	5,000	1,600	1,800	-800	36,000	299,700	298,400	1,300	0.44%
34	-75,600	-6,600	73,500	33,600	2,000	2,800	-13,700	4,600	1,600	1,700	-800	21,300	263,300	261,500	1,800	0.67%
35	-88,500	-4,600	77,300	10,300	2,100	3,000	-14,300	4,800	1,600	1,700	-800	-8,800	241,900	240,600	1,300	0.54%
36	-86,600	-5,200	65,800	21,600	2,100	2,700	-15,800	4,900	1,600	1,600	-800	-9,800	249,000	247,400	1,600	0.63%
37	-106,300	-5,600	38,700	44,600	2,200	4,400	-13,600	4,800	1,600	1,800	-900	-29,100	277,000	276,000	1,000	0.36%
38	-75,100	-9,100	86,000	69,500	1,800	3,100	-13,300	5,000	1,600	1,600	-900	66,800	289,600	286,200	3,300	1.15%
39	-75,200	-11,600	66,400	66,200	1,300	1,600	-14,500	4,900	1,600	1,600	-800	40,500	280,900	279,900	1,000	0.35%
40	-88,600	-5,600	67,800	10,700	1,500	2,000	-14,300	4,900	1,600	1,600	-800	-19,300	239,700	239,700	0	-0.01%
41	-93,600	-6,000	70,000	31,400	1,500	2,700	-14,800	4,900	1,600	1,500	-900	-2,300	266,800	266,200	600	0.23%
42	-94,200	-6,100	19,700	41,100	1,500	3,200	-12,800	4,800	1,600	1,800	-900	-40,200	243,800	243,900	-100	-0.06%
43	-69,800	-12,200	81,100	66,300	1,000	2,200	-13,600	4,900	1,500	1,600	-800	59,800	278,100	275,800	2,300	0.84%
44	-75,500	-14,000	67,500	61,600	600	1,800	-15,100	4,800	1,500	1,500	-800	32,900	275,200	274,100	1,100	0.40%
45	-87,200	-8,600	67,600	22,600	900	2,700	-14,800	4,800	1,500	1,700	-800	-10,800	259,300	258,200	1,100	0.41%
46	-88,500	-5,700	70,500	10,000	1,000	4,300	-15,400	4,800	1,500	1,700	-800	-17,800	240,100	239,100	1,000	0.41%
47	-105,600	-7,500	24,200	45,200	1,200	5,700	-14,300	4,800	1,500	1,800	-900	-43,700	272,500	272,700	-200	-0.06%
Average	-115,300	-7,100	69,700	41,200	2,600	5,500	-7,200	5,000	1,600	1,700	-800	-4,600	295,700	294,200	1,500	0.50%

Model Water Year	2030 INFLOWS											
	Groundwater Extraction	Drain Return Flow	Flow from streams	Deep Percolation	Seawater Intrusion	Underflow from Monterey	Underflow from Eastside	Underflow from Forebay	Underflow from Langley	Mountain front recharge	Underflow from Pajaro	From Storage
1	9,700	0	74,200	42,300	2,400	9,200	10,800	5,200	1,600	2,500	200	91,100
2	12,700	0	78,100	140,600	2,300	9,100	11,400	5,400	1,600	2,600	200	94,300
3	12,800	0	80,000	68,900	2,300	9,400	11,900	5,500	1,600	2,800	200	96,600
4	13,200	0	82,300	76,300	2,400	9,700	11,800	5,400	1,600	2,600	100	89,500
5	13,800	0	55,200	49,800	3,000	11,700	12,100	5,500	1,600	2,400	100	124,900
6	16,100	0	90,400	119,600	2,700	11,100	12,200	5,500	1,600	2,700	100	85,800
7	17,700	0	79,800	100,400	2,500	10,400	11,600	5,400	1,600	2,700	200	86,100
8	16,900	0	77,900	65,000	2,700	10,700	11,200	5,400	1,700	2,600	200	94,100
9	14,100	0	69,800	27,700	3,300	11,200	11,100	5,400	1,700	2,400	100	99,900
10	12,400	0	5,800	37,900	4,100	11,400	11,700	5,400	1,700	2,500	100	126,100
11	16,200	0	103,100	131,500	4,100	12,400	12,600	5,600	1,700	2,700	100	87,800
12	18,800	0	88,300	76,800	4,000	12,800	12,200	5,600	1,700	2,600	100	99,500
13	19,200	0	84,700	88,100	3,900	12,400	11,600	5,400	1,700	2,700	100	88,900
14	18,100	0	87,200	62,000	4,200	13,100	11,800	5,500	1,700	2,600	100	98,700
15	20,400	0	83,100	94,600	3,600	11,400	10,900	5,300	1,700	2,600	100	79,900
16	21,400	0	77,100	143,400	3,400	11,000	10,900	5,300	1,700	3,000	100	92,400
17	19,400	0	82,600	63,300	3,900	12,700	11,900	5,400	1,700	3,100	100	107,100
18	20,300	0	83,000	50,900	3,900	11,600	11,500	5,400	1,800	2,600	100	97,200
19	21,500	0	80,800	85,300	3,500	11,000	11,000	5,300	1,700	2,700	100	89,600
20	19,500	0	77,800	42,800	3,700	11,300	11,100	5,400	1,800	2,600	100	97,000
21	20,900	0	33,800	50,900	4,400	11,800	11,800	5,300	1,900	2,500	100	150,400
22	20,800	0	10,800	51,000	5,200	12,200	13,000	5,300	2,000	2,800	100	142,700
23	17,900	0	6,700	40,200	5,700	11,700	13,100	5,200	2,000	2,600	100	123,500
24	18,900	0	52,600	73,200	6,100	13,000	12,900	5,200	2,000	2,500	100	134,700
25	20,900	0	75,900	80,800	6,100	13,600	12,400	5,100	2,000	2,500	100	122,700
26	23,000	0	117,400	127,300	5,700	13,700	11,300	5,200	1,900	2,700	100	86,300
27	22,300	0	76,100	50,500	5,300	12,100	9,700	5,000	1,900	2,500	100	118,100
28	24,100	0	101,300	135,800	5,000	12,300	9,700	5,200	1,900	2,700	100	87,600
29	25,100	0	93,900	88,800	4,700	12,800	9,500	5,400	1,900	2,700	100	87,500
30	26,100	0	95,600	94,400	4,800	13,500	9,600	5,400	1,900	2,700	100	92,400
31	26,200	0	87,900	117,600	4,000	11,800	8,400	5,300	1,800	2,900	100	81,900
32	25,000	0	84,100	50,600	3,500	11,100	7,900	5,300	1,800	2,900	200	77,400
33	24,300	0	80,100	90,600	3,200	10,400	7,100	5,200	1,800	2,700	200	74,200
34	24,100	0	75,600	66,100	2,900	9,400	6,700	4,900	1,700	2,600	100	69,100
35	21,700	0	79,200	44,700	2,800	9,500	6,600	5,000	1,700	2,500	200	67,900
36	22,100	0	67,800	54,800	2,800	9,300	6,200	5,100	1,700	2,400	200	76,600
37	22,500	0	40,400	72,100	3,000	10,400	6,900	5,100	1,800	2,600	100	112,100
38	24,100	0	88,000	95,400	2,800	9,200	6,500	5,200	1,700	2,600	100	54,000
39	24,900	0	68,700	96,000	2,400	8,600	6,200	5,100	1,700	2,500	200	64,500
40	23,000	0	69,800	45,900	2,300	8,700	6,400	5,100	1,700	2,400	200	74,200
41	22,600	0	72,000	68,500	2,300	9,000	6,600	5,100	1,700	2,300	200	76,500
42	23,000	0	21,700	64,700	2,300	8,700	6,800	5,000	1,700	2,500	100	107,200
43	24,800	0	83,000	90,800	2,200	8,200	6,800	5,100	1,700	2,600	200	52,800
44	25,300	0	70,100	92,500	1,900	8,100	6,500	5,000	1,700	2,400	200	61,700
45	24,400	0	69,800	59,700	1,900	8,500	6,600	5,000	1,700	2,500	200	79,200
46	23,400	0	72,600	44,400	1,800	9,000	6,700	5,000	1,700	2,400	200	72,800
47	23,400	0	26,400	73,400	2,100	10,000	7,400	5,000	1,700	2,600	100	120,400
Average	20,400	0	71,500	76,300	3,500	10,900	9,800	5,300	1,800	2,600	100	93,500

Model Water Year	2030 OUTFLOWS											
	Pumping	Drain Flows	Flow to Streams	Groundwater Evapotranspiration	Underflow to Ocean	Underflow to Monterey	Underflow to Eastside	Underflow to Forebay	Underflow to Langley	Underflow to Upland Areas	Underflow to Pajaro	To Storage
1	136,200	3,600	1,400	44,100	700	3,100	13,600	300	100	800	600	44,500
2	129,700	18,700	2,900	47,000	1,300	3,500	13,400	300	100	1,000	700	139,600
3	135,100	9,900	2,000	49,500	1,000	3,400	13,000	300	100	800	700	75,900
4	135,000	10,100	2,000	47,700	1,100	3,400	13,400	300	100	800	700	79,400
5	155,000	4,100	1,700	42,900	700	3,300	14,200	300	100	800	800	56,000
6	138,300	12,400	1,700	41,700	1,100	3,700	13,000	300	100	1,000	800	132,700
7	130,200	14,300	2,300	43,300	1,200	3,900	13,100	300	100	900	700	105,700
8	131,000	6,800	2,000	44,600	800	3,600	13,400	300	100	800	800	81,800
9	132,500	2,200	1,700	41,100	500	3,300	13,900	300	100	800	1,000	46,800
10	154,300	1,400	700	17,600	300	3,100	13,100	200	100	800	1,000	26,900
11	149,600	8,800	1,400	36,300	900	4,000	13,000	300	100	1,200	1,000	159,700
12	156,000	7,400	1,700	44,800	900	4,200	14,400	300	100	1,000	900	89,100
13	144,500	7,800	1,900	41,700	900	4,200	14,600	300	100	900	900	100,200
14	155,400	5,100	1,600	44,800	700	4,200	15,100	300	100	900	900	72,600
15	127,300	10,200	1,800	37,300	1,000	4,500	14,800	300	100	900	900	111,400
16	132,900	20,500	3,200	44,000	1,300	4,800	14,400	300	100	1,000	900	144,200
17	164,400	7,700	2,000	51,400	900	4,400	14,400	300	100	900	900	62,200
18	146,100	4,200	1,800	42,800	700	5,000	14,700	300	100	800	1,000	70,100
19	140,300	6,600	1,900	39,600	800	5,400	14,900	300	100	900	1,100	100,200
20	155,800	2,700	1,700	41,600	500	5,500	15,200	400	100	900	1,100	48,000
21	178,900	2,100	1,600	27,200	400	5,400	15,200	400	100	800	1,000	56,900
22	175,300	1,600	700	9,000	400	5,500	12,800	300	100	800	1,100	58,300
23	165,200	700	400	3,900	200	5,900	11,700	400	100	800	1,100	38,100
24	166,100	1,300	600	12,200	400	6,400	12,900	400	100	1,000	1,300	115,600
25	171,000	1,900	900	19,800	500	7,000	15,100	500	100	1,100	1,300	119,400
26	157,200	6,400	1,500	34,200	900	7,600	17,100	500	100	1,200	1,000	165,700
27	149,600	1,800	1,700	31,300	500	7,300	18,400	400	100	900	900	78,600
28	145,400	8,000	1,700	35,800	1,000	7,400	18,600	300	100	1,000	1,000	164,600
29	154,500	5,800	1,900	41,400	800	7,300	19,900	400	100	900	1,000	97,500
30	166,900	6,800	2,000	44,600	900	7,100	20,900	500	100	900	1,000	94,200
31	125,700	11,700	2,500	38,900	1,100	6,600	21,100	400	100	900	1,000	136,700
32	124,800	4,500	1,900	38,800	700	6,400	20,800	400	100	800	1,000	68,300
33	111,100	8,100	2,300	36,000	1,000	6,700	20,900	300	100	800	900	110,100
34	99,700	6,600	2,200	32,500	900	6,600	20,300	300	100	800	1,000	90,400
35	110,200	4,600	2,000	34,400	700	6,500	20,800	300	100	800	1,000	59,100
36	108,700	5,200	1,900	33,200	800	6,700	22,000	300	100	800	1,000	66,800
37	128,800	5,600	1,700	27,500	800	6,000	20,500	300	100	800	1,000	82,900
38	99,200	9,100	2,000	25,900	1,000	6,100	19,800	200	100	900	1,000	120,800
39	100,100	11,600	2,400	29,800	1,100	7,000	20,700	200	200	900	1,000	105,100
40	111,600	5,600	2,100	35,200	800	6,800	20,700	200	200	800	1,000	54,900
41	116,200	6,000	2,000	37,100	800	6,300	21,300	300	200	800	1,000	74,200
42	117,100	6,100	2,000	23,500	800	5,600	19,600	200	200	800	1,000	66,900
43	94,600	12,200	1,900	24,500	1,200	6,000	20,400	200	200	1,000	1,000	112,700
44	100,800	14,000	2,500	30,900	1,300	6,200	21,500	200	200	900	1,000	94,700
45	111,600	8,600	2,100	37,100	1,000	5,800	21,400	200	200	800	1,000	68,400
46	111,900	5,700	2,100	34,400	800	4,700	22,200	200	200	800	1,000	55,100
47	129,000	7,500	2,100	28,200	900	4,300	21,700	200	200	800	1,000	76,800
Average	135,800	7,100	1,800	35,100	800	5,400	17,000	300	100	900	1,000	88,900

Model Water Year	Net Groundwater Extraction	Net Drain Flow	Net Stream Exchange	Net Deep Percolation	Net Seawater Intrusion	Net flow from Monterey	Net flow to Eastside	Net flow from Forebay	Net flow from Langley	Net mountain front recharge	Net flow to Pajaro	Net Storage Change	Total In	Total Out	In-Out	Percent Error
1	-131,400	-3,500	74,200	-2,400	2,200	6,300	-2,500	5,000	1,500	1,700	-300	-49,800	255,700	255,200	500	0.20%
2	-121,600	-19,800	75,000	99,500	1,500	5,900	-1,500	5,100	1,500	1,600	-500	47,100	374,100	374,600	-500	-0.14%
3	-126,700	-11,500	78,500	25,800	1,800	6,400	-400	5,200	1,500	2,000	-500	-18,500	308,500	308,000	500	0.16%
4	-128,200	-10,700	81,800	28,600	1,900	6,800	-900	5,200	1,500	1,700	-600	-13,800	305,600	304,700	900	0.31%
5	-147,600	-4,000	50,000	8,000	2,900	9,000	-1,100	5,200	1,500	1,600	-600	-76,500	287,100	285,600	1,500	0.52%
6	-127,100	-14,000	90,500	88,300	2,200	8,000	200	5,300	1,500	1,800	-600	54,800	367,600	366,400	1,200	0.33%
7	-117,700	-15,700	77,800	61,600	1,800	7,100	-600	5,100	1,500	1,800	-600	20,300	331,400	329,700	1,700	0.53%
8	-120,200	-7,400	78,000	22,200	2,400	7,700	-1,300	5,100	1,500	1,800	-700	-13,800	300,700	297,700	2,900	0.98%
9	-128,000	-2,300	68,800	-13,400	3,500	8,800	-1,800	5,300	1,600	1,600	-800	-59,700	258,000	255,100	2,900	1.14%
10	-148,500	-1,400	5,200	22,400	4,500	9,100	-300	5,200	1,600	1,800	-900	-101,100	225,800	226,000	-300	-0.12%
11	-137,900	-10,500	102,800	105,300	3,700	8,800	600	5,400	1,600	1,500	-900	79,000	396,800	395,500	1,300	0.32%
12	-141,400	-8,500	87,200	36,900	3,600	9,100	-1,200	5,200	1,600	1,700	-900	-7,900	338,000	336,700	1,300	0.40%
13	-132,400	-9,000	83,600	51,900	3,600	8,900	-2,000	5,200	1,600	1,800	-800	12,100	336,900	336,700	200	0.06%
14	-141,900	-6,500	86,200	22,700	3,900	9,500	-2,200	5,200	1,600	1,800	-800	-23,500	321,000	318,000	3,000	0.94%
15	-110,400	-11,800	80,300	61,700	3,100	7,500	-2,800	5,000	1,600	1,800	-800	33,600	326,200	324,600	1,600	0.50%
16	-116,300	-23,800	72,100	111,200	2,500	6,700	-2,300	5,000	1,600	2,100	-800	56,700	392,600	391,300	1,300	0.34%
17	-151,300	-8,500	81,700	10,700	3,500	9,100	-1,200	5,100	1,600	2,300	-800	-48,800	321,600	320,500	1,100	0.33%
18	-131,200	-4,400	81,700	7,200	3,900	7,500	-1,800	5,100	1,700	1,800	-900	-30,900	295,300	294,000	1,300	0.43%
19	-123,800	-7,400	79,900	48,000	3,300	6,300	-2,700	5,100	1,700	1,700	-1,100	10,700	323,500	323,000	500	0.15%
20	-140,700	-3,100	77,900	3,300	3,700	6,400	-3,000	5,100	1,700	1,800	-1,000	-47,900	283,000	283,000	0	-0.01%
21	-171,300	-2,100	14,800	30,500	4,700	7,500	-1,100	5,000	1,800	1,900	-900	-110,600	290,700	289,400	1,300	0.46%
22	-159,900	-1,600	9,900	43,800	5,500	7,600	2,000	5,100	1,900	1,900	-1,000	-84,900	271,800	271,700	0	0.01%
23	-155,200	-800	7,400	40,300	6,100	6,600	2,800	4,900	1,900	1,800	-1,100	-85,300	239,900	239,800	100	0.03%
24	-152,800	-1,600	54,100	65,700	6,200	7,400	1,300	4,800	1,900	1,500	-1,200	-15,700	335,300	332,200	3,100	0.93%
25	-155,900	-2,400	76,900	66,300	6,100	7,400	-1,800	4,700	1,900	1,400	-1,200	2,000	354,200	352,600	1,500	0.43%
26	-139,800	-8,000	116,000	102,400	5,300	6,800	-4,900	4,700	1,900	1,500	-900	84,100	413,800	412,900	800	0.20%
27	-133,300	-2,100	80,000	21,800	5,300	5,500	-7,800	4,700	1,800	1,700	-800	-39,900	321,400	304,600	16,800	5.36%
28	-127,200	-9,400	99,400	105,600	4,600	5,700	-8,000	4,900	1,800	1,700	-900	77,600	402,800	402,100	600	0.15%
29	-134,800	-7,100	94,300	53,700	4,400	6,200	-9,500	5,000	1,800	1,900	-900	13,000	351,600	349,600	2,000	0.56%
30	-147,200	-7,700	94,100	52,500	4,500	7,200	-10,400	5,000	1,800	1,900	-900	200	361,500	360,900	600	0.16%
31	-103,600	-13,800	85,600	87,400	3,400	6,000	-11,800	5,000	1,700	2,000	-900	58,800	368,700	366,600	2,100	0.56%
32	-104,700	-5,000	83,200	12,100	3,200	5,500	-12,000	4,900	1,700	2,100	-900	-10,800	281,500	280,600	900	0.33%
33	-91,300	-10,300	78,100	64,700	2,600	4,500	-12,900	5,000	1,700	1,900	-800	41,400	321,800	320,200	1,600	0.50%
34	-79,800	-7,800	72,300	37,700	2,400	3,500	-12,900	4,600	1,600	1,800	-900	22,000	276,800	276,100	700	0.25%
35	-92,700	-4,800	76,600	8,200	2,500	3,800	-13,400	4,800	1,600	1,800	-900	-13,200	247,500	246,900	600	0.26%
36	-91,900	-5,300	61,200	21,300	2,600	3,600	-14,700	4,900	1,600	1,700	-900	-17,700	259,200	257,600	1,600	0.62%
37	-110,500	-5,800	39,800	46,800	2,800	5,200	-12,800	4,900	1,700	1,900	-900	-27,800	286,100	285,300	700	0.26%
38	-78,900	-10,800	87,900	77,400	2,200	3,900	-12,700	5,000	1,600	1,700	-900	71,400	307,300	302,400	4,900	1.61%
39	-78,300	-13,100	66,700	71,000	1,700	2,300	-14,000	4,900	1,600	1,700	-900	42,800	293,300	292,400	900	0.32%
40	-92,200	-5,900	68,900	10,000	1,900	2,700	-13,800	4,900	1,600	1,700	-900	-21,100	247,500	247,400	0	0.01%
41	-97,900	-7,500	65,900	38,300	1,900	3,500	-14,200	4,800	1,600	1,600	-900	-4,100	283,000	281,900	1,200	0.41%
42	-98,600	-6,800	20,500	43,400	2,000	3,900	-12,000	4,800	1,600	1,900	-900	-40,200	253,200	253,100	100	0.03%
43	-73,200	-14,500	81,500	73,400	1,400	2,900	-12,900	4,900	1,600	1,700	-900	64,000	293,900	292,200	1,700	0.58%
44	-78,800	-15,000	68,000	63,600	1,100	2,500	-14,500	4,800	1,500	1,600	-900	33,100	285,200	284,400	800	0.28%
45	-91,600	-10,100	69,300	27,100	1,300	3,400	-14,300	4,800	1,600	1,700	-900	-9,400	275,800	274,100	1,700	0.63%
46	-94,300	-6,000	65,400	8,700	1,400	5,100	-14,900	4,800	1,500	1,700	-900	-29,600	247,300	245,000	2,200	0.91%
47	-110,000	-8,000	29,000	47,700	1,700	6,600	-13,500	4,800	1,600	1,900	-900	-40,800	285,000	283,300	1,800	0.62%
Average	-8,000	69,800	45,100	3,200	6,200	-6,200	5,000	1,600	1,800	-800	-4,700	0	308,600	307,100	1,600	0.51%

Model Water Year	Groundwater Extraction	Drain Return Flow	Flow from streams	Deep Percolation	Seawater Intrusion	Underflow from Monterey	Underflow from Eastside	Underflow from Forebay	Underflow from Langley	Mountain front recharge	Underflow from Pajaro	From Storage
1	9,700	0	75,600	43,200	2,700	9,400	11,100	5,300	1,600	2,500	200	94,400
2	12,800	0	78,000	149,100	2,700	9,400	11,800	5,400	1,600	2,600	200	100,500
3	13,100	0	80,700	77,700	2,700	9,700	12,400	5,500	1,600	2,900	200	102,000
4	13,400	0	83,800	78,800	2,800	10,200	12,300	5,500	1,600	2,600	100	94,500
5	13,900	0	51,700	50,100	3,400	12,200	12,700	5,500	1,600	2,500	100	133,300
6	16,400	0	92,300	131,600	3,200	11,600	12,900	5,600	1,600	2,800	100	89,500
7	17,900	0	80,200	107,200	2,800	10,900	12,200	5,500	1,600	2,700	200	90,200
8	17,300	0	80,100	69,200	3,100	11,200	11,800	5,400	1,700	2,700	200	98,100
9	14,300	0	70,500	29,900	3,900	12,000	11,800	5,500	1,700	2,500	100	105,800
10	12,600	0	5,900	39,600	4,700	12,100	12,400	5,500	1,700	2,600	100	128,600
11	16,800	0	104,200	143,300	4,500	12,900	13,300	5,700	1,700	2,700	100	91,600
12	19,100	0	89,100	83,800	4,400	13,300	12,900	5,600	1,700	2,700	100	105,400
13	19,600	0	85,600	96,400	4,300	13,100	12,300	5,500	1,700	2,700	100	95,600
14	18,900	0	87,900	69,800	4,600	13,700	12,500	5,500	1,700	2,700	100	103,700
15	21,000	0	82,300	101,100	4,000	11,900	11,500	5,300	1,700	2,700	100	84,700
16	22,100	0	75,900	158,300	3,700	11,400	11,500	5,300	1,700	3,100	100	99,400
17	20,000	0	83,800	65,200	4,200	13,400	12,600	5,500	1,800	3,200	100	111,800
18	20,800	0	83,500	51,600	4,400	12,300	12,200	5,400	1,800	2,700	100	100,500
19	22,100	0	81,900	89,400	3,900	11,600	11,700	5,400	1,800	2,700	100	92,900
20	20,200	0	79,600	46,500	4,100	11,800	11,700	5,400	1,800	2,700	100	99,100
21	21,400	0	16,200	53,200	5,000	12,800	13,000	5,400	2,000	2,700	100	159,000
22	21,300	0	10,600	51,700	5,800	13,000	14,000	5,400	2,000	2,800	100	145,100
23	18,500	0	7,800	44,300	6,300	12,500	14,100	5,300	2,000	2,600	100	126,400
24	19,600	0	54,800	78,300	6,600	13,800	13,800	5,200	2,000	2,500	100	138,500
25	21,700	0	77,800	87,400	6,600	14,400	13,100	5,200	2,000	2,600	100	123,300
26	24,200	0	117,700	138,400	6,100	14,400	11,900	5,200	2,000	2,700	100	91,100
27	23,200	0	81,800	54,900	5,700	12,800	10,300	5,100	1,900	2,600	100	122,900
28	24,900	0	101,200	143,400	5,400	13,000	10,200	5,300	1,900	2,800	100	94,500
29	26,200	0	96,300	97,300	5,100	13,400	10,000	5,400	1,900	2,800	100	92,900
30	27,100	0	96,300	99,600	5,200	14,200	10,100	5,500	1,900	2,800	100	98,700
31	27,300	0	88,300	128,600	4,400	12,400	8,900	5,400	1,900	2,900	100	88,500
32	25,900	0	85,300	53,300	3,800	11,800	8,400	5,300	1,800	3,000	200	82,900
33	25,300	0	80,600	103,200	3,500	11,100	7,600	5,300	1,800	2,700	100	80,700
34	25,000	0	74,600	72,600	3,200	10,000	7,100	4,900	1,800	2,700	100	74,900
35	22,200	0	78,600	44,300	3,100	10,100	6,900	5,100	1,800	2,600	100	72,800
36	22,300	0	63,300	55,200	3,200	10,000	6,600	5,100	1,800	2,500	200	89,100
37	23,000	0	41,500	74,800	3,400	11,100	7,300	5,100	1,800	2,700	100	115,300
38	24,700	0	90,000	104,800	3,100	9,800	6,900	5,200	1,800	2,700	100	58,400
39	25,700	0	69,200	102,400	2,700	9,100	6,500	5,100	1,700	2,600	100	68,100
40	23,600	0	71,000	46,900	2,600	9,300	6,700	5,100	1,800	2,500	200	77,900
41	23,200	0	68,000	77,400	2,600	9,600	6,900	5,100	1,800	2,400	100	85,900
42	23,600	0	22,400	67,100	2,600	9,400	7,200	5,000	1,800	2,700	100	111,300
43	25,400	0	83,500	99,400	2,400	8,700	7,200	5,100	1,700	2,700	100	57,500
44	25,900	0	70,700	96,200	2,100	8,500	6,800	5,000	1,700	2,500	200	65,600
45	25,000	0	71,600	66,700	2,200	9,000	6,900	5,000	1,700	2,600	200	85,100
46	23,800	0	67,600	44,600	2,100	9,700	7,100	5,000	1,700	2,500	200	83,100
47	23,800	0	31,000	75,800	2,500	10,700	7,800	5,100	1,800	2,700	100	123,800
Average	21,000	0	71,700	81,800	3,900	11,500	10,400	5,300	1,800	2,700	100	98,600

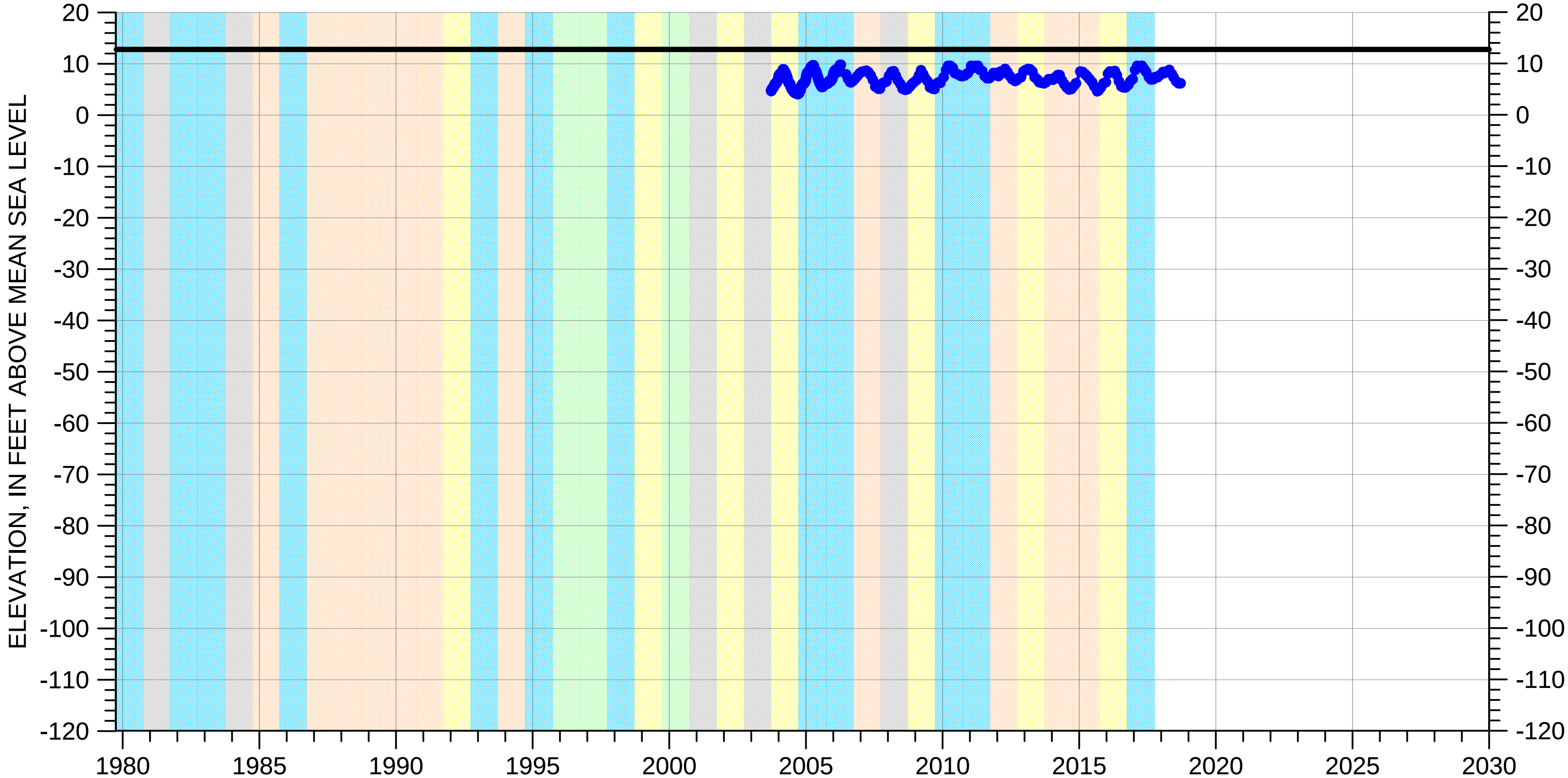
Model Water Year	2070 OUTFLOWS											
	Pumping	Drain Flows	Flow to Streams	Groundwater Evapotranspiration	Underflow to Ocean	Underflow to Monterey	Underflow to Eastside	Underflow to Forebay	Underflow to Langley	Underflow to Upland Areas	Underflow to Pajaro	To Storage
1	141,100	3,500	1,400	45,700	500	3,100	13,600	300	100	800	600	44,600
2	134,500	19,800	3,100	49,500	1,100	3,500	13,300	300	100	1,000	700	147,600
3	139,800	11,500	2,200	52,000	900	3,300	12,800	300	100	900	700	83,500
4	141,700	10,700	2,000	50,200	900	3,300	13,200	300	100	900	700	80,700
5	161,500	4,000	1,700	42,100	500	3,200	13,800	300	100	800	800	56,900
6	143,500	14,000	1,800	43,300	900	3,700	12,700	300	100	1,000	800	144,400
7	135,600	15,700	2,400	45,600	1,000	3,800	12,900	300	100	900	700	110,500
8	137,500	7,400	2,000	47,000	700	3,500	13,100	300	100	900	800	84,400
9	142,200	2,300	1,700	43,300	400	3,200	13,600	300	100	800	1,000	46,200
10	161,000	1,400	700	17,300	200	3,000	12,700	300	100	800	1,000	27,500
11	154,700	10,500	1,500	38,000	800	4,100	12,700	300	100	1,300	1,000	170,500
12	160,600	8,500	1,900	46,900	800	4,200	14,100	300	100	1,000	1,000	97,400
13	151,900	9,000	2,000	44,600	700	4,200	14,200	300	100	1,000	1,000	107,700
14	160,800	6,500	1,700	47,100	600	4,200	14,600	300	100	900	900	80,200
15	131,300	11,800	2,000	39,400	900	4,400	14,300	300	100	900	900	118,300
16	138,400	23,800	3,800	47,100	1,200	4,700	13,800	300	100	1,000	900	156,100
17	171,300	8,500	2,100	54,500	700	4,300	13,900	300	100	900	900	63,000
18	152,000	4,400	1,900	44,400	500	4,800	14,100	300	100	900	1,000	69,600
19	145,900	7,400	2,000	41,300	600	5,300	14,300	300	100	1,000	1,200	103,600
20	160,900	3,100	1,700	43,200	400	5,400	14,700	400	100	900	1,100	51,100
21	192,800	2,100	1,400	22,700	300	5,300	14,000	400	100	800	1,000	48,400
22	181,200	1,600	600	7,900	300	5,400	12,100	300	100	900	1,100	60,200
23	173,700	800	400	4,000	200	5,900	11,200	400	100	800	1,200	41,000
24	172,400	1,600	700	12,600	400	6,400	12,500	400	100	1,000	1,300	122,800
25	177,600	2,400	900	21,100	400	7,000	14,900	500	100	1,200	1,300	125,300
26	164,000	8,000	1,600	36,100	800	7,600	16,800	500	100	1,200	1,000	175,100
27	156,500	2,100	1,800	33,100	400	7,300	18,100	400	100	900	900	83,000
28	152,200	9,400	1,800	37,800	900	7,300	18,200	400	100	1,000	1,000	172,100
29	161,000	7,100	2,000	43,600	700	7,300	19,600	400	100	900	1,000	105,900
30	174,300	7,700	2,100	47,000	700	7,000	20,500	500	100	900	1,000	99,000
31	130,900	13,800	2,700	41,200	1,000	6,500	20,700	400	100	1,000	1,100	147,400
32	130,600	5,000	2,000	41,200	600	6,300	20,400	400	100	800	1,000	72,100
33	116,500	10,300	2,500	38,500	900	6,600	20,500	300	100	900	1,000	122,100
34	104,800	7,800	2,300	34,900	800	6,500	19,900	300	100	800	1,000	96,900
35	114,900	4,800	2,100	36,100	600	6,300	20,400	300	200	800	1,000	59,500
36	114,300	5,300	2,100	33,900	600	6,300	21,400	300	100	800	1,000	71,400
37	133,500	5,800	1,700	27,900	600	5,900	20,100	300	200	800	1,000	87,500
38	103,600	10,800	2,100	27,400	900	5,900	19,600	200	200	1,000	1,000	129,800
39	104,000	13,100	2,500	31,400	900	6,800	20,500	200	200	900	1,000	110,800
40	115,800	5,900	2,100	36,900	600	6,600	20,500	300	200	800	1,000	56,700
41	121,100	7,500	2,200	39,000	700	6,100	21,200	300	200	800	1,000	81,800
42	122,200	6,800	2,000	23,700	700	5,400	19,200	200	200	800	1,000	71,100
43	98,700	14,500	2,000	26,000	1,000	5,900	20,100	200	200	1,000	1,000	121,600
44	104,700	15,000	2,700	32,600	1,000	6,000	21,300	200	200	900	1,000	98,800
45	116,500	10,100	2,300	39,500	900	5,600	21,200	300	200	800	1,000	75,700
46	118,100	6,000	2,200	35,900	600	4,500	22,000	300	200	800	1,000	53,500
47	133,800	8,000	2,000	28,100	700	4,100	21,300	200	200	800	1,000	83,000
Average	141,600	8,000	1,900	36,700	700	5,300	16,600	300	100	900	1,000	94,000

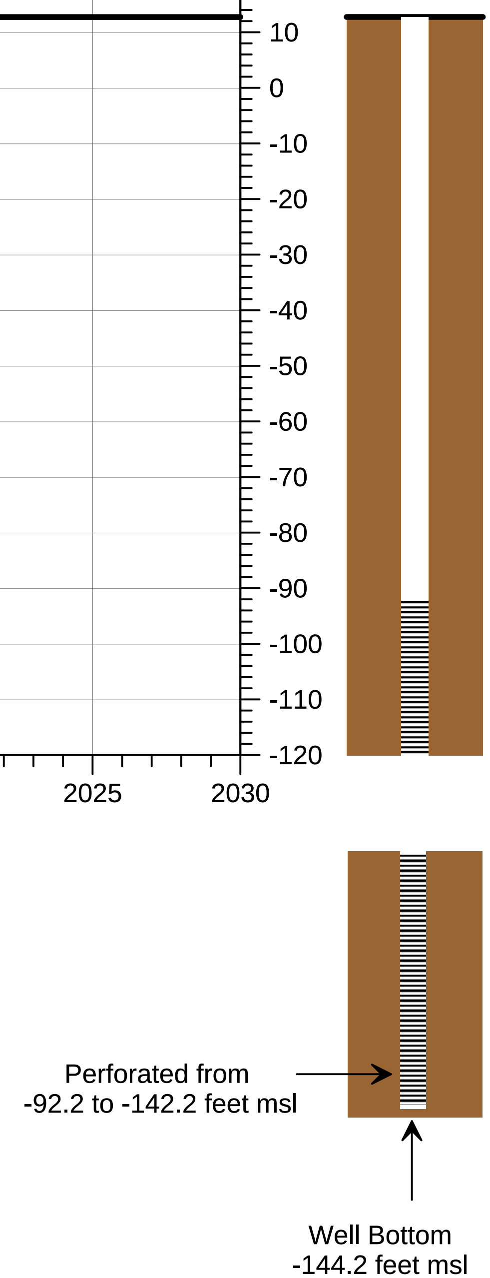
APPENDIX 7A

HYDROGRAPHS

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-21Q01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

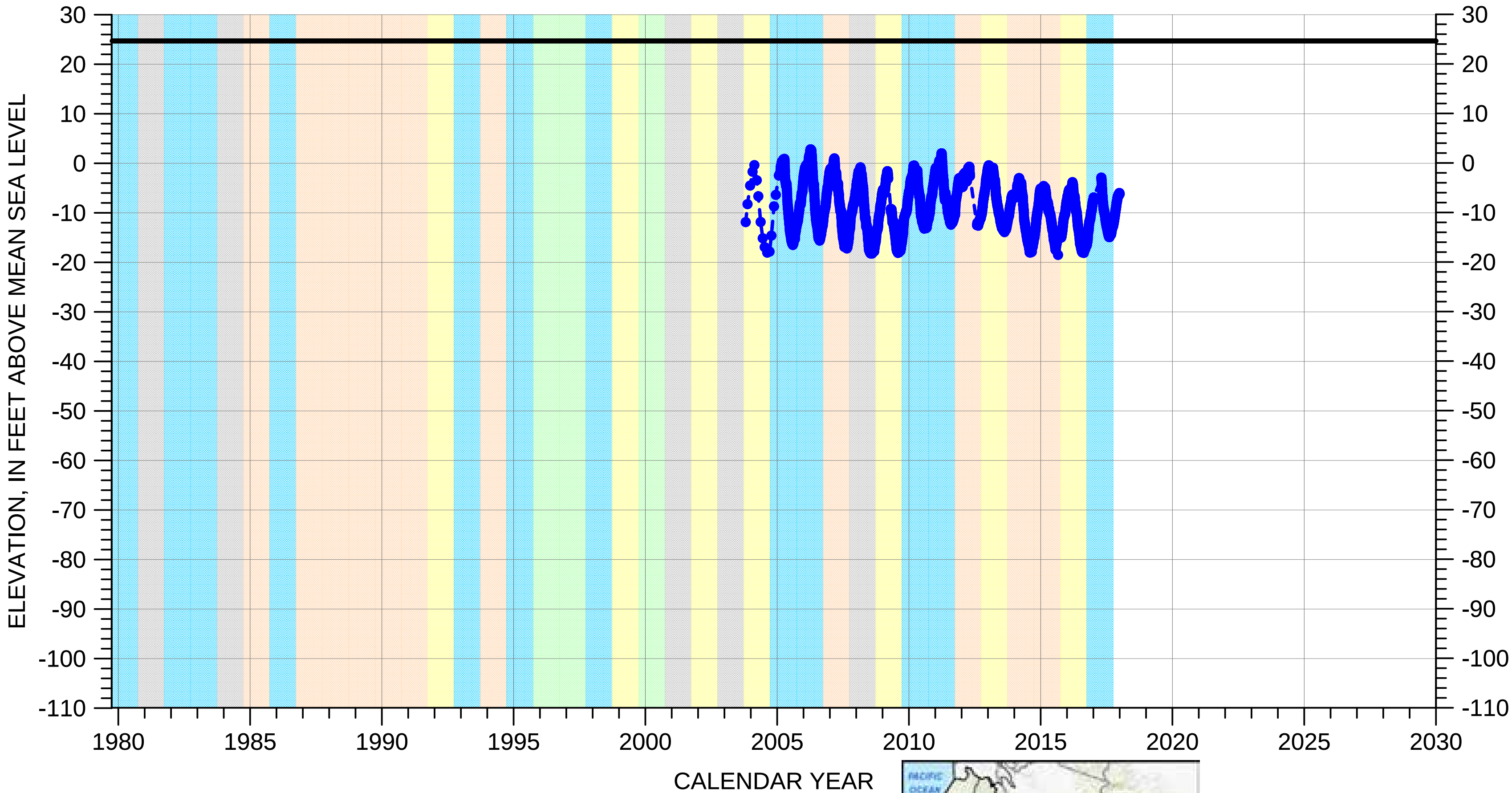
WATER YEAR TYPE DESIGNATION (MCWRA)

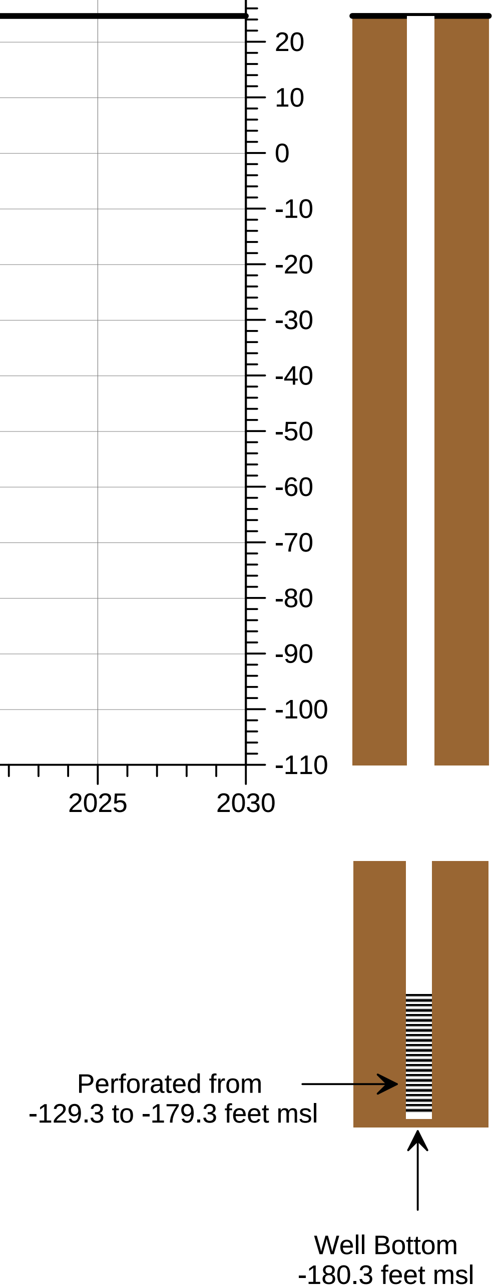
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\13S_02E-21Q01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

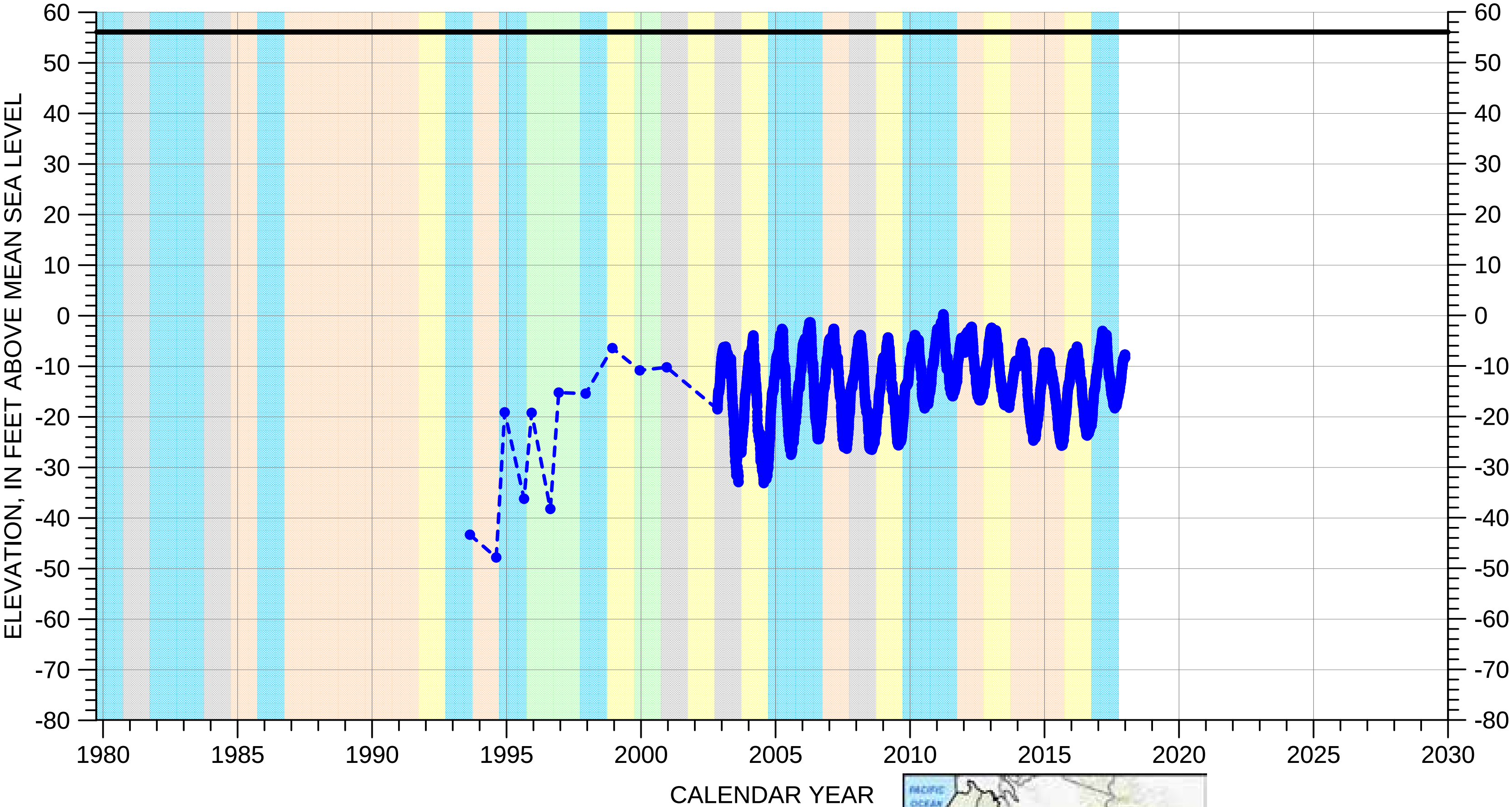
WATER YEAR TYPE DESIGNATION (MCWRA)

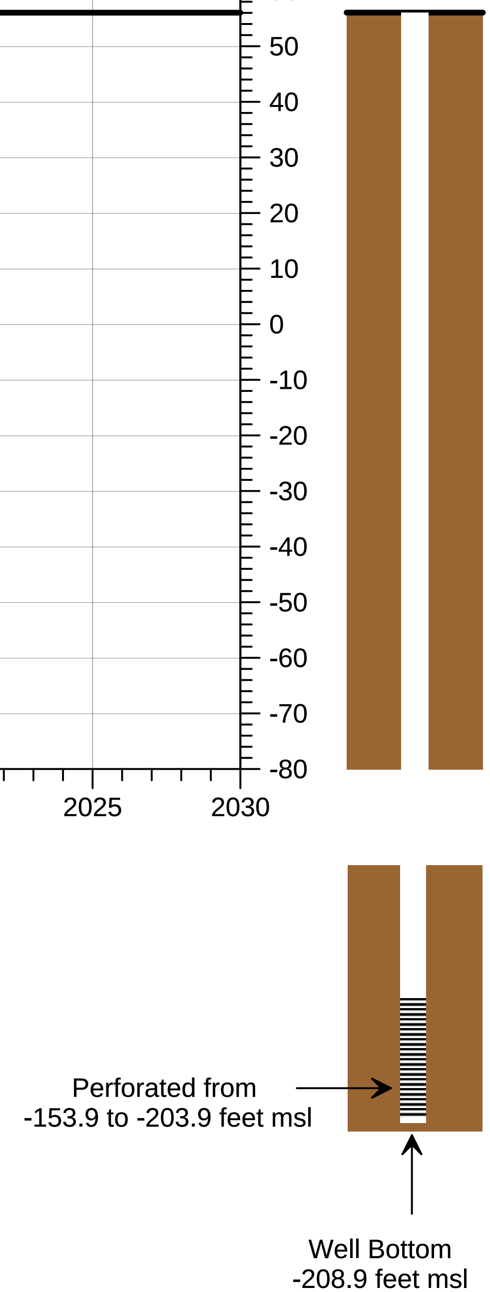
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-03F04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY

DRY - NORMAL

NORMAL

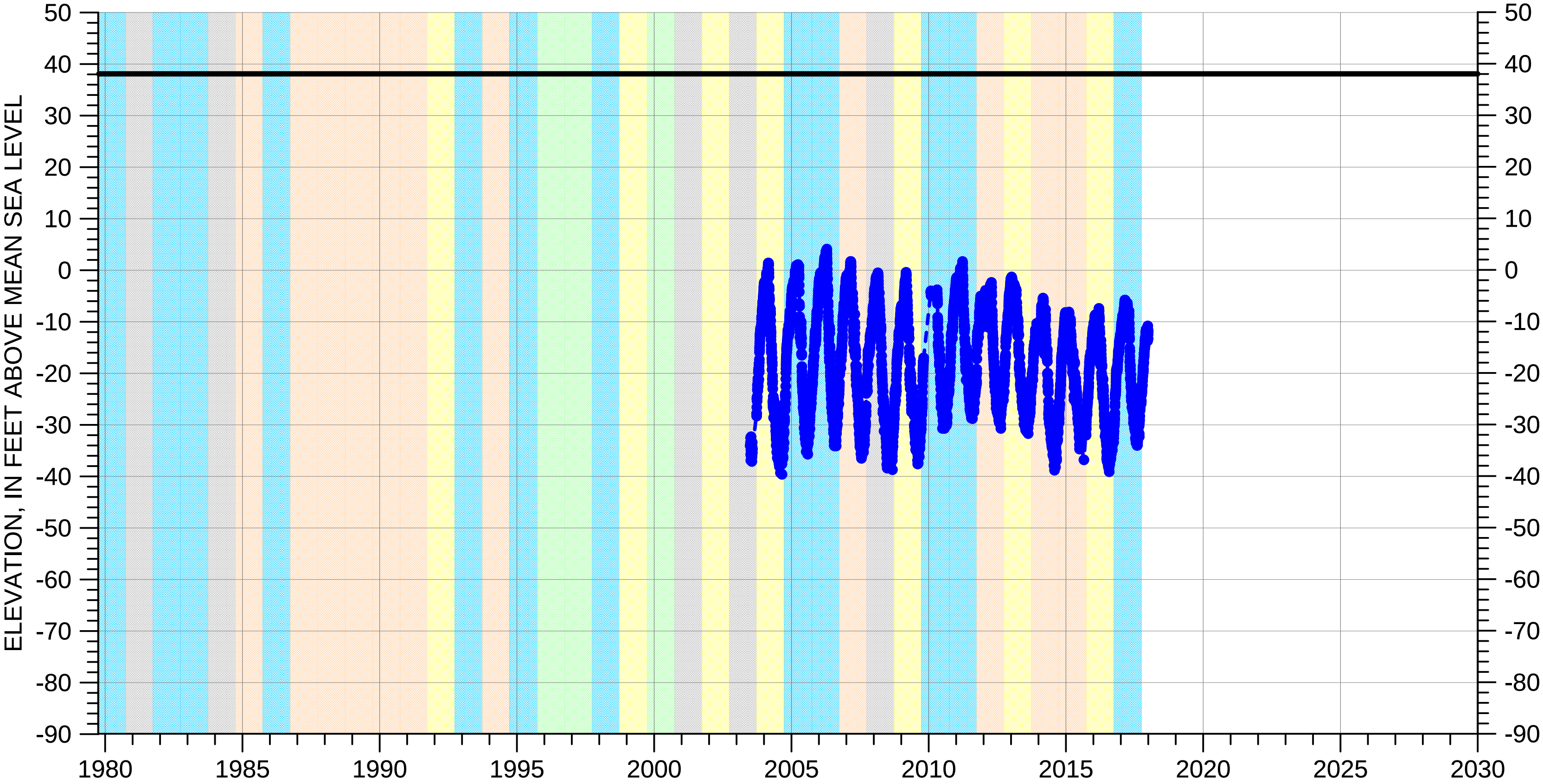
WET - NORMAL

WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-12B02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-26H01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



Perforated from
-248.9 to -298.9 feet msl

Well Bottom
-300.9 feet msl

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\14S_02E-26H01.grf

EXPLANATION

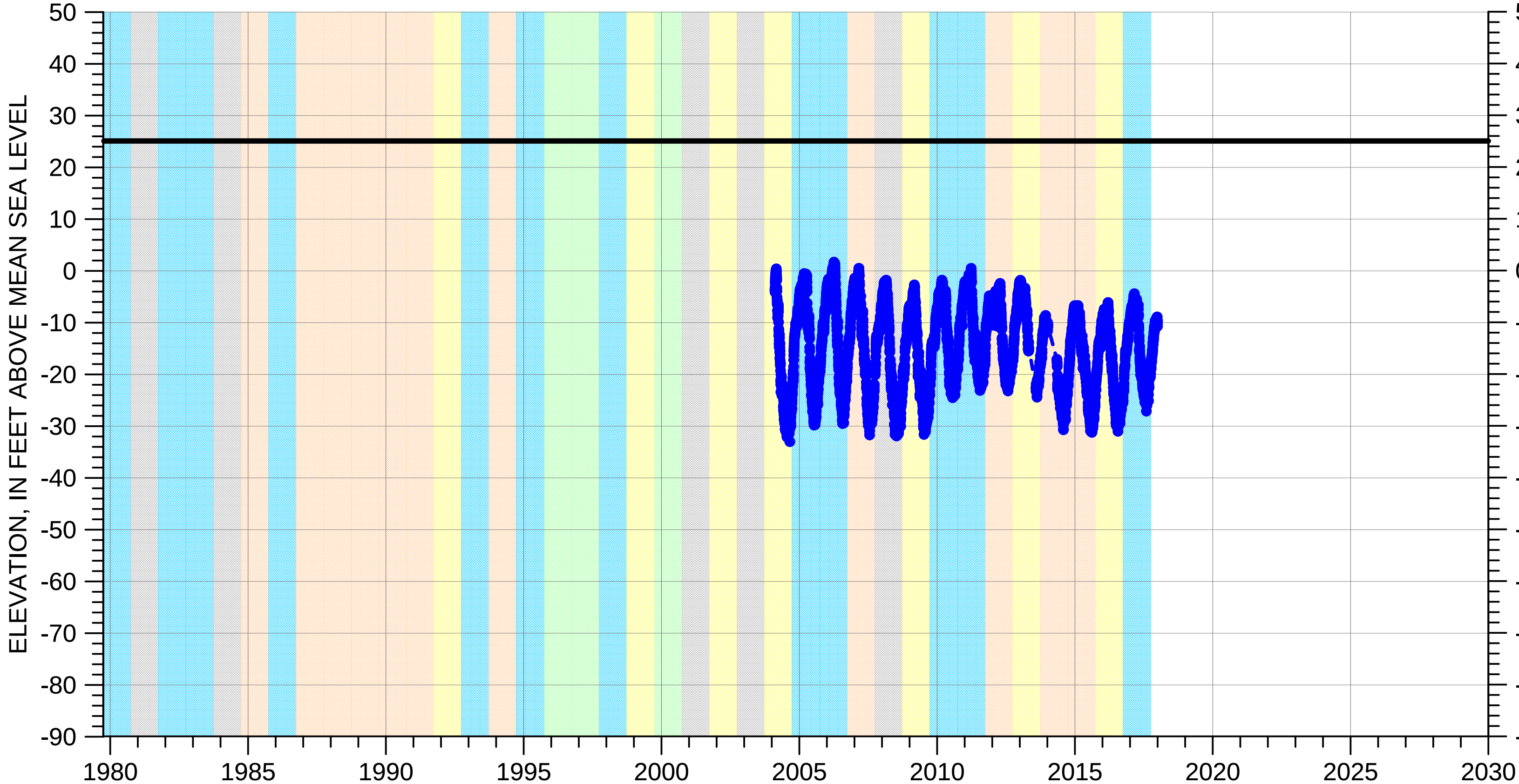
GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

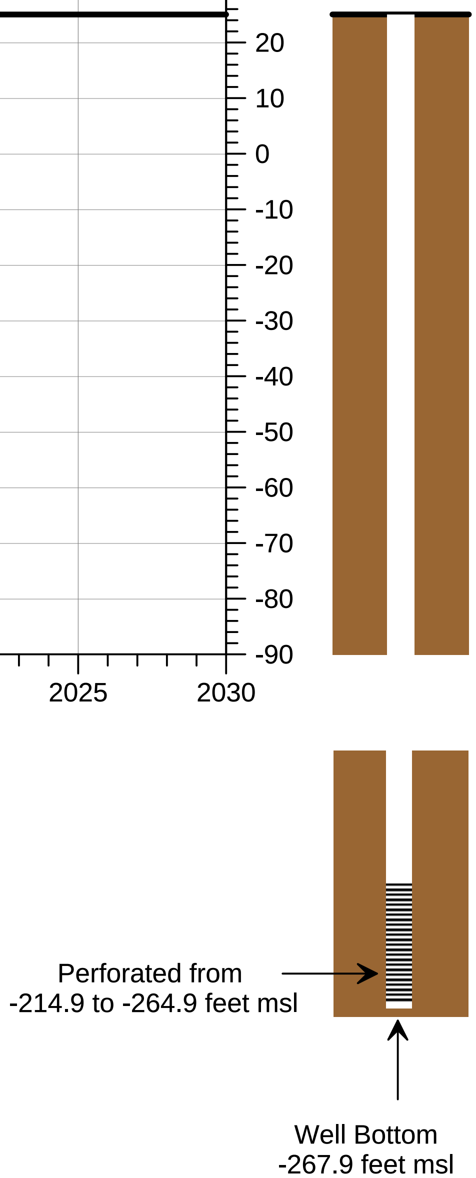
WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-27A01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

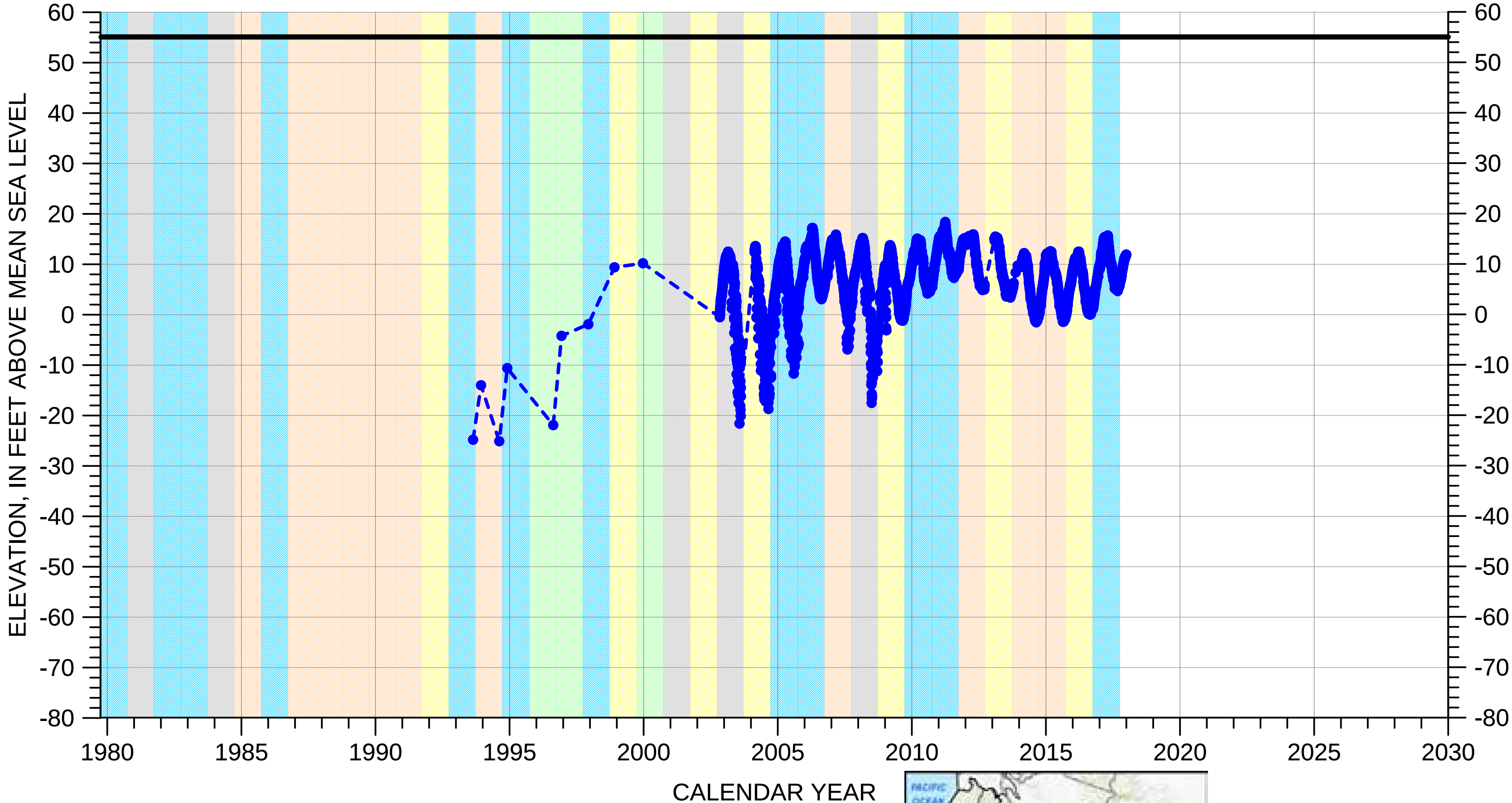
WATER YEAR TYPE DESIGNATION (MCWRA)

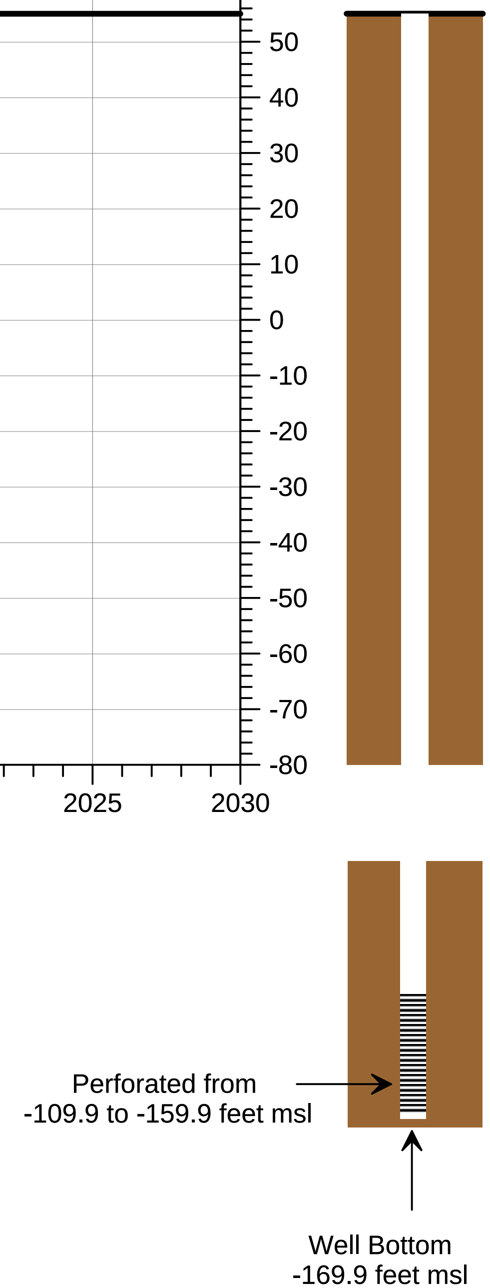
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-27A01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

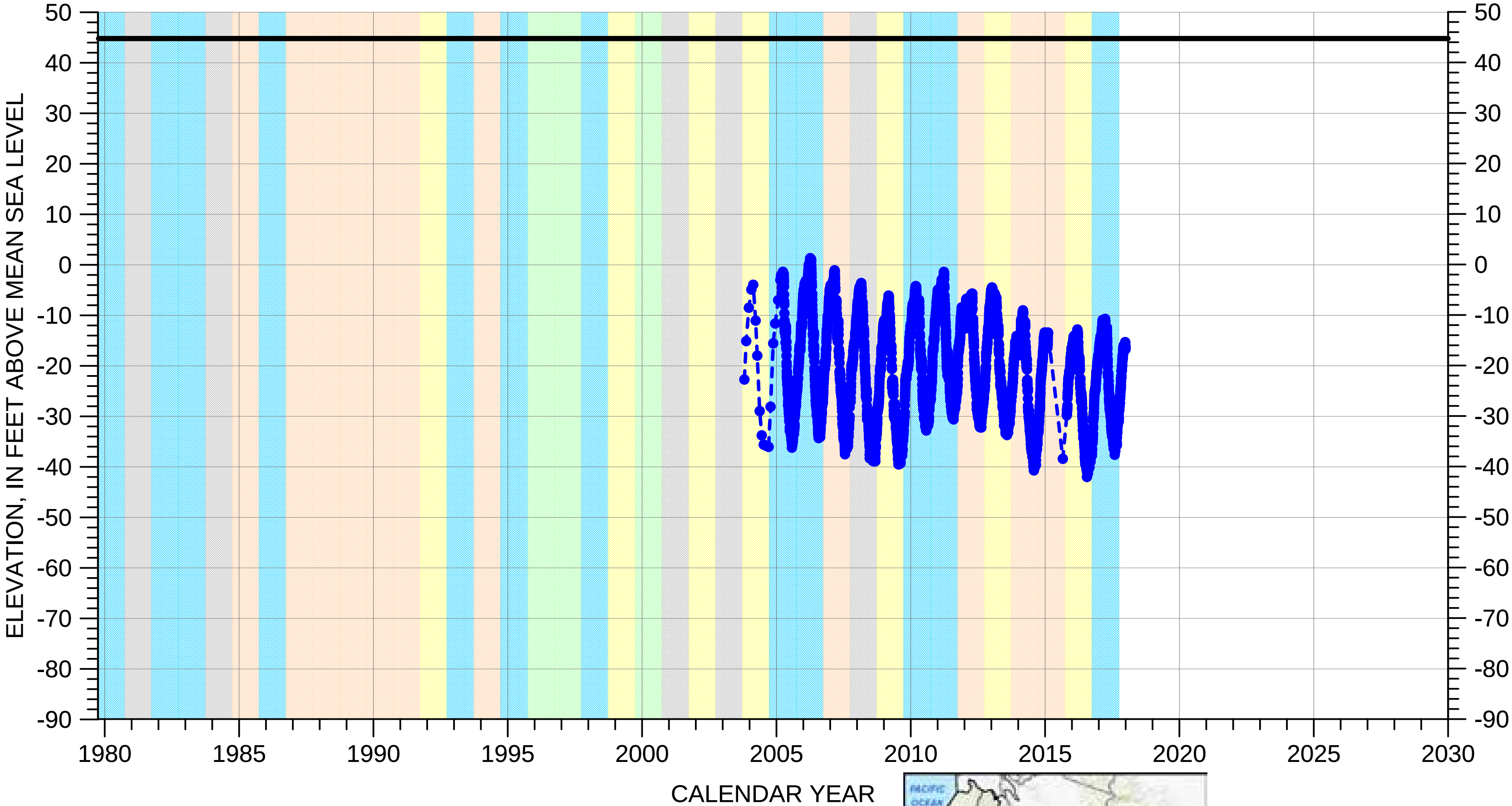
WATER YEAR TYPE DESIGNATION (MCWRA)

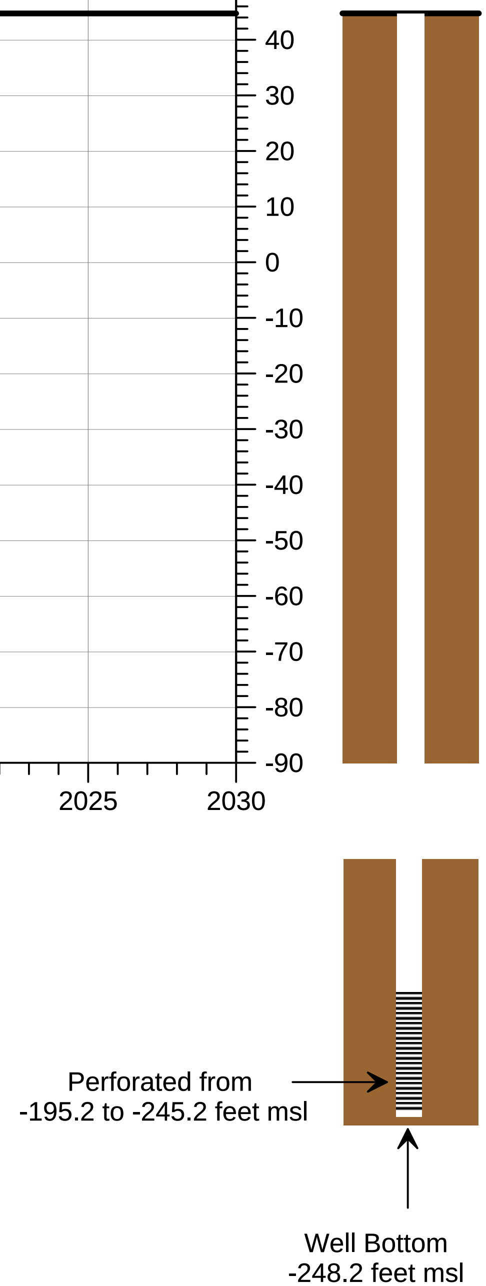
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\14S_03E-18C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-30G08

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

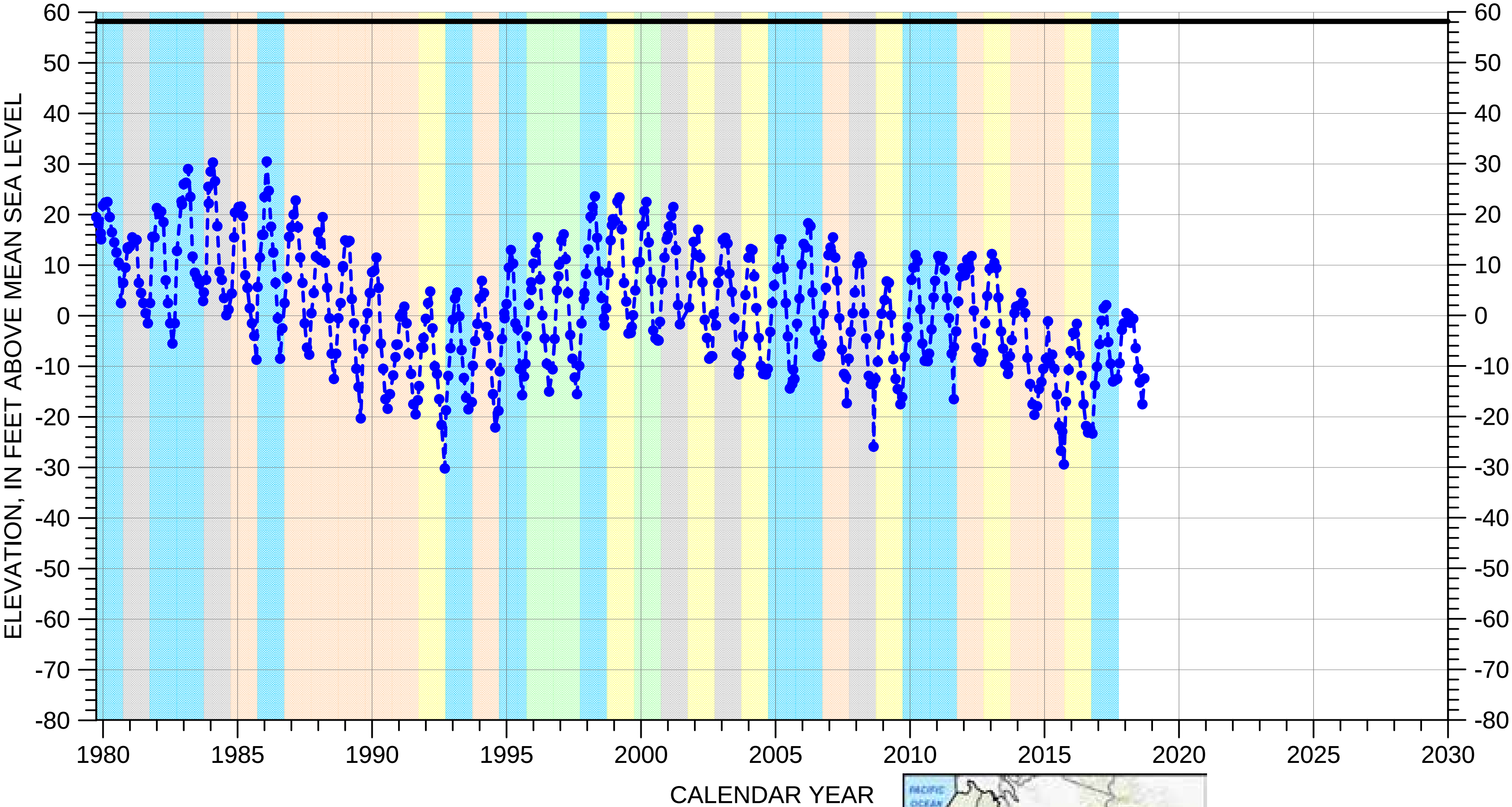
WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\14S_03E-30G08.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-16M01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

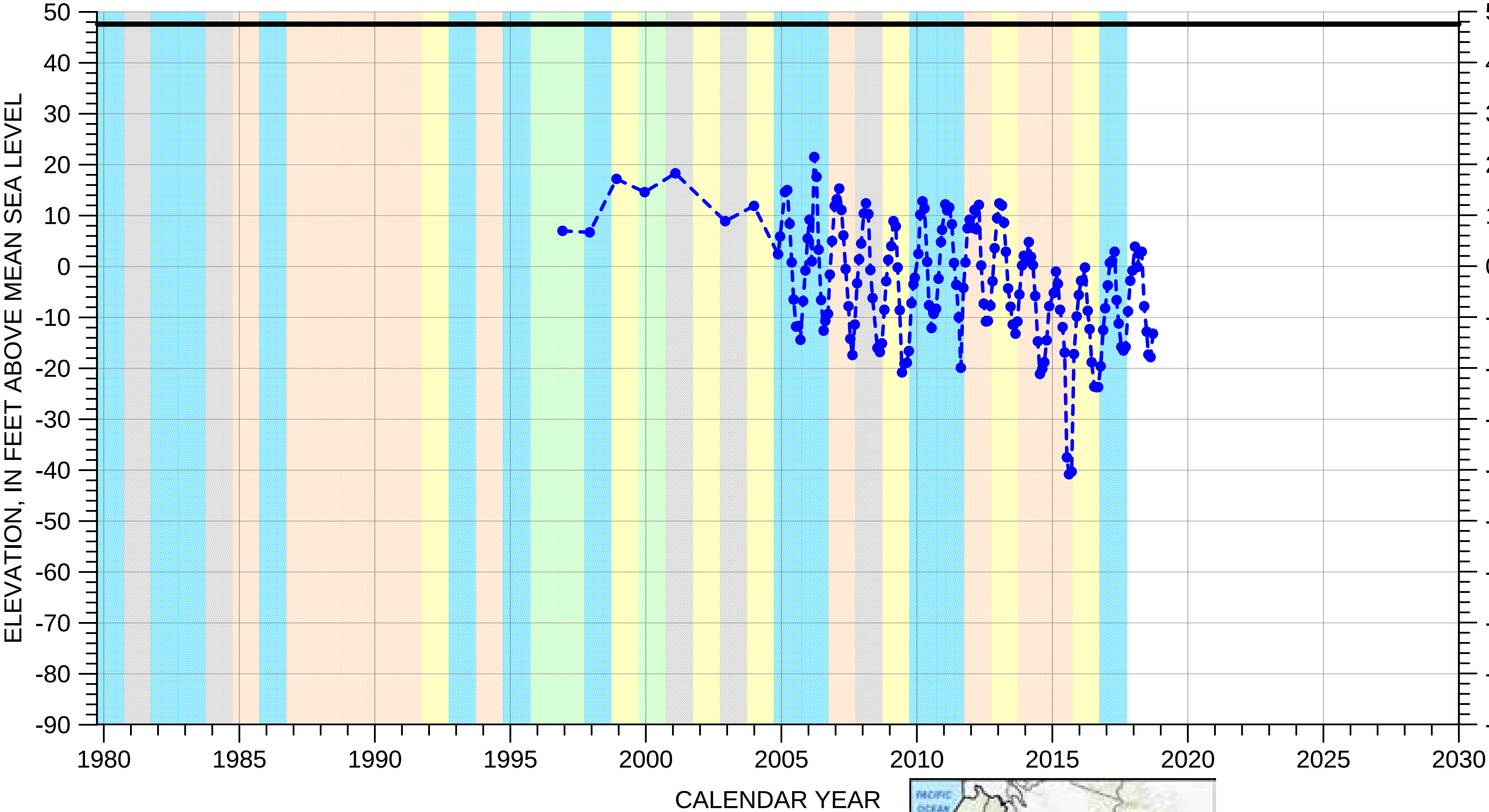
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

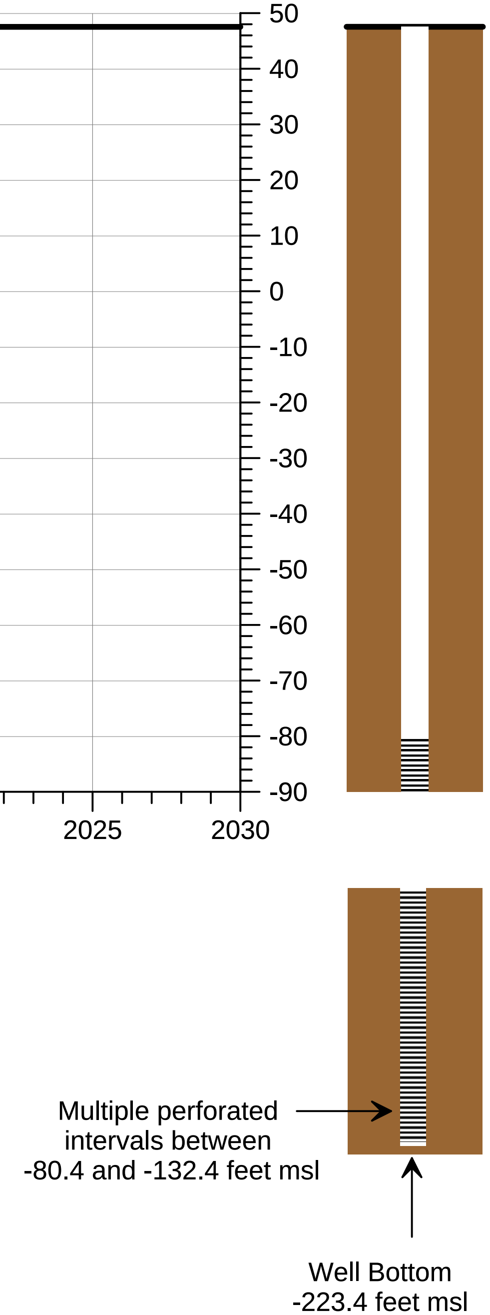
Perforated interval unknown

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\15S_03E-16M01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-17M01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY

DRY - NORMAL

NORMAL

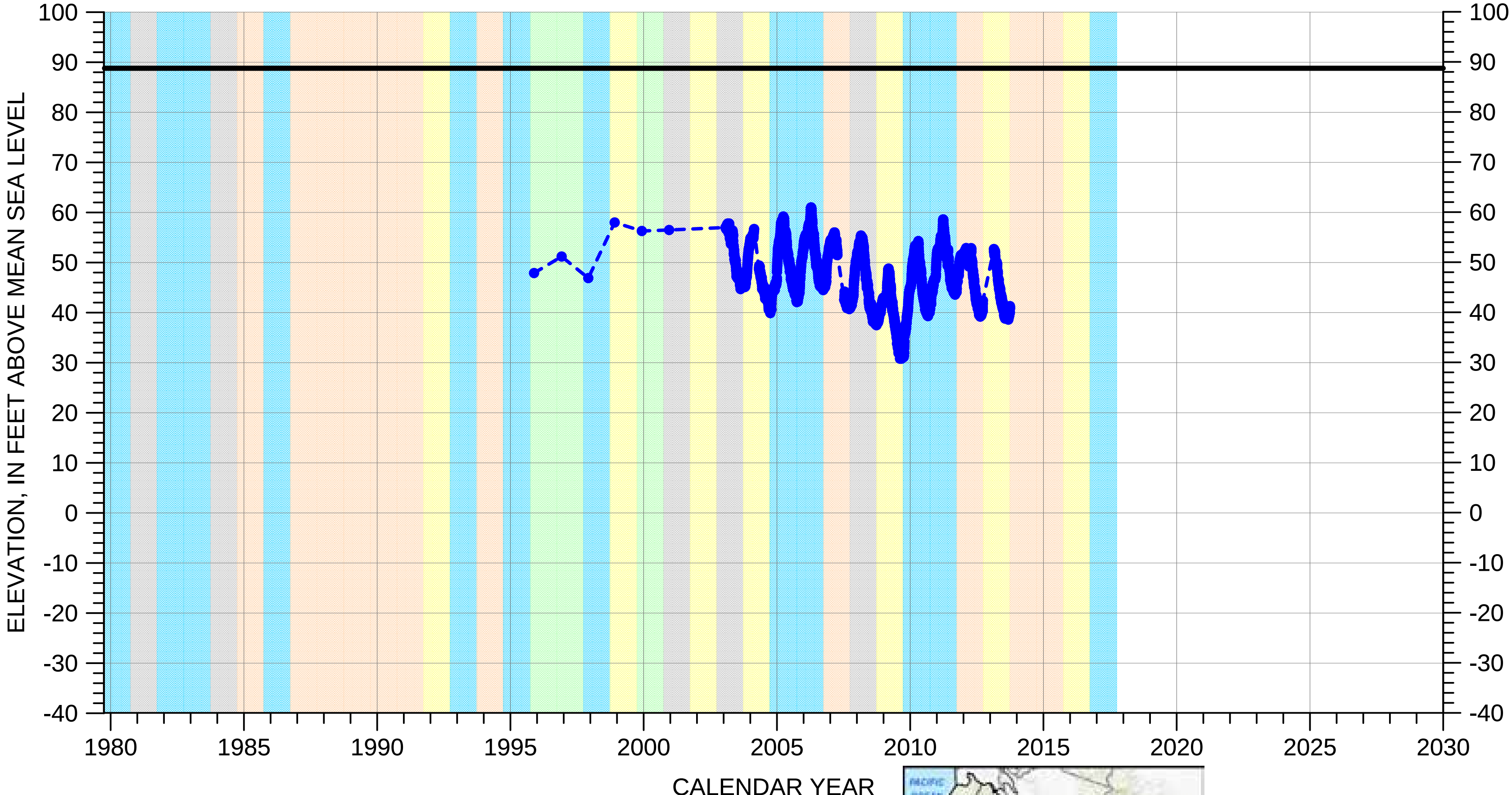
WET - NORMAL

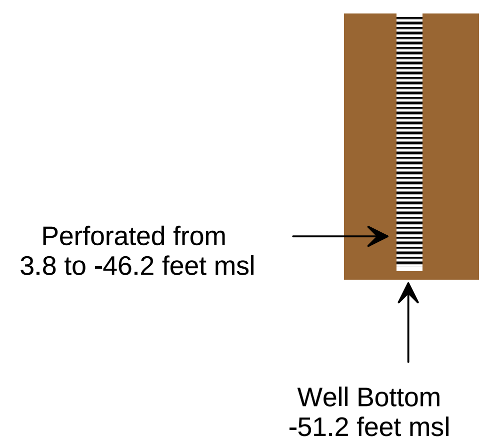
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\15S_03E-17M01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

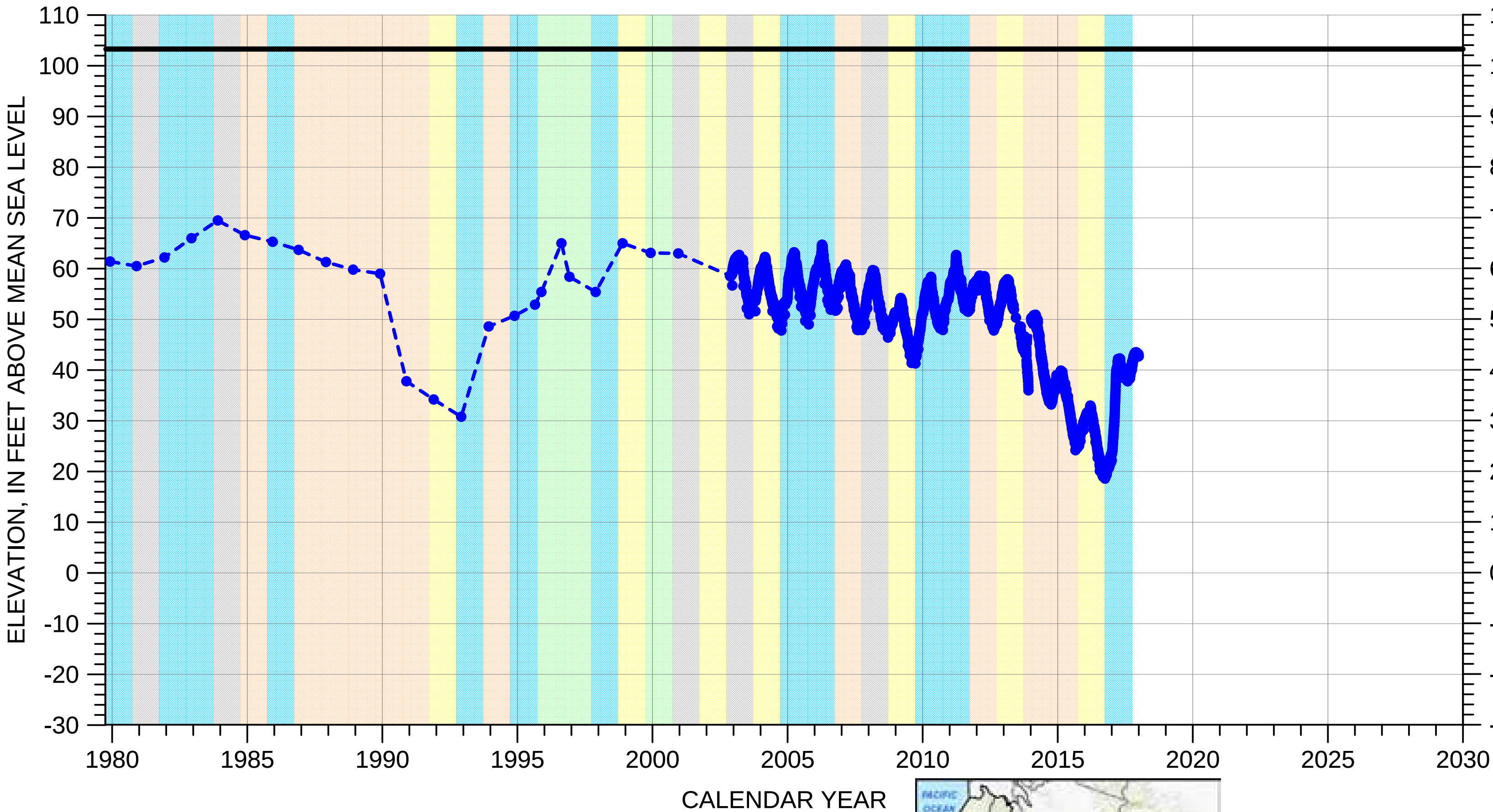
WATER YEAR TYPE DESIGNATION (MCWRA)

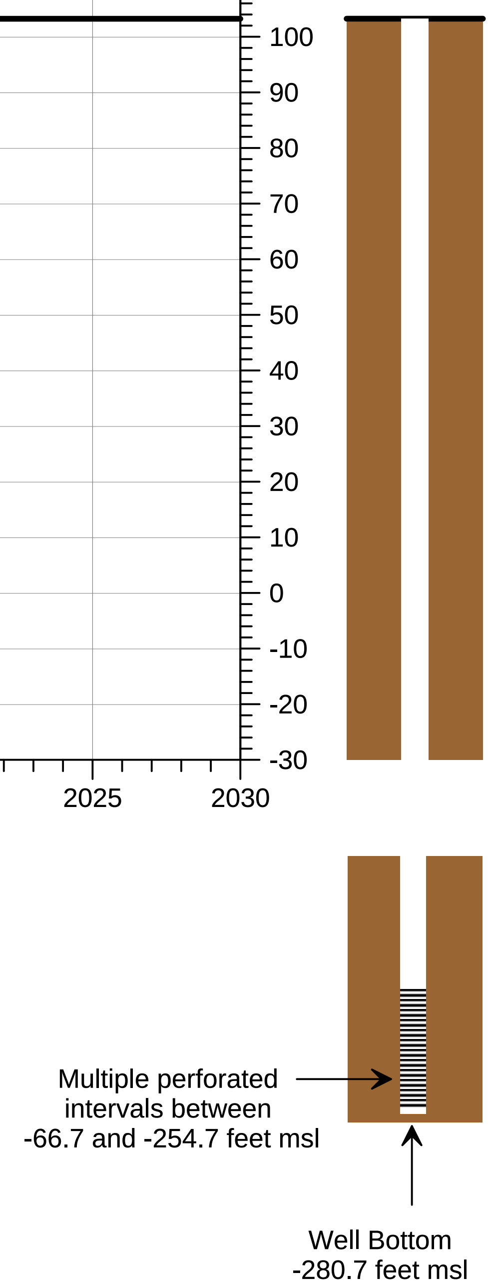
DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY16S_04E-08H04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-15D01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

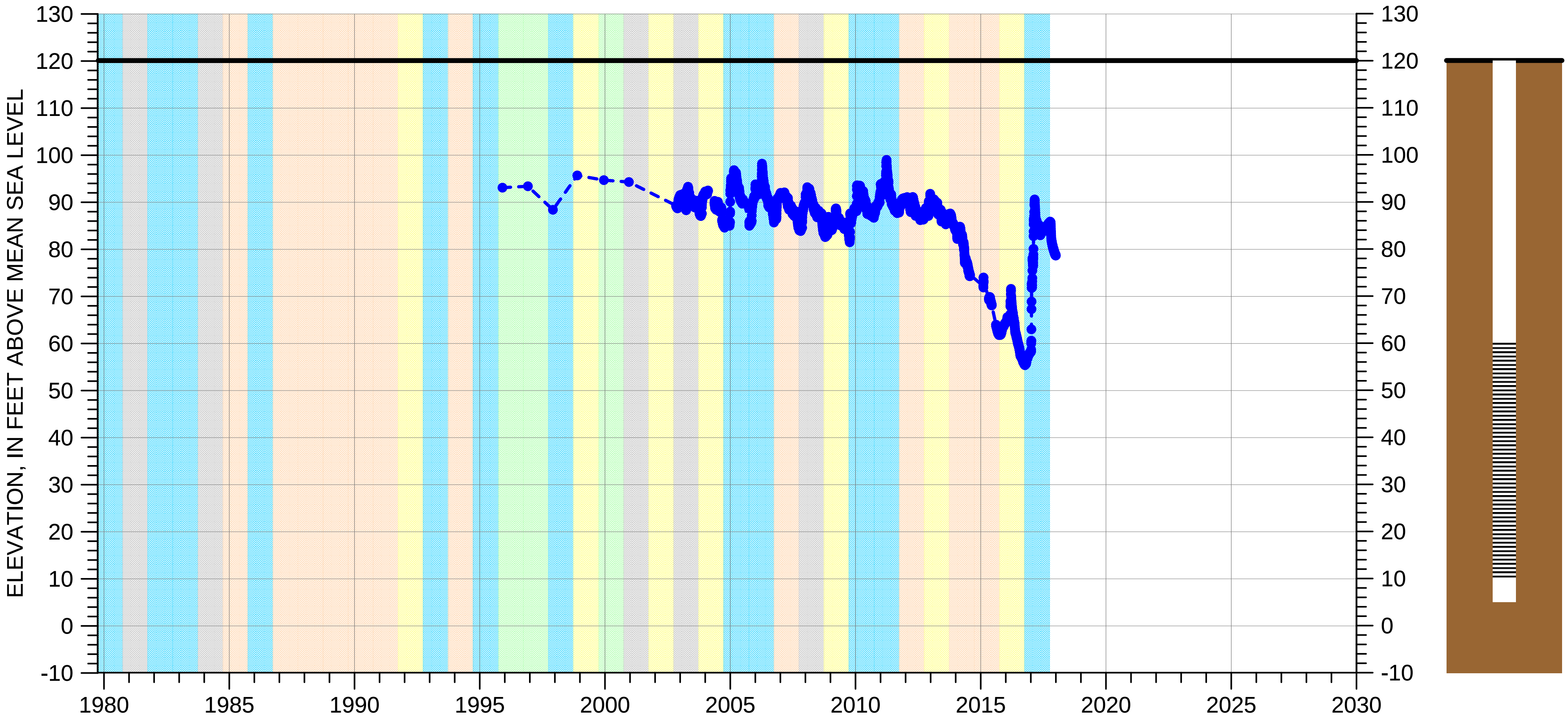
WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY16S_04E-15D01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

DRY

DRY - NORMAL

NORMAL

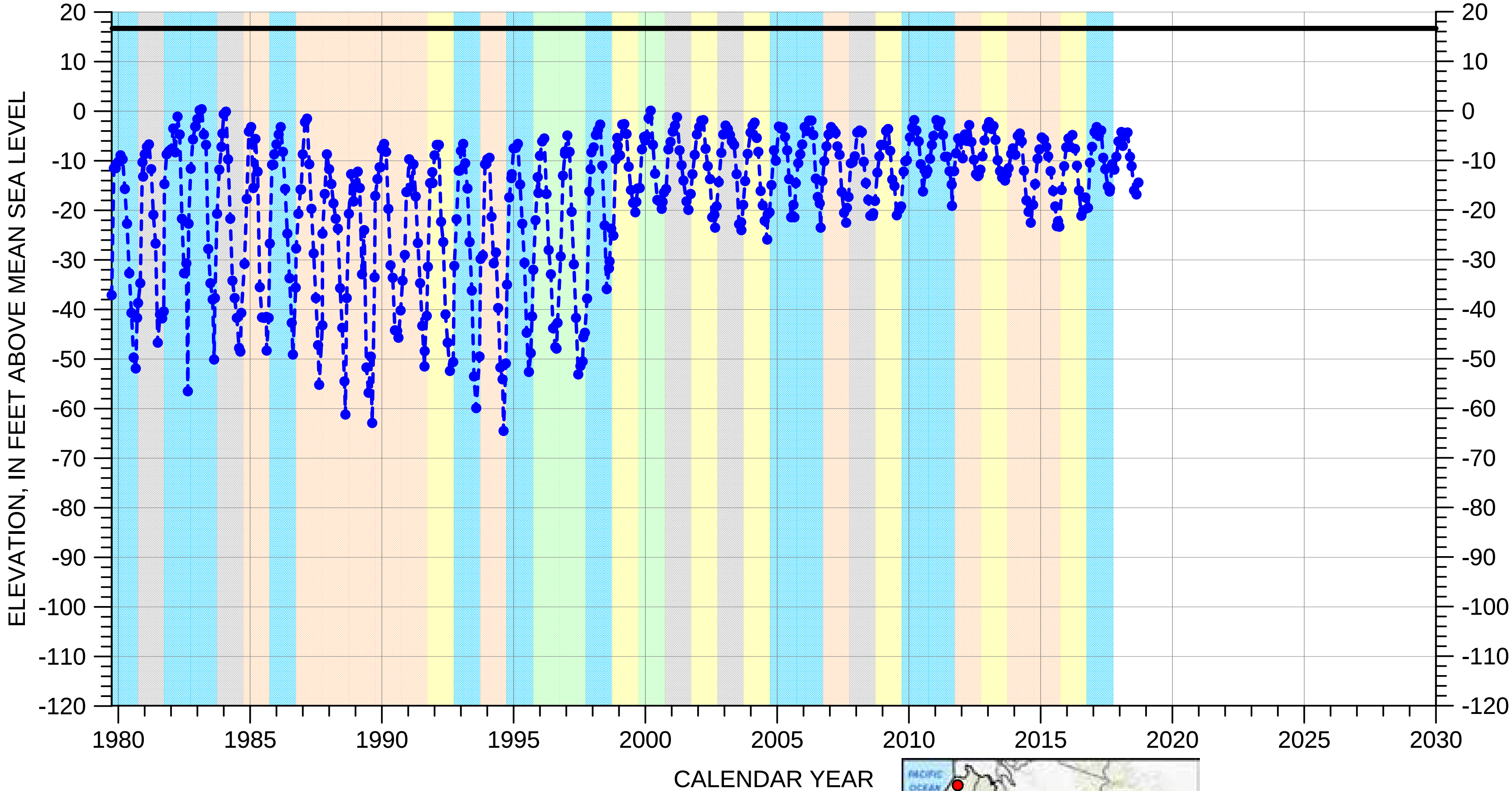
WET - NORMAL

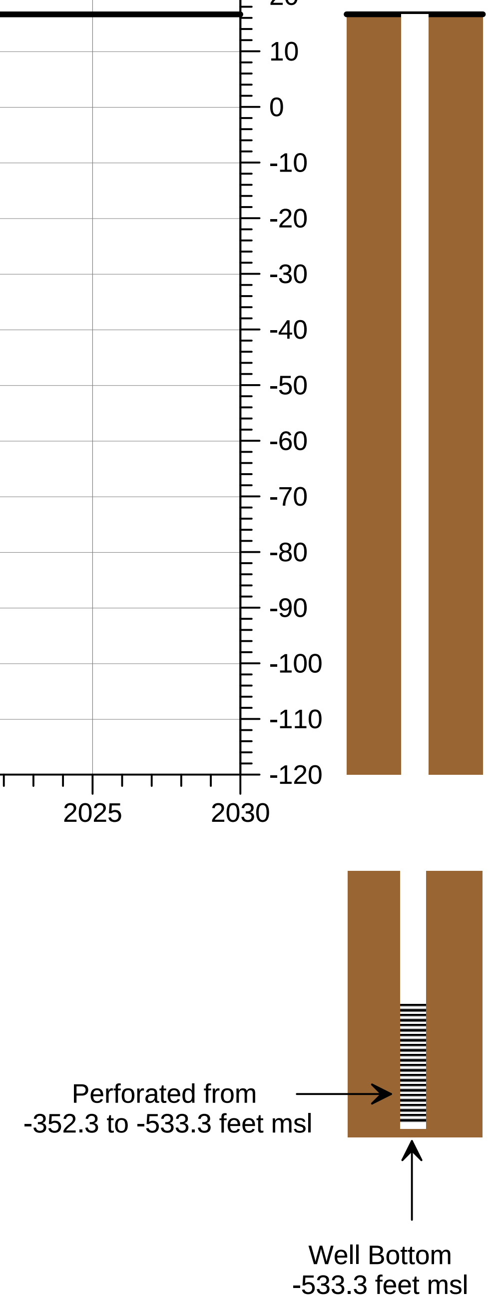
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\17S_05E-06C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-21N01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

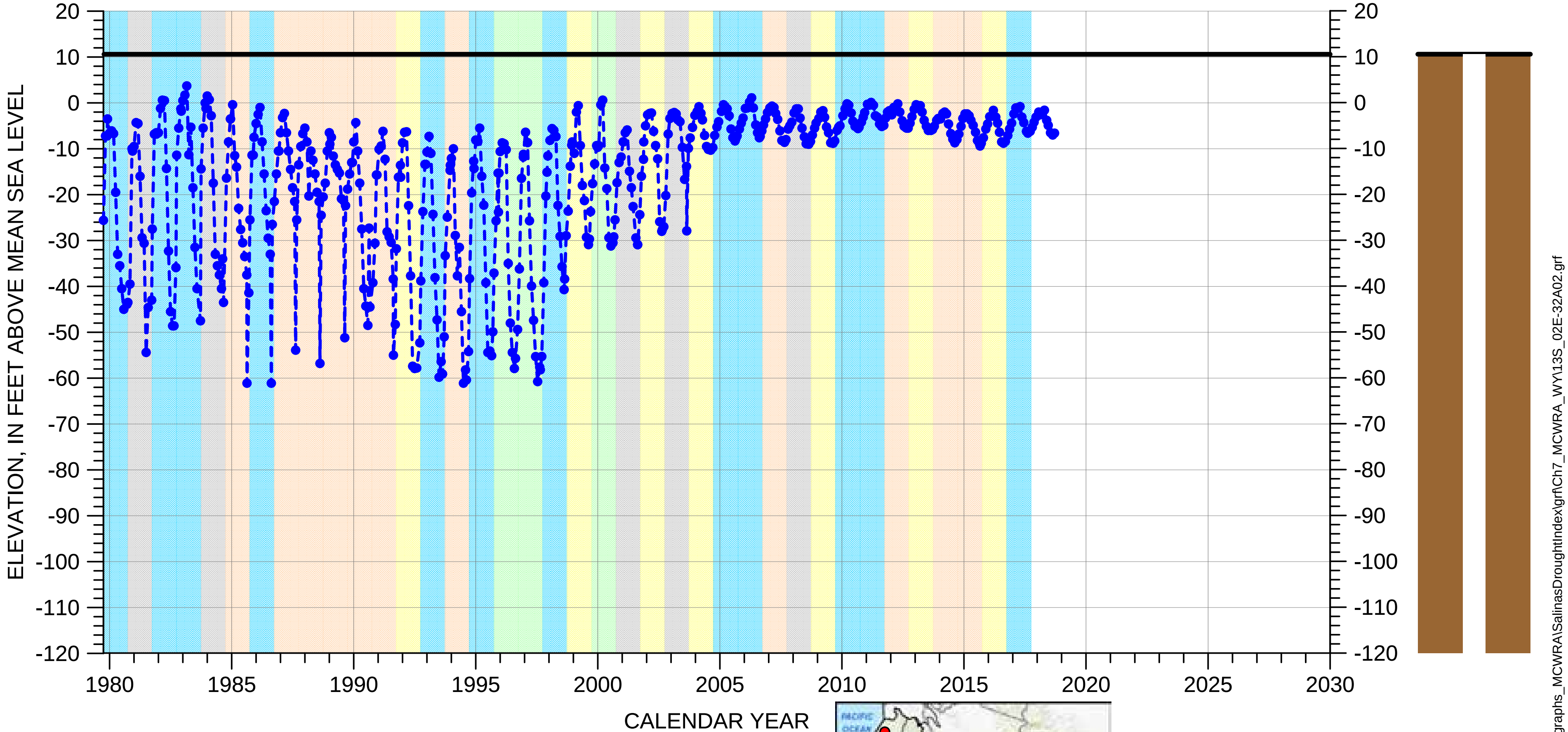
WATER YEAR TYPE DESIGNATION (MCWRA)

- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY13S_02E-21N01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-32A02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

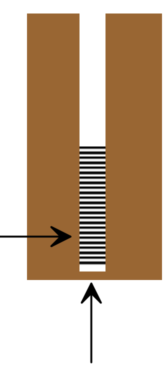
DRY

DRY - NORMAL

NORMAL

WET - NORMAL

WET



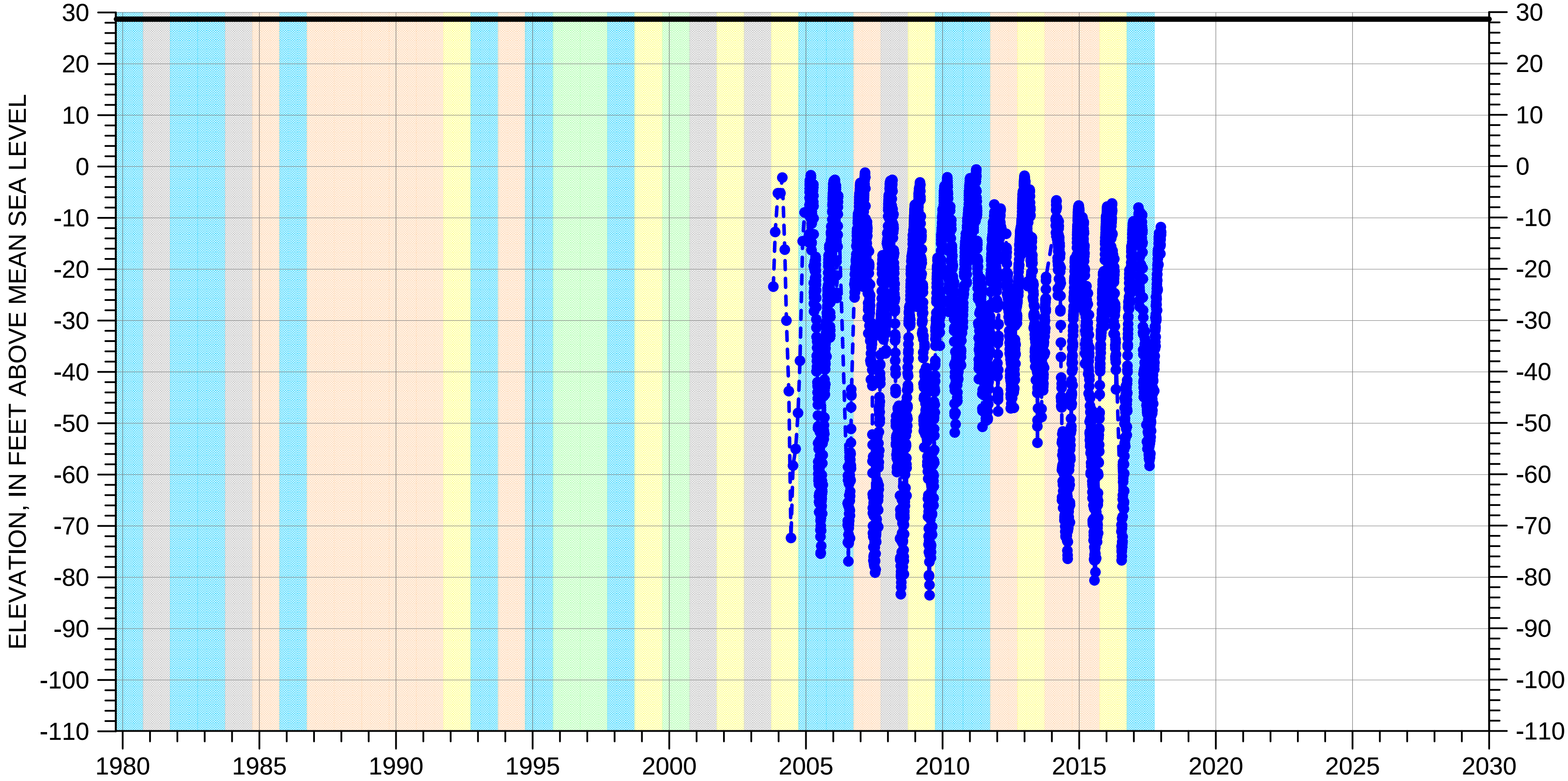
Perforated from
-289.4 to -589.4 feet msl

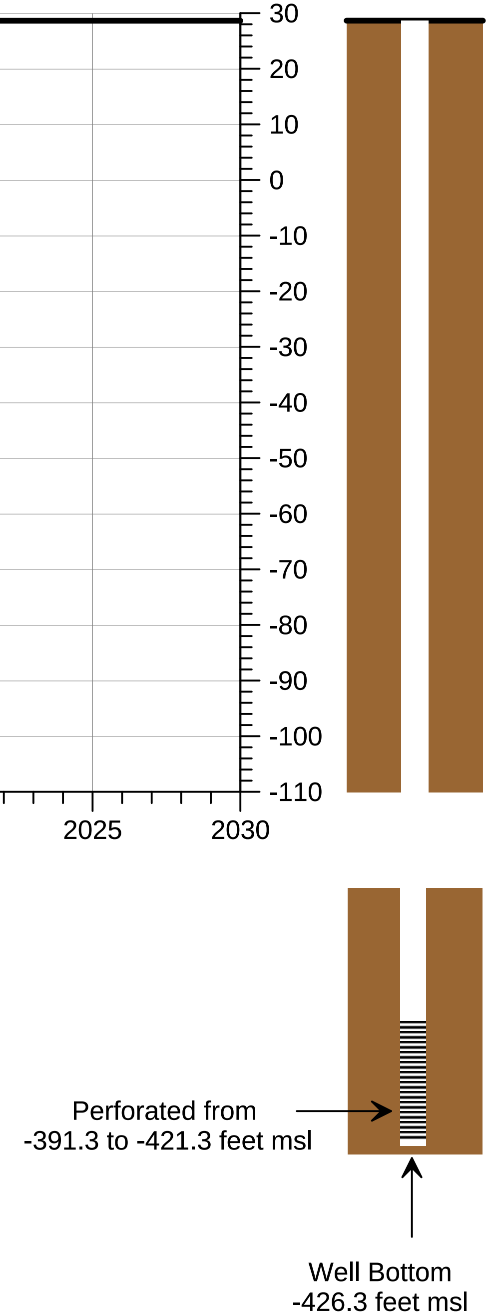
Well Bottom
-589.4 feet msl

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY13S_02E-32A02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

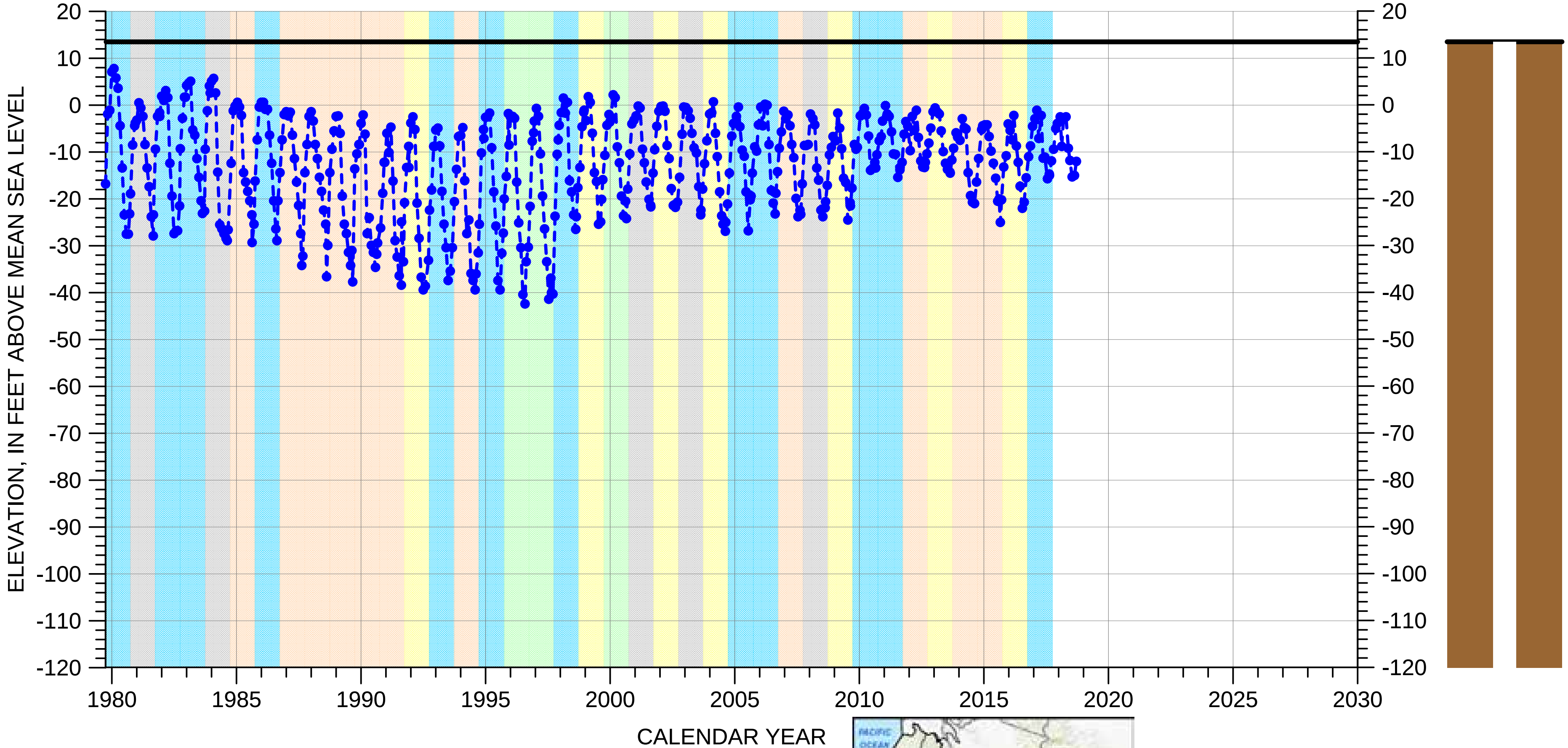
WATER YEAR TYPE DESIGNATION (MCWRA)

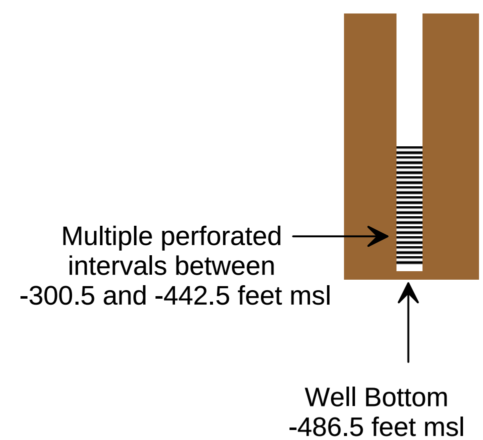
DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-03F03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-08M02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION

ESTIMATED ELEVATION

LAND SURFACE

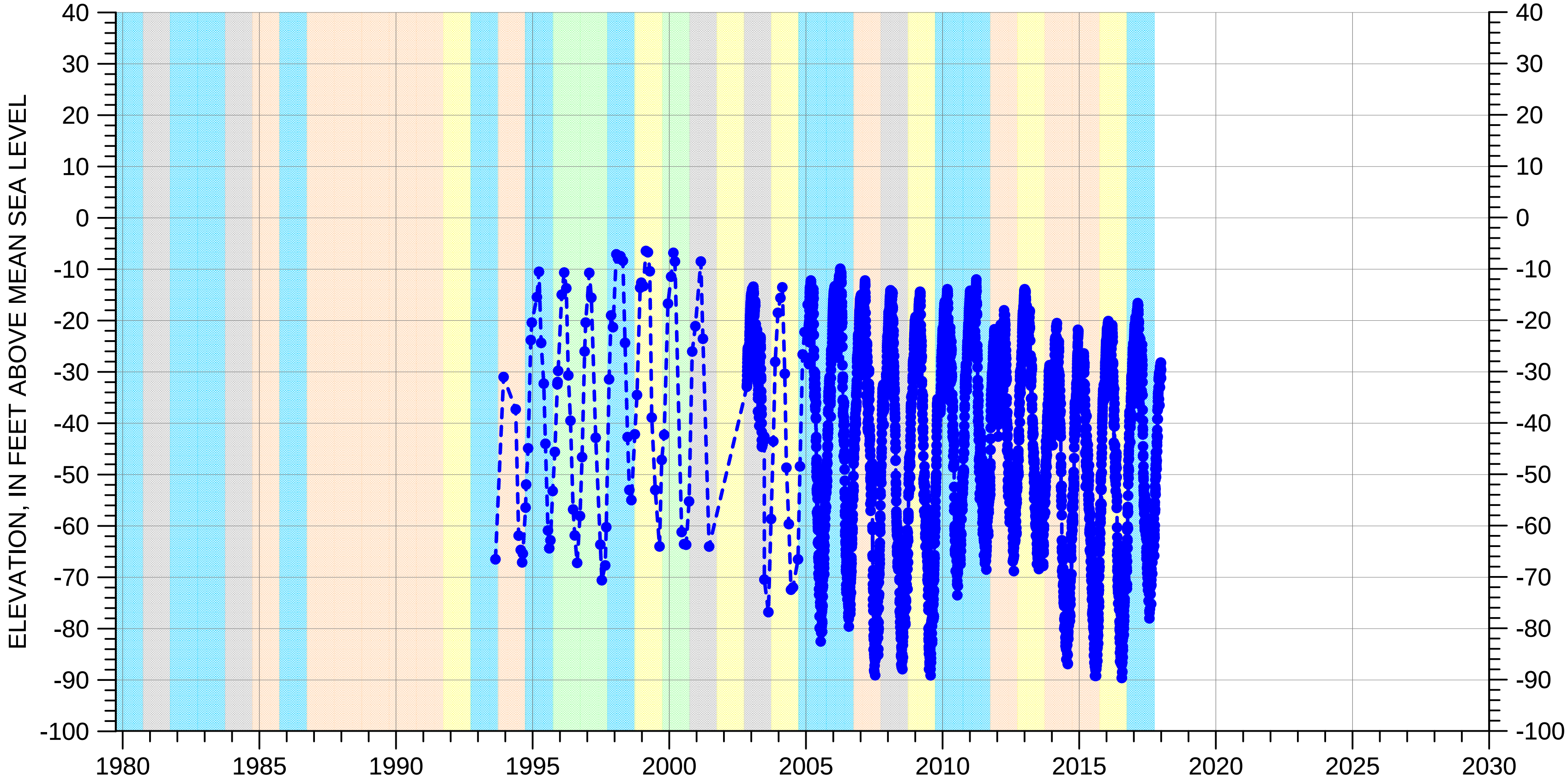
WATER YEAR TYPE DESIGNATION (MCWRA)

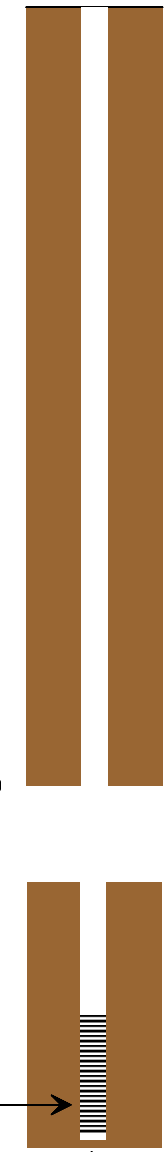
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-08M02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





Perforated from
-293.9 to -323.9 feet msl

Well Bottom
-333.9 feet msl

EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE (56.1 FT MSL)

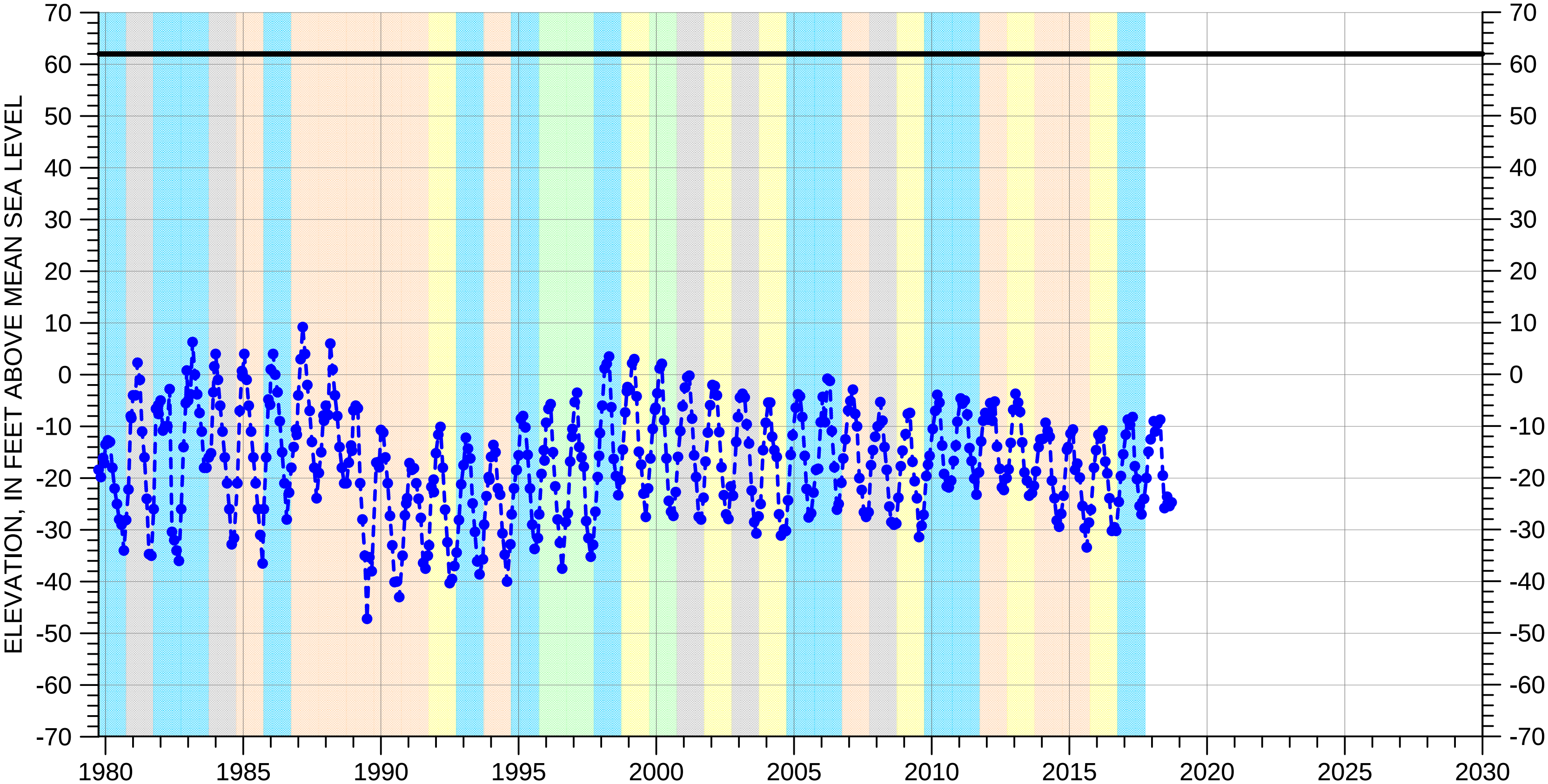
WATER YEAR TYPE DESIGNATION (MCWRA)

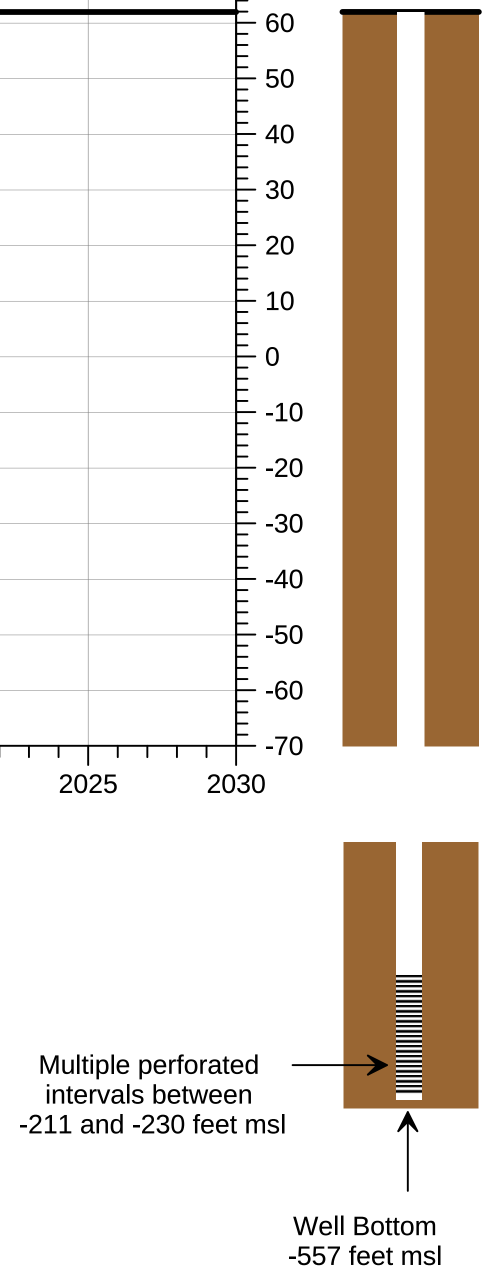
DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\14S_02E-12B03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12Q01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

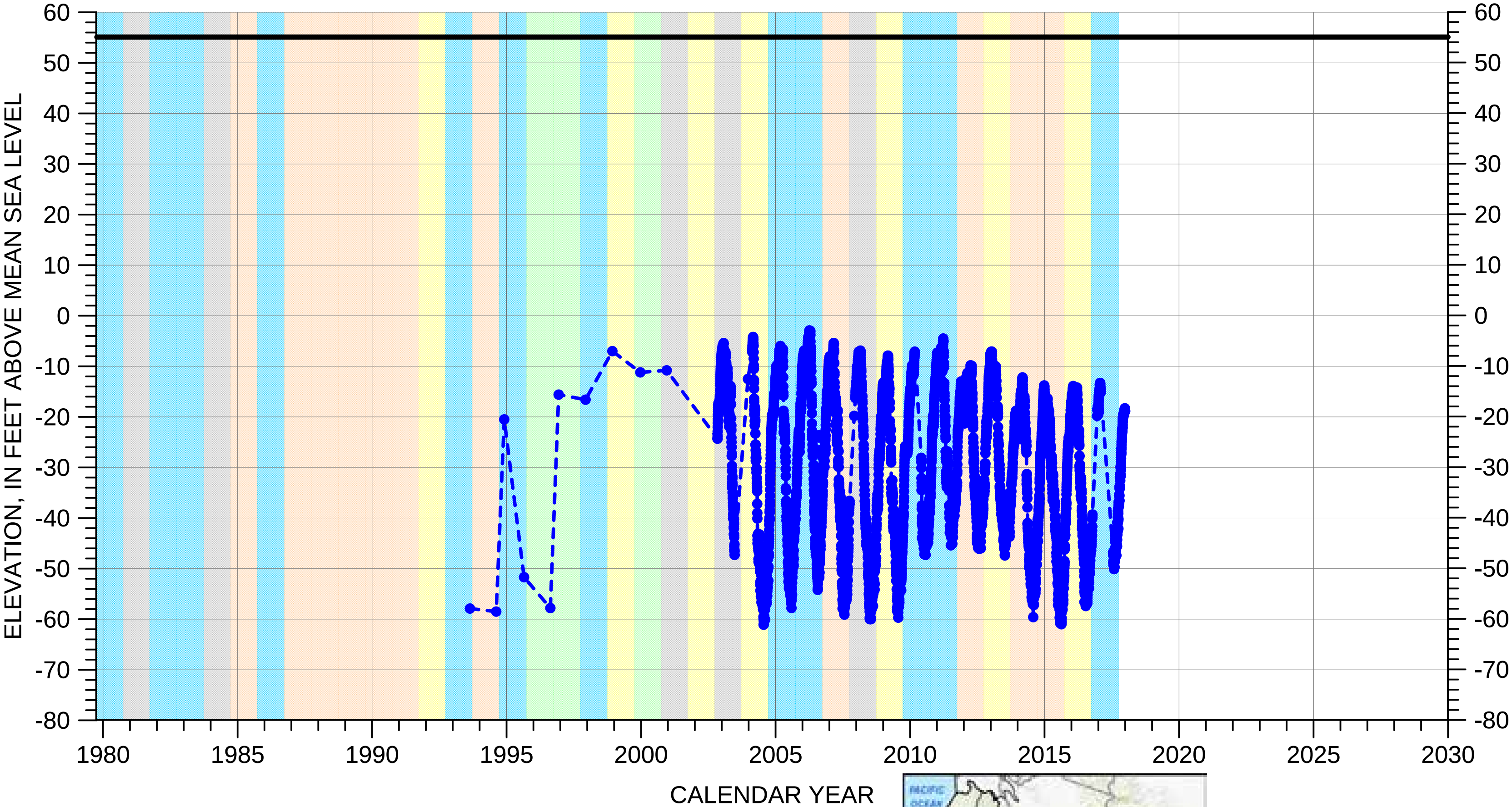
WATER YEAR TYPE DESIGNATION (MCWRA)

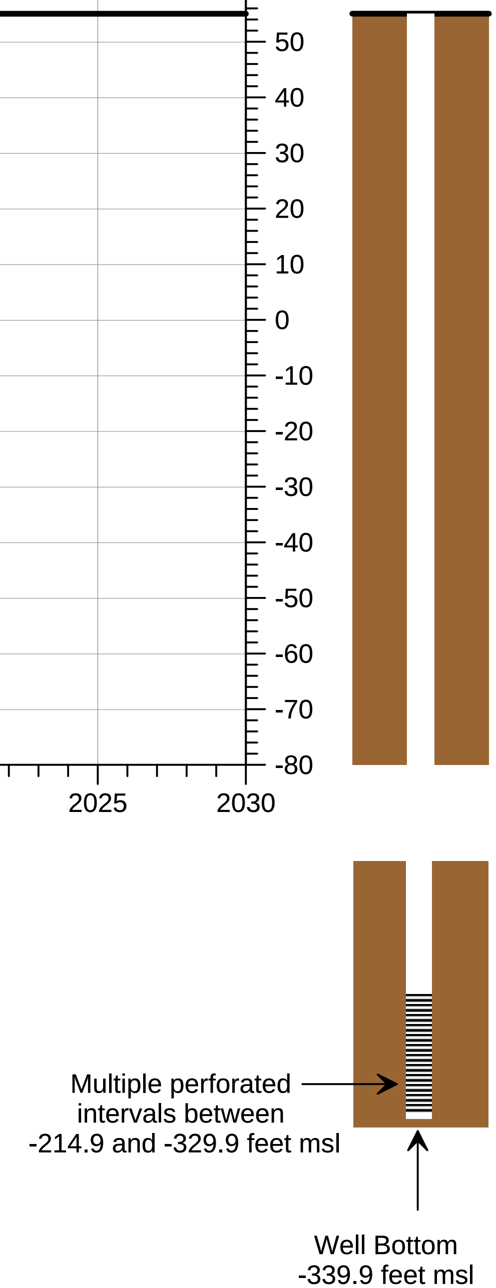
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY14S_02E-12Q01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

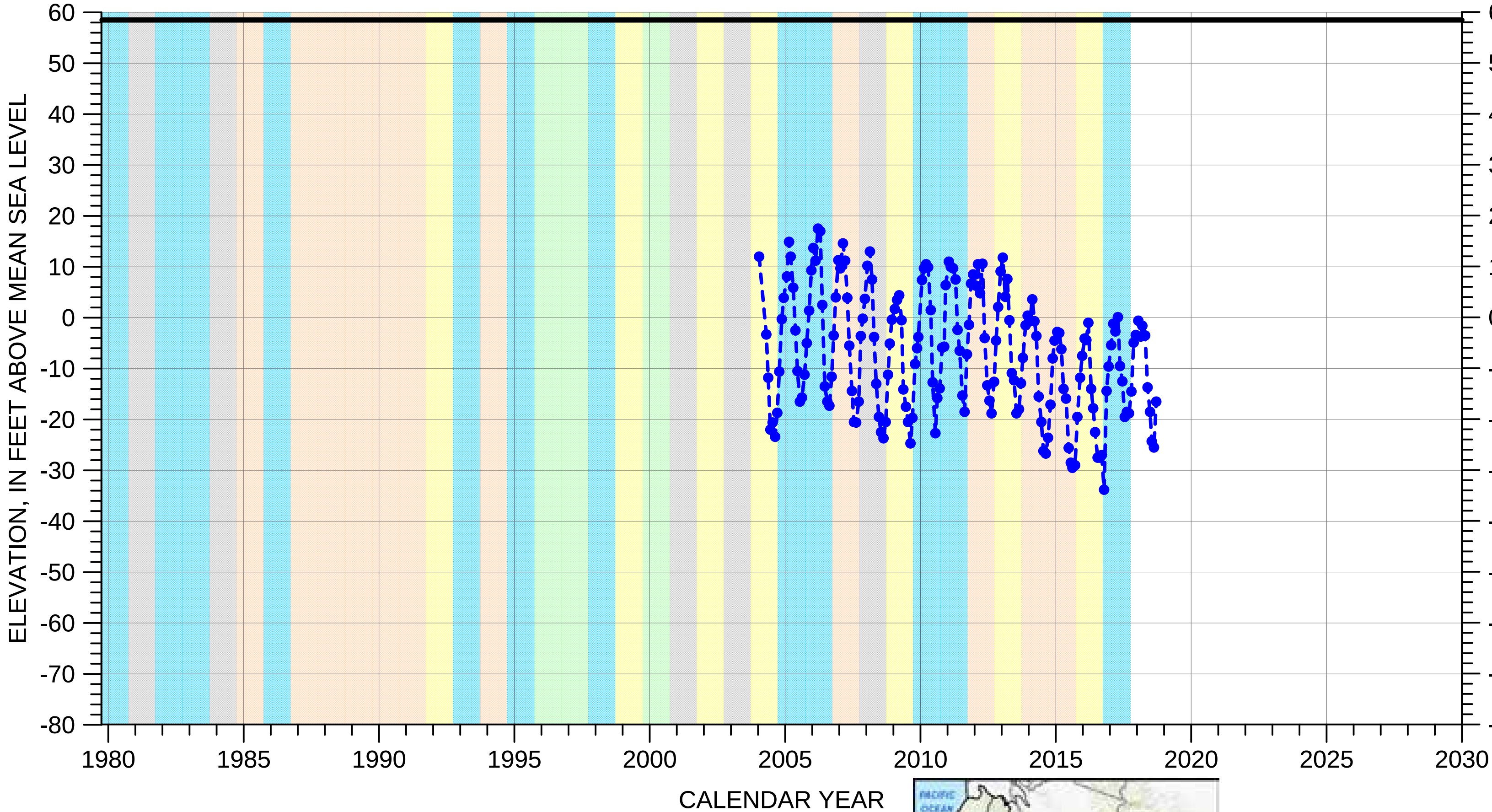
WATER YEAR TYPE DESIGNATION (MCWRA)

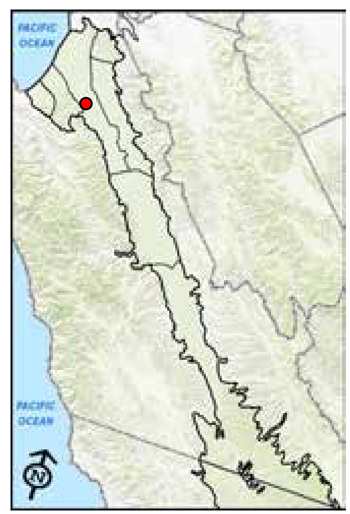
DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

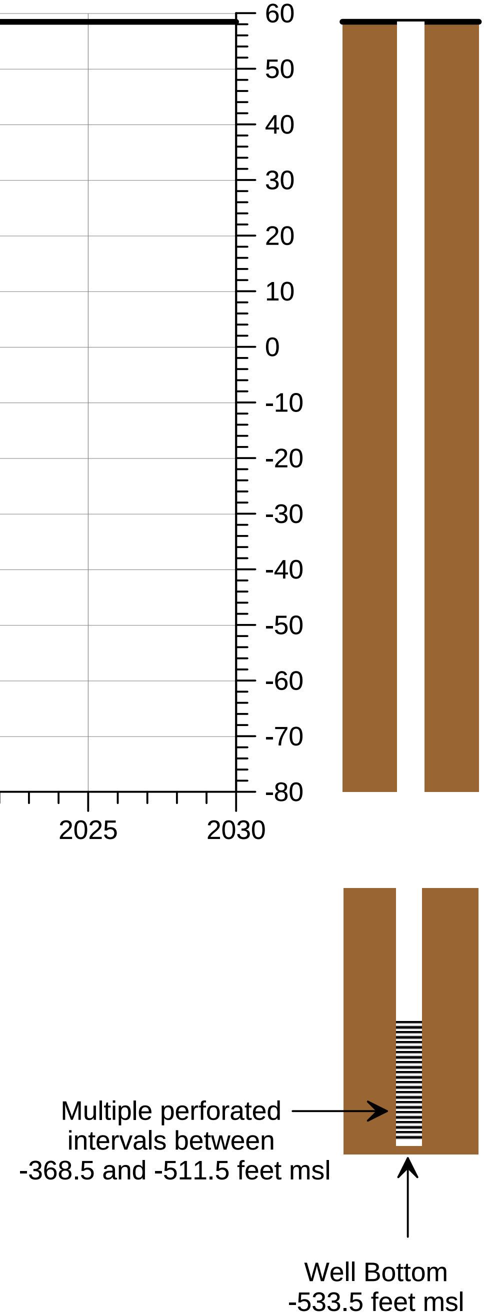
S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY\14S_03E-18C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-16F02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)







EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

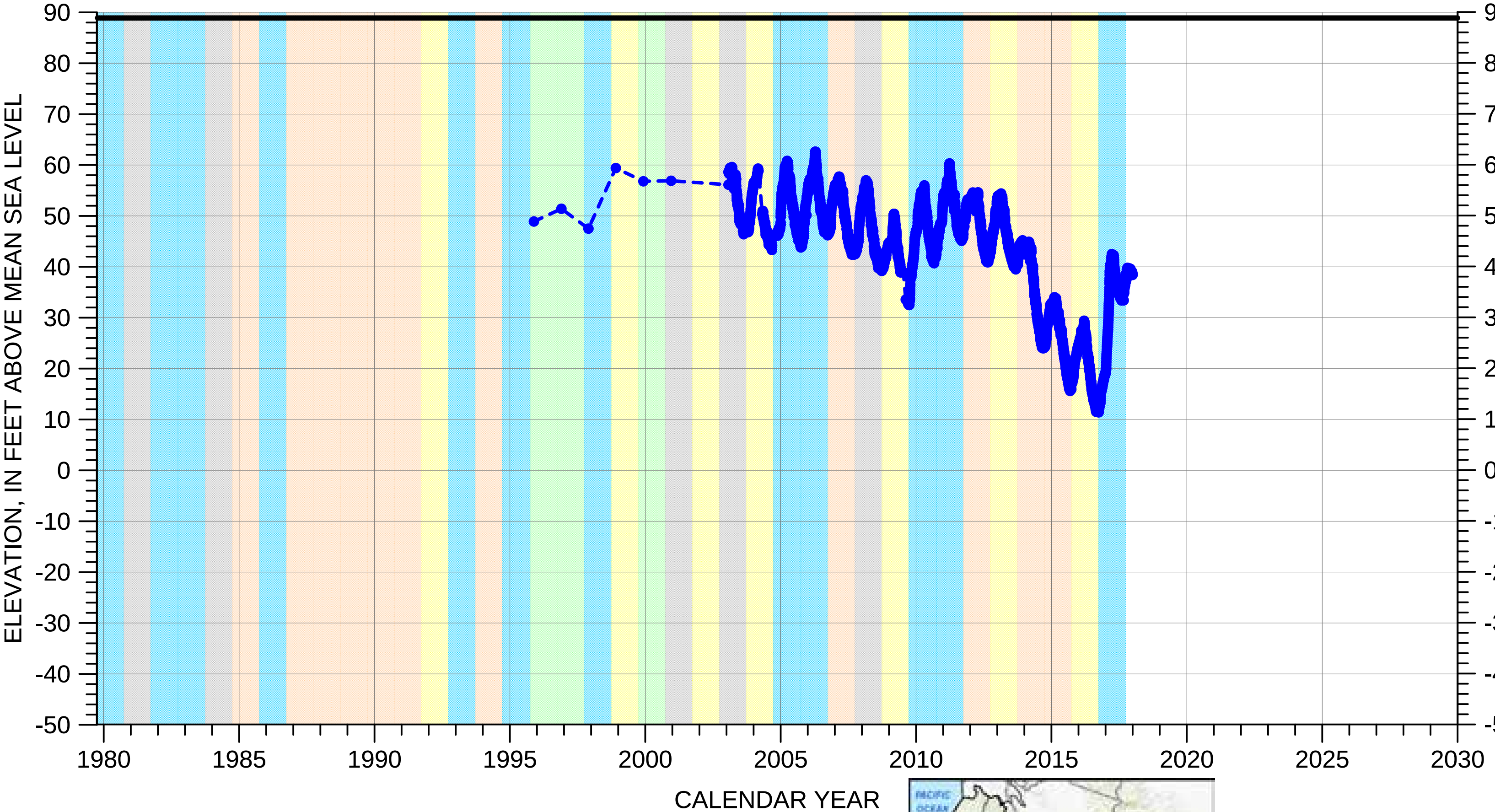
WATER YEAR TYPE DESIGNATION (MCWRA)

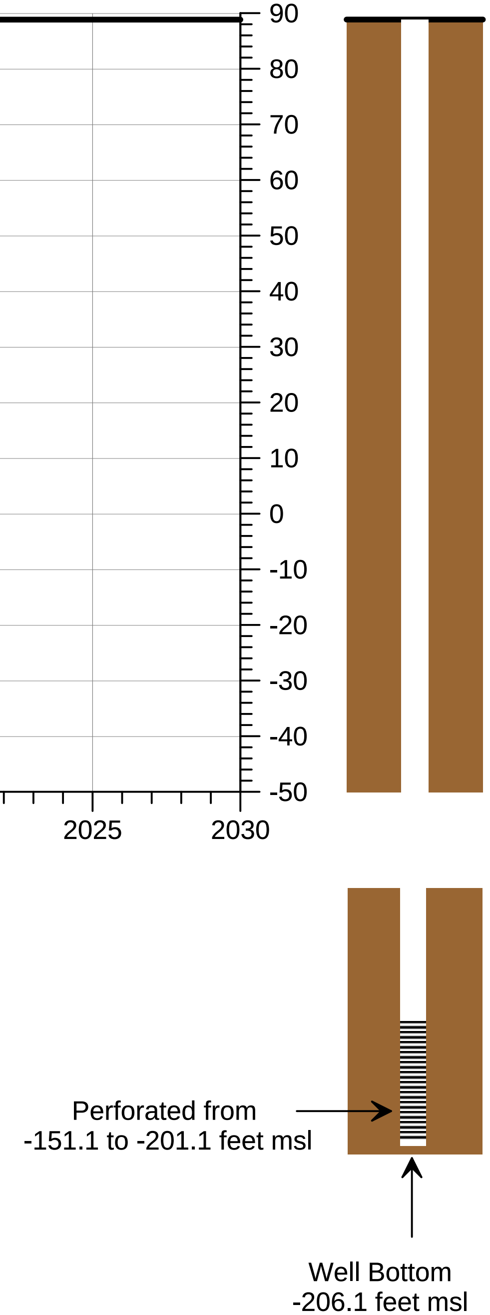
- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY15S_03E-16F02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

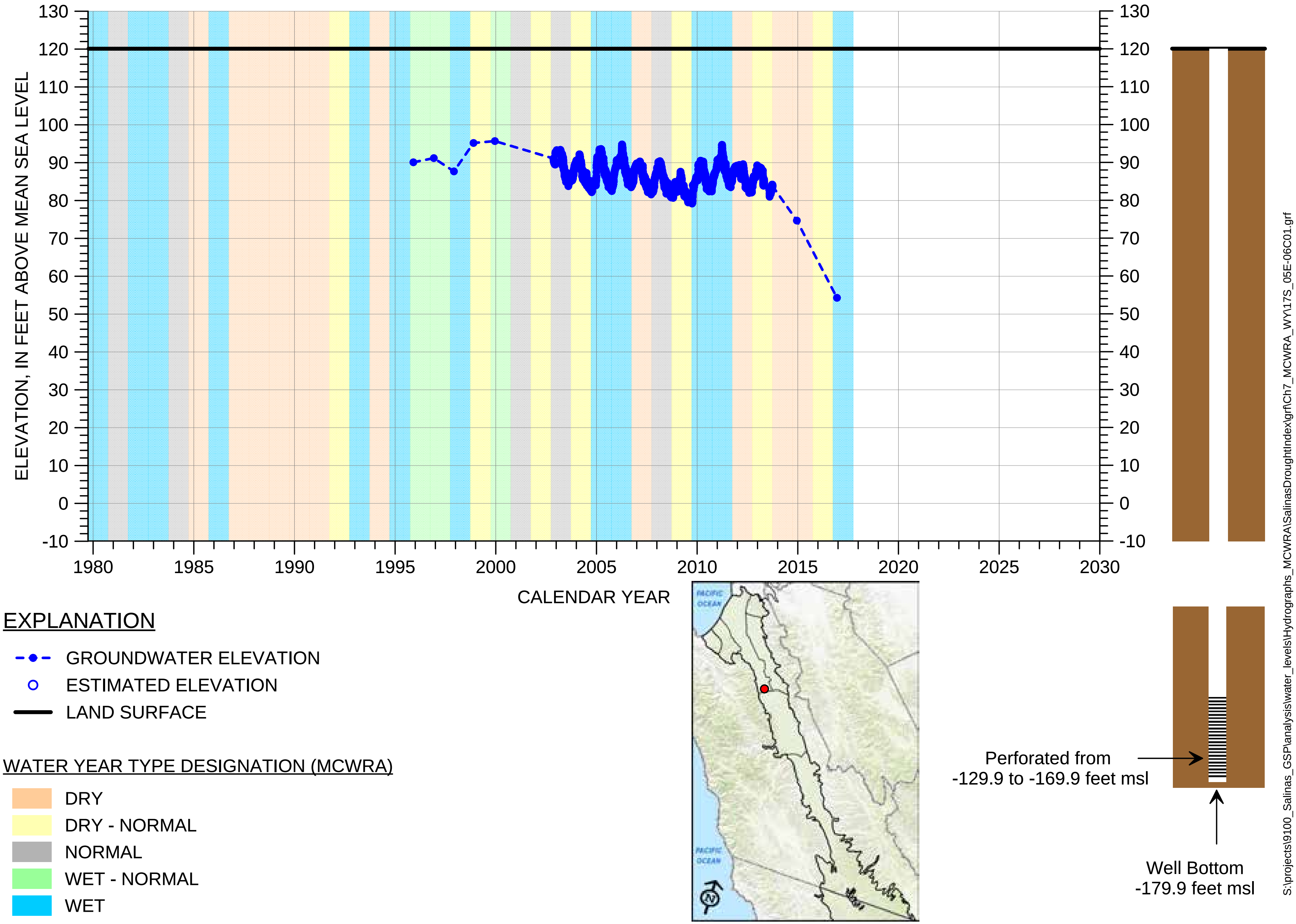
WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY16S_04E-08H03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

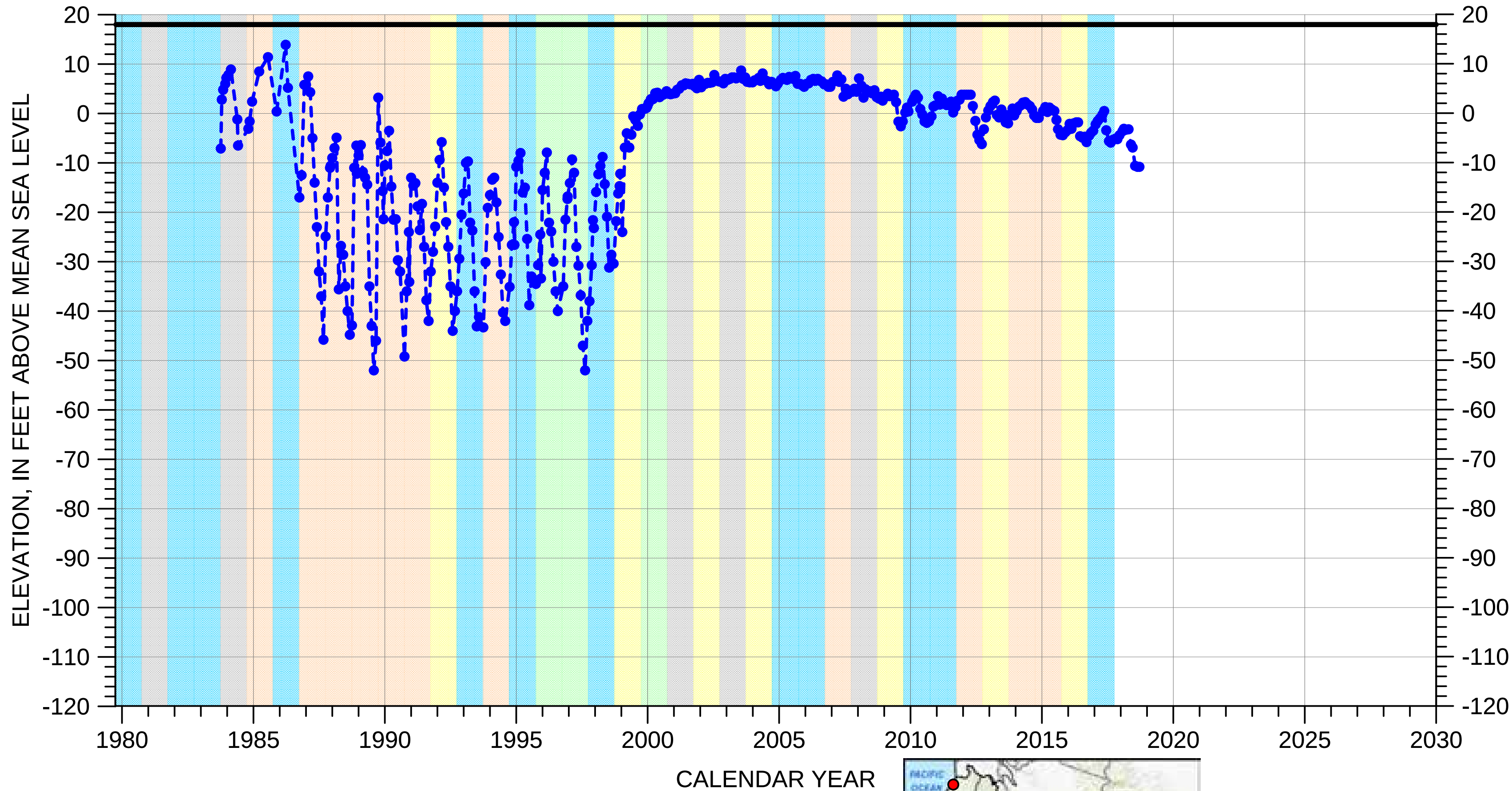
GROUNDWATER ELEVATION
ESTIMATED ELEVATION
LAND SURFACE

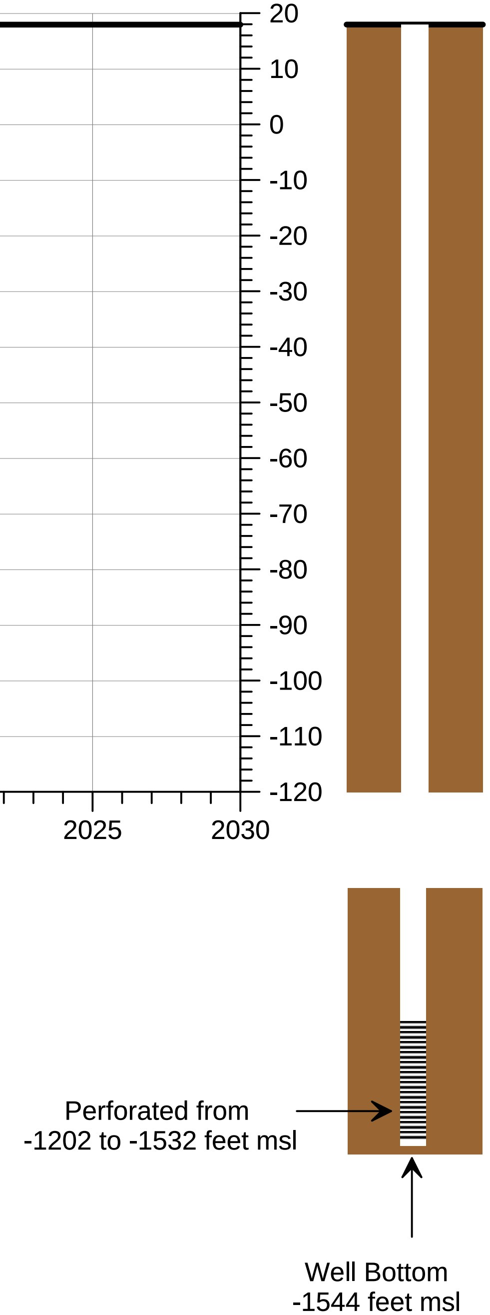
WATER YEAR TYPE DESIGNATION (MCWRA)

DRY
DRY - NORMAL
NORMAL
WET - NORMAL
WET

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-19Q03

180/400-Foot Aquifer Subbasin
(Deep Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- LAND SURFACE

WATER YEAR TYPE DESIGNATION (MCWRA)

- DRY
- DRY - NORMAL
- NORMAL
- WET - NORMAL
- WET

S:\projects\9100_Salinas_GSP\analysis\water_levels\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch7_MCWRA_WY13S_02E-19Q03.grf

APPENDIX 7B

MONITORING PROCEDURES FROM MCWRA CASGEM MONITORING PLAN

4.0 Monitoring Procedures

This section addresses the various procedures and protocols involved in collecting, processing, and reporting data from wells in the CASGEM network.

4.1 Monitoring Frequency and Timing

Nineteen (19) of the CASGEM wells are currently, and will continue to be, measured on a monthly basis. The three (3) voluntary wells are also measured monthly. MCWRA will use the monthly measurements from August and either January, February, or March to satisfy the biannual CASGEM reporting criteria.

To determine the monthly distribution of seasonal high and low groundwater elevations, MCWRA analyzed measurements from approximately 50 wells throughout the Salinas Valley Groundwater Basin. This included wells in the 180/400 Foot Aquifer, East Side Aquifer, Forebay Aquifer, and Upper Valley Aquifer. The measurements were collected during eight (8) different Water Years (WY): WY 1985, representative of near normal conditions; WY 1991, representative of dry conditions; and the six most recent Water Years, WY 2009 through WY 2014. MCWRA reports this data on a quarterly basis; a sample report is included in Appendix B.

Based on this analysis of historical data, August is typically representative of seasonal low conditions (Figure 10). A relaxation of groundwater levels, or seasonal high conditions, is evident during the period from January to March (Figure 11). Data from these three months will be evaluated and the highest groundwater elevation from that series will be submitted to the CASGEM online submittal system. The month chosen to be representative of the seasonal high groundwater conditions will be consistent across all data groups.

Nineteen (19) of the CASGEM wells are equipped with pressure transducers which collect depth to water data on an hourly basis. This data will be synthesized so that biannual measurements representing seasonal high and low conditions are available for CASGEM reporting. The groundwater level measurement collected at noon on the fifteenth day of the month will be selected and compared to other monthly data to ensure that it is a representative value. Data from the month of August will be used to represent the seasonal low and a fall/winter measurement from either January, February, or March will be used to represent the seasonal high; the same month will be used as was selected based on monthly well measurements, as discussed above.

Four (4) of the wells in the CASGEM network are currently measured once per year, during the period from November to January. Based on the recent analysis of seasonal groundwater highs, this period will be shifted to cover the months from January through March. An additional measurement event will be added during the month of August for these wells in order to also capture the seasonal groundwater low.

Appendix C contains a summary of the frequency and timing of measurement of wells in the CASGEM network. Any new wells that are brought into the CASGEM program will be monitored on a biannual basis, with data collection occurring on the same schedule as the other wells that are measured twice a year.

4.2 Well Locations

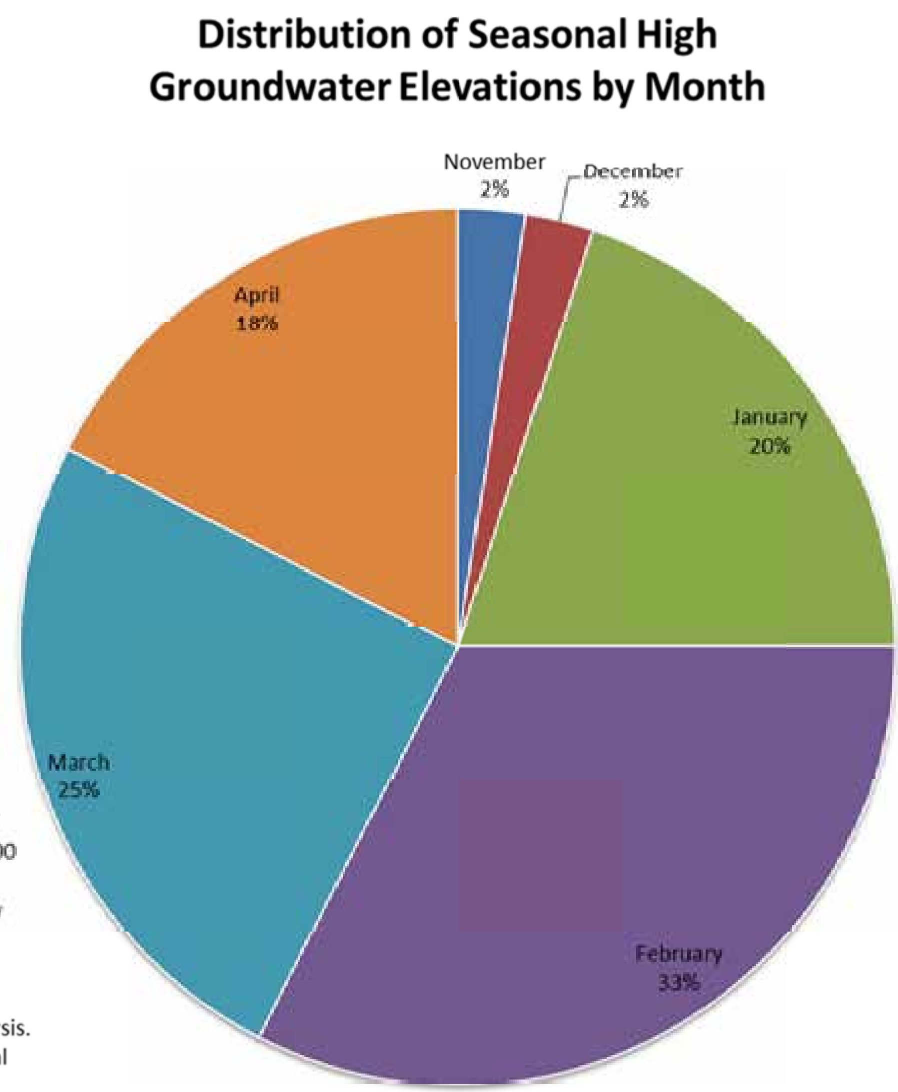
The latitude and longitude of each well was collected using a handheld GPS unit, which has accuracy to within one (1) meter. Coordinates for wells in the CASGEM network are shown in Appendix A. Any wells incorporated into the CASGEM network in the future will be geographically located using a similar method.

4.3 Reference Points

All of the wells that comprise the CASGEM network described herein are currently part of a groundwater level monitoring program conducted by MCWRA. As part of the existing monitoring programs, reference points (RP) have been established for all of the wells. To ensure consistency in measuring depth to water, a description of each well's RP is recorded in a field data collection notebook. In many cases, photographs have also been taken of the RP. Reference point elevations have been determined for all wells that are currently in a monitoring program; this data is listed in Appendix A.

A reference point will be determined for any new wells that are brought into the CASGEM network. Reference point elevations are determined using a digital elevation model from the United States Geological Survey (USGS) with a cell size of 32 feet by 32 feet.

Figure 10 – Distribution of Seasonal High Groundwater Elevations by Month

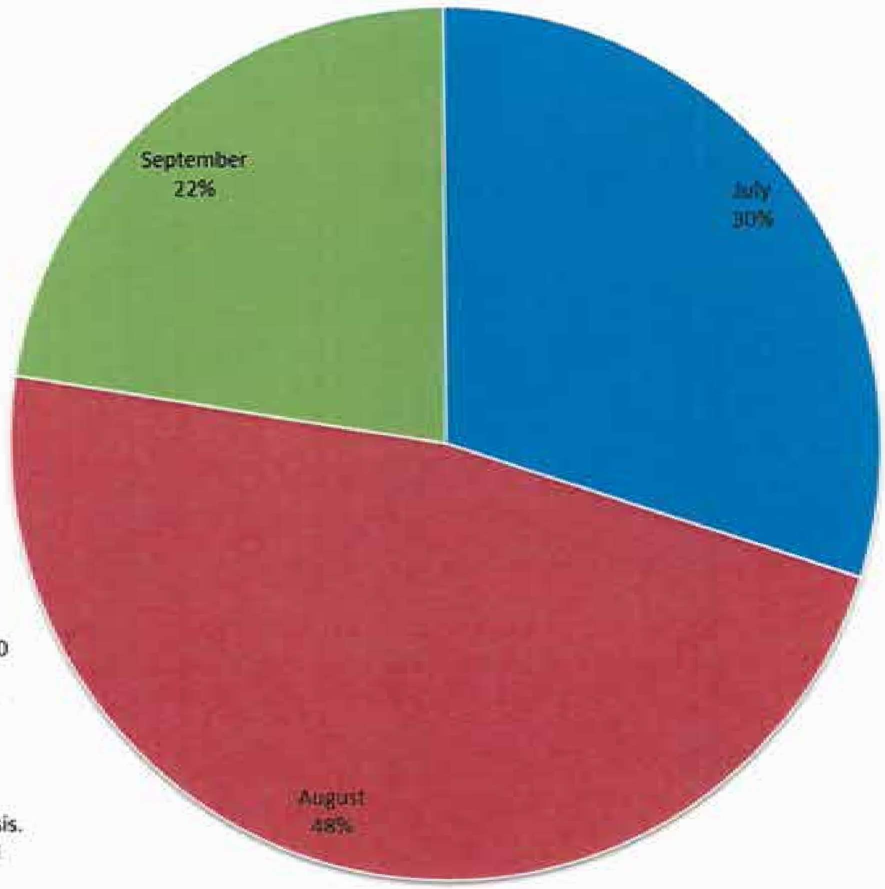


Notes
(1) Chart reflects data from the following subbasins of the Salinas Valley Groundwater Basin: 180/400 Foot Aquifer, East Side Aquifer, Forebay Aquifer, and Upper Valley Aquifer.

(2) Water Years 1985, 1991, and 2009-2014 were used in this analysis. These years represent near normal conditions (WY85), dry conditions (WY91), and the six most recent water years.

Figure 11 – Distribution of Seasonal Low Groundwater Elevations by Month

Distribution of Seasonal Low Groundwater Elevations by Month



Notes

(1) Chart reflects data from the following subbasins of the Salinas Valley Groundwater Basin: 180/400 Foot Aquifer, East Side Aquifer, Forebay Aquifer, and Upper Valley Aquifer.

(2) Water Years 1985, 1991, and 2009-2014 were used in this analysis. These years represent near normal conditions (WY85), dry conditions (WY91), and the six most recent water years.

4.4 Field Methods

Groundwater elevation data collected from wells in the CASGEM network is intended to reflect static conditions. Best efforts will be made to ensure that wells have not recently been pumped prior to collecting a data point. Depth to water measurements will be made using one or more of the methods discussed in the following sections. Measurement methods described in the following sections are based on the Department of Water Resources document *Groundwater Elevation Monitoring Guidelines* (December 2010) with some alterations specific to wells in the monitored basins/subbasins described in this Monitoring Plan.

4.4.1 Graduated steel tape

Prior to measurement:

- Ensure that the reference point on the well can be clearly determined. Check notes in the field data collection notebook.
- Review the notes and comments for previous measurements in the field data collection notebook to determine if there are any unique circumstances at this well.
- Take note of whether oil has previously been present at this well; this will be recorded in the comments section of the data form.

Making a measurement:

- Use the previous depth to water measurement to estimate a length of tape that will be needed.
- Lower the tape into the well, feeling for a change in the weight of the tape, which typically indicates that either (a) the tape has reached the water surface or (b) the tape is sticking to the side of the well casing.
- Continue lowering the tape into the well until the next whole foot mark is at the reference point. This value on the tape should be recorded in the field data collection notebook.
- Bring the tape to the surface and record the number of the wetted interval to the nearest foot.
- If an oil layer is present, read the tape at the top of the oil mark to the nearest foot. Note in the comments section of the data form that oil was present.
- Repeat this procedure a second time and note any differences in measurement in the field data collection notebook.

4.4.2 Electric water level meter

This method of measurement employs a battery-powered water level meter and a small probe attached to a ruled length of cable. Depth to water measurements collected using this equipment are recorded to the nearest tenth of an inch. This instrument is sometimes referred to as a “sounder”.

Prior to measurement:

- Review the field data sheet for the well and note whether oil has been present at this well in the past. The electric water level meter should not be used in wells where oil is present.
- Ensure that the reference point on the well can be clearly determined. Check notes in the field data collection notebook.
- Confirm that the water level meter is functioning and is turned on so that the beeping indicator will operate properly.

Making a measurement:

- Review previous depth to water measurements for the well to estimate the length of tape that will be needed.
- Lower the electrode into the well until the indicator sounds, showing the probe is in contact with the water surface.
- Place the tape against the reference point and read the depth to water to the nearest 0.1 foot. Record this value on the field data sheet.
- Make a second measurement and note any differences in measurement in the field data collection notebook.

4.4.3 Sonic water level meter

This meter uses sound waves to measure the depth to water in a well. The meter must be adjusted to the air temperature outside the well; there is a card with reference temperatures in the case with the sonic meter.

Making a measurement:

- Insert the meter probe into the access port and push the power-on switch. Record the depth from the readout.
- Record the depth to water measurement in the field data collection notebook.

4.4.4 Pressure transducer

Automated water-level measurements are made with a pressure transducer attached to a data logger. Pressure transducers are lowered to a depth below the water level in the well and fastened to the well head at a reference point. Data points are logged on an hourly basis. MCWRA uses factory-calibrated, vented pressure transducers (Appendix D). MCWRA staff collects the pressure transducer data once per quarter. During the data collection process, data loggers are stopped, and the data is downloaded onto a laptop, and then the data logger is reactivated and scheduled to begin collecting data again on the next hour. Upon return from the field, data is processed and reviewed for errors.

4.5 Data Collection, Processing, and Reporting

Following completion of all fieldwork, data is transcribed from field data sheets and checked for errors before being loaded into MCWRA's Oracle platform database. All data will be stored in the MCWRA database before being uploaded to the CASGEM website. Submittal of data to the CASGEM website will occur at a minimum of twice per year, no later than January 1 and July 1, per DWR CASGEM program guidelines.

Bi-annual submittal of data to the CASGEM website will include the following for each well in the CASGEM network, as described in the DWR document *CASGEM Procedures for Monitoring Entity Reporting*:

- Well identification number
- Measurement date
- Reference point and land surface elevation, in feet, using NAVD88 vertical datum
- Depth to water, in feet
- Method of measuring water depth
- Measurement quality codes
- Measuring agency identification
- Comments about measurement, if applicable

The following information will also be submitted to the CASGEM online system, as it is required by DWR unless otherwise noted:

- Monitoring Entity name, address, telephone number, contact person name and email address, and any other relevant contact information
- Groundwater basins being monitored (both entire and partial basins)
- State Well Identification number (recommended)
- Decimal latitude/longitude coordinates of well (NAD83)
- Groundwater basin or subbasin
- Reference point elevation of the well, in feet, using NAVD88 vertical datum
- Elevation of land surface datum at the well, in fee, using NAVD88 vertical datum
- Use of well
- Well completion type (e.g. single well, nested well, or multi-completion well)
- Depth of screened interval(s) and total depth of well, in feet, if available
- Well Completion Report number (DWR Form 188), if available

APPENDIX 7C

MONTEREY COUNTY QUALITY ASSURANCE PROJECT PLAN (QAPP)

Quality Assurance Project Plan (QAPP)
For
Water Quality Monitoring
Associated with the Salinas Valley Integrated Water Management Plan (SVIWMP)

EPA R9#03-238
X-97994701-0

Monterey County Water Resources Agency
P.O. Box 930
Salinas, CA 93902
Telephone: (831) 755-4860
Fax: (831) 424-7935
Website: http://www.mcwra.co.monterey.ca.us

WATRC584GV4 (COPY 2)

1.0 PROJECT MANAGEMENT

1.1 TITLE AND APPROVAL PAGE

Quality Assurance Project Plan
For
Water Quality Monitoring Associated with
The Salinas Valley Integrated Water Management Plan (SVIWMP)
EPA R9#03-238
X-97994701-0

Prepared by:
Monterey County Water Resources Agency (MCWRA)
P.O. Box 930
Salinas. CA 93902

Prepared for:
US EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105-3901

Approval Signatures

Elizabeth Krafft
Agency Project Manager:

Date: 8/10/07

Kathleen Thomasberg
Agency Project QA/Task Manager:

Date: 8/17/07

Eugenia McNaughton, Ph.D.
USEPA Region 9 QA Program Manager:

Date:

Carolyn Yale
USEPA Region 9 Project Officer:

Date:

Mark Kutnink
USEPA Region 9 Chemist.

Date: 22 Oct 2007

1.2 TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.3 DISTRIBUTION LIST

The following is a list of organizations and persons who will receive copies of the approved QA Project Plan and any subsequent revisions:

Monterey County Water Resources Agency (Agency)
P.O. Box 930
Salinas, CA 93902

Elizabeth Krafft
Project Manager
(831) 755-4860
kraffiea@co.monterey.ca.us

Kathleen Thomasberg
Project QA/Task Manager
(831) 755-4860
thomasbergk@co.monterey.ca.us

Manuel Saavedra
Hydrologist/ Team Lead
(831) 755-4860
saavedram@co.monterey.ca.us

Carla James
Water Resources Technician/ Field Sampler
(831) 755-4860
JamesCR@co.monterey.ca.us

Tamara Voss
Water Resources Technician/ Field Sampler
(831) 755-4860
vossll@co.monterey.ca.us

U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105-3901

Eugenia McNaughton, Ph.D.
QA Program Manager
(415) 972-1111

Carolyn Yale
Project Officer
(415) 972-3482

Mark Kutnink
Chemist
(415) 972-3801

Monterey County Consolidated Chemistry Laboratory (CCL)
1270 Natividad Road, Room A15
Salinas, CA 93906

Germain Guibert
Laboratory Director
(831) 755-4516

1.4 PROJECT/TASK ORGANIZATION

The organization responsible for overseeing this ground water monitoring program is the Monterey County Water Resources Agency (Agency). This project is funded through a grant from the Environmental Protection Agency (EPA), under the authority of Section §104 (b)(3) of the Clean Water Act. This project falls under the Monitoring and Assessment funding category. The Monterey County Health Department's Consolidated Chemistry Laboratory is a California state certified laboratory that will perform the chemical analyses for this ground water monitoring program. The laboratory will use standard analytical methods.

The roles and responsibilities of those involved in the implementation of the ground water monitoring program are described below. An organizational chart for the program is shown below.

Project Manager is the responsible official who will oversee the preparation of grants and the fiscal management of the project.

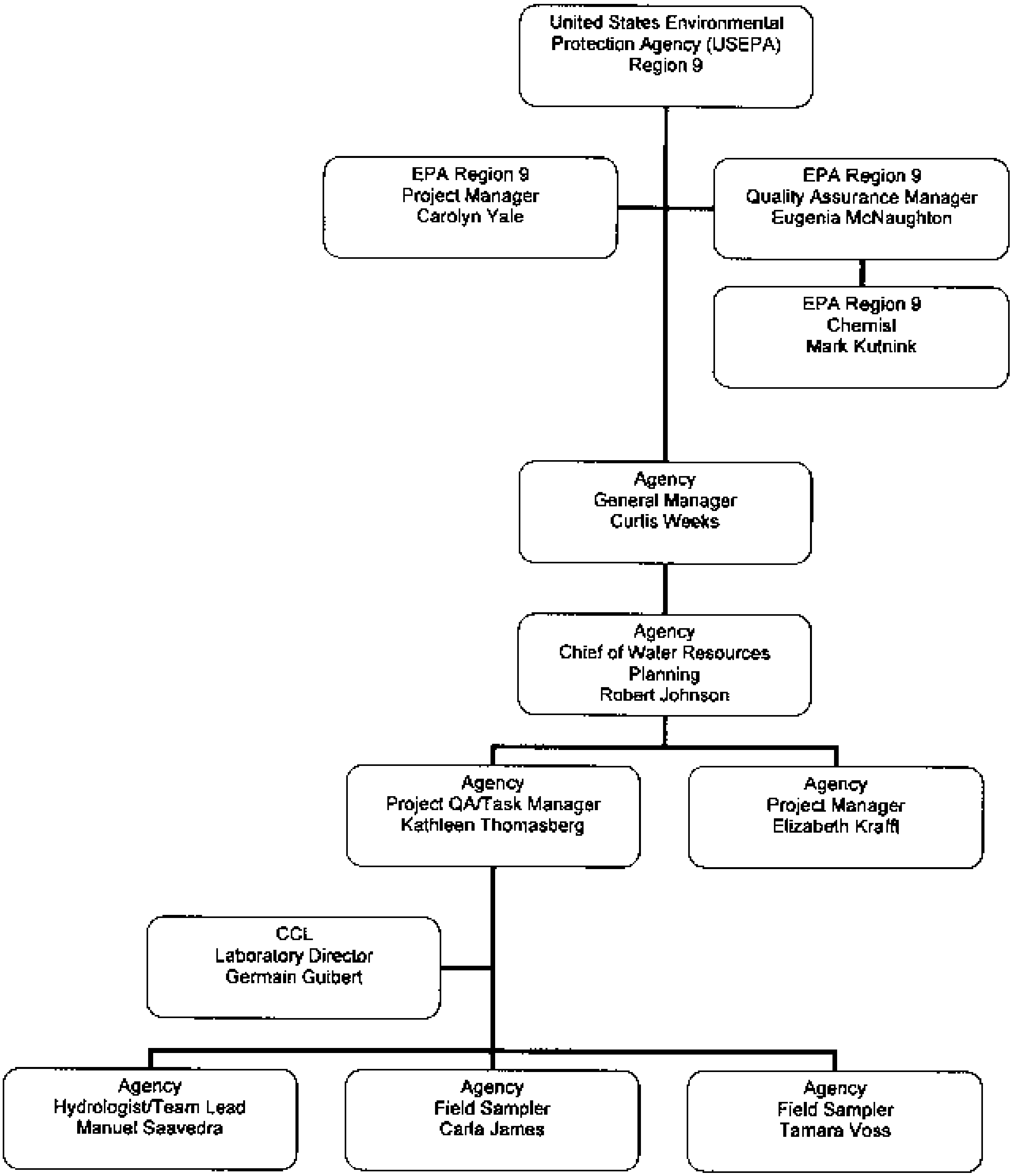
Project QA Manager is in charge of establishing the QA/QC protocols found in the QAPP as part of the sampling and analysis procedures. The QA Manager will also review and assess all analytical data from the contract laboratory and will be the liaison regarding data quality issues and concerns. She may stop all actions, including those conducted by the contract laboratory and will be responsible for ensuring that any amended versions of the QAPP are distributed to the organizations and individuals listed in Section 1.3.

Project Task Manager will oversee the ground water monitoring program. She will ensure that all QAPP protocols are followed and will oversee the writing and revisions of the QAPP. Since the Agency's Water Quality Department is not large, the Project Task Manager will function in the dual role of Task Manager and QA Manager.

Hydrologist/Team Lead will be responsible for coordinating with the Water Resources Technicians/ Field Samplers to review field and analytical requirements, documentation, and sampling schedules.

Water Resources Technicians/Field Samplers will be responsible for sample collection and communication with the contract laboratory regarding the sampling shipment schedule. They are also responsible for writing the QAPP.

ORGANIZATIONAL CHART



1.5 PROBLEM DEFINITION/BACKGROUND

1.5.1 Background

The Monterey County Water Resources Agency's (Agency) mission is to manage, protect, and enhance the quantity and quality of water for present and future generations of Monterey County (County). Monterey County, located along the California Central Coast, covers 3,322 square miles (8604 km^2) and has a resident population of 424,842 (Fact Finder, 2007). The County supports a $3.4 billion agricultural industry (Ag Commission, 2006) and a $1.75 billion tourism industry (EPA Grant R9#03-238). The primary land use within the Salinas Valley is agricultural. Since the 1940's, irrigated acreage within the valley has increased substantially. Coastal regions of California are subject to rapid urbanization, and the milder coastal climate supports year-round intensive cultivation of many high-value crops (Hunt et al, 2003). As agricultural and urban areas have expanded, so have the water needs of the County (EPA Grant R9#03-238).

The Agency uses a network of wells to monitor ground water conditions in the Salinas Valley Ground Water Basin (Basin) (Geomatrix, 2001). The Basin is situated entirely within the County (EPA Grant R9#03-238). The Salinas Valley is surrounded by the Gabilan and Diablo Ranges on the east, by the Sierra de Salinas and Santa Lucia Range on the west, and is drained by the Salinas River, which empties into Monterey Bay in the north (DWR 1946a) (Fig 1). Four subareas based on differences in local hydrogeology and recharge have been identified (White Paper, 1995; DWR, 2003). These are known as the Pressure, East Side, Forebay, and Upper Valley subareas (Fig 2). These subareas are hydrologically and hydraulically connected (EPA Grant R9#03-238); all information collected to date indicates there are no barriers to the horizontal flow (of ground water) between these subareas (White Paper, 1995). The "boundaries" between these subareas have been identified as zones of transition between different depositional environments in past millennia (White Paper, 1995).

The primary surface water features overlying and influencing the Basin's hydrology are the Salinas River and its tributaries, the Nacimiento and San Antonio reservoirs, and the Monterey Bay (EPA Grant R9#03-238). The Salinas River extends approximately 120 miles from the river's headwaters in San Luis Obispo County, near Santa Margarita, and flows north/northwest and discharges into the Monterey Bay National Marine Sanctuary near Moss Landing in Monterey County (EPA Grant R9#03-238). The Nacimiento and San Antonio reservoirs, located in the upper watershed, serve as storage and flood control for the Basin.

Ground water recharge in Salinas Valley is principally from infiltration from the Salinas River, Arroyo Seco Cone, and to a much lesser extent, from deep percolation of rainfall (White Paper, 1995). Deep percolation of applied irrigation water is the second largest component of the ground water budget, but because it represents recirculation of existing ground water rather than an inflow of "new" water, it is not considered a source of recharge (White Paper, 1995). Nitrate contamination of ground water poses a significant threat to the beneficial use of ground water for drinking water and for some agricultural water uses (White Paper, 1995). Nitrate concentrations exceed drinking water standards in some parts of the Basin (MCWRA, 1997). The principal source of nitrates to ground water is almost certainly excess fertilizer that is leached by rainfall and applied irrigation water (White Paper, 1995).

Seawater intrusion is another source of inflow to the Basin, but because it is not usable freshwater it is also excluded as a source of recharge (White Paper, 1995). Historically, ground water flowed from subareas to the south and east through the (Pressure) and seaward to discharge zones in the walls of the submarine canyon in Monterey Bay (Durbin et al 1978; Greene 1970). Within the Pressure subarea, due to the impermeable nature of the clay aquitard above the 180-Foot Aquifer, recharge from precipitation, agricultural return flows, or river flow is nil (DWR, 2003). Instead, recharge is from underflow originating in Upper Valley areas such as the Arroyo Seco Cone and Salinas River bed or the East Side subarea, and more recently, from seawater intrusion (DWR, 2003). Heavy pumping of the Pressure-180 Foot and Pressure-400 Foot aquifers has caused significant seawater intrusion into both of these aquifers, which was first documented in the1930's (DWR 1946a). Ground water flow in the northernmost area of the Pressure subarea has been directed from the Monterey Bay inland since this time (DWR, 2003). With increased pumping in the East Side subarea since the 1970's, ground water flow is dominantly northeast in the Pressure's central and southern locations (DWR, 2003).

Declining ground water levels in the Pressure and East Side subareas, Basin overdraft, ground water contamination, including nitrate and seawater intrusion are serious concerns for the Agency. (EPA Grant R9#03-238)

1.5.2 Program Objectives

The Agency is charged with management of the Basin's ground water resources. Much of the Agency's investigative work pertaining to the occurrence and use of ground water is to identify the quality, quantity, and temporal trends of ground water resources within the County. A network of monitoring wells provides the information needed to manage and protect ground water resources and sustain beneficial uses. In order for the Agency to develop projects to mitigate problems, such as seawater intrusion, local ground water overdraft, and high nitrate concentrations, the Agency must first implement an effective and accurate monitoring program to identify the extent of the potential problem.

The Ground Water Quality Monitoring Objectives are:
-continued monitoring of the ambient ground water quality, including general minerals
-continued monitoring of coastal aquifers (including Pressure Deep Aquifer) for detection of advancing seawater intrusion
-continued monitoring to determine distribution of conductivity in ground water
-continued monitoring to determine distribution of nitrate in ground water and identification of problem areas

Ambient ground water quality will be used to establish a cohesive and succinct Water Quality Management Plan in accordance to the work begun under EPA-I and continued under EPA-II. For the purposes of this QAPP, the EPA-I grant has funded the Agency to develop this QAPP. The EPA-II grant is funding the Agency to implement the sampling described in the QAPP.

1.5.3 Program Goals

The ground water monitoring objectives in the Salinas Valley will be met by the goal of sampling all 344 wells located throughout the four subareas within the Salinas Valley Ground Water Basin, during the 2007 summer field season.

The ground water monitoring objectives along the coast, specifically located within the Pressure subarea will be met by the goal of sampling all 85 monitoring wells, during the 2007 summer field season.

The Agency's overarching goal for this program is the continued monitoring of the Basin's ambient ground water for use in the management of this important resource, and *not* for the purpose of regulatory control.

1.6 PROJECT/TASK DESCRIPTION

1.6.1 Work Statement and Produced Products

The Salinas Valley Ground Water monitoring will sample 344 wells located throughout the Salinas Valley Ground Water Basin for ten constituents (Table 1). Each well will be sampled once. Samples will be collected during the 2007 summer agricultural growing season and analyzed for a complete mineral panel. The Coastal Ground Water monitoring will sample 85 wells located within the area of historic seawater intrusion. Each well in the Coastal Program will be sampled once a month during the agricultural growing season. The first month's sample will be analyzed for complete mineral panel and the two remaining sampling events will by analyzed for partial mineral panel (three constituents) (Table 1). All water monitoring samples will be delivered the same day as collected to the contract laboratory for analysis.

All ground water sampling locations are accessible using a 4-wheel drive vehicle. All samples will be collected as a grab sample. All sampling locations will be recorded using global positioning system (GPS) equipment, and digital pictures will be taken at each site.

After laboratory analysis and data validation is completed, a technical memorandum (EPA II, XP-96995301 Task 2 Water Quality Assessment) will be written and submitted to US EPA. The technical memorandum, EPA II, XP-96995301 Task 2 Water Quality Assessment, will include result tables for chloride, nitrate, and specific conductivity, and maps of chloride, nitrate, and specific conductivity gradient contours.

1.6.2 Constituents to be monitored and measurement techniques

Samples will be sent to an off-site laboratory for analysis. Ground water samples will be analyzed for either complete or partial mineral panels. A complete mineral panel includes calcium, cation-anion balance, chloride, conductivity, magnesium, nitrate, pH, potassium, sodium, sulfate, and total alkalinity. A partial mineral panel consists of chloride, conductivity, and nitrate.

Sample analysis will be preformed at the Monterey County Consolidated Chemistry Laboratory (CCL), which is part of the Environmental Health Department. Listed below is the laboratory's contact information and ELAP Certification number.

Laboratory Name	*Contact Information*	*Abbreviation*
Monterey County Consolidated Chemistry Laboratory ELAP Certification No 1395	1270 Natividad Road Salinas, CA 93900 Phone: 831-755-4516 Fax: 831-755-4652 http://www.co.monterey.ca.us/health	CCL

1.6.3 Project Schedule

The proposed project schedule is summarized below.

Prior to Sample Collection	
January 2006 - January 2007	: Develop project strategy
15 January, 2007	: Submit Draft QA Project Plan
22 March, 2007	: Receive review comments on QA Project Plan from US EPA
6 July, 2007	: Submit Draft Final QA Project Plan
13 July, 2007	: Obtain QA Project Plan approval (to begin fieldwork)
20 July, 2007	: Submit Final QA Project Plan (signatory copy) EPA R9#03-238; X-97994701-0
Sample Collection	
August 2007 - September 2007	: Coastal Ground Water (each well 3x, once per month)
August 2007 - September 2007	: Salinas Valley Ground Water (each well 1x)
Post Sample Collection	
November 2007	: Compile all remaining laboratory analyses reports
1 - 15 December, 2007	: Evaluate laboratory data for QA/QC requirements
15 December, 2007	: Copy of analytical results sent to well owner/operators
16 - 31 December, 2007	: Summarize and tabulate data
January 2008	: Write Technical Memorandum (EPA II, XP-96995301 Task 2 Water Quality Assessment)
March 2008	: Submit Technical Memorandum (EPA II, XP-96995301 Task 2 Water Quality Assessment) to US EPA

1.6.4 Geographical Setting

The Salinas Ground Water Basin encompasses approximately 537.5 square miles (1,392 km^2). The regional ground water flow is to the northwest. Seawater intrusion is a result of coastal pumping (Figure 3). Ground water pumping can dramatically impact localized coastal ground water flow.

1.6.5 Constraints

Ground water samples must be taken from the well while the pump is operating to ensure that the sample is representative of the aquifer and not standing water within the well casing. The Agency wants to measure the water quality when the aquifers are stressed due to pumping. For this reason the 2007 field sampling season will coincide with the agricultural irrigation season.

1.7 DATA QUALITY OBJECTIVES FOR MEASUREMENT DATA

This section describes the data objectives of the project and defines the measurement performance criteria deemed necessary to meet those objectives.

1.7.1 Objectives and Project Decisions

In Monterey County the Salinas Valley and Coastal Ground Water ambient monitoring programs are designed to characterize the ground water quality conditions of the Basin. All data generated from the sampling program in this project are tabulated as they have been over the many years of the program. Data generated from these monitoring activities allows the Agency to track changes in ground water quality over time and to assess potential impacts to ground water in the Basin. Water resource management and policy decisions may follow based on maps and tabulated data generated as a part of this project (program).

For the coastal ground water sampling program, the general mineral data are evaluated to determine if seawater intrusion is progressing landward as indicated by increasing well chloride values. The chloride values for all wells are evaluated, and then the 500mg/L chloride isochlor contours are mapped for the two coastal aquifers. When the maps are published, the information generated by MCWRA staff and approved by the MCWRA Board of Directors, is posted and passed on to Monterey County departments, regional government regulatory agencies, and public / private entities via the MCWRA web page, presentations, public meetings, and networking.

Monterey County departments such as the Planning Department and Health Department utilize the advancement of seawater as it relates to potable water and public health, while the agricultural community becomes aware of the proximity of their wells to the intrusion advancement, and the possible need for funds to drill new, deeper, wells and destroy the older high nitrate wells. Actions by regulators, depending on the entity, are related to prioritization of Regional Watershed and Water Quality Action Plans, and the associated success of MCWRA capital projects to halt seawater intrusion as governed by the State Water Resources Control Board adjudication process.

Actions by the MCWRA after the landward advancement of seawater have been ongoing for many years. Actions include consideration of more stringent Monterey County well drilling ordinances for assuring the continued prevention of cross-aquifer contamination in the coastal Salinas Valley, *"Zone 6 Drilling Standards", April 19, 1988;* the development and implementation of the Monterey County Recycling Projects, a tertiary treatment plant and treated water distribution system, to help further reduce agricultural pumping in the coastal Salinas Valley for halting seawater intrusion; and future use of these data will be utilized by the newly established Seaside Watermaster for comparison to and the development of the Monterey Peninsula seawater intrusion front.

For the Salinas Valley general mineral ground water sampling program, nitrate data tabulation and map representation has been the focus of the MCWRA for many years. All results over the laboratory's practical quantitative limit generated from this program are tabulated to evaluate the minimum, maximum, median, and mean value of nitrate as NO_3 in mg/L for each of the Salinas Valley Hydrogeologic Subareas.

For the Salinas Valley monitoring program, the Agency sends the general mineral testing results, including nitrate, to the well owners/growers who operate the wells sampled. Also, in this transmittal, the well operators are also provided with a conversion sheet of the nitrate concentration *from mg/L nitrate as NO_3 to pounds of nitrate per acre inch of water*, agricultural terms. If a nitrate value in ground source water is elevated, then that growers can incorporate this available nitrate into their fertilizer crop scheduling. This is a method for growers to reduce applied nitrate to crops, while maintaining maximum crop productivity.

And, as with the Coastal monitoring program, the tabulated and mapped Salinas Valley nitrate data are posted and passed on to Monterey County departments, regional government regulatory agencies, and public / private entities via the MCWRA web page.

The MCWRA uses the well nitrate data during the technical well application review process. Monterey County Health Department (Heatlh Department) issues well permits after the Agency provides a technical review of well applications for new, abandoned, or repaired wells. The well application proposal is evaluated with other well construction and water quality within a one miles radius of the new well and represented on a map. Agency staff makes qualitative recommendations to the Health Department on the new well's sanitary seal based on other well seals, the perforated intervals, and the nitrate values of wells in the area. The final decision for the well construction is made by the Health Department after the well drilling progresses.

Actions taken by the MCWRA are conditional. If extreme nitrate values are observed in agricultural production wells, then re-sampling of the wells may take place to confirm the elevated concentrations and may lead to increased sampling points for wells in the same vicinity and with the same well design. Continued increases in Salinas Valley ground water nitrate values could lead to special nitrate investigations on movement of nitrate in ground water and also outreach to the public on the reduction of nitrate to the environment.

1.7.2 Action Limits/Levels

Since the overarching goal for this project is the continued monitoring of ambient ground water, the Agency has set no specific water quality standards. As a result, the laboratory's practical quantitation limits (PQL) will serve as the Project Action Levels (PALs). Table 1 provides a listing of the parameter to be sampled and a summary of the laboratory's method detection limit, those minimum concentrations that can be detected above the instrumental background/baseline signal noise. Table 1 also provides the PQL, lowest calibration standard and PALs required by the Agency for the QAPP. The quality limits listed are deemed acceptable by the Agency to meet the project objectives.

1.7.3 Measurement Performance Criteria

The objective of data collection for this Monitoring Project is to produce data that represent the *in situ* conditions of the ground water. This objective will be achieved by using accepted standard methods for water collection and analysis and defining data quality indicators (DQIs) for each analytical parameter. The DQIs include accuracy, precision, comparability, sensitivity, completeness, and representativeness and are defined below and presented in Table 2. Some DQIs will be assessed quantitatively, while others will be qualitatively assessed. Example calculations have been provided for quantitative assessments and appropriate quality control (QC) samples have been identified. Laboratory Data Quality Objectives are given in Table 3.

Accuracy, or bias, is a measure of how close a result is to the expected value of the target analyte in a sample. Accuracy will be determined by the analysis of certified reference materials and matrix spikes, where the results can be compared with an expected value and expressed as %recovery. This is an assessment of laboratory analytical methods. For Laboratory Control Samples (LCS), it will be expressed as %recovery by the following equation:

$$\%Recovery = \frac{X}{T} \times 100$$

where,

X = Measured concentration
T = True spiked concentration

or, for Matrix Spike (MS) samples, by the following equation:

$$\%Recovery = \frac{(B - A)}{T} \times 100$$

where,

B = Measured concentration of spiked sample
A = Measured concentration of unspiked sample
T = True spiked concentration

The frequency of the LCS and MS samples associated with the analytical parameters will be 5%. MS and MSD samples will be spiked at 3-10 times the native sample concentration.

Accuracy/bias as related to contamination involves both field and laboratory components. Field blanks will be collected at a frequency of 5%. Laboratory blanks will be prepared and analyzed at a one per batch or 5% frequency.

Precision is concerned with the ability to quantitatively repeat results. To demonstrate the precision of a method or instrument, field duplicates will be collected, analyzed, and their results compared. Precision is expressed as relative percent difference (RPD) by the following equation:

$$RPD\ (\%) = \frac{|X_1 - X_2|}{(X_1 + X_2)/2} \times 100$$

where,

X_1 = Original sample concentration
X_2 = Duplicate sample concentration
$|X_1 - X_2|$ = Absolute value of $X_1 - X_2$

Field duplicates will be collected at a frequency of 10% for the first two sampling events. If the criterion of <25% RPD is met, then the remaining field duplicates will be collected at a 5% frequency. Laboratory duplicates will be prepared and analyzed at a one per batch or 5% frequency.

Comparability of the data can be defined as the similarity of data generated by different monitoring programs. Comparability helps to measure the scientific coherence and validity of a project. This objective is addressed primarily by using standard sampling and analytical procedures. Additionally, comparability of analytical data is addressed by result comparison of certified reference materials.

Sensitivity of the analytical instrument or method is the ability to detect and quantify an analytical parameter at the concentration level of interest. Sensitivity can be evaluated by method or instrument detection limit studies (MDL and IDL) or calculated practical quantitative limits (PQL) and method report limits (MRL).

Completeness is a measure of the amount of successfully collected and validated data relative to the amount of data planned to be collected for the project. Project completeness is typically based on the percentage of the data needed for the program or study to reach statistically valid conclusions. Because the SVIWMP is a monitoring program, data that are not successfully collected for a specific sample event or site can typically be recollected at a later sampling event. For this reason, most of the data planned for collection can not be considered statistically critical, and it is difficult to set a meaningful objective for data completeness. However, some reasonable objectives for the data are desirable, if only to measure the effectiveness of the Monitoring Program. %Completeness will be expressed by the following equation:

$$\%\text{Completeness} = \frac{N}{T} \times 100$$

where,

N = Number of usable results
T = Total number of samples planned to be collected

A completeness goal of 90% has been set for the ground water monitoring program.

Representativeness can be defined as the degree to which the environmental data generated by the monitoring program accurately and precisely represent actual environmental conditions. This objective is addressed by the overall design of the monitoring program. Specifically, assuring the representativeness of the data is addressed primarily by selecting appropriate locations, methods, times, and frequencies of sampling for each environmental parameter, and by maintaining the integrity of the sample after collection. Representativeness judges how well a single sample can describe the conditions of an entire sample population. Accurate, artifact-free sampling procedures and appropriate sample homogenization achieve representativeness.

1.8 TRAINING REQUIREMENTS/CERTIFICATION

1.8.1 Training of Field Personnel

A specialized training requirement for this project is for the use of Global Positioning Systems (GPS) Technology. Training in the use of handheld GPS units and software will be performed on an individual basis between the trainer and the trainee. Training will be provided by staff experienced in the use of GPS and Geographic Information Systems (GIS).

Field personnel will also be given initial instructions prior to the beginning of sample collection activities. These initial instructions will help familiarize the field personnel with sample collection containers, sample handling techniques, chain-of-custody forms, and sample transport. New field personnel will be accompanied by a trainer in the field as part of the initial instructions. All field samplers have completed a four-hour training session in the field. Training included confirmation of the well ID electrical meter tag number and MCWRA tag number, recognizing the appropriate sampling port, sample collection technique, proper handling of the sample during transportation to the lab, and accurate completion of the chain-of-custody forms. The completion of field training session has been documented in the Agency's personnel files.

All field personnel will follow sample collection procedures from accepted methods for the collection of ground water. Sample collection will follow protocols in accordance with recommended guidelines established by the U.S. Geological Survey (USGS) for ground water collection as described in the

National Field Manual for the Collection of Water-Quality Data, U.S. Geological Survey, Techniques of Water-Resources Investigations, Book 9, Chapters A1-A9. Field personnel will be familiar with the above-mentioned document.

Field personnel will also read and be familiar with this Quality Assurance Project Plan (QAPP) prior to beginning any sample collection activities.

1.8.2 Training of Laboratory Personnel

No specialized training of laboratory personnel is required for this project. The ground water constituents to be analyzed by the laboratory are routine and do not require additional expertise. In addition, the laboratory's QA plan notes that analysts 'must conduct sufficient preliminary tests using the methodology and typical samples to demonstrate competence in the use of the measurement procedure'.

1.8.3 GPS Training Documentation

Documentation of field personnel training for GPS includes: the name of the staff member being trained, the training date, the name of the trainer (instructor), and a checklist of satisfactory completion of each step. These training records are stored inside a monitoring binder and filed in the Agency's Water Quality Section. A sample GPS training record is attached in Appendix A.

Training documentation of laboratory personnel for routine methods is kept on file at the Consolidated Chemistry Laboratory (CCL). The CCL has written a policy regarding laboratory personnel training in their lab QA plan.

1.9 DOCUMENTATION AND RECORDS

1.9.1 QA Project Plan Distribution

The MCWRA Hydrologist/ Team Lead will safeguard the original QAPP and any subsequent revisions (both hard and electronic), plus keep a record of the distribution list in order to send out amendments to the QAPP and retrieve any obsolete versions (from the individuals listed earlier in section 1.3).

1.9.2 Field Documentation and Records

All field documentation generated by the sampling program will be kept on file in the Water Quality Section of the Agency. Field documentation includes field sheets, chain of custody (COC) forms, photographs, and labels (see Appendix B for examples of each).

1.9.2.1 Field Sheets

Field sheets are used to aid in the identification of each ground water source (well). The field sheets list the name of each well (as assigned by the well owner) and the State Well Number. The field sheets also contain a section that describes who the sampler should contact in order to have a well turned on, where to find the sample port, etc. The sampler is responsible for recording the sample date and time on the field sheet. Site observations should be written in the comments section of the field sheet, and initialed by the sampler. Site observations may include information such as detailed directions to the well location, changes to the electrical meter tag number, and the owner contact name and phone number. Field sheets also contain PG&E electrical meter numbers, which can be either verified or updated while the sampler is in the field.

Field sheets are double-checked by the sampler for completeness and accuracy while still in the field. The sampler should look for: incomplete and/or missing data/omissions, incorrect or invalid information, and clarity problems. Any discrepancies should be cleared up before the sampler leaves the field. Data that has been entered by one field sampler will be reviewed by a different field sampler to verify that no transcription errors have occurred. These data entry reviews will take place at least weekly.

Original field sheets are categorized (according to Coastal wells or Salinas Valley wells) inside binders which are kept in the Water Quality Section at the Agency for a period of 10 years. After such time, the copies are transferred to the Monterey County Record Retention Center and archived for a period of 5 years.

Data collected on field sheets will also be recorded electronically and stored in an Access database inside a shared network drive that is backed-up on a daily basis. These electronic records will be retained permanently.

1.9.2.2 Chain Of Custody (COC) Forms

Chain-of-custody (COC) forms will be provided by the Consolidated Chemistry Laboratory and filled out while the sampler is in the field. The COC will accompany the samples at all times in order to insure the custodial integrity of the samples. A sample is considered to be in custody if it is: in someone's physical possession, in someone's view, locked up, or secured in an area that is restricted to authorized personnel.

Care should be taken to protect the COC from physical damage (i.e., water, wind, etc). The COC will have the following information:

- Client Code
- Client Name
- Client Address
- Client Phone Number
- Client Fax Number
- Report Attention
- Sampler Name
- Collection Date
- Collection Time
- Sample Site (identified by state well identification number) or QC sample (if appropriate)
- Sample Type (all of the samples in this project will be **grab samples**)
- Matrix (all of the samples in this project will be **ground water** samples)
- Analyses Requested

Upon relinquishing the sample(s) to the Consolidated Chemistry Laboratory, the sampler will sign and date the COC form. Lab personnel will then receive the sample(s), mark the date and time received, assign unique lab identification numbers (lab IDs) to each sample, and sign the COC form. The signed COC form is then photocopied; the lab keeps the original, and a copy is given to the sampler.

Hard copies of COC forms are categorized (Coastal wells or Salinas Valley wells) inside binders which are kept in the Water Quality Section at the Agency for a period of 10 years. After such time, the copies are transferred to the Monterey County Record Retention Center and archived for a period of 5 years.

Electronic COC information is also stored in an Access database inside a shared network drive that is backed-up on a daily basis. These electronic records will be retained permanently.

1.9.2.3 Photographs

The Agency maintains a photo catalog which contains photographs of the Coastal well site locations. The photo catalog is carried into the field to assist with the identification of each well. If there are significant changes to the appearance of the well site, then staff will take a new digital photo. The old photo in the catalog will then be replaced with a copy of the new photo. Photographs will be taken of the Salinas Valley wells after confirming the correct well location of each.

Two photographs of each well location will be taken using a high resolution digital camera. One photograph will be from a distance of 100 ft. or more to aid in the identification of the correct site location. The second photograph will be a close up of the well and pump head, which will be used to verify location of the correct sampling port. Printed hard copies of these two photographs for each well will be kept in the photo log book and labeled with the state well identification number as listed on the field sheets.

Photographs will serve to help verify information entered into the field sheets. Photographs are stored in an electronic database and labeled according to site number and date last photographed. Previous photos will be archived electronically for retrieval purposes if the need arises.

1.9.2.4 Labels

Labels for each sample site are pre-printed on Avery (size 5163) sheets (10 labels per sheet). Indelible ink will be used on the labels and clear packing tape will be applied over the label to prevent it from coming off if it gets wet. Each label will have the following information:

- Sample Site (pre-printed)
- Collection Date (to be filled out in the field)
- Collection Time (to be filled out in the field)
- Analyses Requested (complete or partial mineral panel)
- Sampler Name (to be filled out in the field)
- Comments (if any)

The sample site name (state well identification number) will serve as the unique identifier for each sample (e.g. 14S/02E-08M02). When the samplers arrive at the CCL a unique in-house lab number is assigned to each sample.

1.9.2.5 Field Quality Control Sample Records

Quality Control samples from the field will be identified using the state well identification number plus either -1 or -2 (e.g. 14S/02E-08M02-1, for a field blank).

- -1 = Field Blank
- -2 = Field Duplicate

1.9.3 Laboratory Documentation and Records

The Consolidated Chemistry Laboratory will keep a sample receiving log containing the completed COC forms submitted with the samples collected for this project. The CCL will keep records of all analyses performed as well as associated QC information, including: laboratory blanks, laboratory duplicates, matrix spikes, matrix spike duplicates and laboratory control samples Hard copy data of analytical results will be maintained for three years by the CCL. The CCL maintains a Laboratory Information Management System (LIMS) which will be used to store electronic data.

The data generated by the CCL for each sampling event will be compiled into individual data reports. The individual data reports will include the following information:

- Sample results and associated Quantitative Limits (QLs)
- Cation-Anion Balance Sheet
- QC check sample records and acceptance criteria for the following:
  - Laboratory Control Sample(s)
  - Matrix Spike(s)
  - Matrix Spike Duplicate(s)
  - Analytical Duplicate(s)
  - Method Blank(s)
- Project narrative including a discussion of problems or unusual events (including, but not limited to, topics such as: receipt of samples in incorrect, broken, or leaky containers, with improperly or incompletely filled out COC forms; receipt and/or analysis of samples after the holding times have expired; summary of QC results exceeding acceptance criteria; etc.)

The above information is logged into the LIMS database at CCL.

The Public Health Chemist of the Consolidated Chemistry Laboratory will be responsible for reviewing, validating, and/or qualifying results on the data reports. Any deviations from sample preparation, analysis, and/or QA/QC procedures will be documented. Departure from QC acceptance limits will be highlighted. Once the data reports are finalized, the hard copy will be sent to the Project QA Manager at the Agency.

At the end of the sampling season, all data for both programs (Coastal and Salinas Valley) will be electronically transferred to the Agency. After data verification, the Agency Hydrologist/ Team Lead will upload the data to the Agency's Water Resources Agency Information Management System (WRAIMS) relational database.

1.9.4 Technical Reviews and Evaluations

Technical reviews and evaluations are limited to Field Activities and Laboratory Data Review Checklists.

1.9.4.1 Field Activities Review Checklist

Field personnel will be required to fill out a Field Activities Review Checklist as part of the double-check process upon returning from the field after each sampling event (see Appendix C).

1.9.4.2 Laboratory Data Review Checklist

Laboratory data reports from the CCL will be routed to the Project QA Manager at the Agency, who will do a preliminary assessment of the data. The data reports will then be given to the Agency

Hydrologist/ Team Lead who will be responsible for completing a Laboratory Data Review Checklist (see Appendix C).

1.9.5 Technical Memorandum

The Agency Project QA Manager is responsible for the preparation of the technical memorandum. The technical memorandum will be written in the "post sample collection" phase (see section 1.6.3). The technical memorandum will be submitted to USEPA for review by the EPA Region 9 Project Manager.

The technical memorandum will contain the following elements:

- Table of results for Chloride
- Table of results for Nitrate
- Table of results for Specific Conductance
- Map of Chloride contours for 500 mg/L values
- Map of Nitrates showing those sites which have values above and below the Drinking Water Standard Limit of 45 mg/L (nitrate as NO3)
- Map of Conductivity contours

2.0 DATA GENERATION AND ACQUISITION

2.1 SAMPLING DESIGN

In the Salinas Valley, there are four hydrogeologic subareas: Pressure, East Side, Forebay, and Upper Valley. All four subareas were selected using a directed sampling design approach. These subareas were selected deliberately based on knowledge from previous monitoring work to contain analytes of interest, specifically nitrate and conductivity in the Salinas Valley Program, and chloride and conductivity in the Coastal Program. Actual sampling sites/wells within the Salinas Valley Basin Monitoring Program were chosen using a non-deliberate sampling approach. The wells included are acquired opportunistically. Site accessibility is a key issue for sampling. Permission of property owners must be secured before accessing private wells.

There are just over 1700 active wells in the Salinas Valley. Of this total number of wells, 344 wells make up the Salinas Valley Ground Water program and 85 wells make up the Coastal Ground Water program. The wells that make up these two programs have all been sampled in the past; some have data sets as far back as the 1950's, when this was a State of CA Department of Public Works (now the Department of Water Resources) program. The Agency wants to keep as complete and continuous a data set for each of these wells as possible.

Due to the time constraints the Agency is facing during this shortened 2007 field season, June - September, staff will prioritize which wells within the Salinas Valley portion of this project will be sampled. Wells to be sampled first will be located within approximately one mile radius of municipalities and industries (such as vegetable packing plants). We refer to these areas as high beneficial use areas. Ground water wells will be identified by State Well Numbers (Township, Range, Section, and Subsection).

All wells are high production agricultural wells. All wells are sampled in the same way, if the pump is in operation then a sample will be collected. If the pump if not operating then the field sampler will note it on the field sheets and come back to the well at a later date when the well is in operation. The pump must be operating for a sample to be collected. The age of well does not alter sampling protocols. If a well is found to have been abandoned since the Agency last sampled the well, a notation will be made on the field sheets and the well will be removed from future sampling efforts.

2.1.1 Salinas Valley Ground Water

While it is known that high levels of nitrates exist in some aquifers of the Salinas Valley Ground Water Basin, a significant sampling effort to determine the extent in the ground water has not been conducted by the Agency for several years. There are a total of 344 sample locations within the Salinas Valley monitoring program. Sample locations are operational ground water wells, the majority of which are used for agricultural irrigation. The Pressure subarea has 158 wells, the East Side subarea has 66 wells, the Forebay has 84 wells, and the Upper Valley has 35 wells (Figures 4-7). Each of these wells will be sampled once during the 2007 summer field season (July-September). The primary criterion currently used to determine if a well will be included in the Salinas Valley monitoring program has been its status as previously sampled. This program is an ongoing ambient ground water monitoring program and continuity in sampling the same wells each field year is of prime importance, especially for water quality trend analysis. Other factors that are important in deciding if a well should be included in the monitoring program are; copy of the well completion report (commonly referred to as the driller's log), location of the perforation interval along the well casing to determine which aquifer is sampled, age of the well, and construction method used to drill the well. Additionally it is useful to know the proximity of the well to other water use (industrial, municipal, or domestic) areas. A list of Salinas Valley well names and locations are given in Table 4. All wells on this program are planned to be part of the monitoring design for subsequent years. Until these monitoring wells are abandoned or destroyed, they will remain part of this program.

2.1.2 Coastal Ground Water

The Agency currently conducts a seawater intrusion monitoring and mapping program (EPA II). This program will continue to evaluate the extent and status of seawater intrusion in the coastal areas of the Salinas Valley Basin (EPA II). The Coastal portion of the ground water program contains 85 wells, most of which are located in the Pressure subarea (Figure 8). Each well will be sampled three times, once each month of the summer 2007 field season (July-September). The first sample collection at each well will be analyzed for a complete mineral panel (Table 1), and following two collections will be analyzed for a partial mineral panel (Table 1). There are 21 wells located in the Pressure 180-Foot Aquifer, 52 wells within the Pressure 400-Foot Aquifer, two wells with perforations within both the Pressure180-Foot and 400-Foot Aquifers, four wells are located within the Pressure Deep Zone Aquifer, three in the East Side Deep Aquifer, one in the East Side Shallow Aquifer, and one in the Prunedale Aquifer. The principal criterion for inclusion in the Coastal monitoring program is historical sampling and well availability. Additional criteria for selecting a well for inclusion into the Coastal monitoring program are: a well completion report, location of the perforation interval along the well casing to determine which aquifer is sampled (180, 400, or deep zone AQ), well age, and well construction type. A list of Coastal sites and their representative aquifers are listed in Table 5.

It can not be stressed enough how important the continued monitoring of these ground water wells are for the Agency to meet its mission of monitoring the quality of the County's ground water resources. Some of these well have been sampled since the 1950's and the loss of such a long term water quality record within the County of Monterey would irreplaceable.

2.2 SAMPLING METHODS

The objectives of the sampling procedure are to minimize changes in ground water chemistry during sample collection and transport to the laboratory, and to maximize the probability of obtaining a representative, reproducible ground water sample. This well-volume purging procedure provides a reproducible sampling technique with the goal that the samples obtained will represent water quality over the entire screen interval of the well.

Standing water in the well casing can be of a different chemical composition than that contained in the aquifer to be sampled. Solutes may be adsorbed on to, or desorbed from the well casing material, oxidation may occur, and biological activity is possible. Therefore, the stagnant water within the well must be purged so that the sample is representative of the aquifer. As a result, a well may be sampled only after the pump has been in operation for at least 15-20 minutes.

All the wells included in this project, from both the Salinas Valley area and the Coastal monitoring area are high production agricultural wells that contain deep turbine pumps operating at 500-1200 gallons per minute (gpm). Over the years of managing the ambient monitoring program, the Agency has determined that operating a deep turbine pump for 15-20 minutes before taking a sample is sufficient time to clear the entire well casing of three well volumes for ensuring a representative well sample. For referencing well casing volume, the Agency uses the well casing size provided in the well completion reports (driller's log) for each of the wells included in this monitoring program (National Field Manual for the Collection of Water-Quality Data, Chapter A2).

Sample bottles and caps are rinsed three times with ambient ground water prior to collection. The sample container is then filled, tightly capped, and labeled. No field sample filtration is required. Samples are put into a cooler with ice immediately and maintained at 4°C and delivered to the laboratory daily. See Table 6 for sample collection requirements. Extra sample containers, caps and field supplies will be carried in the truck as back-up should any problem arise in the field. Additionally, the Field Sampler will carry and maintain an updated hardcopy of the QAPP in the field to be used as a reference.

The following precautions will be followed in order to limit sampling error at the wellhead:

- Operate the pump long enough to produce water that is representative of the aquifer and not stagnant water from the casing.
- Take samples at the wellhead or near the wellhead and away from fertilizer injection ports.

Sample collection will follow protocols in accordance with recommended guidelines established by the U. S. Geological Survey (USGS) for ground water collection as described in the National Field Manual for the Collection of Water-Quality Data.

The National Field Manual for the Collection of Water-Quality Data, U.S. Geological Survey, Techniques of Water-Resources Investigations, Book 9, Chapters A1-A9 is maintained as a web-based document and is located at http://pubs.water.usgs.gov/twri9A. Updates and revisions for the National Field Manual can be found using this web-based approach.

2.3 SAMPLE HANDLING AND CUSTODY

This section describes how all samples will be treated after collection, during transport, and upon arrival at the CCL. It also includes information on proper sample disposal after laboratory analysis.

2.3.1 Sample Containers and Preservatives

Sample containers to be used in this project are high density polyethylene (HDPE), one pint (~0.5 L) and 0.5 gallon (~2 liter) sizes, for partial mineral or complete mineral analyses, respectively. The Agency has used these same sample container types during previous years of this ongoing ambient monitoring program and has never had any problems with container contamination issues. Field blanks will be closely monitored and, should a problem arise, corrective actions will be taken. Only one container (pint *or* half gallon) is needed per sampling site to provide the necessary volume to run the required lab analyses (see Table 6). Sample containers and caps are purchased in bulk from a plastic container manufacturer (Consolidated Container Company). The caps for the containers are packaged separately. The containers and caps are clean upon receipt, as long as they arrive with the outer cardboard packaging intact. The containers will be kept in a closed, dry environment away from the outside elements. Sterility is not of importance because this sampling project does not include microbiological testing. As previously mentioned, all containers and caps will be rinsed three times with ambient sample water prior to sample collection.

Sample containers are labeled with pre-printed labels, which lists which panel of analytes is requested, either complete mineral or partial mineral. The collection date, collection time, and sampler name are recorded in the field with an indelible marker. After being filled out, labels will be covered with clear plastic tape (packaging type) to protect the labels from destruction during transport.

No chemical *field preservation* of the samples is required. All samples will be kept at 4±2°C.

Preservation of samples, if required prior to analysis, will be the responsibility of the contract lab (CCL). Part of the CC lab sample receiving protocols includes lab personnel verifying, at the time of sample receipt, if any samples require lab preservation. Refer to Table 6 for listings of preservatives for specific analytes.

2.3.2 Sample Packaging and Transport

All samples will be handled, prepared, transported and stored in a manner so as to minimize contamination and spills. After collection, sample caps will be checked for tightness, and the samples will be put in ice chests immediately. During travel between sites, ice chest lids will be kept tightly closed in order to keep the samples at the correct temperature and protect them from sunlight. Ice used for maintaining sample temperature will be double-bagged inside durable plastic bags (Ziploc type) and be of sufficient quantity so that all samples will stored at 4±2°C. Maximum holding times for specific analytes are listed in Table 6.

2.3.3 Sample Custody

Chain of custody (COC) procedures require that possession of samples be traceable from the time the samples are collected until completion and submittal of the analytical results. A completed chain of custody form is to accompany the samples to the contract laboratory (CCL). Requirements for COC paperwork can be found in Section 1.9.2.2 of this document.

All samples collected for this project will be transported from the field to the CCL via an Agency vehicle. The field sampler will deliver the samples directly to the CCL daily; there will be no intermediary transfers. Samples need to arrive at the CCL no later than 15:00, to ensure log-in and laboratory preservation. Personnel at the CCL will examine the samples for correct documentation and holding times. The CCL will follow sample custody procedures as outlined in their QA plan (see Appendix D).

2.3.4 Sample Disposal

All samples remaining after successful completion of analyses will be disposed of properly. It is the responsibility of the personnel at the CCL to ensure that all applicable regulations are followed in the disposal of samples or related chemicals. Sample disposal procedures used by the CCL are discussed in their QA plan (see Appendix D).

2.4 ANALYTICAL METHODS

All samples will be analyzed at the County Consolidated Chemistry Laboratory (CCL). Analyses will be performed following either EPA approved methods or methods from *Standard Method for the Examination of Water and Wastewater, 18th Edition*, see Table 1 (CCL's QA Manual cites *18th Edition*, see Appendix D). Standard operating procedures (SOPs) from CCL have been included in Appendix D for each of the analyses. Should there be any deviation from these SOPs the Laboratory Director must contact the Project QA Manager.

The CCL will submit a data report and associated QC results after analyses are complete to the Project QA Manager. This data report is described in Section 1.9.3. After a preliminary assessment the Project QA Manager will pass the data on to the Team Lead, who will review the data report and QC results and evaluate its quality and usability in addressing the Project objectives.

2.5 QUALITY CONTROL

2.5.1 Field Sampling Quality Control

The assessment of field measurements will be determined from the collection and analysis of field blanks and field duplicates. For this monitoring program the field blanks will be collected at one every 20 samples or a frequency of 5%. Field duplicates will be collected at a frequency of 10% for the first two sampling events. If the criterion of <25% RPD is met, then the remaining field duplicates will be collected at a 5% frequency. Analytical acceptance criteria and corrective actions for field QC are listed in Table 2.

Deionized (DI) water will be acquired from the CCL and kept at 4±2°C, while transported into the field. Field blank samples will be obtained by pouring DI water into a pint (~500 mL) HDPE sample container that has been triple-rinsed with DI water at the sampling location. The container will be tightly capped, placed in the cooler and delivered to the contract laboratory. Field blanks are labeled with the sampling location (State Well Number) followed by "-1".

Field blanks will be used to evaluate the collection process (from field sampling through sample analysis) for contamination from exposure to ambient conditions, from sample containers or from improper sampling and handling technique. If target analytes are found in field blanks, sampling and handling procedures will be reevaluated and corrective actions taken. Corrective actions may consist of, but are not limited to, re-training of field personnel, discussions with the contract laboratory, invalidation or qualifying of results.

Field duplicates will be collected for every analytical parameter. The duplicate sample will be collected immediately after collection of the native, following the same sampling protocols. Field duplicates are labeled with the sampling location (State Well Number) followed by "-2".

Field duplicates will be used to evaluate the precision of the sample collection through analysis. The combined variability from sampling and analysis technique, in addition to sample heterogeneity, will be assessed using field duplicates. If acceptance criteria are exceeded, field sampling and handling protocols will be reviewed and problems corrected. These may consist of, but are not limited to, additional training, revised sampling techniques and reevaluation of sampling location.

2.5.2 Laboratory Analyses Quality Control (Contract Laboratory)

The Monterey County Consolidated Chemistry Laboratory's (CCL) personnel are responsible for analytical Quality Control. Standard laboratory quality control elements include method blanks, laboratory control samples, analytical duplicates, matrix spikes and calibration procedures. Laboratory data quality objectives include QC acceptance criteria, frequency of analysis, and corrective actions. These data quality objectives and quality control elements for CCL are described in its QA Manual (Appendix D) and SOPs (Appendix D) and are listed in Table 3. After examination of these documents, the Agency believes that the laboratory will be able to meet the project data quality needs. Any deviation from these written procedures must be documented by the laboratory and reported to the Project QA Manager.

2.6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

Testing, inspection, and maintenance of laboratory equipment are the responsibility of the Monterey County Consolidated Chemistry Laboratory and are detailed in its QA manual in Appendix D.

2.7 INSTRUMENT CALIBRATION AND FREQUENCY

Instrument calibrations are the responsibility of the Monterey County Consolidated Chemistry Laboratory and acceptance criteria for calibrations are detailed in its QA manual in Appendix D.

2.8 INSPECTION/ACCEPTANCE REQUIREMENTS FOR SUPPLIES

2.8.1 Initial Inspection of Supplies

As mentioned previously in Section 2.3.1, sample containers are purchased in bulk from an outside vendor who specializes in supplying plastics to the beverage industry. An initial inspection will be conducted upon receipt of each shipment. Each shipment will be considered acceptable for use if *all* of the following are true:

- The shipment arrives with the outer cardboard packaging intact.
- The containers are the correct type (HDPE) and size (0.5 gal/~2L *or* 1 pint/~0.5L).
- The insides of the containers are dry.
- The insides of the containers are free of dirt or any particulate matter.

2.8.2 Field Inspection of Supplies

Immediately prior to sample collection, field samplers will visually inspect each sample container for the following:

- Dirt or any particulate matter
- Cracks of any size
- Improper fit of the cap on the container

If the field sampler observes any of the above, then the container will be discarded and an acceptable container will be used instead.

2.8.3 Laboratory Inspection of Supplies

CCL will be responsible for establishing inspection and acceptance criteria for supplies that adhere to their internal QA/QC policies.

2.9 DATA ACQUISITION REQUIREMENTS (NON-DIRECT MEASUREMENTS)

Non-direct measurement data will not be used during this monitoring program. Should at some time in the future the Agency decide to use data from an external source, QA/QC requirements will be established. Should this occur, an addendum to this QAPP will be submitted to USEPA.

2.10 DATA MANAGEMENT

Data, as related to documentation and records, will be managed as outlined earlier in Section 1.9 of this QAPP.

In addition, the CCL will group QA/QC data under a separate client code so that QA/QC data can be filtered from regular sample data before being uploaded into the Agency's Data Management System (WRAIMS). This allows the Agency a greater flexibility both in quickly and easily accessing the data that included QA/QC samples for initial review, and increased flexibility in uploading and moving large data sets.

3.0 ASSESSMENT AND RESPONSE ACTIONS

This section lists review procedures that will be taken to ensure all the protocols outlined in the QAPP are consistently followed.

3.1 REVIEWS

3.1.1 Readiness Reviews

Water Resources Technicians/ Field Samplers will be trained by the Hydrologist/Team Lead before any field sampling begins. Training will cover proper sample collection and handling and the completion of all paperwork (COCs, field logbooks, etc). The Team Lead will ensure that Field Samplers have properly prepared all collection containers, paperwork and other supplies needed to complete a successful sampling event. Any problems discovered during the readiness review will be corrected before the Samplers begin work.

3.1.2 Field Reviews

The Team Lead will be responsible for overseeing that all field activities are incompliance with Agency protocols. The Team Lead will be available via phone should any questions arise while the Samplers are in the field. The Team Lead will also review all field paperwork such as COCs and field logbooks for completion. Additionally the field QC samples (field blanks and duplicates) will be used to evaluate the individual Sampler's technique. If problems are exposed they will be corrected straight away so that all further samples are valid. A stop-work order may be issued by the Project QA Manager at any time if a discrepancy or error is found that could negatively affect the data being collected.

3.1.3 Post Sampling Reviews

Post sampling reviews will be conducted following each sampling event in order to ensure all information is complete. Reviews will be conducted by the Field Sampler due to the small size of the staff. They will include evaluation of sampling activities and field documentation and will take place in the office, not in the field. Findings will be passed on to the Team Lead and the Project QA Manager to be incorporated into the next field event.

3.1.4 Laboratory Data Reviews

The Team Lead will be responsible for reviewing the laboratory's data for completeness and accuracy. The data will also be checked to determine that all specified methods were used and all related QC data was provided with the sample analytical results. These reviews will take place immediately upon receipt of data reports from the laboratory. This will ensure that any method deviations are corrected or explained, and any missing or incomplete data are provided. The Project QA Manager has the authority to request re-testing of laboratory data if it is invalid or would otherwise compromise the quality of the resulting project conclusions.

3.2 REPORTS

The Project QA Manager will be responsible for the technical memorandum (EPA R9# 03-238 Task 3.3) which will be provided in March 2008 to US EPA. The technical memorandum (EPA R9# 03-238 Task 3.3) will include result tables for chloride, nitrate, and specific conductivity, and maps of chloride, nitrate, and specific conductivity gradients. The technical memorandum will include a summary of any significant QA/QC issues and how they were resolved. It is currently understood that this project is of short enough duration that only a final technical memorandum to the EPA is necessary.

4.0 DATA VALIDATION AND USABILITY

4.1 DATA VERIFICATION AND VALIDATION

Data review is the in-house examination to ensure that the data have been recorded, transmitted, and processed correctly. The Team Lead is responsible for the data review. This examination will check for data entry errors, calculation errors, and data omission errors. If possible these errors will be corrected.

4.1.1 Field Data

Field data include logbooks, photographs, and COCs. The Field Sampler is responsible for reviewing the field data at the end of the sampling event. This includes determining that all information is complete and any deviations from the sampling methodologies are documented using the Field Activities Review Checklist (Appendix C).

4.1.2 Laboratory Data

Initial evaluation of the laboratory data are carried out by the CCL in agreement with protocols listed in their SOPs and QA manual. The Team Lead will also conduct an independent review of the data and QC parameters as described in sections 3.1.4 and using the Laboratory Data Review Checklist as detailed in section 1.9.4.4 and Appendix C.

4.2 RECONCILIATION WITH USER REQUIREMENTS

The purpose of the continued ambient monitoring of the Salinas Valley Basin Ground Water is to assess the water quality to manage and protect ground water resources. For data to be useful in developing the overreaching Salinas Valley Integrated Water Management Plan, it must first meet the requirement of this QA project Plan. The Project QA Manager will be responsible for making the final evaluation of the data's usability in meeting the Project objectives. All data passing this final evaluation will then be used to establish a cohesive and succinct Water Quality Management Plan in accordance to the work begun under EPA-I and continued under EPA-II. Additionally, the Agency will integrate these ground water quality data with previously collected data for use in trend analysis.

5.0 REFERENCES

Department of Public Works, Division of Water Resources (DWR). 1946. *Bulletin 52: Salinas Basin Investigation.*

Durbin, TJ, GW Kapple, JR Freckleton. 1978. *Two-Dimensional and Three-Dimensional Digital Flow Models of the Salinas Valley Ground-Water Basin. California.* US Geological Survey. Water Resources Investigations Report 78-113. Prepared in cooperation with the US Army Corps of Engineers.

Geomatrix Consultants. 2001. *Evaluation of the Salinas Valley Groundwater Monitoring Network and Proposed Redesign.* Prepared for The Monterey County Water Resources Agency.

Greene, HG. 1970 *Geology of Southern Monterey Bay and its Relationship to the Ground-Water Basin and Seawater Intrusion.* US Geological Survey Open File Report.

Hunt, JW, BS Anderson, BM Phillips, PA Nicely, RS Tjeerdema, HM Puckett, M Stephenson, K Worcester, V deVlaming. 2003. *Ambient toxicity due to chlorpyrifos and diazinon in a Central California Watershed.* Environ. Monit. Assess. 82: 83-112.

Monterey County Agricultural Commissioner's Office (Ag Commission). 2006. *Monterey County Crop Report.*

Monterey County. 2007. *Fact Finder.* Prepared by Monterey County Administrative Office.

Monterey County Water Resources Agency (MCWRA). 1997. *Water Resources Data Report, Water Year 1994-1995.*

Quality Assurance Project Plan for Monitoring of Surface Water Eagle Valley Reservation. 2005. Prepared by Eagle Valley Environmental Program Eagle Valley Band of Indians Eagle Valley Reservation. Prepared for US EPA Region 9.

Salinas Valley Ground Water Basin Hydrology Conference (White Paper). 1995. *Hydrogeology and Water Supply of Salinas Valley.* Prepared for The Monterey County Water Resources Agency.

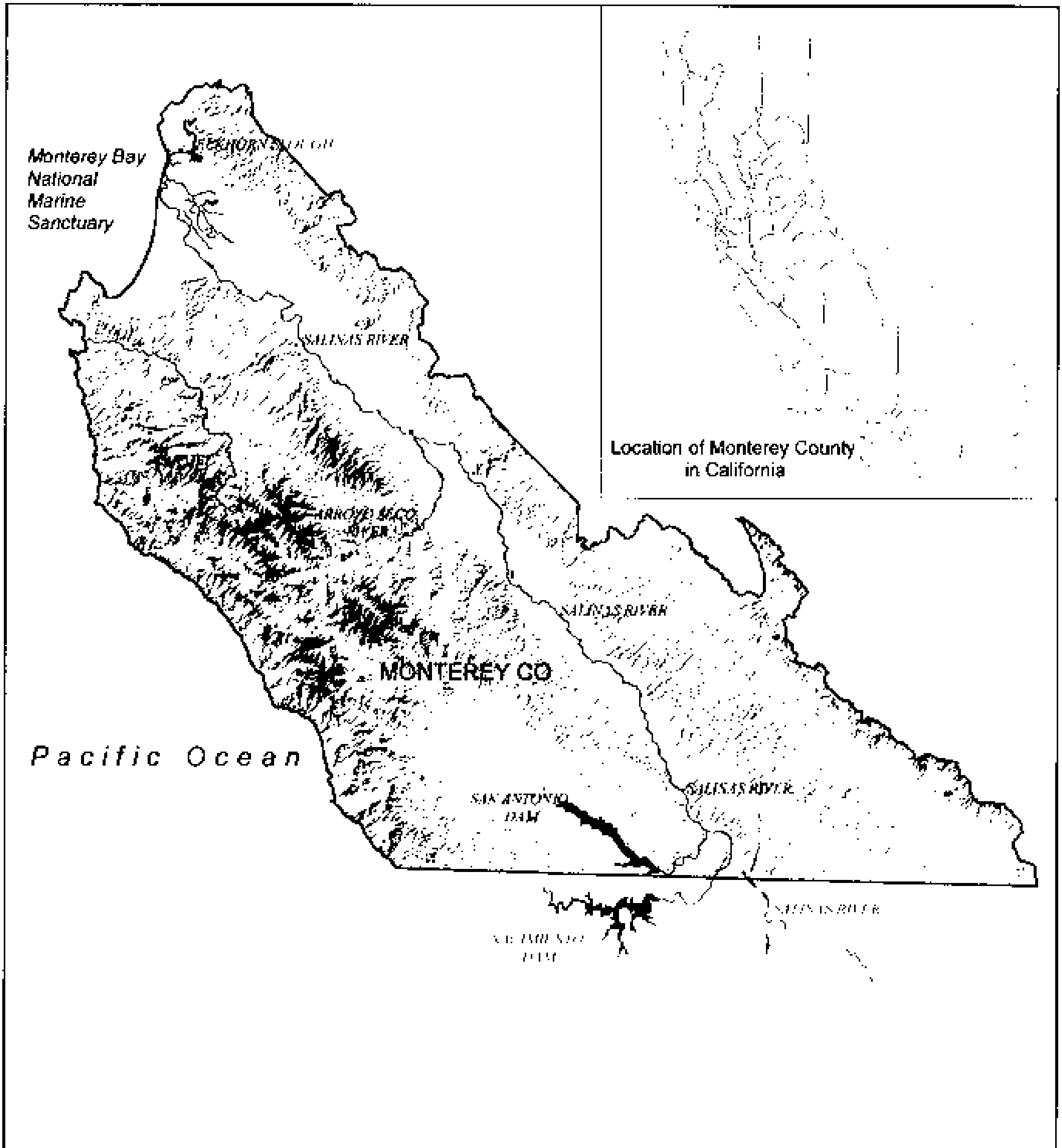
State of California, Department of Water Resources (DWR). 2003. *Bulletin 118 Update: California's Groundwater.*

Sycamore Creek Quality Assurance Management Plan. 2006. Prepared by Instant Reference Sources, Inc. Prepared for California State Water Resources Control Board.

US EPA. 2002. *Guidance for Quality Assurance Project Plans.*

US EPA Grant R9# 03-238. 2003. *Salinas Valley Integrated Water Management Plan.* Prepared by The Monterey County Water Resources Agency. Prepared for US EPA Region 9. Grants Management Office.

FIGURES



Legend

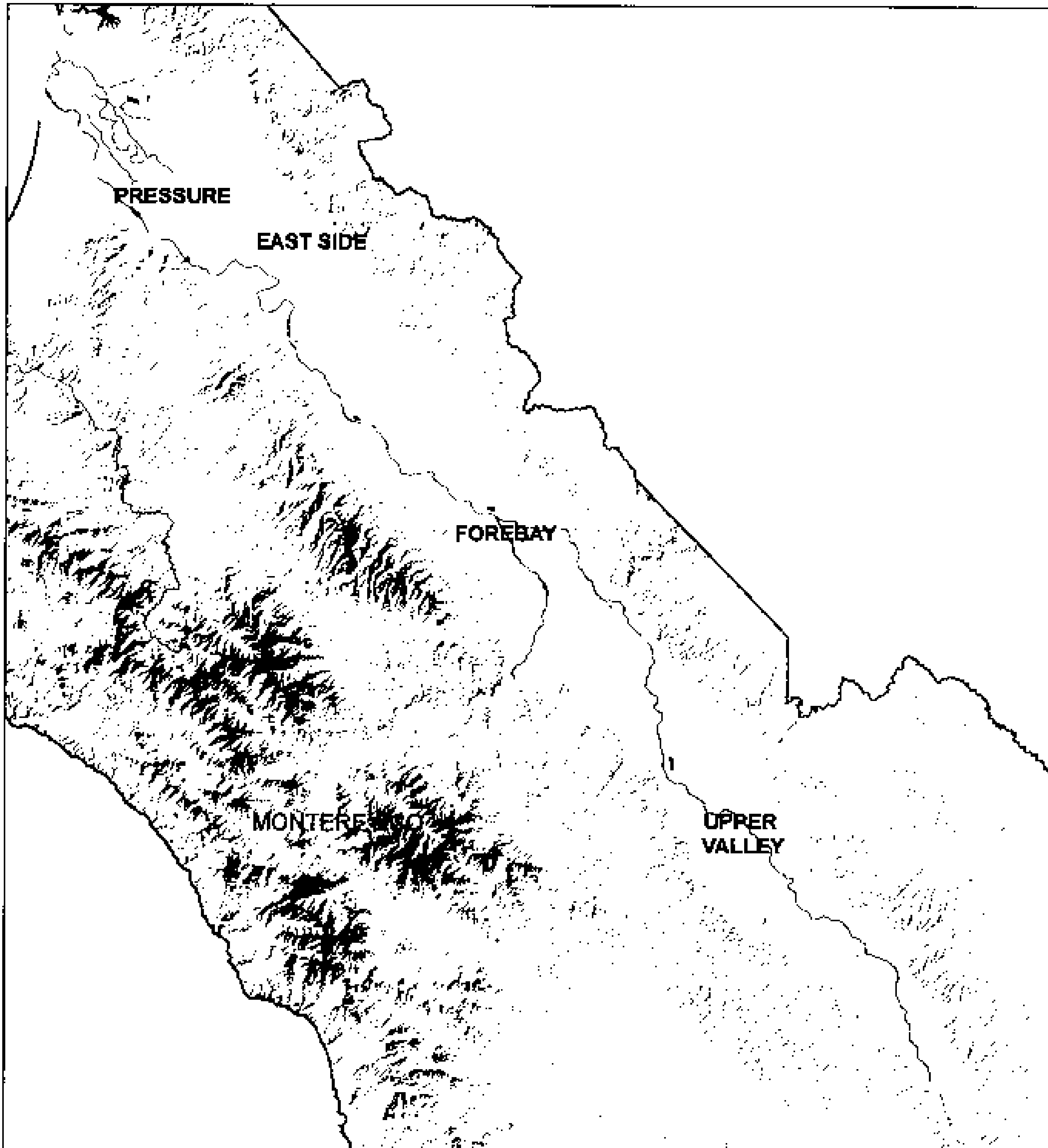
■ Water Bodies/ Channels

Monterey County, California

Figure 1

0 4 8 12 16 Miles

Map Date July 5, 2007



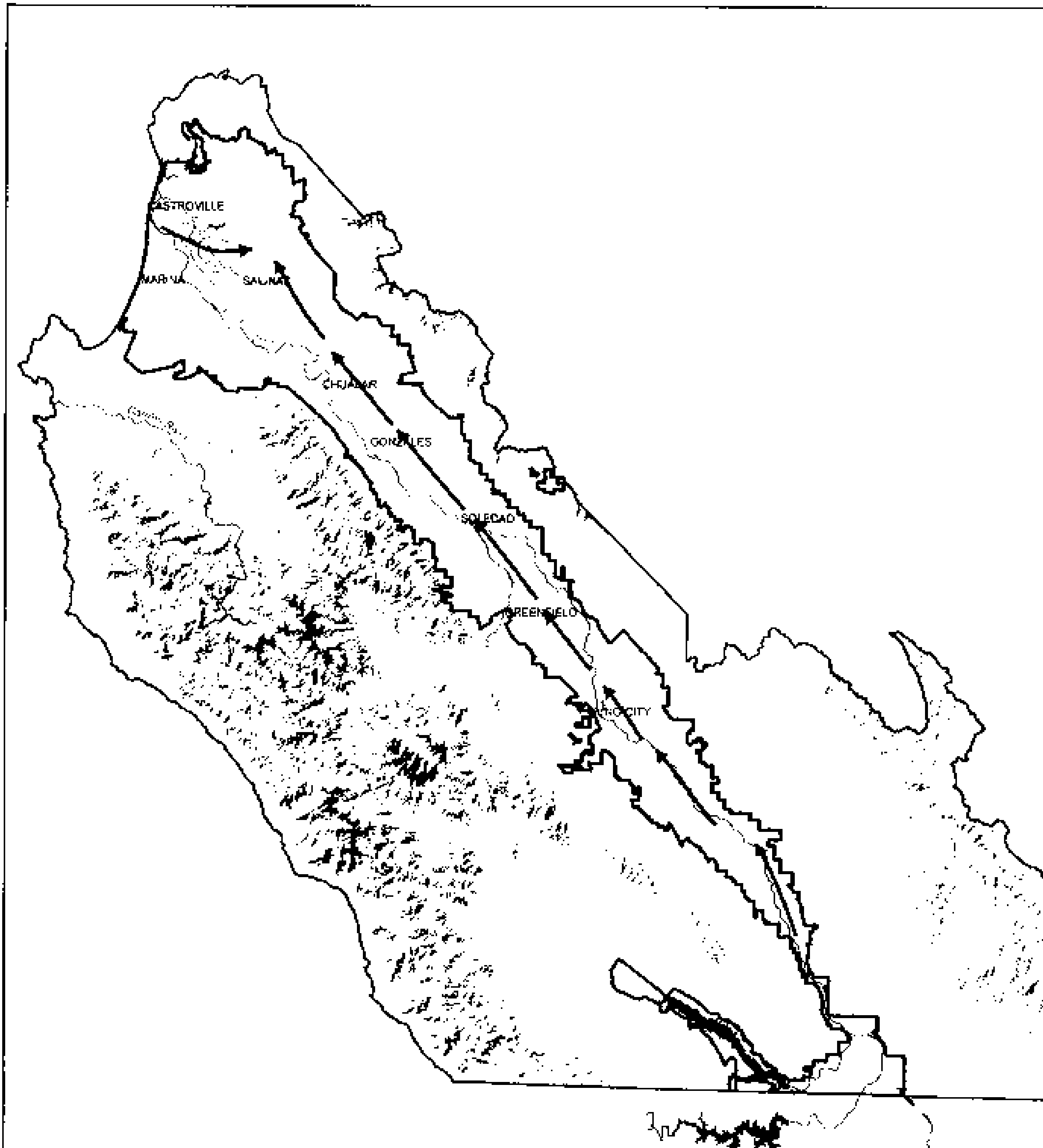
Legend
Water Bodies/ Channels

Salinas Valley Aquifers

Figure 2

0 2 4 6 8 Miles

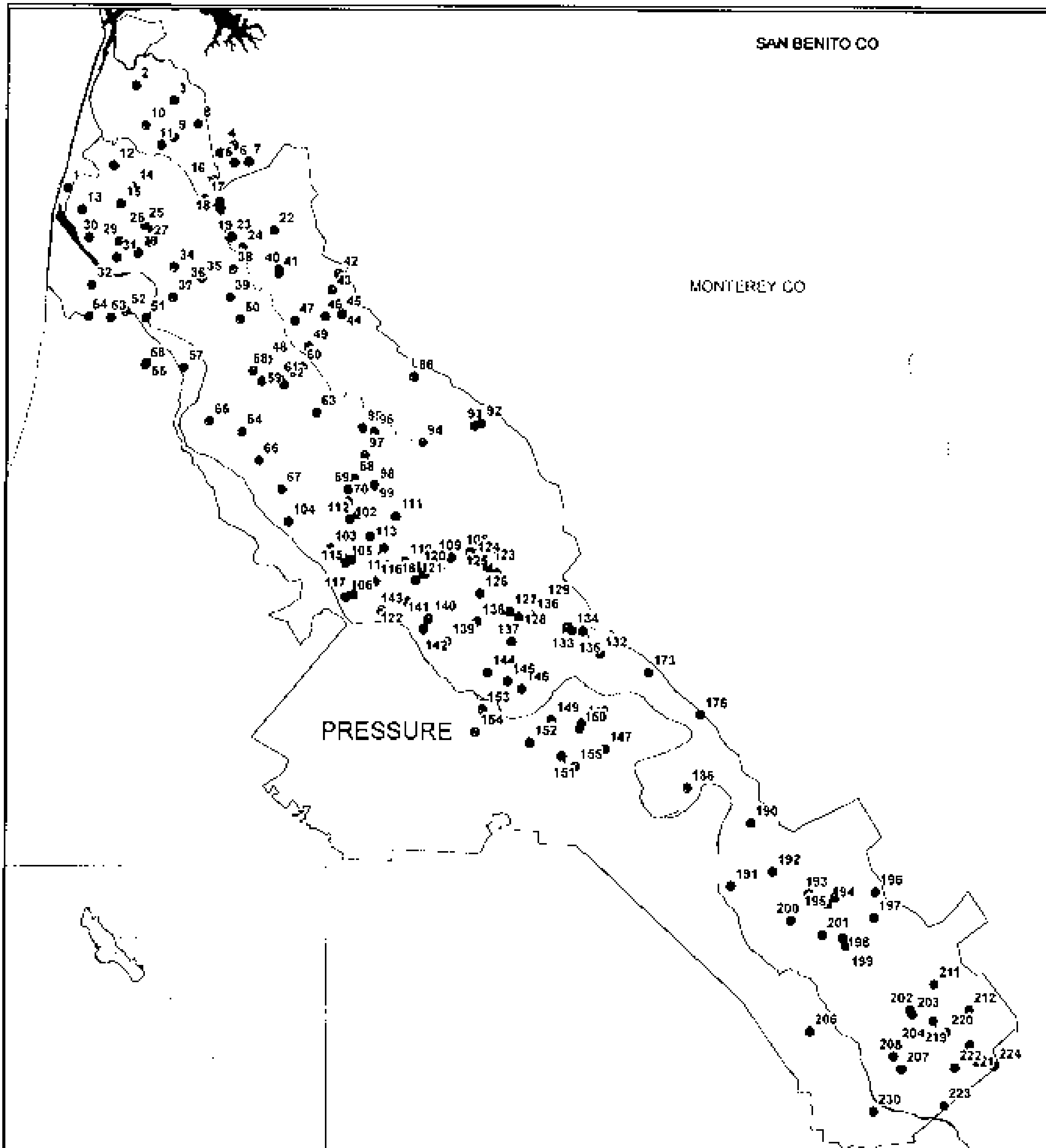
Map Date July 5, 2007



Ground Water Flow Direction
in the Salinas Valley
Figure 3

Legend
- Ground Water Flow Direction
- Assessment Zone 2C
- Monterey County
- Rivers and Other Bodies of Water

Map Date: July 6, 2007



Salinas Valley Wells in the Pressure Subarea

Figure 4

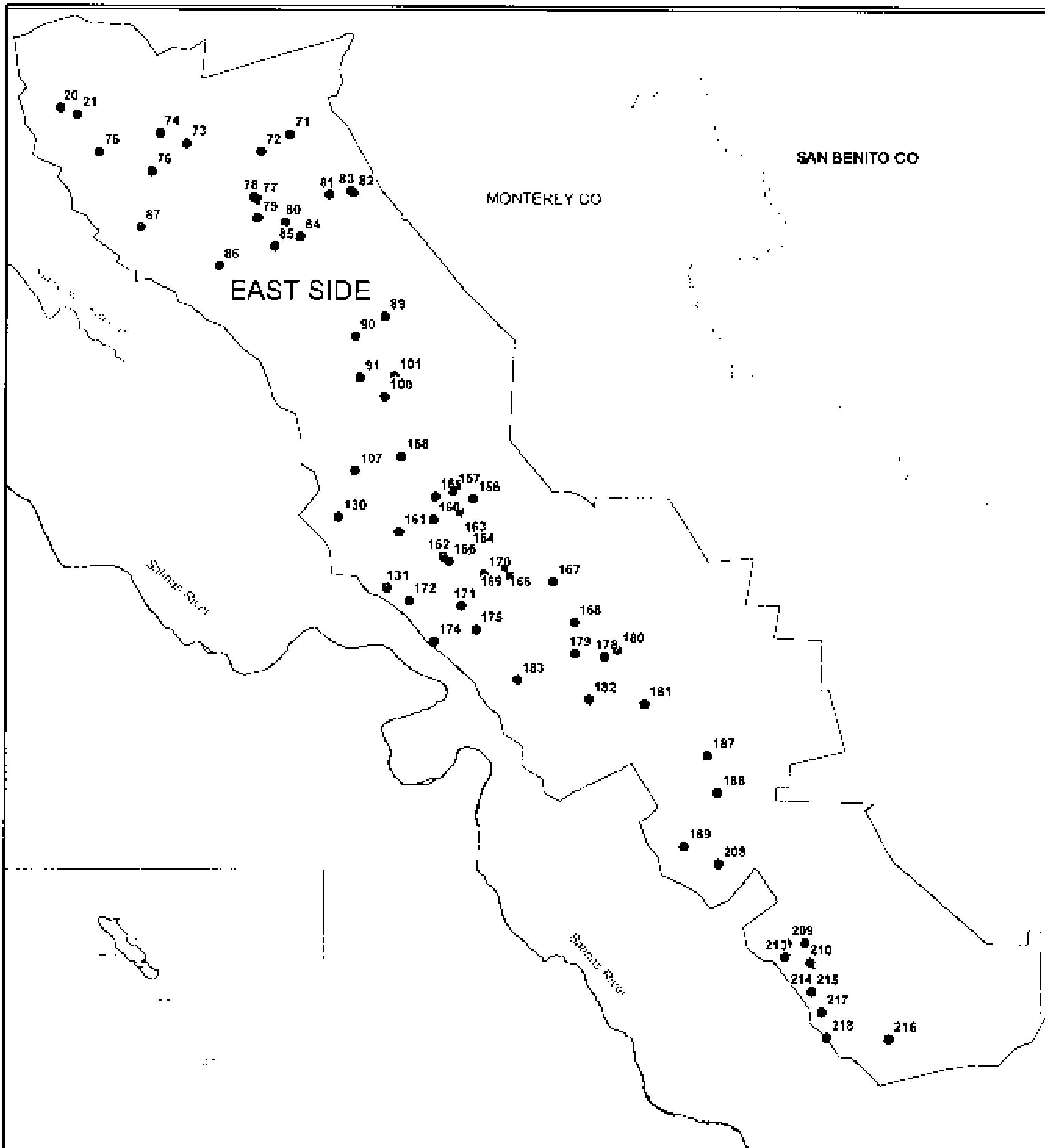
Legend:
- Study Well
- Rivers

SUBAREA

SUBAREA

PRESSURE

Map Date: July 5, 2007



Salinas Valley Wells in the East Side Subarea

Figure 5

Legend:

- ● Study Well
- ▬ Rivers

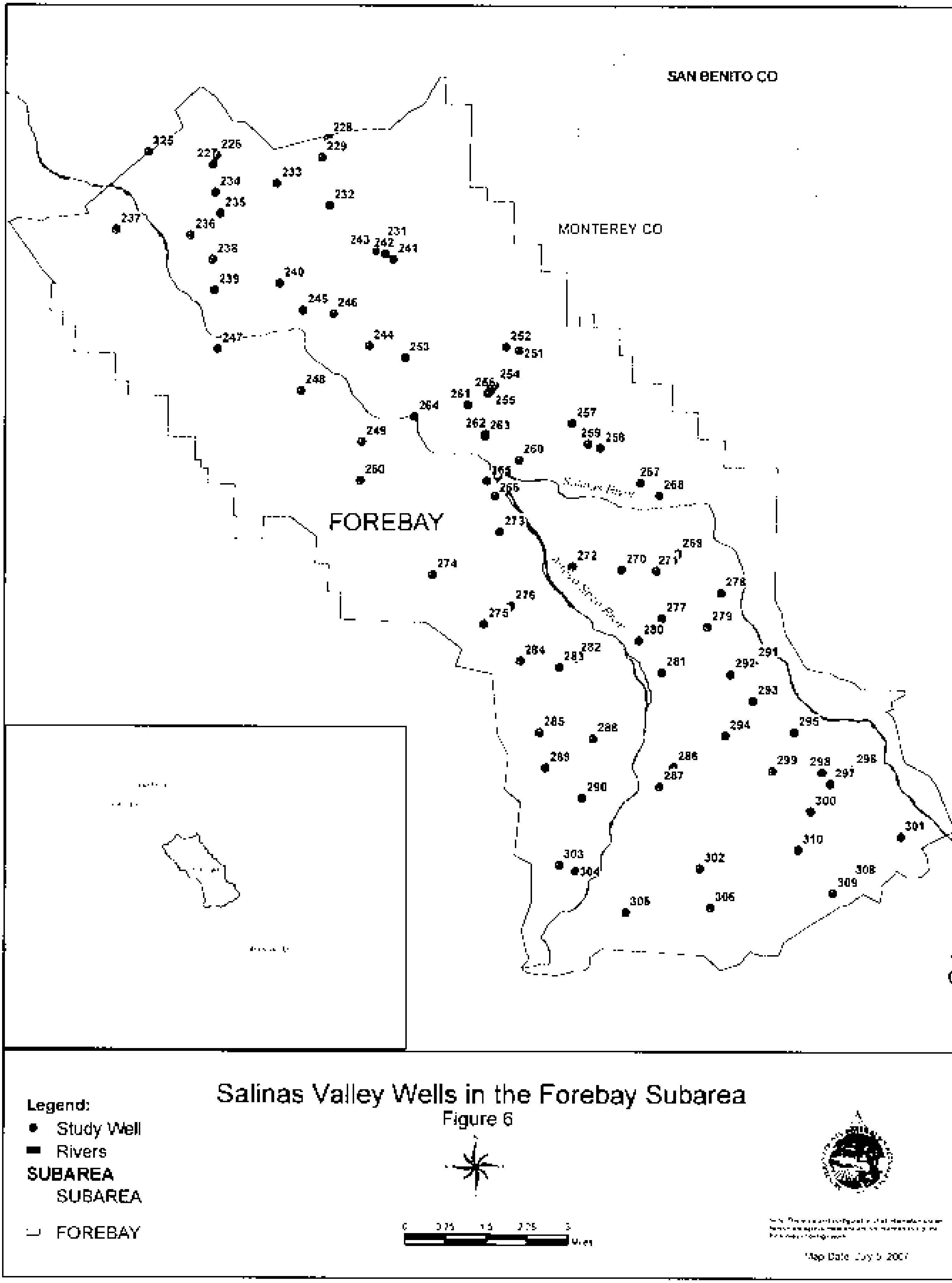
SUBAREA

SUBAREA

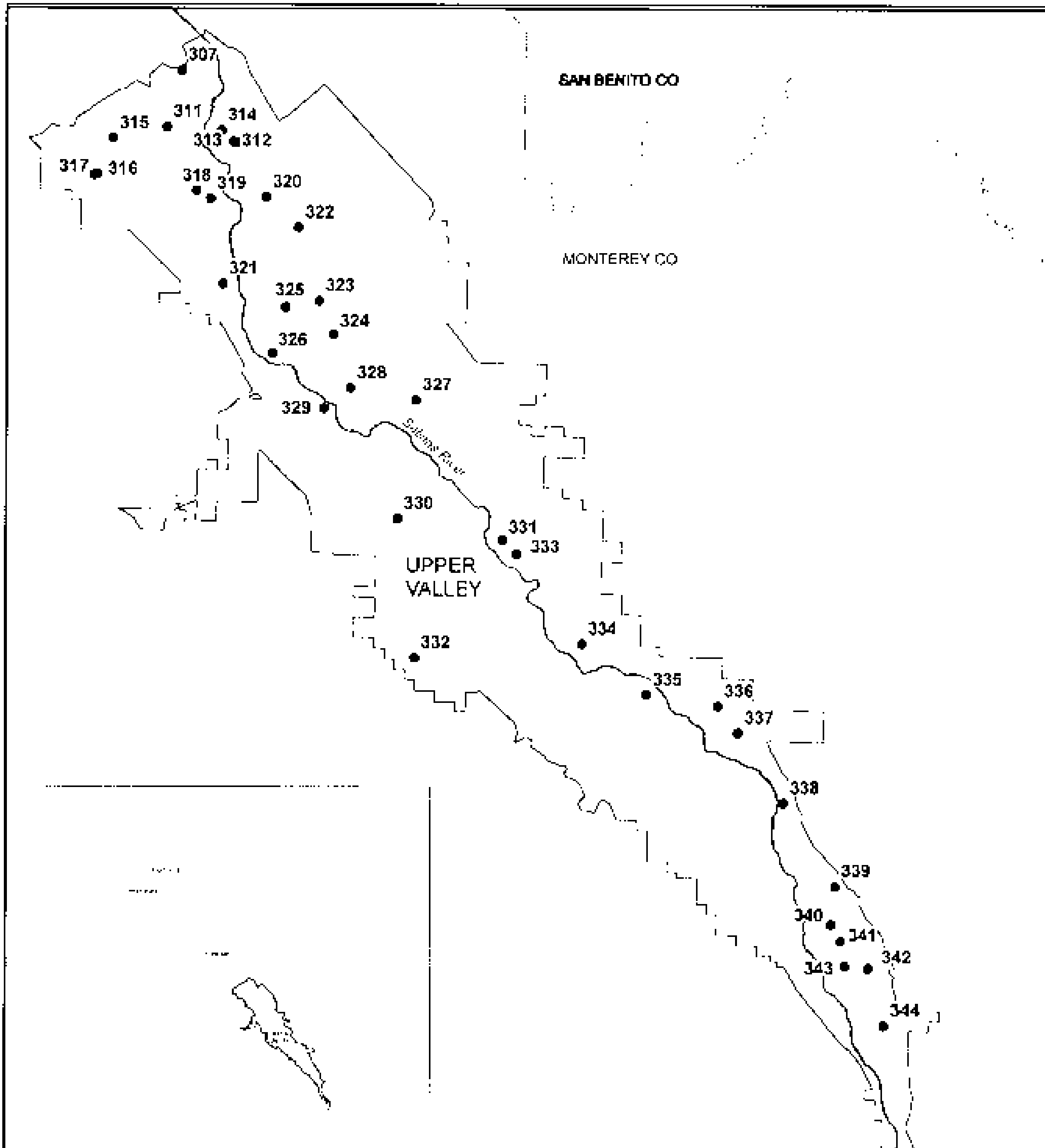
▭ EAST SIDE

0 0.75 1.5 2.25 3 Miles

Map Date: July 5, 2007



Salinas Valley Wells in the Forebay Subarea
Figure 6



Salinas Valley Wells in the Upper Valley Subarea
Figure 7

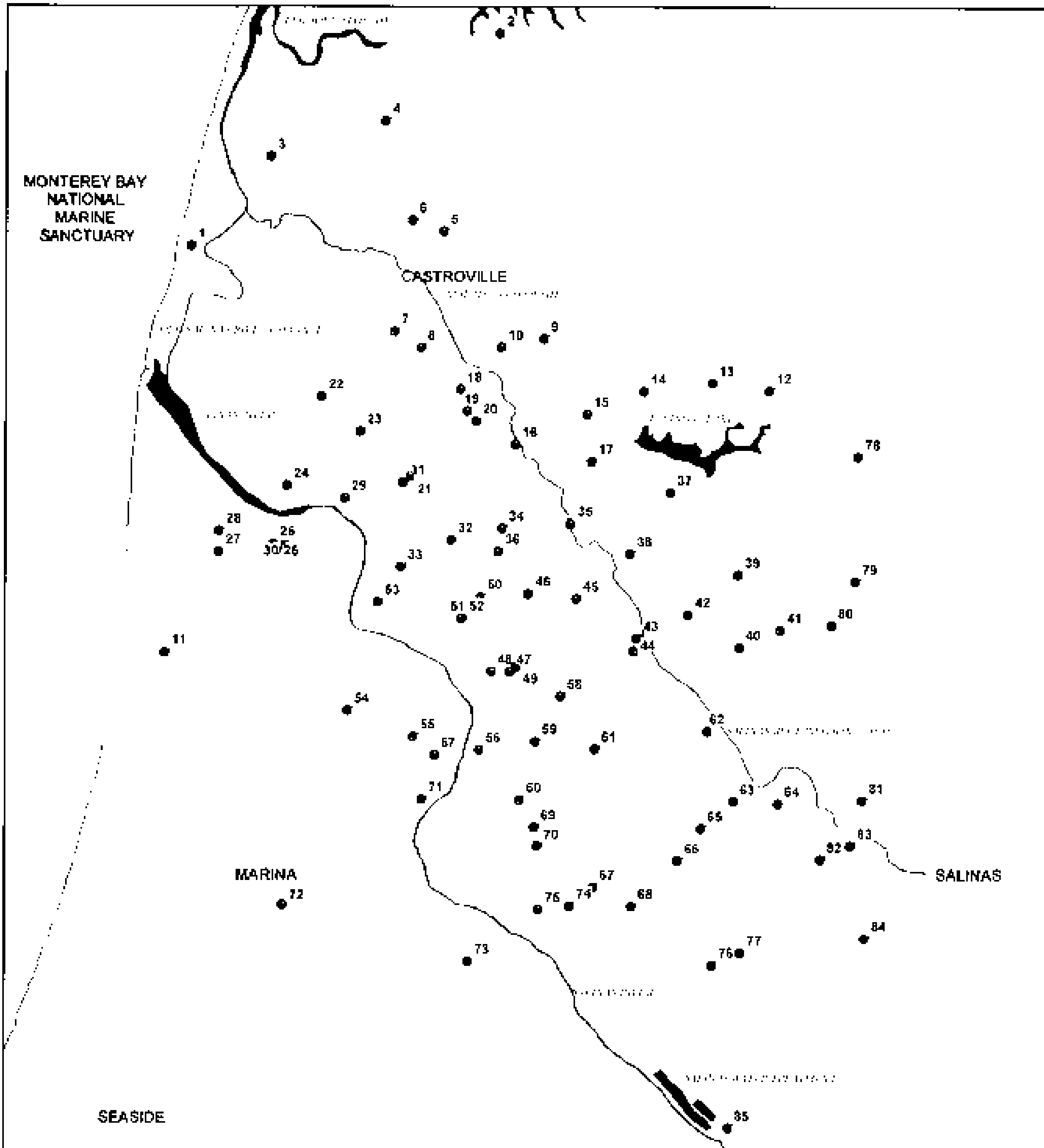
Legend:
- Study Well
- Rivers

SUBAREA
SUBAREA

UPPER VALLEY

0 0.75 1.5 2.25 3 Miles

Map Date: July 5, 2007



Coastal Ground Water Monitoring Program Wells

Figure 8

Legend:

- Study Well
- Cities
- Water Bodies/ Channels

0 0.5 1 1.5 2 Miles

Map Date: July 02, 2007

TABLES

Table 1 COMPLETE MINERAL PANEL ANALYTES

ANALYTE	METHOD	LABORATORY MDL**	LABORATORY PQL	LOWEST CALIB. STD.	PAL
Calcium (Ca)	SM 3111 B[1]	0.02 mg/L	1.0 mg/L	1.0 mg/L	1.0 mg/L
CATION ANION BALANCE	Calculated	--	--	--	--
*Chloride (Cl)	EPA 300.0[2]	0.01 mg/L	1.0 mg/L	0.1 mg/L	1.0 mg/L
*Conductivity (SEC)	SM 2510 B	1 umho/cm @ 25 C	1 umho/cm @ 25 C	N/A	1 umho/cm @ 25 C
Magnesium (Mg)	SM 3111 B	0.005 mg/L[1]	1.0 mg/L	0.1 mg/L	1.0 mg/L
*Nitrate (NO3)	EPA 300.0	0.002 mg/L[2]	1.0 mg/L	0.1 mg/L	1.0 mg/L
pH (Laboratory)	SM 4500-H B	pH Units (2 sig figs)	pH Units (2 sig figs)	N/A	pH Units (2 sig figs)
Potassium (K)	SM 3111 B	0.025 mg/L[1]	0.1 mg/L	0.1 mg/L	0.1 mg/L
Sodium (Na)	SM 3111 B	0.03 mg/L[1]	1.0 mg/L	0.1 mg/L	1.0 mg/L
Sulfate (SO4)	EPA 300.0	0.03 mg/L[2]	1.0 mg/L	0.1 mg/L	1.0 mg/L
Total Alkalinity (as CaCO3)	SM 2320 B	1.0 mg/L	1.0 mg/L	N/A	1.0 mg/L

[1] = MDL study completed February 2007

[2] = MDL study completed May 2007

* = Partial Mineral Panel analytes

** = These are the laboratory's latest MDLs and supersede the MDLs listed in Appendix D-1.

MDL = method detection limit; PQL = practical quantitative limit; PAL = project action level

All laboratory results are bracketed by calibration standards. No "estimated" results (below the lowest calib std and above the MDL) are given to the Agency

Table 2 QUALITY CONTROL REQUIREMENTS FOR LABORATORY ANALYSES

QA PROCEDURE	QA PARAMETER	FREQUENCY	CRITERION	CORRECTIVE ACTION
Field Blank	Field Contamination	1/20 field samples; 5% frequency	<MDL	Recollect sampling event or flag data if unable recollect
Field Duplicate	Field Precision	1/10 field samples for first two events; if criterion is met, then 1/20 field samples	RPD < 25%	Recollect sampling event or flag data if unable recollect
Method Blank	Analytical Contamination	3 per analytical batch	< RL	Reanalyze analytical batch
LCS (CRM)	Accuracy	1 per analytical batch	80-120% REC	Reanalyze analytical batch
Analytical Duplicate	Analytical Precision	1 per analytical batch	RPD < 25%	Reanalyze analytical batch
Matrix Spike	Matrix Interference and Accuracy	1 per analytical batch; at 3-10x the native conc.	75-125% REC	Reanalyze analytical batch
Matrix Spike Duplicate	Precision and Accuracy	1 per analytical batch; at 3-10x the native conc.	RPD <25%	Reanalyze analytical batch
Continuing Calibration	Analytical Control	1 per 10 sample runs	80-120% of initial slope	Reanalyze analytical batch
Assess percent of data successfully collected	Data Completeness	N/A	90%	N/A

MDL=Method Detection Limit; RPD=Relative Percent Difference RL=Report Limit.

REC=Recovery; LCS=Laboratory Control Sample; CRM=Certified Reference Material

An analytical batch is defined as 20 or fewer samples.

Table 3 LABORATORY DATA QUAILITY OBJECTIVES (DQOs)

ANALYTE	METHOD BLANK	LCS (CRM)	ANALYTICAL DUPLICATE	MATRIX SPIKE	MATRIX SPIKE DUPLICATE	CONTINUING CALIBRATION
Calcium (Ca)	yes	yes	yes	yes	yes	yes
Chloride (Cl)	yes	yes	yes	yes	yes	yes
Conductivity (SEC)	yes	yes	yes	no	no	yes
Magnesium (Mg)	yes	yes	yes	yes	yes	yes
Nitrate (NO3)	yes	yes	yes	yes	yes	yes
pH (Laboratory)	no	yes	yes	no	no	yes
Potassium (K)	yes	yes	yes	yes	yes	yes
Sodium (Na)	yes	yes	yes	yes	yes	yes
Sulfate (SO4)	yes	yes	yes	yes	yes	yes
Total Alkalinity (as CaCO3)	yes	yes	yes	no	no	yes

Table 4 SALINAS VALLEY WELLS AND LOCATIONS

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
13S/01E-36J01	PRESSURE 900	1	5741483.0	2170847.00002
13S/02E-20M02	PRESSURE 400	2	5748878.5	2182094 25003
13S/02E-21N01	PRESSURE 400	3	5753018.5	2180456.75002
13S/02E-27L01	PRESSURE 180	4	5759500.0	2175572.50002
13S/02E-27M01	PRESSURE 400	5	5758010.0	2174784.50002
13S/02E-27P01	PRESSURE 400	6	5759593.5	2173660.50002
13S/02E-27Q02	PRESSURE 400	7	5761129.5	2173768 75002
13S/02E-28B01	PRESSURE 400	8	5755624.0	2177900.75002
13S/02E-28E01	PRESSURE 400	9	5752984.0	2176434.75002
13S/02E-29F02	PRESSURE 400	10	5749961.0	2177732.25002
13S/02E-29J01	PRESSURE 400	11	5751657.5	2175604.25002
13S/02E-31A02	PRESSURE 900	12	5746516.5	2173308.00002
13S/02E-31N02	PRESSURE 400	13	5743060.5	2168496.25002
13S/02E-32M02	PRESSURE 900	14	5748673.0	2170965.00002
13S/02E-32N01	PRESSURE 400	15	5747285.0	2169132.75003
13S/02E-33H03	PRESSURE 180	16	5757325.5	2171726.00002
13S/02E-33R01	PRESSURE 180	17	5756359.5	2169699.75003
13S/02E-34M02	PRESSURE 180	18	5757952.0	2169365.25003
13S/02E-34N01	PRESSURE 180	19	5758043.5	2168657.25003
13S/02E-36J01	EAST SIDE BOTH	20	5772057.0	2168257.00002
14S/02E-01A01	EAST SIDE	21	5773736.0	2167596.00002
14S/02E-02E02	PRESSURE 400	22	5763989.0	2166284.00003
14S/02E-03F02	PRESSURE 180	23	5759284.0	2165549.00003
14S/02E-03K02	PRESSURE 400	24	5760546.0	2164390.00002
14S/02E-05F04	PRESSURE 400	25	5749784.5	2166850.50002
14S/02E-05G03	PRESSURE 400	26	5750701.5	2166258.50002
14S/02E-05K01	PRESSURE 400	27	5750303.5	2164892.00002
14S/02E-05P02	PRESSURE 400	28	5749120.0	2163754.25002
14S/02E-06J03	PRESSURE 400	29	5747119.5	2164986.75002
14S/02E-06L01	PRESSURE 900	30	5743826.5	2165438.75002
14S/02E-06R02	PRESSURE 400	31	5746852.5	2163229.50003
14S/02E-07K01	PRESSURE 400	32	5744199.0	2160286.75002
14S/02E-08A01	PRESSURE 400	33	5751818.0	2162226.75002
14S/02E-09D03	PRESSURE 400	34	5753098.5	2162246.50002
14S/02E-09H03	PRESSURE 400	35	5756070.0	2161048.75002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
14S/02E-09L02	PRESSURE 400	36	5754291.5	2160250.25002
14S/02E-09N01	PRESSURE 400	37	5752950.5	2158867.00003
14S/02E-10C01	PRESSURE 400	38	5759437 0	2162015.75002
14S/02E-10P02	PRESSURE 400	39	5759125.0	2158942.75002
14S/02E-11C01	PRESSURE 180	40	5764471.5	2161959.50002
14S/02E-11D01	PRESSURE 180	41	5764508.5	2161568.25002
14S/02E-12B01	PRESSURE 400	42	5771184.5	2161614.00002
14S/02E-12L02	PRESSURE 400	43	5770434 5	2159815.50002
14S/02E-12Q01	PRESSURE 400	44	5771537.0	2157088.75002
14S/02E-13B02	PRESSURE 180	45	5771526.0	2157219.75003
14S/02E-13D01	PRESSURE 180	46	5769699.5	2156883.75002
14S/02E-14B01	PRESSURE 180	47	5766275.0	2156434.00002
14S/02E-14N03	PRESSURE 400	48	5763230.0	2152205.50003
14S/02E-14R01	PRESSURE 180	49	5767842.5	2153580 50002
14S/02E-15B01	PRESSURE 400	50	5760275.5	2156533.25002
14S/02E-17B02	PRESSURE 400	51	5749990.5	2156598.25002
14S/02E-17C01	PRESSURE 180	52	5747844.0	2157381.75003
14S/02E-18A01	PRESSURE 400	53	5746233.0	2156686.25002
14S/02E-18C01	PRESSURE 400	54	5743827.5	2156787.25002
14S/02E-20B01	PRESSURE 180	55	5750165.5	2151711.75003
14S/02E-20B02	PRESSURE 180	56	5750001.0	2151554.75003
14S/02E-21F02	PRESSURE 180	57	5754169.5	2151251.50002
14S/02E-22H01	PRESSURE 400	58	5761690.5	2150902.75002
14S/02E-22H02	PRESSURE 180	59	5762674.0	2149777.00002
14S/02E-23A01	PRESSURE 180	60	5767130.0	2151399.50002
14S/02E-23F01	PRESSURE 180	61	5764570.5	2149971 00002
14S/02E-23L03	PRESSURE 400	62	5765164.5	2149382.00002
14S/02E-25D03	PRESSURE 400	63	5768753.5	2146325.50002
14S/02E-27K01	PRESSURE 180	64	5760536.0	2144212.25002
14S/02E-28H02	PRESSURE 180	65	5756940.5	2145354.75002
14S/02E-34A03	PRESSURE 400	66	5762394.5	2141097.75002
14S/02E-35L02	PRESSURE 400	67	5764879.0	2137944.25002
14S/02E-36H01	PRESSURE 180	68	5773015.5	2139158.50003
14S/02E-36J02	PRESSURE 400	69	5772268.5	2137939 00002
14S/02E-36R02	PRESSURE 400	70	5772326.5	2136698.50002
14S/03E-02E03	EAST SIDE BOTH	71	5794727.5	2165742.50002
14S/03E-03K01	EAST SIDE BOTH	72	5791884.0	2164011.25002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
14S/03E-04E01	EAST SIDE BOTH	73	5784479.5	2164809.75002
14S/03E-05B02	EAST SIDE BOTH	74	5781839.5	2165837.25002
14S/03E-06L01	EAST SIDE SHALLOW	75	5775895.0	2163924.50003
14S/03E-08C01	EAST SIDE BOTH	76	5781050.5	2162072.25002
14S/03E-10F02	EAST SIDE	77	5791569.0	2159330.50002
14S/03E-10F03	EAST SIDE BOTH	78	5791236.5	2159578.00002
14S/03E-10P01	EAST SIDE	79	5791544.0	2157558.25002
14S/03E-10R02	EAST SIDE BOTH	80	5794251.5	2157151.00002
14S/03E-11H01	EAST SIDE SHALLOW	81	5798504.0	2159823.00002
14S/03E-12E01	EAST SIDE SHALLOW	82	5800865.5	2160009.25003
14S/03E-12E02	EAST SIDE	83	5800608.5	2160173.25003
14S/03E-14D01	EAST SIDE SHALLOW	84	5795697.5	2155748.25003
14S/03E-15H03	EAST SIDE BOTH	85	5793222.5	2154777.00002
14S/03E-16K03	EAST SIDE	86	5787748.0	2152845.50003
14S/03E-17D01	EAST SIDE	87	5779979.0	2156594.00002
14S/03E-20D01	PRESSURE 400	88	5779540.0	2150357.75002
14S/03E-24H01	EAST SIDE SHALLOW	89	5803951.0	2147934.50002
14S/03E-24N01	EAST SIDE	90	5801060.0	2146002.50002
14S/03E-25L02	EAST SIDE BOTH	91	5801508.5	2141975.75002
14S/03E-28B02	PRESSURE 400	92	5786919.0	2145249.50002
14S/03E-28F02	PRESSURE 400	93	5786200.6	2144963.98574
14S/03E-29L04	PRESSURE 180	94	5780547.4	2143125.21920
14S/03E-30E01	PRESSURE 180	95	5773899.5	2144670.25003
14S/03E-30F02	PRESSURE 180	96	5775180.5	2144268.50002
14S/03E-30N01	PRESSURE 180	97	5774083.5	2141696.50002
14S/03E-31F01	PRESSURE 180	98	5775271.5	2138346.50003
14S/03E-31F02	PRESSURE 400	99	5775228.5	2138492.00002
14S/03E-36A01	EAST SIDE SHALLOW	100	5803921.0	2140085.50002
14S/04E-30N01	EAST SIDE BOTH	101	5804847.5	2142132.00001
15S/02E-01A03	PRESSURE 400	102	5772482.0	2134724.00002
15S/02E-01K01	PRESSURE 180	103	5770291.5	2131514.75002
15S/02E-02G01	PRESSURE 400	104	5765615.0	2134401.50002
15S/02E-12A01	PRESSURE 400	105	5772051.5	2129878.50002
15S/02E-12R01	PRESSURE 400	106	5772057.5	2126203.25003
15S/03E-01L01	EAST SIDE	107	5801038.5	2132896.75002
15S/03E-04K03	PRESSURE 400	108	5785732.5	2131172.00002
15S/03E-04N03	PRESSURE 400	109	5783621.0	2130577.75002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
15S/03E-05N01	PRESSURE 180	110	5778619.0	2130164.00003
15S/03E-06A03	PRESSURE 180	111	5777613.0	2135010.00002
15S/03E-06D02	PRESSURE 400	112	5773392.0	2135175.75002
15S/03E-06F02	PRESSURE 400	113	5774781.5	2132857.75002
15S/03E-06K01	PRESSURE 400	114	5776302.5	2131605.50002
15S/03E-07D02	PRESSURE 400	115	5772729.0	2130304.25002
15S/03E-07G01	PRESSURE 400	116	5775356.0	2127909.75002
15S/03E-07N01	PRESSURE 180	117	5772911.5	2126430.50002
15S/03E-08B04	PRESSURE 400	118	5780790.5	2128738.25002
15S/03E-08C06	PRESSURE 180	119	5780025.5	2129640.75003
15S/03E-08C07	PRESSURE 400	120	5780124.5	2129385.50002
15S/03E-08F07	PRESSURE 400	121	5779786.0	2128096.50002
15S/03E-08N03	PRESSURE 400	122	5778859.5	2125760.50002
15S/03E-09B01	PRESSURE 180	123	5787613.5	2129526.50003
15S/03E-09C01	PRESSURE 180	124	5785912.0	2130387.75002
15S/03E-09H02	PRESSURE 180	125	5788543.5	2128841.50003
15S/03E-09K04	PRESSURE 400	126	5786815.0	2126625.50003
15S/03E-10P01	PRESSURE 180	127	5789973.0	2124641.25002
15S/03E-10P03	PRESSURE 180	128	5790992.5	2124075.25002
15S/03E-10R02	PRESSURE 180	129	5793537.5	2125764.25002
15S/03E-12E02	EAST SIDE BOTH	130	5799472.0	2128349.25000
15S/03E-13J02	EAST SIDE	131	5804170.5	2121482.50002
15S/03E-13N01	PRESSURE 180	132	5799834.5	2120075.00003
15S/03E-14C01	PRESSURE 180	133	5796323.5	2123063.75002
15S/03E-14G01	PRESSURE 180	134	5796738.0	2122656.50003
15S/03E-14H01	PRESSURE 180	135	5797941.0	2122606.00002
15S/03E-15B01	PRESSURE 400	136	5792336.0	2124219.00002
15S/03E-15L02	PRESSURE 180	137	5790177.0	2121393.00002
15S/03E-16B03	PRESSURE 400	138	5786481.0	2123545.50002
15S/03E-16M01	PRESSURE 180	139	5783233.5	2121388.25002
15S/03E-17B01	PRESSURE 180	140	5781259.5	2123911.75003
15S/03E-17B02	PRESSURE 180	141	5781099.5	2123757.50002
15S/03E-17G01	PRESSURE 180	142	5780630.0	2122750.25002
15S/03E-18B01	PRESSURE 180	143	5776074.5	2124737.50002
15S/03E-21A01	PRESSURE 180	144	5787617.0	2118056.00002
15S/03E-22F02	PRESSURE 180	145	5789756.5	2117099.00002
15S/03E-22G01	PRESSURE 180	146	5791343.0	2116241.25002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
15S/03E-25L01	PRESSURE 180	147	5800408.5	2109728.50003
15S/03E-26A01	PRESSURE 400	148	5797857.5	2112518.00002
15S/03E-26D01	PRESSURE 180	149	5794548.5	2112893.75003
15S/03E-26H02	PRESSURE 180	150	5797573.5	2111904.75002
15S/03E-26P01	PRESSURE 400	151	5795686.5	2108925.25002
15S/03E-27J01	PRESSURE 400	152	5792207.5	2110413.00002
15S/03E-28B02	PRESSURE 400	153	5787075.5	2113993.25002
15S/03E-28G01	PRESSURE 180	154	5786358.0	2111546.50003
15S/03E-35B05	PRESSURE 180	155	5797153.0	2107813.50003
15S/04E-05K01	EAST SIDE	156	5812585.0	2130171.00001
15S/04E-05M01	EAST SIDE BOTH	157	5810608.5	2130920.50001
15S/04E-06D04	EAST SIDE BOTH	158	5805535.0	2134296.75001
15S/04E-06R01	EAST SIDE BOTH	159	5808832.0	2130397.50001
15S/04E-07A01	EAST SIDE BOTH	160	5808667.0	2128112.25001
15S/04E-07E02	EAST SIDE	161	5805290.0	2126918.25001
15S/04E-07R01	EAST SIDE SHALLOW	162	5809617.5	2124497.75001
15S/04E-08C01	EAST SIDE SHALLOW	163	5811226.0	2128961.75001
15S/04E-08L01	EAST SIDE BOTH	164	5812038.0	2125163.50001
15S/04E-08N01	EAST SIDE BOTH	165	5810237.5	2124086.00001
15S/04E-09N01	EAST SIDE	166	5815679.0	2123673.25001
15S/04E-15D02	EAST SIDE SHALLOW	167	5820525.5	2122131.50001
15S/04E-15P02	EAST SIDE BOTH	168	5822591.0	2118164.75001
15S/04E-16D01	EAST SIDE BOTH	169	5816370.5	2122604.00001
15S/04E-17B01	EAST SIDE	170	5813674.5	2122802.00001
15S/04E-17P02	EAST SIDE SHALLOW	171	5811444.0	2119748.75001
15S/04E-18L01	EAST SIDE	172	5806258.0	2120249.25001
15S/04E-19D02	PRESSURE 400	173	5805231.0	2118084.25001
15S/04E-19H03	EAST SIDE	174	5808765.0	2116311.75003
15S/04E-20B02	EAST SIDE SHALLOW	175	5812893.0	2117437.00001
15S/04E-20N01	PRESSURE 400	176	5810999.0	2113437.25001
15S/04E-20Q01	EAST SIDE	177	5813019.5	2113916.75003
15S/04E-22J01	EAST SIDE	178	5825620.5	2114797.50001
15S/04E-22L02	EAST SIDE BOTH	179	5822626.0	2115130.25001
15S/04E-23M01	EAST SIDE	180	5826800.0	2115510.00001
15S/04E-26G01	EAST SIDE	181	5829452.0	2110273.75001
15S/04E-27G01	EAST SIDE BOTH	182	5824082.0	2110658.00001
15S/04E-28C01	EAST SIDE	183	5817013.0	2112539.50001

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
15S/04E-28C01	EAST SIDE	184*	*	*
15S/04E-29K03	EAST SIDE	185*	*	*
15S/04E-32E01	PRESSURE 180	186	5809573.0	2105524.75003
15S/04E-36H01	EAST SIDE BOTH	187	5835591.5	2105235.00001
15S/04E-36R02	EAST SIDE BOTH	188	5836592.5	2101652.75001
16S/04E-01L02	EAST SIDE	189	5833261.5	2096387.25003
16S/04E-04C01	PRESSURE 400	190	5816563.5	2101653.00001
16S/04E-08J01	PRESSURE 180	191	5814399.5	2094772.87501
16S/04E-09A01	PRESSURE 180	192	5818962.5	2096385.75001
16S/04E-10K01	PRESSURE 400	193	5822871.5	2093933.87501
16S/04E-10R02	PRESSURE 400	194	5824891.5	2092808.00001
16S/04E-11E02	PRESSURE 400	195	5825734.0	2093587.12501
16S/04E-12M01	PRESSURE 400	196	5830110.0	2094179.62501
16S/04E-13D01	PRESSURE 400	197	5829977.5	2091400.75001
16S/04E-14M01	PRESSURE 400	198	5826507.0	2089158.00001
16S/04E-14M02	PRESSURE 400	199	5826934.0	2088314.12501
16S/04E-15D01	PRESSURE 180	200	5820915.5	2091029.00003
16S/04E-15H02	PRESSURE 400	201	5824314.0	2089470.00001
16S/04E-24R01	PRESSURE 400	202	5833826.5	2081330.00003
16S/04E-25A01	PRESSURE 400	203	5834115.0	2080854.00001
16S/04E-25K01	PRESSURE 180	204	5832503.0	2077482.12501
16S/04E-25Q01	PRESSURE 400	205	5832125.5	2076199.75001
16S/04E-27G01	PRESSURE 180	206	5823057.0	2078926.75001
16S/04E-36B01	PRESSURE 180	207	5833029.5	2074811.87501
16S/05E-07G01	EAST SIDE BOTH	208	5836648.0	2094674.00003
16S/05E-17P01	EAST SIDE BOTH	209	5843361.0	2086999.12503
16S/05E-17R01	EAST SIDE SHALLOW	210	5845212.0	2087024.25003
16S/05E-19F01	PRESSURE 180	211	5836477.0	2084158.37503
16S/05E-19R01	PRESSURE 180	212	5840423.0	2081360.37503
16S/05E-20C01	EAST SIDE	213	5843125.0	2085585.12503
16S/05E-20H01	EAST SIDE	214	5845691.0	2085074.25003
16S/05E-20R01	EAST SIDE BOTH	215	5845834.0	2082220.00003
16S/05E-27G01	EAST SIDE	216	5853466.8	2077678.05320
16S/05E-28D01	EAST SIDE BOTH	217	5846865.0	2080272.25003
16S/05E-28P01	EAST SIDE BOTH	218	5847355.5	2077784.37503
16S/05E-30C01	PRESSURE 180	219	5836401.5	2080129.50003
16S/05E-30G01	PRESSURE 180	220	5837912.0	2078876.87503

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
16S/05E-30J02	PRESSURE 400	221	5840526.5	2077512.50003
16S/05E-31A01	PRESSURE 180	222	5838804.0	2075067.12503
16S/05E-31Q01	PRESSURE 180	223	5837656.0	2070857.75003
16S/05E-32C01	PRESSURE 180	224	5843159.0	2075228.62503
16S/05E-32M01	FOREBAY	225	5840439.0	2072879.00003
16S/05E-33F01	FOREBAY	226	5847064.0	2072544.75003
16S/05E-33Q01	FOREBAY	227	5846731.0	2071679.00003
16S/05E-35C01	FOREBAY	228	5857923.0	2074215.75003
16S/05E-35L01	FOREBAY	229	5857341.0	2072381.25003
17S/04E-01D01	PRESSURE 180	230	5829970.4	2070190.88233
17S/05E-01R01	FOREBAY	231	5863270.5	2064114.75003
17S/05E-02G01	FOREBAY	232	5858061.5	2067655.75001
17S/05E-03B01	FOREBAY	233	5852910.5	2069821.37503
17S/05E-04C01	FOREBAY	234	5846947.5	2068985.25003
17S/05E-04K01	FOREBAY	235	5847433.5	2066928.37503
17S/05E-04N01	FOREBAY	236	5844523.0	2064819.50003
17S/05E-06Q01	FOREBAY	237	5837274.0	2065350.12503
17S/05E-09G01	FOREBAY	238	5846689.0	2062431.75003
17S/05E-09Q01	FOREBAY	239	5846868.5	2059437.25003
17S/05E-10Q01	FOREBAY	240	5853142.5	2060133.00003
17S/05E-12B01	FOREBAY	241	5864362.0	2062470.37503
17S/05E-12B02	FOREBAY	242	5863570.5	2063023.50003
17S/05E-12B03	FOREBAY	243	5862636.0	2063300.00003
17S/05E-13L02	FOREBAY	244	5861995.0	2054065.12503
17S/05E-14D01	FOREBAY	245	5855476.7	2057512.98904
17S/05E-14G01	FOREBAY	246	5858431.5	2057156.87503
17S/05E-21A01	FOREBAY	247	5847203.9	2053734.78530
17S/05E-23L01	FOREBAY	248	5855276.5	2049667.00003
17S/05E-25L01	FOREBAY	249	5861282.5	2044709.87503
17S/05E-36F02	FOREBAY	250	5861156.5	2040988.13679
17S/06E-16N01	FOREBAY	251	5876658.0	2053579.37503
17S/06E-17R01	FOREBAY	252	5875370.0	2053960.00003
17S/06E-19D01	FOREBAY	253	5865512.0	2052870.75003
17S/06E-20K01	FOREBAY	254	5874270.5	2050202.50003
17S/06E-20Q02	FOREBAY	255	5873861.0	2049734.12503
17S/06E-20Q03	FOREBAY	256	5873624.0	2049413.37503
17S/06E-27E03	FOREBAY	257	5881725.5	2046512.12503

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
17S/06E-27K01	FOREBAY	258	5884526.5	2044144.50003
17S/06E-27L01	FOREBAY	259	5883319.0	2044534.62503
17S/06E-28N01	FOREBAY	260	5876603.5	2042971.37503
17S/06E-29C01	FOREBAY	261	5871659.0	2048323.00003
17S/06E-29K01	FOREBAY	262	5873377.5	2045490.50003
17S/06E-29Q01	FOREBAY	263	5873361.0	2045274.25003
17S/06E-30F01	FOREBAY	264	5866434.0	2047190.00003
17S/06E-32G01	FOREBAY	265	5873481.5	2040947.12503
17S/06E-32J02	FOREBAY	266	5874264.0	2039466.50003
17S/06E-35F01	FOREBAY	267	5888535.0	2040776.00003
17S/06E-35J01	FOREBAY	268	5890370.5	2039573.75003
18S/06E-01E01	FOREBAY	269	5892201.0	2033873.12503
18S/06E-02N01	FOREBAY	270	5886656.0	2032336.12503
18S/06E-02R01	FOREBAY	271	5890070.0	2032210.75003
18S/06E-03P01	FOREBAY	272	5881836.0	2032629.37503
18S/06E-05H01	FOREBAY	273	5874765.0	2035980.12503
18S/06E-07A01	FOREBAY	274	5868250.5	2031805.25003
18S/06E-08R01	FOREBAY	275	5873246.0	2027074.87503
18S/06E-09M02	FOREBAY	276	5875856.5	2028751.00003
18S/06E-11J01	FOREBAY	277	5890622.5	2027590.87503
18S/06E-12A01	FOREBAY	278	5896424.0	2030093.87503
18S/06E-12R02	FOREBAY	279	5895096.5	2026768.25003
18S/06E-14B01	FOREBAY	280	5888379.5	2025469.87503
18S/06E-14R01	FOREBAY	281	5890625.0	2022391.37503
18S/06E-15F01	FOREBAY	282	5882187.0	2023781.12503
18S/06E-15M01	FOREBAY	283	5880584.0	2022838.50003
18S/06E-16L01	FOREBAY	284	5876773.5	2023478.50003
18S/06E-21Q01	FOREBAY	285	5878665.0	2016542.37503
18S/06E-25F01	FOREBAY	286	5891762.0	2013188.12503
18S/06E-26R01	FOREBAY	287	5890408.5	2011271.25003
18S/06E-27A01	FOREBAY	288	5883864.0	2015914.75003
18S/06E-28J01	FOREBAY	289	5879251.0	2013091.87503
18S/06E-34B01	FOREBAY	290	5882838.0	2010128.37503
18S/07E-18K01	FOREBAY	291	5899619.5	2023322.62503
18S/07E-18P01	FOREBAY	292	5897367.5	2022162.75003
18S/07E-19G02	FOREBAY	293	5899561.5	2019657.12503
18S/07E-19N01	FOREBAY	294	5896875.0	2016213.75002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
18S/07E-20K01	FOREBAY	295	5903526.5	2016596.50003
18S/07E-28K01	FOREBAY	296	5909064.5	2012996.12503
18S/07E-28N02	FOREBAY	297	5906995.5	2011573.25003
18S/07E-29J01	FOREBAY	298	5906172.5	2012704.50003
18S/07E-29M01	FOREBAY	299	5901432.0	2012790.87503
18S/07E-32G02	FOREBAY	300	5905129.0	2008896.37503
18S/07E-34P02	FOREBAY	301	5913853.5	2006429.50003
19S/06E-01H01	FOREBAY	302	5894418.0	2003322.50003
19S/06E-03E02	FOREBAY	303	5880577.0	2003637.62503
19S/06E-03K01	FOREBAY	304	5882172.5	2003068.00003
19S/06E-11C01	FOREBAY	305	5887118.5	1999053.25003
19S/06E-12A01	FOREBAY	306	5895441.5	1999532.50003
19S/07E-03H02	UPPER VALLEY	307	5916058.0	2002263.25003
19S/07E-04G01	FOREBAY	308	5908976.0	2002192.50003
19S/07E-04Q01	FOREBAY	309	5907241.5	2000938.12503
19S/07E-05B02	FOREBAY	310	5903922.5	2005128.00003
19S/07E-10P02	UPPER VALLEY	311	5914112.0	1994937.37503
19S/07E-13D01	UPPER VALLEY	312	5923060.5	1993005.87503
19S/07E-13D02	UPPER VALLEY	313	5922703.0	1993016.87503
19S/07E-13D03	UPPER VALLEY	314	5921177.5	1994464.25003
19S/07E-16D01	UPPER VALLEY	315	5907215.0	1993447.25003
19S/07E-20A01	UPPER VALLEY	316	5904728.0	1988737.75003
19S/07E-20A02	UPPER VALLEY	317	5905140.0	1988780.50003
19S/07E-23F01	UPPER VALLEY	318	5917918.5	1986682.87503
19S/07E-23G01	UPPER VALLEY	319	5919819.5	1985678.50003
19S/07E-24H02	UPPER VALLEY	320	5927076.5	1985899.12503
19S/07E-36N01	UPPER VALLEY	321	5921376.0	1974705.75003
19S/08E-30A01	UPPER VALLEY	322	5931268.5	1981945.62503
20S/08E-05C02	UPPER VALLEY	323	5933968.0	1972500.37503
20S/08E-05R03	UPPER VALLEY	324	5935855.5	1968133.00003
20S/08E-06B01	UPPER VALLEY	325	5929631.0	1971657.50003
20S/08E-07E01	UPPER VALLEY	326	5927847.5	1965744.25003
20S/08E-15H03	UPPER VALLEY	327	5946414.0	1959720.37503
20S/08E-16C01	UPPER VALLEY	328	5938055.0	1961243.37501
20S/08E-17K03	UPPER VALLEY	329	5934573.0	1958618.62503
20S/08E-34G01	UPPER VALLEY	330	5944061.5	1944379.50003
20S/08E-36R01	UPPER VALLEY	331	5957517.0	1941628.62503

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
21S/08E-15J01	UPPER VALLEY	332	5946267.0	1926489.62503
21S/09E-06C01	UPPER VALLEY	333	5959365.5	1939884.62503
21S/09E-16E02	UPPER VALLEY	334	5967913.5	1928310.37503
21S/09E-22J01	UPPER VALLEY	335	5976378.5	1921774.75003
21S/09E-24Q01	UPPER VALLEY	336	5985537.5	1920320.00003
21S/10E-30E02	UPPER VALLEY	337	5988110.5	1916891.25003
21S/10E-32N01	UPPER VALLEY	338	5993930.5	1907839.00003
22S/10E-09P01	UPPER VALLEY	339	6000619.0	1897117.87503
22S/10E-16P01	UPPER VALLEY	340	6000072.0	1892154.87503
22S/10E-21C01	UPPER VALLEY	341	6001268.5	1890089.75003
22S/10E-22N01	UPPER VALLEY	342	6004921.0	1886561.87503
22S/10E-28B01	UPPER VALLEY	343	6001816.0	1886849.25003
22S/10E-34G01	UPPER VALLEY	344	6007012.0	1879185.87503

[1] State Plane Coordinate System, California Zone IV, Feet North American Datum 1983

*Coordinates to be collected

Table 5 COASTAL WELLS AND LOCATIONS

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
13S/01E-25R01	PRESSURE 900	1	5742345.5	2174687.00002
13S/02E-15M01	PRUNEDALE	2	5757881.5	2185405.50002
13S/02E-19Q03	PRESSURE 900	3	5746313.5	2179184.50002
13S/02E-20J01	PRESSURE 400	4	5752096.0	2180981.25002
13S/02E-28L02	PRESSURE BOTH	5	5755055.5	2175441.75002
13S/02E-28M02	PRESSURE 400	6	5753447.0	2175997.50002
13S/02E-32J03	PRESSURE 400	7	5752560.0	2170401.75002
13S/02E-33N04	PRESSURE 400	8	5753898.0	2169605.00002
13S/02E-34G01	PRESSURE 400	9	5760129.5	2170052.25002
13S/02E-34M01	PRESSURE 400	10	5757997.5	2169621.75002
14S/01E-13J02	PRESSURE 400	11	5741048.0	2154289.50002
14S/02E-01C01	EASTSIDE DEEP	12	5771477.5	2167454.25002
14S/02E-02A02	EASTSIDE DEEP	13	5768561.0	2167823.50002
14S/02E-02C03	PRESSURE 400	14	5765109 0	2167416.00002
14S/02E-03H01	PRESSURE 400	15	5762283.0	2166255.50002
14S/02E-03M02	PRESSURE 400	16	5758710.5	2164740.50002
14S/02E-03R02	PRESSURE 400	17	5762517.0	2163892.75002
14S/02E-04B01	PRESSURE 400	18	5755909.0	2167499.00002
14S/02E-04G02	PRESSURE 400	19	5756262 0	2166403.75002
14S/02E-04H01	PRESSURE 400	20	5756715.0	2165886.25002
14S/02E-04N03	PRESSURE 400	21	5753365.0	2163112.75002
14S/02E-05C03	PRESSURE 400	22	5748893.5	2167132.50002
14S/02E-05K02	PRESSURE 400	23	5750829.0	2165370.75002
14S/02E-07A01	PRESSURE 400	24	5747142.5	2162655.25002
14S/02E-07J02	PRESSURE 400	25	5746655.0	2159408.25002
14S/02E-07J03	PRESSURE DEEP ZONE	26	5746476.9	2159735.06998
14S/02E-07L04	PRESSURE 400	27	5743780.0	2159328.00002
14S/02E-07L05	PRESSURE 400	28	5743784.5	2160380.50002
14S/02E-08C03	PRESSURE 400	29	5750055.0	2162036.75002
14S/02E-08M02	PRESSURE 400	30	5747103.0	2159672.50002
14S/02E-09D04	PRESSURE 400	31	5753016.5	2162818.75002
14S/02E-09K02	PRESSURE 400	32	5755450.0	2159946.25002
14S/02E-09N02	PRESSURE 400	33	5752897 5	2158609.50002
14S/02E-10E02	PRESSURE 400	34	5758062.0	2160525.75002
14S/02E-10H01	PRESSURE 400	35	5761492.0	2160761.75002

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
14S/02E-10M02	PRESSURE 400	36	5757853.5	2159387.75002
14S/02E-11B01	PRESSURE 400	37	5766446.0	2162325.25002
14S/02E-11M03	PRESSURE 400	38	5764448.5	2159266.75002
14S/02E-12N02	PRESSURE 180	39	5769893.5	2158219.50002
14S/02E-13F01	PRESSURE 180	40	5769952.5	2154587.75002
14S/02E-13G01	PRESSURE 400	41	5772057.5	2155470.50002
14S/02E-14A01	PRESSURE 400	42	5767367.0	2156210.25002
14S/02E-14L02	PRESSURE 180	43	5764775.5	2155024.75003
14S/02E-14L03	PRESSURE 400	44	5764610.5	2154419.75002
14S/02E-15A01	PRESSURE 400	45	5761774.5	2157015.50002
14S/02E-15C02	PRESSURE 400	46	5759385.5	2157259.00002
14S/02E-15L02	PRESSURE 180	47	5758452.0	2153366.00003
14S/02E-15N01	PRESSURE 400	48	5757522.5	2153353.25002
14S/02E-15P01	PRESSURE 400	49	5758767.5	2153584.50002
14S/02E-16A02	PRESSURE 400	50	5756957.5	2157123.50002
14S/02E-16G01	PRESSURE 400	51	5755957.0	2155999.50002
14S/02E-16H01	PRESSURE 400	52	5756041.0	2156035.25002
14S/02E-17A02	PRESSURE 400	53	5751744.5	2156837.50002
14S/02E-20B03	PRESSURE 900	54	5750210.5	2151407.25003
14S/02E-21E01	PRESSURE 400	55	5753561.0	2150101.50003
14S/02E-21J01	PRESSURE 180	56	5756896.0	2149447.75002
14S/02E-21L01	PRESSURE 180	57	5754605.0	2149175.75002
14S/02E-22B01	PRESSURE 400	58	5760986.0	2152124.75002
14S/02E-22L01	PRESSURE 400	59	5759725.0	2149855.00002
14S/02E-22P02	PRESSURE 180	60	5758952.5	2146937.25002
14S/02E-23M01	PRESSURE 180	61	5762708.0	2149478.75002
14S/02E-24E01	PRESSURE 180	62	5768326.5	2150393.25002
14S/02E-24P02	PRESSURE 400	63	5769670.0	2146858.75002
14S/02E-24Q01	PRESSURE 180	64	5771942.5	2146772.50003
14S/02E-25D04	PRESSURE 180	65	5768019.0	2145519.50003
14S/02E-26J03	PRESSURE 400	66	5766847.5	2143883.00002
14S/02E-26N03	PRESSURE 180	67	5762617.0	2142567.75002
14S/02E-26P01	PRESSURE 180	68	5764519.0	2141615.00003
14S/02E-27C02	PRESSURE 400	69	5759686.0	2145562.00002
14S/02E-27F02	PRESSURE 180	70	5759825.0	2144647.75002
14S/02E-28C01	PRESSURE 400	71	5753983.5	2146953.50002
14S/02E-32D06	PRESSURE 180	72	5746981.0	2141653.75003

STATE WELL NUMBER	AQUIFER	MAP ID	FALSE EASTING[1]	FALSE NORTHING[1]
14S/02E-33P01	PRESSURE BOTH	73	5756348.0	2138806.75003
14S/02E-34A04	PRESSURE 180	74	5761465.0	2141623.00002
14S/02E-34B03	PRESSURE 180	75	5759909.5	2141431.00002
14S/02E-36E01	PRESSURE 180	76	5768600.0	2138685.00002
14S/02E-36G01	PRESSURE 400	77	5770039.0	2139297.50002
14S/03E-06L02	EASTSIDE DEEP	78	5775957.0	2164155.50002
14S/03E-07P02	EASTSIDE SHALLOW	79	5775832.0	2157899.00003
14S/03E-18E02	PRESSURE 400	80	5774633.5	2155704.50003
14S/03E-19Q02	PRESSURE 180	81	5776192.0	2146948.50002
14S/03E-30E03	PRESSURE 400	82	5774081.0	2143975.75002
14S/03E-30F01	PRESSURE 180	83	5775609.5	2144673.00002
14S/03E-31B01	PRESSURE 180	84	5776312.0	2140030.50002
15S/02E-12C01	PRESSURE 180	85	5769441.0	2130513.75002

[1] State Plane Coordinate System, California Zone IV, Feet, North American Datum 1983

Table 6 REQUIREMENTS FOR SAMPLE COLLECTION[1]

ANALYTE	CONTAINER TYPE	SAMPLE VOLUME	PRESERVATIVE	HOLDING TIME
Calcium (Ca)	polyethylene (HDPE[2])	200 mL[3]	HNO_3 pH<2	3 days w/o pres. 6 months w/ pres.
CATION ANION BALANCE[4]	N/A Calculation	N/A Calculation	N/A Calculation	N/A Calculation
Chloride (Cl)[5]	polyethylene (HDPE[2])	100 mL[2]	4±2°C	28 days
Conductivity (SEC)[5]	polyethylene (HDPE[2])	100 mL[2]	4±2°C	28 days
Magnesium (Mg)	polyethylene (HDPE[2])	200 mL[2]	HNO_3 pH<2	3 days w/o pres. 6 months w/ pres.
Nitrate (NO3)[5]	polyethylene (HDPE[2])	100 mL[2]	none HSO_4 pH<2	48 hours at 4° C 28 days
pH (Laboratory)	polyethylene (HDPE[2])	30 mL[2]	none	48 hours at 4° C
Potassium (K)	polyethylene (HDPE[2])	200 mL[2]	HNO_3 pH<2	3 days w/o pres 6 months w/ pres.
Sodium (Na)	polyethylene (HDPE[2])	200 mL[2]	HNO_3 pH<2	3 days w/o pres 6 months w/ pres.
Sulfate (SO4)	polyethylene (HDPE[2])	100 mL[2]	4±2°C	28 days
Total Alkalinity (as CaCO3)	polyethylene (HDPE[2])	100 mL[2]	4±2°C	14 days

[1] = CCL QA Manual and SOPs
[2] = High Density Polyethylene
[3] = only one 0.5 gal (~2L) container is needed for all analyses
[4] = Cation anion balance is a calculation
[5] = Analytes in partial mineral panel, one pint (~500 mL) container is need for analyses

APPENDICES

APPENDIX A

GLOBAL POSITIONING SYSTEM (GPS) TRAINING

Appendix A-1: GPS Training Record

Appendix A-2: TSC1 Asset Surveyor Manual

Appendix A-3: Pro XR/XRS Receiver Manual

Geographic Positioning System (GPS) Training Record

Name of Trainee	
Name of Trainer	
Date of Training	

	Satisfactory Completion / Understanding
Verification of access to Pathfinder Office software	
Preparation of data dictionary	
Set-up of equipment	
Trimble© TSC1 Asset Surveyor[1]	
Trimble® Pro XR Receiver[1]	
Connector cables	
Batteries (Asset Surveyor and Receiver)	
Confirmation of communication between Asset Surveyor and Receiver	
Acquiring satellites	
Setting up and checking critical settings	
-logging intervals	
-PDOP mask[2]	
Proper packing and unpacking of equipment	
Transferring data files from Asset Surveyor to the computer	

[1] The Agency uses Trimble® products, the GPS industry standard.
[2] PDOP = Position Dilution Of Precision

TSC1 Asset Surveyor
Operation Manual

Trimble

TSC1 Asset Surveyor

Operation Manual

Part Number 34182-05-ENG

Version 5.00

October 1999

Revision A

Trimble Navigation Limited
Mapping & GIS Systems
645 North Mary Avenue
P.O. Box 3642
Sunnyvale, CA 94088-3642
U.S.A.

1-800-827-8000 in North America
+1-408-481-8000 International
Fax: +1-408-481-7744
www.trimble.com

1 Quick Setup

The instructions in this chapter are a simplified version of the various steps found in Chapters 4, 5, and 6 of this manual. The purpose of the simplified version is to provide quick setup guides with reasonable default values that can be distributed to field crews to ensure proper setup of rover or base station receivers.

Data is logged to the TSC1 with the Asset Surveyor software. For full details on configuration and data collection, refer to the *TSC1 Asset Surveyor Software User Guide*.

Note – The steps outlined in this chapter do not include steps required to collect data using carrier phase information. For instructions on how to collect high accuracy features, see Chapter 7, Carrier Phase Data Collection.

1.1 Before Leaving the Office

1. Install the Pathfinder Office software on your office computer (refer to the *Pathfinder Office Getting Started Guide*).
2. Using the Pathfinder Office software, prepare any data files or data dictionaries you require, and transfer them to the TSC1. If you want to update GPS or attribute information on features stored in a GIS, import the data files and data dictionary into Pathfinder Office and then transfer them to the TSC1. You may also want to transfer any waypoint and coordinate system files to the datalogger.

3. Check that you have all the required equipment, and that it is operational. Set up and connect your GPS system (the appendix for your GPS receiver lists the equipment and shows you how to connect it).

4. If the GPS receiver has an On/Off switch, turn it on (the Series 4000, GPS Total Station 4700, GPS Total Station 4800, Site Surveyor 4400 and 4600LS receivers have an On/Off switch).

   Start the Asset Surveyor software to check that it and the GPS receiver are communicating correctly. If communication is established, the GPS status line appears. If communication fails, an error message pops up on the screen.

5. Check all critical settings in the Asset Surveyor software.

   You should also check non-critical and display settings, especially if the system has been used by someone else recently. For details of how to configure Asset Surveyor, refer to the *TSC1 Asset Surveyor Software User Guide*.

6. Turn everything off and pack it into carrying cases if you have to travel a significant distance to the survey site. Pack spare sets of batteries if you expect to operate the receiver for any length of time.

1.2 In the Field

1. Travel to the survey site, remembering to carry all the required equipment with you.

2. Reassemble the system.

3. If the GPS receiver has an On/Off switch, turn it on. Then start the Asset Surveyor software, if it is not already on.

   Wait until the GPS receiver acquires enough satellites to start computing GPS positions, before beginning to work. The number of satellites being tracked displays on the status line.

TSC1 Asset Surveyor Operation Manual Trimble

You should now change some of the configuration settings as follows:

Main menu

1.	*Configuration*	Highlight *Configuration* then press the key

Configuration menu

2.	*GPS rover options*	Press
3.	*Logging options*	Press

Logging options screen

4.	*Point feature*	Synchronized with the base station
5.	*Line/area*	Synchronized with the base station
6.	*Not in feature*	Synchronized with the base station
7.	*Minimum positions*	3
8.	*Allow GPS update*	'Warn first'
9.	*Warning distance*	'Any'
10.	To accept	Press

Position filters screen

11.	*Position mode*	'Manual 3D' or 'Overdet. 3D' depending on canopy density
12.	*PDOP mask*	4 or 6 (depending on receiver)
13.	To accept	Press

4. Create a new data file, associating the correct data dictionary with it. Alternatively, re open an existing data file.
5. Begin collecting data. Collect, review and update all the features necessary.
6. Close the data file.
7. Disconnect and repack the components of the system. Remember to turn off the GPS receiver, if it has an On/Off switch. Return to your office.

1.3 Back in the Office

1. Transfer the data files from the TSC1 to the PC using the Pathfinder Office software.
2. Use the Pathfinder Office software for differential correction, plotting, and exporting the data file(s) to a GIS.
3. Recharge the TSC1 datalogger and GPS receiver batteries.

1.4 Rover Configuration

Use the following procedure to set up your system in a rover configuration.

From the *Utilities* menu, select *Factory defaults*. This resets the Asset Surveyor software to its default configuration and then restarts the datalogger.

Antenna options screen

14. *Height*	Height to antenna's phase center
15. *Measure*	'Vertical'
16. *Type*	For a list of antenna types, see the *TSC1 Asset Surveyor Software User Guide*
17. *Confirm*	Select 'Per feature', 'Per file', or 'Never'
18. To accept	Press

GPS rover options menu

19. To return to the *Configuration* menu	Press

Configuration menu

20. *Communication options*	Press
21. *Real-time input options*	Press

Real-time input options screen

22. RTCM age limit	5 or 10 (depending on your radio)
23. To accept	Press
24. To return to the *Configuration* menu	Press

Configuration menu

25. To exit the *Configuration* menu	Press

1.4.1 Data Collection

Use the following procedure to set up your system for rover data collection.

Main menu

1. Select *Data collection* and press

Data collection menu

2.	Create a data file	Select *Create new file*: Press and then press
	-or-	-or-
	Open an existing data file	Select *Open existing file*. Press Select an existing file to append to or update, and press
3.	To exit *Data collection*	Press and press Yes to confirm exit

1.5 Base Station Configuration

Use the following procedure to set up your system in a base station configuration.

Main menu

1.	*Configuration*	Highlight *Configuration* then press the key

Configuration menu

2.	*GPS base station options*	Press
3.	*Logging options*	Press

Logging options screen

4.	*Measurements*	One to five seconds (depending on rover interval and free space)
5.	To accept	Press
6.	To return to the *Configuration* menu	Press

Configuration menu

7.	To exit the *Configuration* menu	Press

1.5.1 Base Station Data Collection

Use the following procedure to set up your system for base station data collection.

Main menu

1.	*Data collection*	Press

Data collection menu

2.	*Create base file*	Press

Create File screen

3.	Create file	Press

Antenna options screen

4.	*Height*	Height to antenna's phase center
5.	*Measure*	'Vertical'
6.	*Type*	For a list of antenna types, see the *TSC1 Asset Surveyor Software User Guide*
7.	To accept	Press

Reference Position screen

8.	Enter reference position	Type lat/lon (or north/east) and altitude, and press
	-or-	-or-
	Use an existing waypoint	Press WayPt , select the waypoint and press
	-or-	-or-
	Use an approximate position	Press Here and press
	-or-	-or-
	Leave as is and set in the Pathfinder Office software	Press

Base Station screen

9.	To exit *Base station*	Press and press Yes to confirm exit.

Key Symbols

The Asset Surveyor software uses both *hard* (that is, physical) keys on a keypad and *soft* (that is, visual) keys on the datalogger's screen.

Hard (physical) keys on the TSC1 keypad are indicated as follows:

, , , and so on.

Softkeys on the TSC1 screen are indicated as follows:

Create, Del, Edit, and so on.

A softkey is activated by pressing the corresponding function key (F1...F5) on the TSC1 keypad.

Warnings, Cautions, Notes, and Tips

Warnings, cautions, notes, and tips draw attention to important information, and indicate its nature and purpose.

Warning – Warnings alert you to situations that could cause personal injury or unrecoverable data loss.

Caution – Cautions alert you to situations that could cause hardware damage or software error.

Note – Notes give additional significant information about the subject to increase your knowledge, or guide your actions.

Tip – Tips indicate a shortcut or other time- or labor-saving hint that can help you make better use of the product.

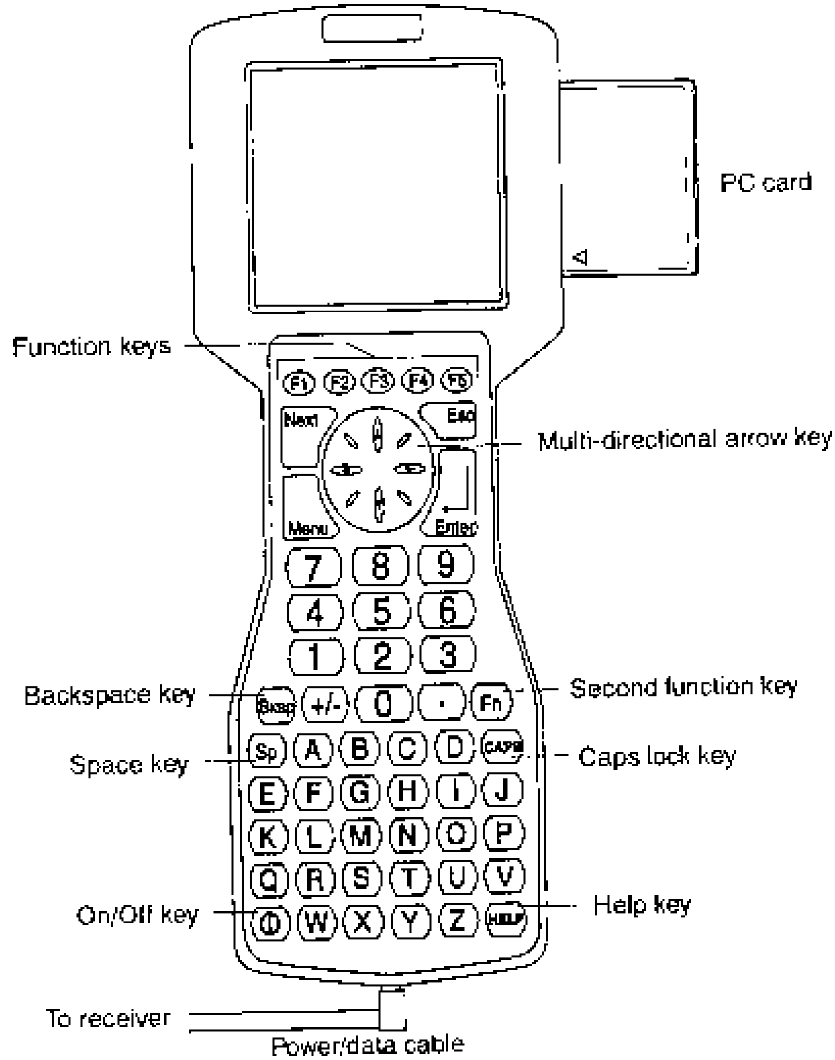


Figure 3-1 Front View of the TSC1 Datalogger

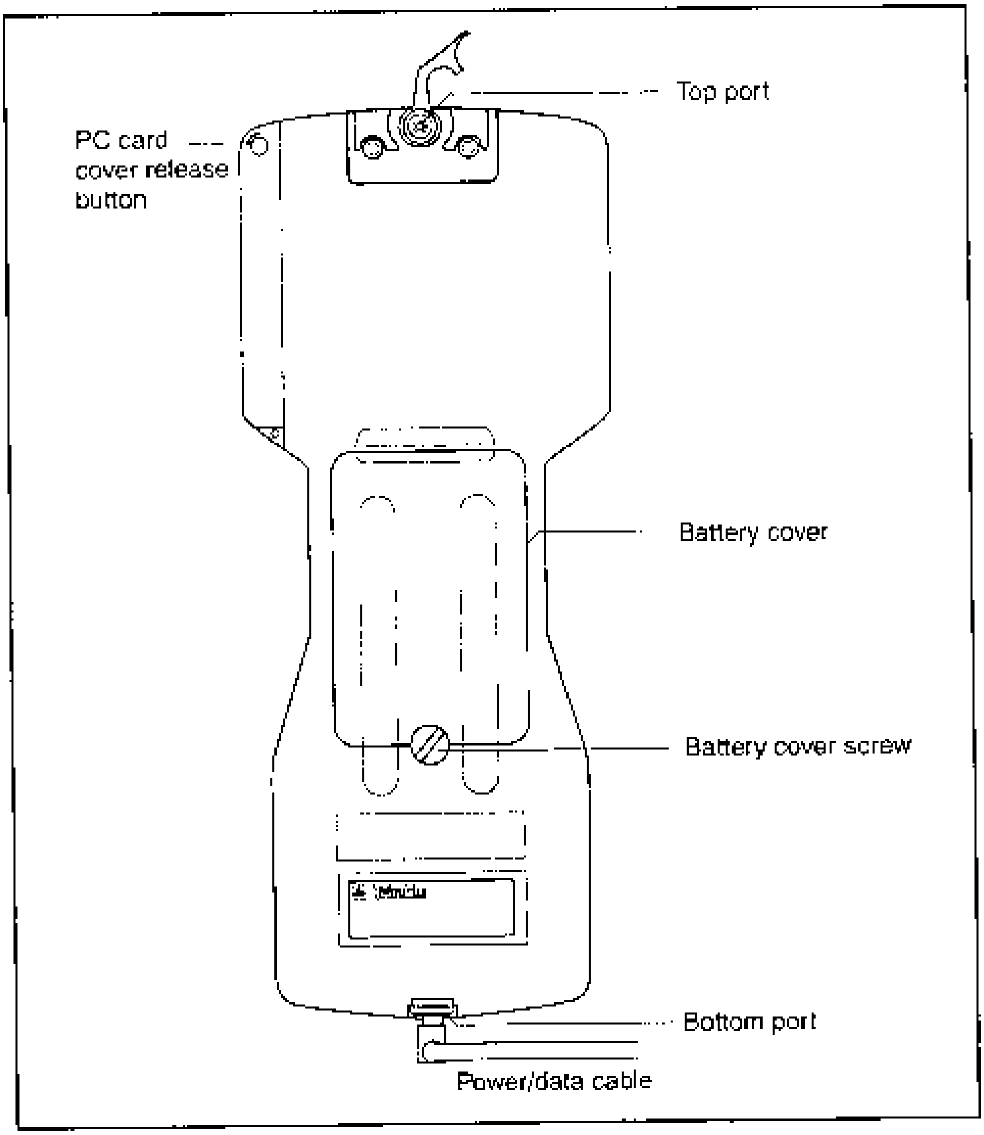


Figure 3-2 Back View of the TSC1 Datalogger

3.2 Turning the TSC1 Datalogger On and Off

To turn on the TSC1 datalogger, make sure that power is supplied (see Power Sources, page 3-11). Then press the green on/off key marked [ ].

To turn off the TSC1, hold down [ ] for one second.

Tip – For the location of the [ ] key and other keys on the TSC1 datalogger's keypad, refer to Figure 3-1.

3.2.1 Hard Keys

Hard keys are the physical keys on the TSC1 keypad, such as [1], [A], [ ], , , and [ ]. Use these keys to enter data and to access different screens.

3.2.2 Alternate Keys

Alternate keys give some hard keys a second function. Some of the second functions are displayed on the hard keys in small yellow lettering. To use a second function, press the [Fn] hard key and then press the alternate hard key.

Table 3-1 shows some of the functions that you can access using alternate keys.

Table 3-1 Useful Second Functions

Keys	Function
[Fn]	Page down
[Fn]	Page up
[Fn]	Home
[Fn]	End
[Fn] [ ]	Previous screen
[Fn] [E]	Contrast up
[Fn] [F]	Contrast down

3.2.3 Softkeys

Softkeys are displayed on the bottom line of the TSC1 screen. A softkey corresponds to the adjacent hard key: F1, F2, F3, F4, F5. Press the hard key to activate the softkey on the screen. To activate the Pause softkey, for example, press F1. See Figure 3-3.

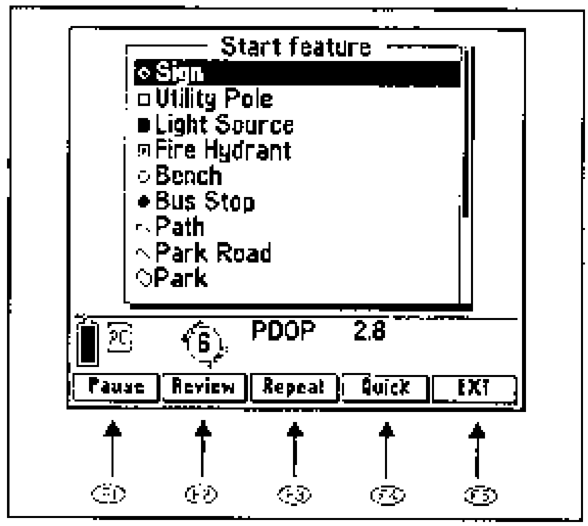


Figure 3-3 How Function Keys Correspond to Softkeys

Softkeys relate to particular forms or fields and only appear when these forms or fields are accessed. For example, the Seg softkey only appears when a line feature is opened for data collection, as this functionality applies to line features only.

3.2.4 Menu Key

To return to the *Main menu* at any time, press the MENU hard key. Use this key in conjunction with the Func key to move around the Asset Surveyor screens quickly.

3.2.5 Next Key

To simplify the task of moving around menus, the hard key offers quick access to open screens (windows).

3.2.6 Help Key

Press the hard key at any time to obtain further information about a topic. When you press it, the *Help* menu appears. To exit *Help*, press from the *Help* menu.

3.3 Screen

The TSC1 has an LCD screen. This screen responds to heat, and prolonged exposure to full sunlight can cause it to darken. If the screen does darken, turn it away from direct sunlight until it returns to normal.

Caution – Repeated exposure to direct sunlight can cause the screen to degrade.

3.3.1 Contrast

To increase the screen contrast, press [Fn] [E].

To decrease the screen contrast, press [Fn] [F].

3.3.2 Backlight

To toggle the screen backlight on and off, press [Fn] [I].

Pro XR/XRS

Receiver Manual

Trimble

Pro XR/XRS

Receiver Manual

Part Number 31172-20-ENG

Revision A

May 1998

Trimble Navigation Limited
Mapping and GIS Systems Division
645 North Mary Avenue
P.O. Box 3642
Sunnyvale, CA 94088-3642
U.S.A.

1-800-827-8000 in North America
+1-408-481-8000 International
Fax: +1-408-481-7744
www.trimble.com

4 Pro XR/XRS System Equipment

This chapter provides details of the equipment associated with the Pro XR and Pro XRS receivers and shows how to assemble the equipment.

4.1 Pro XR Receiver Front Panel

The Pro XR receiver, shown in Figure 4-1, is mounted in a weatherproof housing.

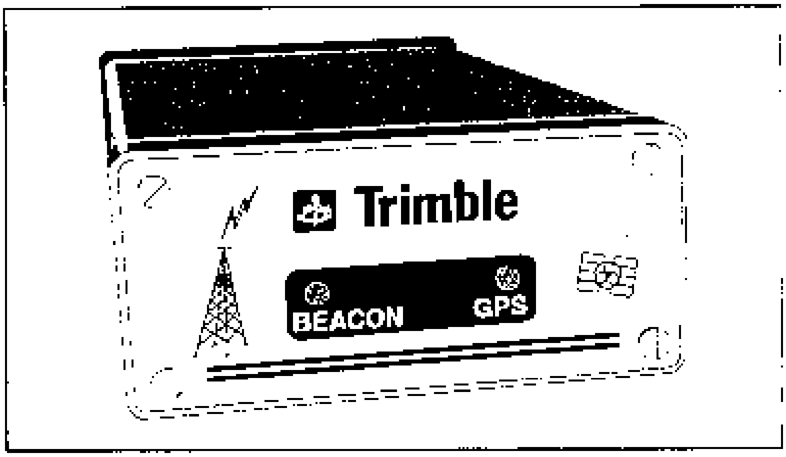


Figure 4-1 Pro XR Receiver Front Panel

4.2.1 Pro XR Status Lights

The two status lights on the front panel of the Pro XR receiver provide the status information listed in Table 4-1.

Table 4-1 Pro XR Status Lights

	GPS	Beacon
OFF	Unit not powered up	Unit not powered up or beacon function is disabled
FAST FLASH	Searching for satellites	Searching for MSK signals
SLOW FLASH	Found one or more satellites. Not enough for a position fix.	Found MSK signal. RTCM data has not been sent to GPS receiver.
ON	Performing position fixes	Good RTCM data is being provided to the GPS receiver

4.3 Back Panel

The Pro XR and Pro XRS receivers have two serial communications ports (RS232) and an antenna cable port. The serial communications ports, shown in Figure 4-3, are 12-pin(m) bulkhead connectors located on the back panel of the Pro XR and Pro XRS receivers.

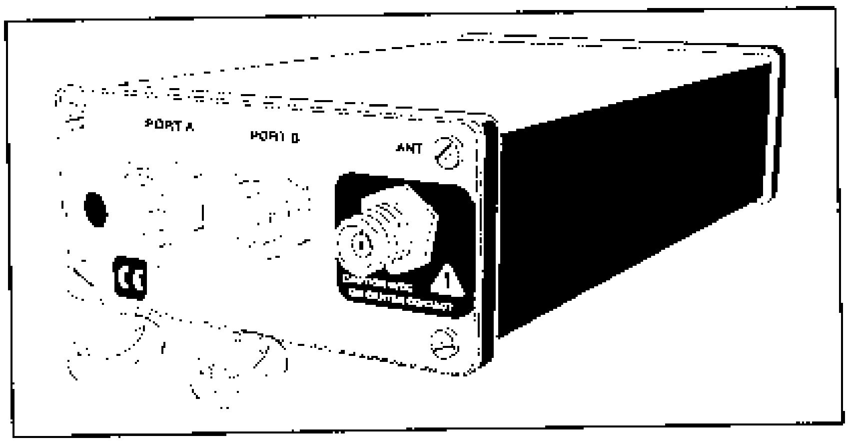


Figure 4-3 Pro XR/XRS Receiver Back Panel

4.3.1 Port A

Port A offers RS232 communication standards. It is designed for NMEA-0183 output and RTCM input.

4.3.2 Port B

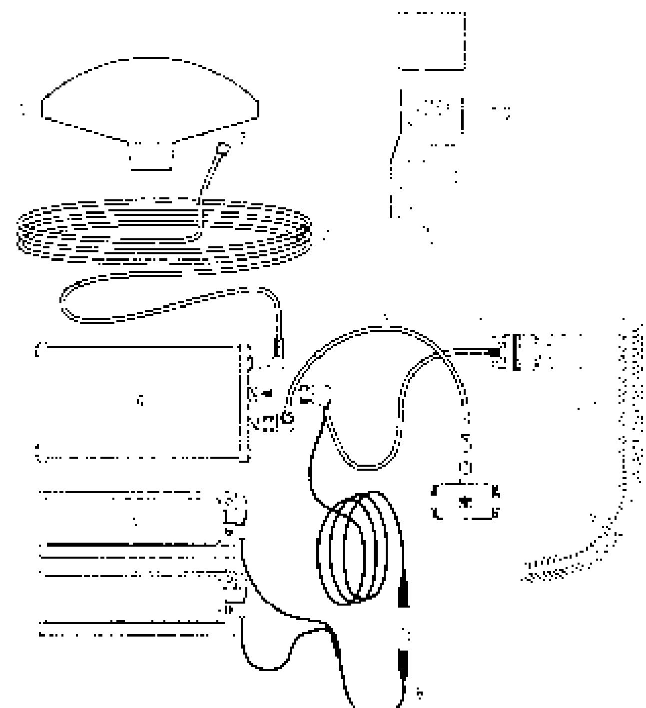
Port B also offers RS232 communication standards. It is designed for two-way data flow, external sensor input and power.

4.3.3 Antenna Port

The antenna connector is a TNC(f) connector located on the far right on the back panel of the Pro XR or Pro XRS receiver.

4.4 GPS Pro XR Cabling

To use the TSC1 handheld with a GPS Pro XR receiver, connect the system as shown in Figure 4-4.



1	P/N 16741-00	Compact Dome Antenna
2	P/N 22628	Antenna Cable
3	P/N 31180	Antenna Cable Adapter
4	P/N 29654-11	12 channel Pro XR receiver
5	P/N 17466	Camcorder Batteries
6	P/N 30232-00	NMEA/RTCM Cable
7	P/N 30231-00	Data/Power Cable
8	P/N 24333	Dual Battery Cable
9	P/N 32287-00	TSC1 Data/ESP Cable
10	P/N 29673-50	TSC1 Handheld

Figure 4-4 GPS Pro XR / TSC1 Connection Diagram

4.7 Pro XR/XRS System Hip Pack

The Pro XR and Pro XRS systems come equipped with an ergonomic hip pack carrying system, see Figure 4-18. The receiver, batteries and antenna are carried in the field using this hip pack/strapping system.

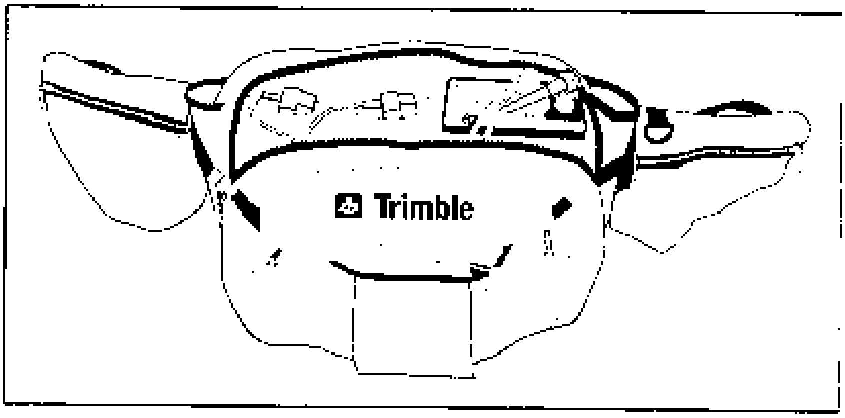


Figure 4-18 Pro XR/XRS System Hip Pack

4.7.1 Pro XR/XRS Hip Pack Contents

The Pro XR and Pro XRS systems are packed so that they are almost ready for use. The items not included in the hip pack are three 1-foot antenna poles, one 6-inch antenna pole and the data collector cable (P/N 30233-00 for TDC1, P/N 30234 for TDC2, or P/N 30236 for Field Computer/MC-V). These are located inside the shipping case.

The large interior of the hip pack contains: the Pro XR or Pro XRS receiver, two camcorder batteries, the power/data cable, and the camcorder power cable. All of these are set up inside the pack and ready for use. The exterior pocket of the hip pack contains a 3-meter antenna cable attached to the receiver and routed through a passage between the large interior pocket and exterior pocket. Both the data collector cable and antenna are routed out of the exterior pocket through the double zipper.

To route the data collector cable:

1. Locate the data collector cable and connect it to the data power cable, DE-9 connector labeled TO RECEIVER.
2. Once connected, feed the coiled cable through the passage and into the exterior pocket.

4.7.2 Wearing and Adjusting the Hip Pack

The Pro XR/XRS hip pack, once adjusted to suit, is comfortable and easy to use. See Figure 4-19.

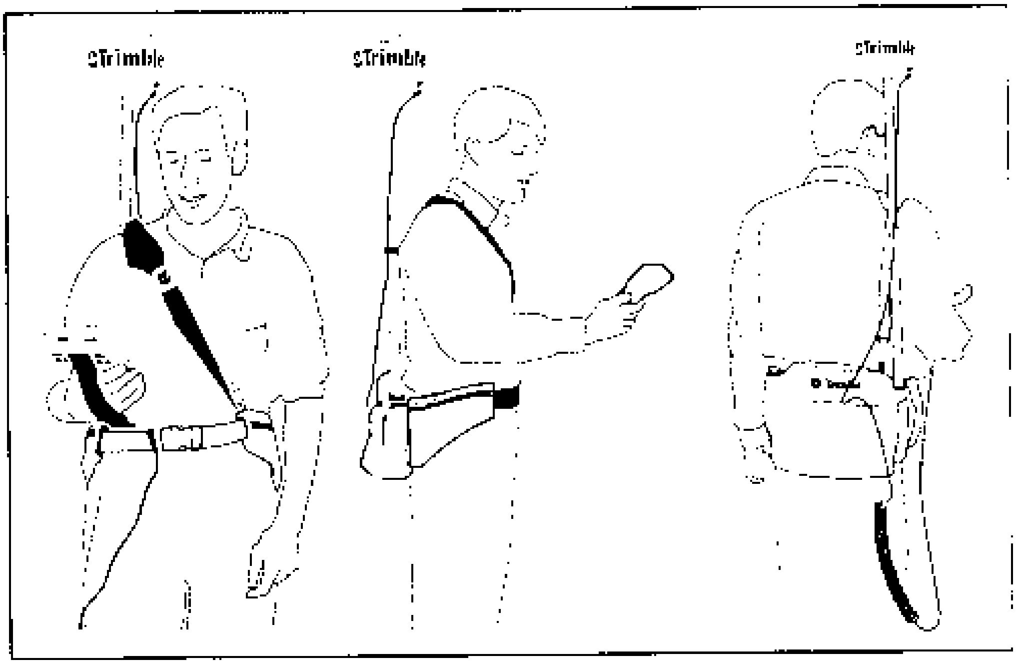


Figure 4-19 View of Hip Pack Setup

Antenna

When wearing the hip pack, the antenna height should be 3-4 inches above your head. The number of antenna pole sections required varies depending on your height. For example, if you are 5'5" tall, you may need two 1-foot and one 6-inch pole sections. If you are 6'2" tall, you may need three 1-foot poles. Try out different pole heights.

To set up the antenna with the hip pack:

1. Attach the pole sections together and connect the antenna onto the top of the pole sections.
2. Attach the pole/antenna to the hip pack.
3. Choose the side of your body that you prefer the antenna to be on and slide the pole sections into the small sleeve on that side of the hip pack.

Hip Pack and Strap

To adjust the hip pack and strap:

1. Connect the strap to the rear D-ring on the side of the pack on which the antenna is located.
2. Connect the other end of the strap to the D-ring on the belt on the opposite of the bag.
3. Slide the antenna pole through the velcro connection on the strap.
4. Put the strap over your head and across your opposite shoulder.

   At this point, the shoulder strap should lead naturally from the antenna pole across your chest to the belt.
5. Buckle the hip pack around your waist/hip area so that the belt buckle is centered in the middle of your body.

   The pack should adjust to fit close to the small of your back.

6. Adjust the front and back straps so the shoulder strap is situated squarely on your shoulder.

7. Put the pack on by slipping the strap over your head and across your body and then buckling the belt of the hip pack.

   The hip pack includes side compression straps that can be pulled towards you to hold the pack firmly and comfortably against your back.

Remove the hip pack/strap by unbuckling the belt and slipping the strap over your head.

The hip pack and strap can also double as a shoulder bag. Tuck the belt portion of the pack into the webbing material on the back of the pack and hook the strap on the large D-rings of the pack. The unit can now be carried on your shoulder instead of around your waist.

The pack has extra room in the interior and exterior pockets for additional items you may need in the field. The hip pack also includes straps on the bottom of the pack to secure an extra sweater or coat while in the field.

4.8 Optional Range Poles and Tripods

Range poles and tripods are very useful when collecting carrier phase data. The height of the antenna can be accurately measured, and the antenna can be held still easily, compared to an antenna mounted from the hip pack.

APPENDIX B

FIELD DOCUMENTATION

Appendix B-1: Example of Field Sheet

Appendix B-2: Example of Chain of Custody Form (COC)

Appendix B-3: Example of Photo-Log

Appendix B-4: Example of Sample Labels

MONTEREY COUNTY WATER RESOURCES AGENCY - COASTAL GROUND WATER MONITORING PROGRAM — June 2007

F CODE	SWID	STATUS	AQUIFER	USE	WELL NAME	METER No	PLANT No	SMPLE PT	VISIT DATE	APPT. DATE	SMPLE DATE	SMPLE TIME	SMPLER	REMARKS
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	DL						[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	[illegible]						[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	DL						[illegible] photo
[illegible]	[illegible]	[illegible]	[illegible]	AG		[illegible]	[illegible]	DL						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	DL			[illegible]	[illegible] AM		[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]		DL			[illegible]	[illegible] AM		[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	DL						[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	CONLEY	[illegible]		DL						[illegible] See photo INACTIVE
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible] ARMSTRONG WELL	[illegible]		DL						[illegible] See photo INACTIVE
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	[illegible]						[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]	[illegible]	[illegible]	[illegible]						[illegible] See photo
[illegible]	[illegible]	[illegible]	[illegible]	AG	ROBINSON [illegible]	[illegible]		[illegible]						[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	AG	[illegible]									[illegible]

ENVIRONMENTAL ANALYSIS REQUEST FORM

MONTEREY COUNTY CONSOLIDATED CHEMISTRY LABORATORY
1270 NATIVIDAD ROAD, SALINAS, CALIFORNIA 93906 Phone (831) 755-4516

Shaded areas for laboratory use only

Chain of Custody:

Collected by (Print & sign)	Received by	Date & Time
Relinquished by	Received for Laboratory	Date & Time

Client Name | Report Attention

Address | Copy to

City, State, Zip | Phone | Fax

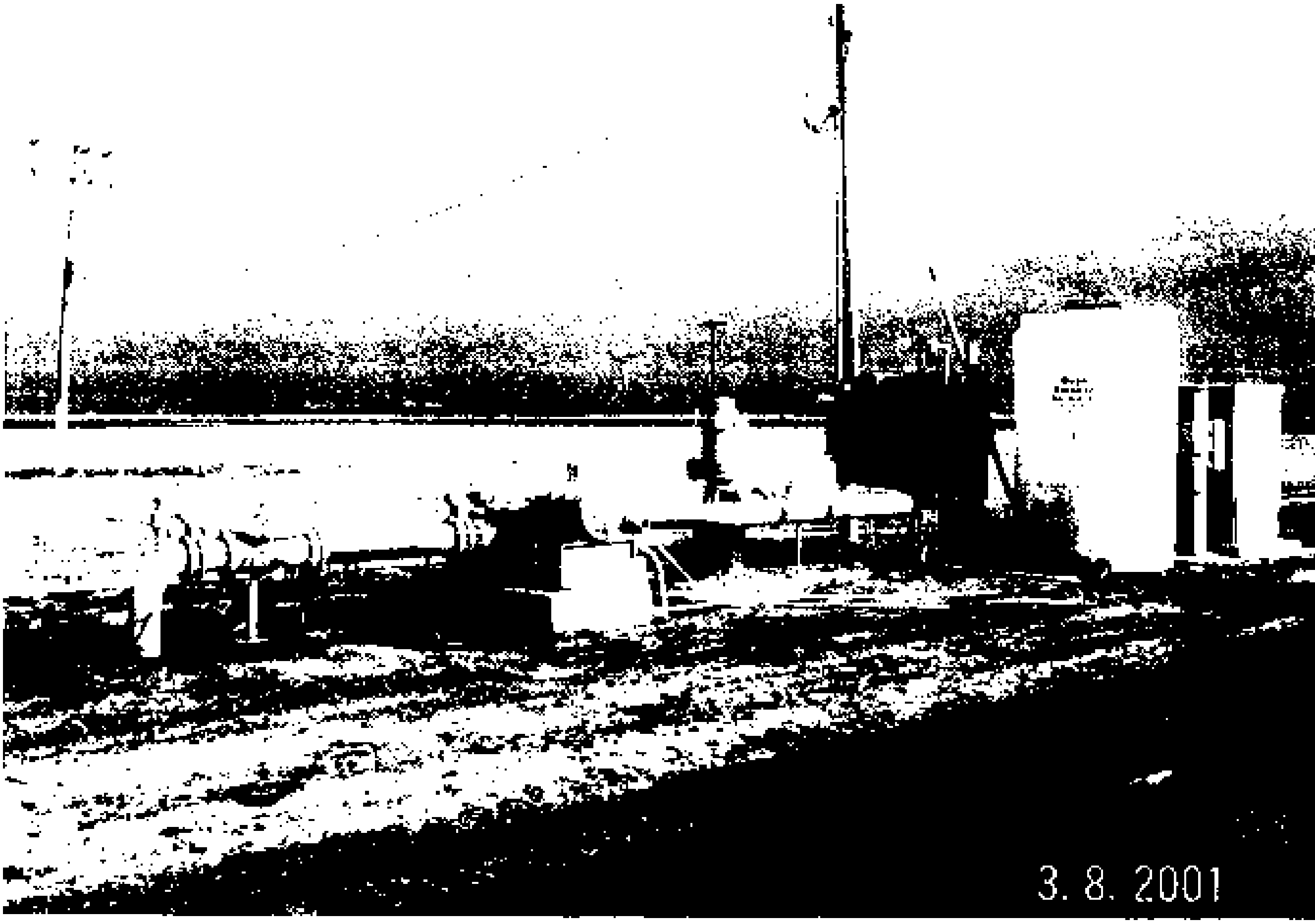
ANALYSES REQUESTED

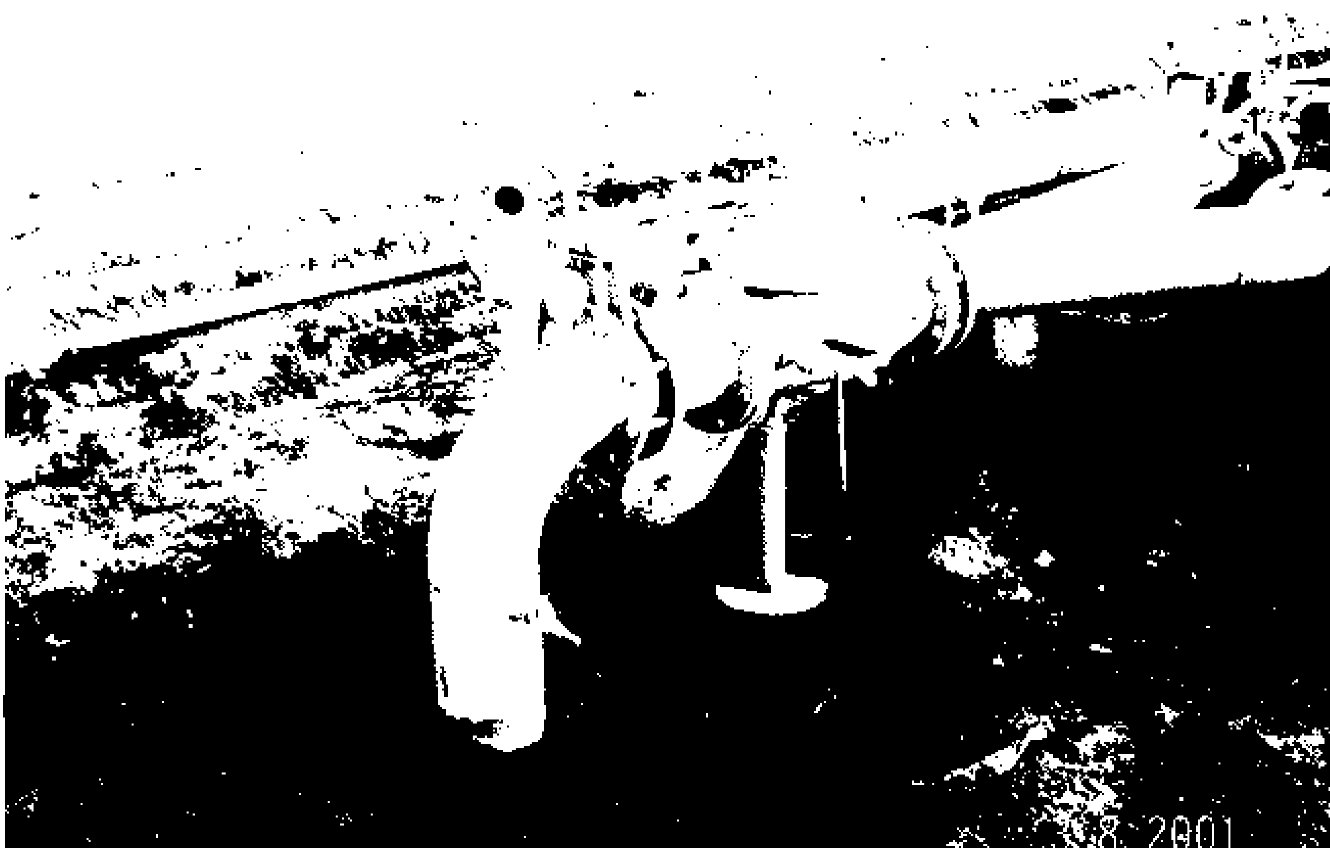
Laboratory Number	Sample ID or System #	Sample Site or Description	Collection Date & Time	Matrix[1] 1-Routine 2-Repeat 3-Replacement	No. of Containers	Coliform	MMO Quanti Tray-D	Nitrate				

[1] **D** Drinking Water (Specify as routine, repeat or replacement) **W** Wastewater (Specify as grab or composite) **O** Other (identify)

[ ] Payment received with delivery	Amount
Check	Initials
Receipt #	Date

Sample comments (irregularities, preservation, billing information if different than reporting)


3. 8. 2001


8. 2001

15S/04E-07A01

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-08M04

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-15D02

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-17P02

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-19H03

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-20B02

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-26G01

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

15S/04E-36H01

Sampling Date: Sampler:

Sampling Time:

Comments:
Complete General Mineral Analyses

APPENDIX C

REVIEW CHECKLISTS

Appendix C-1: Field Activities Review Checklist

Appendix C-2: Laboratory Data Review Checklist

Field Activities Review Checklist

Sampling Location(s): ______________________________

Sampling Date: ______________________________

Item	Yes	No	NA	Comment
All required information was entered into field sheets in ink, and sheets were signed and dated by the field sampler.				
Deviations from SOPs, along with any pertinent verbal approval authorizations and dates, were documented on the field sheets.				
Samples were collected at the correct sites.				
The correct number of samples for each type of analysis and the correct volume was collected (0.5 gal/ ~2L for complete mineral panel OR one pint/ ~0.5L for partial mineral panel).				
Acceptable sample containers, appropriate for the intended analysis, were used.				
Field blanks were collected, and at the correct frequency (one every 25 samples).				
Field duplicates were collected, and at the correct frequency (one every 25 samples).				
Samples were packed with double-bagged ice and transported at the proper temperature (4±2°C).				
Chain of custody (COC) documents were completed properly.				
Sample holding times were not exceeded during field operations. See Table 6 (QAPP).				

Reviewer's Name (print): ______________________________

Reviewer's Signature: ______________________________

Reviewer's Title: ______________________________

Date of Review: ______________________________

Laboratory Data Review Checklist

Sampling Location(s): ____________________

Sampling Date: ____________________

Item	Yes	No	NA	Comment
Samples arrived at the laboratory at the proper temperature (4±2°C).				
All requested analyses were performed and were documented in the analytical report.				
Analyses were performed according to the methods specified in the approved QA Project Plan.				
Holding times for extraction and analysis were not exceeded. See Table 6 (QAPP).				
Field Blanks results were below MDLs and were analyzed at a frequency of one every 25 samples.				
Field Duplicate results were ≤ 25% RPD and were analyzed at a frequency of one every 25 samples.				
Method detection limits were included in the report.				
A narrative summarizing the analyses and describing any analysis problems was included in the data report.				
Data qualifiers and flags were explained in the data report.				
Initial calibration data were within laboratory SOP defined acceptance criteria ($r^2 \geq 0.995$) for all analyses.				
Method blanks were performed at 3 per analytical batch. and were below MDL.				
Laboratory Control Sample (LCS) data were included for all analyses for every analytical batch.				
Laboratory Control Sample Results were within 80-120% recovery.				

Item	Yes	No	NA	Comment
Analytical Duplicate data were included for all analyses for every analytical batch.				
Analytical Duplicate results were < 25% RPD.				
Matrix spike data were included for all pertinent analyses for every analytical batch, and recoveries were within 75-125%.				
Matrix spike additions were at 3-10x the native.				
Matrix spike duplicates were ≤ 25% RPD.				
Continuing calibration data were within QAPP defined acceptance criteria (80-120% of initial slope) for all analyses				

Reviewer's Name (print): ______________________

Reviewer's Signature: ______________________

Reviewer's Title: ______________________

Date of Review: ______________________

APPENDIX D

MONTEREY COUNTY CONSOLIDATED CHEMISTRY LABORATORY

QA MANUAL AND STANDARD OPERATING PROCEDURES

TABLE OF CONTENTS

ORGANIZATION AND RESPONSIBILITY

On October 11, 1988, the Monterey County Board of Supervisors, in Resolution No. 88-508, authorized the Director of the County Health Department and the General Manager of Monterey County Flood Control and Water Conservation District (MCFC&WCD) to consolidate laboratory services for their respective programs into one facility. A Laboratory Steering Committee, comprised of representatives from both agencies, was established for the purpose of providing the planning, operation, and future development of the Consolidated Environmental Laboratory.

Each year the Steering Committee develops a Memorandum of Agreement (MOA) that describes and confirms the services to be provided by the Health Department to the Water Resources Agency (formerly the Flood Control and Water Conservation District) and defines the responsibilities of each party. In addition to providing laboratory support for the Health Department and the Water Resources Agency, the Consolidated Chemistry Laboratory provides analytical services to the Monterey Regional Water Pollution Control District, the County Department of Public Works and numerous water supply systems and wastewater treatment facilities.

The Consolidated Environmental Laboratory is accredited by the State Department of to perform tests in the following fields: 1) microbiology of drinking water and waste water; 2) inorganic chemistry and physical properties of drinking water; 3) analysis of toxic chemical elements in drinking water; 4) wastewater inorganic chemistry, nutrients and demand; and 5) toxic chemical elements in wastewater. A list of analyses and methods used in the laboratory is included in Appendix A.

The following is a brief description of the staff support for the Consolidated Chemistry Laboratory:

1. Director - Plans, organizes and controls laboratory operations. Coordinates laboratory interactions with other programs in the Health Department. Administers laboratory budget, billing and purchasing. Develops laboratory policy and procedures and supervises staff.

2. Public Health Chemist – Principal analyst. Performs complex organic and inorganic chemical analysis, evaluates and implements laboratory methods, develops and maintains quality assurance, reports results and maintains records, purchases equipment and supplies, provides technical consultation to Environmental Health and Water Resources Agency. Trains analysts and documents competency

3. Water Quality Specialist- Performs broad range of professional scientific work related to water quality and environmental issues; is proficient in

performing water quality analyses and managing the laboratory water quality database. Interpret and explain regulatory guidelines to clients.

4. Public Health Microbiologists - Assist Public Health Chemist in performing microbiological analyses and performing quality control.

5. Laboratory Assistant - Prepares culture media and reagents, assists in the processing of specimens, performs low to moderately complex environmental analyses and clinical analyses where interpretation or medical judgement is not required.

5. Laboratory Helper - Washes and sterilizes glassware and supplies. Prepares and labels mailing containers and specimen collection kits. Accession laboratory specimens. Sterilizes and disposes infectious waste. Maintains stockroom.

6. Typist-Clerk II - Enters clients and laboratory results into computer. Prints reports/forms. Prepares billing statements; receives and accounts for payments. Distributes laboratory results, and maintains laboratory files.

QUALITY ASSURANCE OJECTIVES FOR MEASUREMENT OF DATA

Quality Assurance (QA) includes all aspects of laboratory operation that affect the accuracy and reliability of sample test results. In addition to quality control of the analytical test process, quality assurance practices include: 1) proper sample collection, receiving and holding, 2) proper maintenance of equipment, 3) accurate data reduction, validation and reporting; and, 4) periodic performance and systems audits.

CUSTODY, HOLDING AND DISPOSAL OF SAMPLES

Quality assurance includes proper labeling of samples, proper completion of the chain of custody/analysis request form, proper collection, preservation and storage of samples, proper accessioning of samples, and proper disposal of the sample.

1) Sample Collection/Labeling. Sample collection is a coordinated effort between the client and the laboratory. The laboratory will provide clients with appropriate sample containers and sample collection/preservation instructions. The laboratory will also request duplicates and blanks according to client's sample plan requirements. All samples submitted for testing should be appropriately labeled. Sample containers provided by our laboratory have a suitable label which should be filled out at the time of sampling by the sample collector. The following information must be provided with all samples:

   a) Sample identification - submitters identification of sample (e.g. well number)

   b) Location - an address or brief description of the place the sample was taken.

   c) Time and date taken.

   d) Name of sample collector.

   e) Any preservatives

2) Chain of Custody/Analysis Request Form. A Chain of Custody/Analysis Request form should accompany all samples (see Appendix B). The Chain of Custody/Analysis Request form must include the following information: submitter name and address; sample identification; location of sample collection; date & time of collection; sample type; analysis to be performed; signatures of persons involved in the collection and chain of possession; and inclusive dates of possession.

3) Sample Receiving. Laboratory personnel receiving samples should assure that samples are properly collected, labeled, and the Custody/Analysis Request form has been completed:

   a) The laboratory assistant receiving the specimen must sign and date the Custody/Analysis Request form. Make sure that any special requests made by the client are recorded under the comments section of the form

   b) Assign each sample a unique laboratory identification number. Place preprinted lab number on analysis request form and sample container. When a sample is collected in multiple containers for different analyses, each container should receive the same laboratory number. (Exception: sample containers for analytes requiring a rapid turnaround time (e.g. coliforms) may receive separate number to expedite reporting).

c) Check that the samples meet the criteria described in Table 1006:I Summary of Special Sampling or Handling Requirements in 18th ed. of *Standard Methods for the Examination of Water and Wastewater* (Appendix C)

i) Samples should be collected in a suitable container; samples collected in bottles of unknown origin or questionable cleanliness should be brought to the attention of the Water Quality Specialist or the Public Health Chemist.

ii) Samples should be adequately labeled

iii) Samples should be checked for proper preservative, holding time, and holding temperature.

iv) Samples should be adequately sealed. Notify public health chemist if there is evidence of leakage. Verify that adequate sample volume exists to perform requested analysis.

d) NOTE: Samples that are not properly identified or are otherwise unsuitable for testing (e.g. improperly preserved or exceeding holding/ transport time) are recorded on the "Sample Invalidation Log" and the Water Quality Specialist or Public Health Chemist notifies the client. Samples not meeting collection/preservation criteria may be tested only if resampling is impossible; results from such samples must be qualified on the laboratory report by comments describing sample deficiency.

4) When the sample meets criteria for acceptance by the laboratory, required preservatives are added immediately and the sample is stored under conditions specified by the analytical method to be used. For samples requiring thermal preservation, a laboratory refrigerator and freezer is available. The temperature is maintained at 4 degrees and below -10ºC respectively. Temperatures are monitored each day.

5) Chain of Custody/Analysis Request forms are given to the clerk to enter into a password protected computer laboratory information management system. Refer to "Water Sample Entry" in Clerical Manual for instructions on sample log-in.

6) Disposal of samples: Upon completion of all analyses, any remaining

sample will be stored for at least one month prior to disposal. Chain-of-Custody form, worksheets and lab reports are retained for three years. NOTE: Longer retention of samples or data may be required when legal action is probable. The samples and any associated extracts or digests are disposed of following recommendations found in the book, *Prudent Practices for Disposal of Chemicals from Laboratories*, National Academy Press, Washington, D.C. 1983.

CALIBRATION PROCEDURES AND FREQUENCY

Calibration is the process for determining the correctness of the assigned values of the physical standards used or the scales of the measuring instruments. Calibration accuracy is critically dependent on the reliability of the standards used for the required comparisons. Only the highest quality chemicals are used to provide necessary standard solutions, and due care is exercised in their preparation. The concentrations of the calibration standards bracket the expected concentration of the analyte in the samples. No data is reported beyond the range of calibration of the methodology. The calibration data, when plotted graphically, is referred to as a calibration curve. The calibration must be done under the same instrumental and chemical conditions as those that will exist during the measurement process. The frequency of calibration depends on the accuracy requirements of the investigation and the stability of the instrument used for the measurements:

At a minimum, three different dilutions of the standard will be measured when an analysis is initiated. Correlation coefficient must be > 0.995. Reportable analytical results are those within the range of the standard dilutions used. Do not report values above the highest standard. The lowest reportable value is the Method Detection Limit (MDL), providing that the lowest calibration standard is less than 10 times the MDL.

1) Atomic Absorption Spectrophotometers - Two approaches are used to calibrate atomic absorption spectrophotometers. These methods are direct comparison and standard additions.

   a) Direct comparison is the simple approach, and can be used with many instruments to give a direct readout of the concentration of an element in an unknown sample. To obtain good precision (e.g., 1-2% coefficient of variation), the absorbance levels measured must be about 0.1 to 0.6 units. Standard and sample solutions should be similar in bulk matrix constituents, particularly acid and salt content. Interference suppressants are used in all solutions when required. A number of standards (usually three to five in increasing concentration) as well as a blank, are prepared to cover the concentration range. A volume of type II reagent water with the same amounts of acids as the samples and standards) will be used for calibration blank. These solutions are run in absorbance to check linearity of the calibration curve.

   b) The method of standard additions is used when samples contains severe matrix interference. In this case it is possible to add small amounts of conventional standard solutions, in increasing amounts, to aliquots of each sample. A calibration graph can then be constructed. This method will often be used in work with the graphite furnace.

2) UV-VIS Spectrophotometer - The calibration procedure for the UV-VIS spectrophotometer is similar to that for the A.A. spectrophotometers. An integration interval is not required as the signal is very stable. It is important to use blanks and allow at least 1/2 hour warm up time.

3) PH Meters - The proper calibration of pH meters requires the use of two buffer solutions and a thermometer. The two buffer solutions must cover the expected range of samples to be tested. A third buffer is used to confirm calibration. The pH meter should be calibrated each day. The temperature of the buffers must be entered into the meter.

4) Conductivity Meter - The conductivity meter does not require frequent calibration but should be checked against a known standard each day of use. Recalibrate when there is significant deviation with the value of the standard.

5) Ion Chromatograph- Calibration of the Ion Chromatograph is performed at least once each year and whenever: 1) Controls are out of range; or, 2) the column, suppressor or detector is changed.

6) Inductively Coupled Plasma/Mass Spectrometer – Calibration of the ICP-MS is performed every day of analysis and whenever controls are out of range. See the SOP for more information.

ANALYTICAL PROCEDURES

The laboratory employs only methods approved by Environmental Laboratory Accreditation Program. Analysts must conduct sufficient preliminary tests using the methodology and typical samples to demonstrate competence in the use of the measurement procedure.

Each time an analytical procedure is performed controls are included and duplicate samples and known additions are tested to insure accuracy and precision. Results are not reported unless all controls are within acceptance limits referenced in Standard Methods 18th Edition, 1992.

To monitor reliability of analytical measurements, data is periodically obtained on detection limits, accuracy, precision and recovery.

ACQUISITION, REDUCTION, VALIDATION OF REPORTING DATA

The analytical chemist is responsible for describing and reporting the data in an appropriate manner. In order to insure the accurate transcription, calculation and reporting of analytical data, the chemist will adhere to the following quality assurance procedures.

1) Use documented procedures and record all significant experimental details in such a way that the measurements could be reproduced by a competent analyst at a later date.

2) All measurements are made so that results are representative of the matrix (soil, water, etc.) and conditions being measured.

3) Report data only to the number of significant figures consistent with their limits of uncertainty.

4) Report data with the proper units of concentration. Units should be chosen which clearly indicate whether the concentration is in terms of weight by weight, weight by volume or volume by volume. Unless otherwise specified, all data are calculated and reported in standard units to allow comparison with data reported by other laboratories.

5) The analytical methodology used will be cited. The raw data for each sample, along with reagent blanks, control, and spiked samples will be suitably identified if included in the report. If average values are reported, an expression of the precision, including the number of measurements, must be included.

6) The report should include date and place of sampling, sampling point, the name of the sample collector, identification as to type of sample, date and time of submittal to the lab, date of analysis, name of the analyst, and the result. Any conditions which may effect the interpretation of the data should be noted in the report.. All results will be reviewed by a Water Quality Specialist or Public Health Chemist before a final report is released.

7) Laboratory records will be retained in a permanent file for three years.

8) Retain samples for one month after issuing final report and retain data and documentary evidence for three years.

INTERNAL QUALITY CONTROL

Quality Control (QC) may be defined as those measures undertaken in the laboratory to maintain the analytical testing process within acceptable limits of accuracy and precision.
The Quality Control Program consists of the following elements: documentation of operator competence, recovery of known additions, analysis of externally supplied standards, analysis of method blanks, and testing of replicate samples:

1) Operator competence The principal analyst is responsible for: 1) developing a standardized training syllabus for the methods employed in the laboratory; 2) assuring that test personnel are adequately trained; 3) assessing the competency of test personnel, and 4) maintaining documentation of training and competency of all test personnel.

   a) Before test personnel are permitted to do reportable work , competency in performing the analysis is to be demonstrated. Commonly, the analyst performs replicate analysis under the supervision of the principal analyst. General limits for acceptable work are found in Standard Methods 18th Edition, 1992 in Table 1020 :I.

   b) After initial demonstration of competency, the principal analyst will assure test personnel maintain competency through testing internal or external proficiency test samples at least once each year.

2) With each batch of samples tested, controls will be tested to verify the accuracy of results as described below. Controls used with each method are outlined in Appendix D.

   a) Recovery of known additions as part of all regular analytical protocols except titrimetric and gravimetric methods. Use known additions to verify the absence of matrix effects. Spiked samples shall be analyzed with a minimum frequency of ten percent of the samples per matrix per batch of samples. Spike recovery must be between 80-120% for potable water (75-125% for waste water). When a spike sample fails to meet this criteria, retest all samples following the last acceptable spike sample. Spike recovery calculated as % of the known addition recovered.

   b) Analyze control standards with a minimum frequency of ten percent of the samples per matrix, per batch of samples. If there are less than 10 samples in a batch, at least one per matrix per batch must be analyzed. The concentration of the sample shall be within the working range of the method. Sources of these samples include but are not limited to: performance evaluation samples from the EPA, commercially available standards, or standards prepared in-house but from sources different from calibration standard. Control standards must be within the published acceptance range (for external controls). If the control standard does not have a published acceptance range, recovery of the control should be within 10% of the known value. When a control standard fails to meet this criteria, retest all samples following the last acceptable control.

c) Method blanks will be analyzed with each batch of samples. The use of method blanks provides a measurement of laboratory contamination. Blanks cannot exceed the minimum detection level. See Appendix A.

d) Replicate samples will be analyzed with a minimum frequency of ten percent of samples per matrix, per batch of samples for drinking water. For wastewater the requirement is 5%. If there are less than ten samples per batch, at least one sample per matrix per batch must be analyzed. If the analyte is not detected, replicate matrix spike samples will be analyzed. The percent difference between replicate samples must be within 20% for potable water (25% for wastewater). When a replicate sample fails to meet this criteria, retest all samples following the last acceptable replicates. Duplicate % difference calculated as the difference as a percent of the mean. $|100(X1-X2)/avg|$.

e) In addition to the control standards tested with each run, an external reference standard for each analyte will be tested at least once each quarter.

All of the quality assurance control procedures will be followed in the laboratory. All documentation for these checks should be available for inspection by laboratory management.

PREVENTIVE MAINTENANCE

As part of the QA plan, the laboratory has a comprehensive preventive maintenance program. Balances, spectrophotometers, and other instruments undergo routine maintenance and accuracy checks by a manufacturer's representative or by laboratory personnel as described below. All preventive maintenance performed in-house is documented on preventive maintenance forms. Instrument s which undergo routine professional maintenance have labels affixed to indicate date of last servicing. Manufacturer's instructions and service manuals are readily accessible.

Adequate spare parts are kept on hand to perform routine maintenance and minimize downtime. The spectrophotometers have maintenance contracts that provide for immediate servicing in the event of malfunction. Equipment records documenting preventive maintenance and emergency servicing/repairs are kept for a minimum of three years.

1) Thermometer/temperature-reading instruments: Accuracy of thermometers or recording instruments are checked annually against a certified National Bureau of Standards (NBS) thermometer or one traceable to NBS and conforming to NBS specifications. All thermometers a relabeled with date calibrated and correction factor.

2) Balance: Balance accuracy is verified each week using ASTM type 1 reference weights. Accuracy checks are documented on preventive maintenance chart. Balances are serviced and certified annually through a maintenance contract. Type 1 weights are re-certified at least every five years.

3) pH meter: pH meters are standardized with at least two NIST traceable standard buffers (pH 4.0, 7.0, or 10.0) and compensated for temperature before each series of tests. A third buffer is used to confirm calibration. Date buffer solutions when opened and discard buffer after expiration date on bottle. Buffers prepared from powders are replaced after four weeks.

4) Water deionization unit: Conductivity of the RO and Nanopure water is checked each month. A heterotrophic plate count on Nanopure water is also performed monthly. Filters are changed as indicated by conductivity readings and heterotrophic plate count. Records are maintained on preventive maintenance chart. Water is tested annually for bacteriologic quality and heavy metals.

5) Autoclave: Autoclave charts are used to document date, time, temperature and contents of each load. Chem-di indicators and heat sensitive tape are used with each load to identify materials that have been autoclaved; results are recorded on autoclave chart. Autoclave performance is

checked each month with biological indicator (e.g. spore suspension). Autoclaves are serviced quarterly under maintenance contract. The accuracy of autoclave recording thermometer is checked annually. The autoclave operating temperature is monitored on a weekly basis.

6) Refrigerator: Temperatures are recorded daily and units defrosted and cleaned as needed. All media and reagents stored in the refrigerator are labeled.

7) Freezer: Temperatures are recorded daily. Identify and date materials stored. Defrost and clean semiannually; discard outdated materials.

8) Ultraviolet sterilization lamps: Unit is cleaned monthly by wiping lamps with a soft cloth moistened with ethanol. Test lamps quarterly with UV light meter and replace if they emit less than 70 % of initial output or if agar spread plates containing 200 to 250 microorganisms, exposed to the light for 2 minutes, do not show a count reduction of 99%.

9) Water bath: Fecal coliform water bath is checked twice daily. All other water baths are checked each day of use.

10) Incubator: Check and record temperature twice daily (morning and afternoon) on the shelf areas in use. Locate incubator where room temperature is in the range of 16 to 27O C.

11) Fume hoods/Biological Safety Cabinets: Fume hoods are checked once each month using a velometer; readings are recorded on preventive maintenance chart. Hoods and safety cabinets are certified annually through service contract.

PERFORMANCE AND SYSTEMS AUDITS

Corrective action is required when data is outside of predetermined limits for acceptability. The corrective actions can be triggered by the following quality assessment activities: Control Chart analysis; proficiency evaluation testing; and QA audits.

1) CONTROL CHART ANALYSIS:
The laboratory's quality assessment techniques will be used to maintain the precision and accuracy of all laboratory analyses within a state of statistical control. Precision and accuracy measurements are the best way to assess analytical performance. Precision is the degree of reproducibility of a particular analytical procedure. Accuracy is a measure of the agreement between an experimental determination and the true value.

a) PRECISION - Assess precision by replicate analysis, by repeated analysis of a stable standard, or by analysis of known additions to samples. Precision is specified by the standard deviation of the results. The formula for determining standard deviation (SD) is:

$$SD = \sqrt{\Sigma}\,(X1-X)^2/(N-1)$$

X1 is the value of the individual measurements; X is the mean of all measurements for a given sample and N is the number of measurements.

The purpose of determining precision is to establish the typical variance of the method in the absence of any matrix influence. In the course of determining precision, there are two cases that indicate there is a problem with the precision data:

i) The measured values show wide variation from one to another for a given day.

ii) The measured values show little variance from one to another for a given day, but the mean and standard deviation show wide variation from one day to another.

If either of the above occurs, factors such as sample homogeneity, instrument calibration, or analyst error should be checked, documented, and corrected. The precision measurements should then be repeated.

b) ACCURACY - The best method to determine accuracy is to spike an alequot of reagent water with a known amount of the constituent being measured and analyze the sample. The amount spiked should be at least five to ten times greater than the analytical detection limit.

To evaluate the data accuracy, the percent recovery of the spike must be determined. The formula for determining percent recovery is:

$$\% \text{ recovery} = [100(S - S1) \div S2]$$

Where S is the concentration of the spiked sample; S1 is the concentration of the unspiked sample; S2 is the concentration of the spike added to the sample.

If the percent recovery deviates significantly from 100% and the method has not demonstrated significant bias, the problem must be detected and corrected prior to continuing the analysis. Sources of this problem include incorrect standard or spike solution concentration or a problem in the procedural detection system.

Precision, accuracy, and detection limits for all methods used in the laboratory is comparable to values referenced in Standard Methods 18th Edition, 1992 and EPA Methods for Chemical Analysis of Water and Wastes, March 1983.

2) PERFORMANCE EVALUATION SAMPLES: The laboratory director is responsible for enrolling the laboratory in ELAP approved proficiency testing program(s) and assuring that proficiency testing is performed for all regulated tests. The principal analyst (Public Health Chemist) will conduct and document internal proficiency testing at least once a year for tests where proficiency testing is not available. Proficiency test samples are treated in the same manner as routine samples (ie. tested the same number of times, tested using personnel who routinely perform testing, tested using routine methods and tested during patient testing).

3) QUALITY ASSURANCE AUDIT: The quality assurance program will be audited quarterly and any deviations from the program will signal corrective action to be taken. Quality assurance audit will be documented in a written report. The audit will include the following aspect:

a) Competency of test personnel must be evaluated annually and be documented

b) Evidence of the systematic use of control samples, replicate measurements and reference materials all in conjunction with control charts.

c) Proper labeling of reagents and samples.

d) Use of approved methods.

e) Results on blind samples.

f) Acceptable safety equipment and procedures.

g) Quality assurance reports generated on a regular basis.

h) Documentation on equipment performance and maintenance.

i) Training records.

j) All relevant files accessible and organized.

k) Laboratory personnel following good laboratory practices.

l) Laboratory personnel following good measurement practices

The Public Health Chemist will be responsible for initiating and documenting any corrective action necessary. Corrective action will be documented on the appropriate control chart, performance evaluation report, or QA audit report. No data shall be reported until the cause of the problem is located and corrected or the laboratory demonstrates the cause was a random event and no longer affects data. Although the elimination of events requiring corrective action may not be achieved, a reduction in the repetition of these events is the objective of this program.

REFERENCES FOR QUALITY ASSURANCE DOCUMENT

1) Standard Method for the Examination of Water and Wastewater, 18th edition, 1992.

2) Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA-600/4-79-019, March 1979, USEPA.

3) Manuals for the Certification of Laboratories Analyzing Drinking Water Criteria and Procedures/Quality Assurance. EPA QAMS-005/80, Interim Guidelines, EPA-570/9-82-009, USEPA.

4) Methods for Chemical Analysis for Water and Waste. EPA-600/4-79-020, March 1983.

Written by: Gerry Guibert & David Holland

Date: May 1993

Revised: January 1999
Revised: September 21, 2004

Approved by: ______________________

(Laboratory Director's Signature)

Appendix A

Monterey County
Consolidated Chemistry Laboratory

ANALYTICAL METHODS FOR WATER ANALYSIS

PARAMETER	HOLD TIMES	METHOD REFERENCE	MDL	UNITS
Free Chlorine	.25 h; ASAP	SM 4500-Cl G	0.02	mg/L
Total Chlorine	.25 h; ASAP	SM 4500-Cl G	0.05	mg/L
Enterococcus	8 h	IDEXX	1/100 ml	
Heterotrophic Plate Count	8 h	SM 9215 B	1	CFU
E. coli – MPN	6 h waste 8 h source 30 h potable	SM 9221 B	2/100 ml	
Fecal Coliform – MPN	6 h waste 8 h source 30 h potable	SM 9221 B	1/100 ml	
Total Coliform – MPN	6 h waste 8 h source 30 h potable	SM 9221 B	2/100 ml	
Total Coliform – Quantitray	6 h waste 8 h source 30 h potable	SM 9223	1/100 ml	
E. coli – Presence/Absence	30 h potable	SM 9223	1/100 ml	
Total Coliform – P/A	30 h potable	SM 9223	1/100 ml	
pH	.25 h; ASAP	SM4500H B		pH units
Bicarbonate	ASAP (with pH)	SM 2320 B	10	mg/L
Calcium Carbonate	ASAP (with pH)	SM 2320 B	1	mg/L
Carbonate	ASAP (with pH)	SM 2320 B	1	mg/L
Solids	24 h	SM 2540 F	0.1	mL/L
Color Determination	48 h	SM 2120 B	2	CU
Odor	NS: 48 h (rec 6h)	SM 2150 B	1	TON
Turbidity	48 h	SM 2130 B	0.05	NTU
Nitrate	48 h	EPA 300.0	1	mg/L
Nitrite as (N)	48 h	SM 4500 NO2-B	10	ug/L
Total Dissolved Solids	7 d	SM 2540 C	5	mg/L
Total Suspended Solids	7 d	SM 2540 D	5	mg/L
Alkalinity	14 d	SM 2320 B	1.0	mg/L CaCO3
Bromide	28 d	EPA 300.0	1	mg/L
Chloride	28 d	EPA 300.0	1	mg/L
Fluoride	28 d	EPA 300.0	0.02	mg/L
Sulfate	28 d	EPA 300.0	1	mg/L
Conductivity	28 d	SM 2510 B	1	umhos at 25C
Ammonia (N)	28 d	SM 4500 NH3 F	0.05	mg/L
Orthophosphate	NS; 28 d	SM 4500 P E	0.03	mg/L
Total Phosphorus	28 d	SM 4500 P E	0.03	mg/L

PARAMETER	HOLD TIMES	METHOD REFERENCE	MDL	UNITS
Aluminum	6 months	EPA 200.8	5	ug/L
Antimony	6 months	EPA 200.8	0.5	ug/L
Arsenic	6 months	EPA 200.8	1	ug/L
Barium	6 months	EPA 200.8	0.5	ug/L
Beryllium	6 months	EPA 200.8	0.5	ug/L
Cadmium	6 months	EPA 200.8	0.5	ug/L
Chromium	6 months	EPA 200.8	5	ug/L
Copper	6 months	EPA 200.8	0.5	ug/L
Iron	6 months	SM 3111B	100	ug/L
Lead	6 months	EPA 200.8	0.5	ug/L
Manganese	6 months	EPA 200.8	0.5	ug/L
Mercury	6 months	EPA 200.8	0.25	ug/L
Nickel	6 months	EPA 200.8	0.5	ug/L
Selenium	6 months	EPA 200.8	5	ug/L
Silver	6 months	EPA 200.8	5	ug/L
Thallium	6 months	EPA 200.8	0.5	ug/L
Zinc	6 months	EPA 200.8	5	ug/L
Calcium	6 months	SM 3111B	1.0	mg/L
Magnesium	6 months	SM 3111B	0.1	mg/L
Potassium	6 months	SM 3111B	0.1	mg/L
Sodium	6 months	SM 3111B	0.1	mg/L
Hardness as CaCO3	6 months	SM 2340 B	1.0	mg/L
Boron	6 months	SM 4500 B B	0.1	mg/L

Appendix B

ENVIRONMENTAL ANALYSIS REQUEST FORM

MONTEREY COUNTY CONSOLIDATED CHEMISTRY LABORATORY
1270 NATIVIDAD ROAD SALINAS, CALIFORNIA 93906 Phone (831) 755-4516

Shaded areas for laboratory use only

Chain of Custody

Collected by (Print & sign)	Received by	Date & Time
Relinquished by:	Received for Laboratory	Date & Time

Client Name | Report Attention

Address | Copy to

City, State, Zip | Phone | Fax

ANALYSES REQUESTED

Laboratory Number	Sample ID or System #	Sample Site or Description	Collection Date & Time	Matrix[1] 1-Routine 2-Repeat 3-Replacement	No. of Containers	Coliform	MMO Quanti (Tray)	Nitrate					

[1] D Drinking Water (Specify as routine, repeat or replacement) W Wastewater (Specify as grab or composite) O Other (identify)

[ ] Payment received with delivery	Amount	Sample comments (irregularities, preservation, billing information if different than reporting)
Check	Initials	
Receipt #	Date	

SPECIFIC CONDUCTANCE
EPA 120.1/SM 2510 B
umhos at 25°C

Scope and Application:
This method is applicable to drinking, surface and saline waters, domestic and industrial wastes and acid rain.

Summary of Method:
The specific conductance of a sample is measured by use of a self-contained conductivity meter, the YSI Model 32. The conductivity meter is used in the temperature compensated mode.

Sample Criteria & Acceptability:
A minimum of 100 ml sample should be submitted in a clean container provided by the laboratory. Samples can be stored for up to 28 days at 4oC. The samples must be brought to room temperature before testing. If the sample does not meet the above criteria, document it on the worksheet but perform the test.

Reagents:
0.02 Molar Standard Potassium Chloride Solution:

1. Dry 0.85 g of Reagent Grade Potassium Chloride (KCl) for 4 hours at 105°C. Use immediately or store in a desiccator until use.
2. Dissolve 0.7456g of pre-dried potassium chloride in a 1 liter Class A volumetric flask using deionized water.
3. Label the flask with Potassium Standard Solution, 0.7456 g KCl/L, date made, outdate of 3 months, and initial.
4. Alternately, order two 500 ml containers of the Traceable Conductivity Calibration Standard near the 1414 micromho/cm range; from Fisher Scientific, Cat No. 09-328-11.

Control

1. Check deionized water. It should read less than 1 umho. If the reading is higher, clean cell and repeat reading of deionized water. If reading is still high, notify the Chemist.
2. Use current Quality Control sample with each run. The control must be in range before proceeding with specimens. The 0.01 M KCl can be used as control.

Conductance Meter Maintenance:

1. Store cell in deionized water. If the cell has been stored dry, soak in deionized water for 24 hours.
2. Check the platinum black coating on the electrode. If the coating appears thin or if it is flaking off the electrode, the cell should be cleaned and the electrodes replatinized. See "Instruction Manual YSI Model 32 Conductance Meter" pages 11 and 12 for instructions.
3. The electrode should be cleaned and replatinized every four months. Record the preventative maintenance on the "PM Worksheet".

Conductance Meter Calibration Check:
Instrument must be standardized with KCl solution before daily use.

1. Pour 50 ml of the standard potassium chloride solution into a 250 ml beaker. Alternately, immerse the conductivity cell and thermometer in the Rinse Bottle, then transfer to the Read Bottle for actual reading
2. Immerse conductivity cell in sample. The electrodes must be submerged and the electrode chamber must be free of trapped air. Tap the cell to remove any bubbles, and dip it two or three times to assure proper wetting.
3. Rotate the Range Switch to the lowest range position that gives a reading (within range) on the display. An over-range value is indicated by a "1" followed by blanks. An under-range value is indicated by a reading followed by a small letter "u". Readings may be in error when operating in the under range conditions. On the 0.1 – 2 micromho range; allow extra time to stabilize.
4. The conductance value of the solution is displayed on the meter. The units in which it is to be read are determined by the Range Switch, either in mU or in uU (or milli and micro siemens).

   2 uU, 20 uU, 200 uU reading = final result
   2 mU, 20 mU, 200 mU readings x 1000 = final result

5. Use the table below to check accuracy of cell constant:

Conductivity of 0.01 M KCl

Temperature in Centigrade	Micro-omhos cm
21	1305
22	1332
23	1359
24	1386
25	1413
26	1441
27	1468
28	1496

6. If the standard is within range, rinse the cell three times with deionized water, and start testing unknowns as described in steps 2-4.

Reporting:
Report results to three significant figures. Report in units of micromhos per centimeter at 25 °C

References:

1. Instruction Manual YSI Model 32 Conductance Meter", Item 060818, PN A32018 R, October 88 EP
2. Methods for Chemical Analysis of Water and Wastes", EPA- 600: 4-79-020, March 1983, pages 120.1-1 to 120.1-3.
3. "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992.

Written by: David Perez. Date: February 1993
Revised: January 12, 2007

Approved by:______________________________
Chemist

pH
SM 4500-H B
Electrometric

Scope and Application
Application to drinking, surface, ground and saline waters as well as acid rain, and wastewater (domestic and industrial.

Principle of Operation
pH is defined as the negative logarithm of the hydrogen ion concentration in moles per liter. The pH scale goes from zero to fourteen with a value of seven units to be considered neutral. Values below seven are acid; values above seven are basic. It is important to note that a one-unit change in pH represents a ten-fold change in the concentration of the hydrogen ion.

pH has a great impact on almost all biological and chemical processes used for water and wastewater treatment, and proper measurement of this value is critical. pH is measured using a pH meter consisting of a potentiometer, glass pH electrode, reference electrode and temperature compensating device. When calibrating the instrument, use two buffers that bracket the expected pH value for greatest accuracy.

Specimen collection and Handling
Collect sample in plastic or glass container. Test sample immediately upon receiving and/or within two hours after collection.

Instrument Calibration:
Two buffer calibration:

1. Fill a 50 ml beaker with up to 30 ml of pH 7 buffer. Add a stir bar and set the knob on the magnetic stirrer to the second line on the dial (slow spin). Place the electrode in the pH 7 buffer; make sure that the reference electrode is filled with KCl and is open. Allow the electrode to equilibrate for 5 minutes.

2. Release Standby button and press the pH button. Measure the temperature of the buffer solution and set the temperature control. Turn the large slope knob to 100 and the inner know fully clockwise.

3. Adjust the calibration control until the readout displays 7.00. Press the mv button and record the mv reading on the worksheet. Remove electrodes from the buffer and rinse with deionized water.

4. Fill a 50 ml beaker with up to 30 ml of pH 4 buffer. Add a stir bar and set the knob n the magnetic stirrer to the second line on the dial (slow spin). Place the electrode in the pH 4 buffer and allow the electrode to equilibrate for 5 minutes. Press the pH button.

5. Adjust the slope knob until the readout displays 4.00. Press the mv button and record the mv reading on the worksheet. Remove electrodes from the buffer and rinse with deionized water.

6. Fill a 50 ml beaker with up to 30 ml of pH 6.86 buffer. Add a stir bar and set the knob n the magnetic stirrer to the second line on the dial (slow spin). Place the electrode in the pH 6.86 buffer and allow the electrode to equilibrate for 5 minutes. Press the pH button and record the result on the worksheet and quality control graph. PH should be 6.86 ± 0.1; notify chemist if out of range.

7. Rinse the electrodes with deionized water.

8. Record mv readings of calibration buffers. Calculate change in millivolts and divide by 3. The result should be 58 ± 2 mv.

9. If the slope is within limits, begin testing unknowns. If the slope is out of range, re-calibrate the pH meter. If the second calibration slope is out of range, notify the chemist.

Controls

1. Run every tenth specimen in duplicate. The duplicates should be within 20% of each other.

2. Check the 6.86 control buffer after every tenth specimen. Record the results on the worksheet and quality control chart.

Procedure

Once the pH meter has been calibrated, the unknown samples can be tested.

1. Pour 30 ml of unknown (or 50 ml of unknown if also testing for alkalinity) into a 150 ml beaker containing a small stir bar. Start the stirrer. Keep the automatic stirrer at a constant moderate rate (The speed is marked on the dial by a pen marking).
2. Allow the display to stabilize, and record the results on the worksheet.
3. Rinse the electrode with deionized water between specimens. Blot dry with a 'kimwipe'. Do not rub the electrode; the static electricity can alter readings.

Reporting

Report the result to the nearest tenth (0.1).

References:

1. "Method for Chemical analysis of Water and Wastes", EPA 600/4-79-020, Revised March 1983.
2. Standard Methods for the Examination of Water and Wastewater 18th edition 1992

Written by: David Perez
Date: December 1994

Approved by: ______________________________
Chemist

Total Alkalinity
SM 2320 B
Titration

Principle

Total alkalinity is defined as the acid-neutralizing capability of water. It is reported as due to bicarbonate (HCO3), carbonate (CO3), and hydroxide (OH). Unaltered sample is titrated potentiometrically to pH 8.3 endpoint for "carbonate" alkalinity and 4.5 endpoint for "bicarbonate" alkalinity.

Note: Samples with a pH less than 8.3 (i.e. most drinking water samples) are reported as having non-detectable hydroxide and carbonate alkalinity; for these samples total alkalinity is due entirely to the bicarbonate content of the water. Bicarbonate alkalinity (as HCO3) can be calculated from total alkalinity (as CaCO3) by multiplying by a factor of 1.22.

Applicable to drinking and surface waters, domestic and industrial wastes, and saline waters.

Sample Criteria & Acceptability

Samples should be submitted in clean containers provided by the laboratory. A minimum of 100ml of sample should be submitted for testing. Samples, which cannot be tested within 24 hours of collection, should be stored at 4°C and tested within 14 days. If any sample does not meet the above criteria, document it on the worksheet but perform the test.

Equipment

1. pH meter that can read to 0.05 pH units.
2. Two 1,000 ml Class A volumetric flasks.
3. Magnetic stirrer and magnetic stir bars.
4. Two 100 mL beakers.
5. One 250 mL flask
6. One 50 mL graduated cylinder

Reagents

The day before preparing standardize sulfuric acid, dry 0.1 g of Tris Buffer for at least 3 hours at 103 C (overnight is acceptable). After drying, immediately weigh out the Tris buffer. If that is not possible, store the reagent in the desiccators until used.

1. Standardized 0.02 N H_2SO_4 (sulfuric acid) + 0.004 units:

   The concentrated H_2SO_4 and stock 1.0 N H2SO4 may be found in acid cabinet below hood.

   a. Prepare a 1.0 N H H_2SO_4 Stock Solution: Fill a 1,000 ml Class A volumetric flask three quarters full with deionized water. Carefully add 28.0 mL of concentrated H_2SO_4 using a 25 mL and 3 mL Class A volumetric pipette. Fill to the mark with deionized water and mix. Transfer to plastic bottle and label as 1.0 N H_2SO_4 Stock Solution, date made, outdate of 1 year, and initial. Cap tightly.

   b. Prepare a standardized 0.02 N H_2SO_4.
      1. Fill a 1,000 mL Class A volumetric flask three quarters full with deionized water. Carefully add 20.0 mL of the Stock H_2SO_4 using a 20 mL Class A pipette. Fill to mark and mix thoroughly.
      2. Weigh out between 0.0700 to 0.0800 g of Tris buffer using the analytical balance. Record the weight of the Tris Buffer to four places in the "Standard & Reagent Preparation" notebook. Add the buffer to 250 mL flask containing 25 mL of deionized water and stir bar; mix.

3. Add 3 drops of Hach Brom Cresol Green-Methyl Red indicator solution (Hach cat. number 451) to the Tris buffer solution.
4. Fill the titrating buret with the 0.02 N H_2SO_4 solution. Titrate the solution until a stable pink color is reached. Record the volume of reagent used.
5. Calculations:
   Normality of H_2SO_4 = Wt of Tris Buffer (g) ÷ (0.121137 g/meq Tris X mL of 0.02 N H_2SO_4 used)
   Example:
   0.0879 g Tris Buffer ÷ (0.121137 g/meq Tris X 35.7 ml H_2SO_4) = 0.0203 N H H_2SO_4
6. Transfer the 0.02 N H_2SO_4 to a one liter plastic bottle. Record the normality on the bottle, date made, outdate of 3 months, and initial. Store at room temperature.

2. Alternatively, order 0.02 N H_2SO_4, already prepared and standardized from a vendor such as Fisher Scientific. Record lot on QC worksheet.

Controls

1. Run deionized water as blank. Value of blank should be less than 2 mg/L of calcium carbonate (approximately 0.1 mL of H_2SO_4).

2. Use one quality control standard. This is a solution of sodium bicarbonate (100 mg/l). Run once with each set of samples and record results on control chart. Consult chemist if out of control situation exists.

3. Run every 10^{th} specimen in duplicate. Calculate the relative standard deviation (RSD) of the replicates using the following formula: RSD=SD ÷ mean x 100. The RSD should be less than 10% If the replicates are outside of this range, repeat the specimen a third time. Check with the chemist for instructions.

4. Each quarter an external reference sample is to be analyzed. In the case of results exceeding acceptance values, document corrective action. Place any corrective action records in proficiency file

Procedure:

If applicable, standardize the pH meter each day of use (see supplemental procedure). Record slope with offset on worksheet.

Run the blank and control first. If the control is within range (range found in the "QC Inorganic True Value" binder), run the samples. Repeat the control if it is out of range. Notify the chemist if the control is out of range a second time.

1. Add 50 mL of control or sample to a 100 ml beaker containing a magnetic stir bar. Set magnetic stirrer at low speed.

2. Carefully lower pH probe into the solution. **If the pH is above 8.3 consult principal analyst!**

3. Fill the titrating buret to the zero mark with the standardized H2SO4. Carefully add the H2SO4 to the sample until a pH of 4.5 ± 0.05 is reached.

4. Record the volume of H_2SO_4 added to the sample, to the nearest tenth, on the chemistry worksheet.

5. Rinse the pH electrode with deionized water. Measure out the next sample, refill the buret, and titrate the next specimen.

Calculations:

Use the following formula to calculate the alkalinity as mg/L of calcium carbonate.
Exception: For alkalinity below 20 mg/L use low alkalinity calculation procedure (refer to SM2320B part 5)

mg/L = (mL of H_2SO_4 - 0.1) X normality of H_2SO_4 X (50,000 ÷ ml of sample)
<u>Example (for 50 ml sample):</u>
(28.6 mL - 0.1) X 0.02 X (50,000÷50ml) = 570 mg/L of Calcium Carbonate
or
(28.6 ml – 0.1 ml) X (20) = 570 mg/L of Calcium Carbonate

Reporting

Report in **whole** numbers: round off to 3 significant figures. Examples:
2,902.5 = 2,900; 1,125.9 = 1,130; 23.65 = 24

References

Standard Methods for the Examination of Water and Wastewater 18th edition 1992

Written by: David Perez
Date: January 1993
Revised by: G. R. Guibert
Date: August, 1998

Approved by:______________________________
Principal Analyst

Varian Flame AA Procedure
SM 3111B
For Ca, Mg, Na, K and Fe

Principle:
In flame atomic absorption spectrometry, a sample is aspirated into a flame and atomized. A light beam is directed through the flame, into a monochrometer and into a detector that measures the amount of light absorbed. Because each metal has its own characteristic absorption wavelength, a source lamp composed of that element is used. The amount of energy absorbed in the flame is proportional to the concentration of the element in the sample

Sample Collection/Handling:
Use metal free collection bottle to collect sample. Collect one liter of sample. Smaller volumes (not less than 200 ml) can be used if necessary. On collection, acidify samples to pH <2 with 1:1 nitric acid, usually 3ml per liter. If samples are not acidified at time of collection, add acid upon receipt in lab and hold for minimum of 16 hours before analysis.[40 CFR 141.23(K)].

Sample Preparation:
Samples containing particulate or organic material require pretreatment before analysis. Samples with a turbidity <1 NTU, no odor and single phase may be analyzed directly. Digest all other samples before determining total metals.

Digestion Procedure for total metals:
Drinking water samples with turbidity >1 NTU can be analyzed following digestion with nitric acid. See procedure SM 3030E (Nitric Acid Digestion). Wastewater samples are better digested using method SM 3030F part b (Nitric Acid-Hydrochloric Acid Digestion). Report as total recoverable metal.

Sample criteria:
Except as noted, specimens that do not meet the criteria below should be immediately reported as "no test" with an explanatory note:

1. Samples submitted in improper collection container.
2. Sample inadequately identified. (Sample has no identification, or cannot be matched to a laboratory request form).
3. Sample quantity insufficient
4. Sample container broken or leaked in transit.

Special Instructions:
All glassware and pipettes used in this procedure must be cleaned using glassware-cleaning procedure. See document in kitchen.

Reagents:
1. Nitric Acid (HNO_3). Use high purity nitric acid 1+1.
2. Lanthanum solution (1.11%): Dissolve 58.65 g lanthanum oxide in 250 ml of conc HCL. Add slowly with stirring until dissolved and dilute to about 900 ml. Allow to cool for a few hours then dilute to final 1000 ml volume. Used for Ca, Mg, Na, and K analysis.
3. Calcium solution: Dissolve 630 mg calcium carbonate, $CACO_3$, in 50 ml of 1+5 HCL. If necessary, boil gently to obtain complete solution. Cool and dilute to 1000 mL with water. Used for Fe analysis.
4. Standard Metal solutions: Standard metal solutions are prepared from 1000 mg/l AA or ICP-MS standards purchased from Ricca Chemical company, Spex Certiprep, LabChem, Fisher Scientific or VWR. A standard from EM scientific (ICP Multi-element Standard) is very convenient for calibration standards.
5. Deionized Water from Millipore system – metal free water.

Instrument Set-up:
Use the Varian Spectra 300AA operating in the flame mode with Air Acetylene burner.

1. Turn on exhaust hood. Switch is located in the corner by the Chemistry room refrigerator. Note: Turn switch until it clicks on. If you continue turning the switch after it clicks, the airflow will be reduced.

2. Turn on "Acetylene" gas cylinder located outside in the "Safety Storage" shed. The correct door housing the tank is labeled "Acetylene". Pressure should be set at 8-9 PSI.
   Note: The cylinder valve is opened by turning the handle only 1/4 turn counterclockwise. Replace cylinder when pressure in tank drops below 100 psi. This prevents acetone from entering instrument.

3. Check the Varian Spectra AA 300A unit to see if the burner is installed.

4. Check to see if the cathode lamp required is in the correct socket position, and it is lined up in the "Operating Lamp"
   Note: Lamps are stored in the top drawer located directly across from the GTA 96 Graphite Tube Atomizer (next to hood).

5. Turn on the equipment in the following order (allow a 20 minute warm-up period):
   Note: If the computer is already on, turn it off.
   a. Spectra AA 300A: switch located on lower right front of instrument.
   b. IBM PC and Printer: Turn surge suppressor on (power supply); hit reset button.

Once the unit has been set-up, program the machine for testing by:

1. Start at the "C:" prompt. Press "M" and "Enter".

2. Press "Spectra Flame"

3. Press "Index" (F10). Enter number 10, "Sequence Selection", press "Enter" key.

4. Select element to be tested

5. Press "Sequence Control" (F6). Enter number of samples to be tested.

6. Press "Index" (F10), enter number 6, "Optimization", press "Enter" key.

7. The Screen will display two signal bar graphs. Check the previous week worksheet for the "Photomultiplier voltage" reading.

8. Maximize the lamp signal of the Cathode tube using the two thumbscrews located on the back of the lamp socket (see figure 5.8).
   a. Watch the bar graph as you turn one thumbscrew. Once the value reaches .9 or greater press "Rescale" (F1).
   b. Check the Photomutiplier Voltage display on the screen, after rescaling. If the voltage is higher than the preceding week, continue adjusting and rescaling until the proper voltage is reached. If you are unable to reach the proper voltage, try adjusting the second screw.
   c. Note: Normally the voltage stays the same from week to week, but as the lamp nears the end of its usefulness, the voltage reading will go up. If a new lamp is installed, the starting voltage may be different than the previous lamp. Record millivolt reading on worksheet.

9. After adjusting for maximum signal, hit "Rescale" (F1). The photomultiplier voltage will be displayed. If the reading matches the previous week, record the voltage on the new worksheet. If it is out of range, readjust lamps. If voltage is still out of range, notify Chemist.

10. Press "Index" (F10) key and select "Standards" (number 7). Verify that the values of the standards are correct (see previous worksheet for standard values). To select a value to change, use the up and down arrows. Enter the correct value with the keyboard.

11. Check to see that drain hose, located below the Spectra 300A, is inserted into the drain bottle (empty after each use).

12. Press "Index" key, enter number 18 (Signal Graphics), and press "Enter".

13. Press "Shift" and "Instrument Zero" (F10).

14. Light burner by pressing ignite button. Aspirate DI water for about 10 minutes. This will allow burner temperature to stabilize.

Standard and Sample Preparation:
Required sample preparation depends on the metal form being measured.

Procedure for Ca, Mg, Na, and K
1. Label the 10 ml beakers with the standard value; label the sample beakers with the last three numbers of the tiny tab number. Using the adjustable pipette, pipette 1.0 ml of sample or standard into each disposable beakers.

2. Add 9.0 ml of 1.11% lanthanum to each sample or standard using the adjustable pipette.

3. Repeat the process once again by diluting 1 ml of the diluted sample to 10 ml with the 1.11% Lanthanum. The samples have now been diluted 1:10 and 1:100. Alternatively use proportionally smaller volumes (i.e. .5 ml sample and 4.5 ml of 1.11% lanthanum).

4. The standards are prepared from stock solutions that when diluted 1:10 will give the necessary concentrations for calibration. The stock solutions are prepared from 1000 ppm standard metal solutions purchased from Ricca Chemical Co. Record dates of preparation and expiration (3 months) in sample prep manual.

5. The final concentration of calibration standards will be.

    1. Ca: 1.00, 3.00, 5.00 and 10.00 mg/l
    2. Mg 0.10, 0.50, 1.00 and 1.50 mg/l
    3. Na 0.10, 0.50, 1.00, 1.50 and 2.50 mg/l
    4. K 0.10, 0.50, 1.00, 1.50 and 2.50 mg/l

6. Set report format: Go back to index by pressing the "Index" (F10) key, then select the "Report Format" (number 13). Here you can enter the name of the operator, batch name, and date. No other changes are usually necessary.

7. Start program: Press the "Start" (F11). The screen will show the message "Select Lamp 3"; press "Start" (F11). The program will now run to completion.

8. Calibration of other Metals besides Fe/Mn: The other metals tested by flame AA does not require an ionization suppressor and can be directly aspirated. See specific method on computer for required calibration standards.

Standard and Sample Preparation: Procedure for Fe:

1. Label the sample beakers with the last three numbers of the tiny tab number. Using the adjustable pipette, pipette 1.0 ml of Ca solution into each disposable beakers.

2. Add 4.0 ml of sample to each beaker using the adjustable pipette.

3. The standards are prepared from 1000 ppm standard metal solutions purchased from LabChem or Spex Certiprep. Add 20 ml Ca solution and 1 ml conc HNO3 to each 100 ml of standard prepared. Record dates of preparation and expiration (3 months) in sample prep manual.

4. The final concentration of Fe calibration standards will be: 0.3, 0.5, 1.0, and 3.00 mg/l

5. Set report format: Go back to index by pressing the "Index" (F10) key, then select the "Report Format" (number 13). Here you can enter the name of the operator, batch name, and date. No other changes are usually necessary.

6. Start program: Press the "Start" (F11). The screen will show the message "Select Lamp 3"; press "Start" (F11). The program will now run to completion.

Quality Control:

1. Analyze a Blank after every 10 samples to verify baseline stability. Rezero when necessary.
2. Duplicate Spikes - replicate spikes are to be performed on 10% of samples. Recovery of spike in drinking water should be between 80% and 120% with a precision of 20%. Recovery of spike in wastewater should be between 75-125% with a precision of 25%. Spike level should not exceed MCL for analyte. Spiking solutions are available from Cresent Chemical Co.or SPEX.
3. External Reference Sample - Analyze a known reference sample after initial calibration and after every ten samples to confirm the test is in control.
4. See Table 3111:III in Standard Methods for recommended concentrations of standards to be run, limits of acceptability, and reported single operator precision data.
5. Analyze External Reference Sample on quarterly basis. Solutions available from APG, ERA or SPEX.

CRITERIA FOR ACCEPTABILITY OF RUN

1. Recoveries of spikes and controls are within acceptable range.
2. Blank values below detection levels.
3. Acceptable levels of precision.

NOTE: If any of the acceptance criteria are not met, the analyst must stop the run, correct the problem and and retest the samples.

OUT OF CONTROL PLAN

No sample should be reported until the all acceptance criteria have met. Or the out-of-control condition has been corrected and any problems or departure from protocol identified.

Trouble Shooting:

1. PROBLEM - poor precision,

   Check alignment of hollow cathode lamp. Check that capillary hose is not clogged. Make sure burner is clean and flame appears smooth and even. Replace pinched or crimped capillary tubing.

2. PROBLEM - error message

   Refer to instrument service manual

3. PROBLEM - Contamination

Check supplies associated with sample collection for contamination. Check rinse water, sample diluent, pipettes, sample cups. Make sure work area is free from dust.

Shutdown Procedure:
Turn off acetylene, IBM PC and AA300, and exhaust hood, in that order.

Calculations:
The results will be printed and should be recorded on a worksheet. The dilution factor must be shown and considered in the calculations.

Reporting:

1. The data from the printout should be transferred to the worksheet. Verify that controls were within acceptable range and that duplicates are within range.

2. The lab clerk enters the results into the computer. Results are reported in units and number of significant figures consistent with MDL of method.

References:

1. "Analytical Methods for Flame Atomic Absorption Spectrometry" Varian Techtron Pty. Limited. 1989.

2."Standard Methods for the Examination of Water and Wastewater"
18th Edition 1992 by APHA, AWWA, and the WEF.

Written by: David Holland
Date: January 1999

Approved by: ____________________
Laboratory Director

DETERMINATION OF INORGANIC ANIONS
BY ION CHROMATOGRAPHY (EPA METHOD 300.0)
USING THE DIONEX DX-80 ION ANALYZER

PRINCIPLE
This method determines the following inorganic anions: fluoride, chloride, nitrite, bromide, nitrate, phosphate and sulfate.

A small volume of sample (approx. 1 ml) is loaded into the ion chromatograph. The injection valve injects 10 ul of the sample into the flow of eluent. The eluent (a NaHCO3 - Na2CO3 solution) flows continuously through the IC and serves as a carrier for the 10 ul of sample and facilitates in the separation process.

The anions of interest are separated using suppressed conductivity detection, and are identified and quantified by comparing data to those obtain from a standard solution. The major parts of the system are the liquid eluent, high pressure pump, sample injector, guard column, the separator column, the chemical suppressor and the conductivity detector. The guard column protects the separator column, which separates the anions based on their size and charge. The function of the suppressor is to chemically reduce the background conductivity of the electrolytes in the eluent, and to convert the sample anions into a more conductive form. The detector then detects the conductivity of the solution, which varies depending on the concentrations of the anions (higher conductivity indicates a greater concentration of the anion).

SAMPLE CRITERIA
The holding times for drinking water samples are as follows:

F^-	28 days
Cl^-	28 days
NO_2^-	48 hours
NO_3^-	48 hours
$SO_4^=$	28 days
Br^-	28 days

Samples submitted for IC testing routinely should be run within 48 hours of collection, especially for nitrite and nitrate. If testing needs to be delayed, the sample can be preserved with sulfuric acid; preserved samples can be held for up to 28 days and the nitrate results reported as combined Nitrate/Nitrite. Any samples not tested within specified holding times should be identified on the worksheet.

Samples bottles dedicated for IC testing only are placed on the IC bench. As soon as a sample is setup, place it on the white tray for easier storage. After 6 weeks the containers should be emptied and discarded. Nondedicated samples (i.e. those also submitted for additional testing) should be returned to the designated cart after IC testing.

QUALITY ASSURANCE

Operator competency - Ion chromatography may be performed only by analysts who have been trained and who have demonstrated competency with the procedure. One check consists of preparing the calibration standards and calibrating the IC. An r-value of 0.995 or higher (correlation coefficient of 99.95%) in the linear fit type must be attained for each analyte of interest. Another way to demonstrate competence is to run a minimum of four replicate analyses of an independently prepared sample. Each analyte of interest in the sample should have a known concentration between 5 and 50 times the MDL.

Blank - A blank consisting of nanopure water should be included at the beginning of each run. The results for the blank must be below the MDL for each analyte.

Control standard(s) - Controls representing two concentration levels for each analyte (ICMIX HIGH & ICMIX LOW) must be analyzed as described below. The source of the analytes used to prepare these controls must be different from the source used to prepare the calibration standards. An ICMIX HIGH stock solution of the 7 anions with the following final concentrations:

Anion	*Final Conc*	*Preparation in 500 ml volumetric flask*
F^-	20 ppm	10 ml of 1000 ppm Fl std
Cl^-	100 ppm	50 ml of 1000 ppm Cl std
NO2	65.5 ppm	10 ml of 1000 ppm NO2-N std
Br^-	20 ppm	10 ml of 1000 ppm Br std
NO3	100 ppm	50 ml of 1000 ppm NO3 std
PO4	100 ppm	50 ml of 1000 ppm PO4 std
SO4	100 ppm	50 ml of 1000 ppm SO4 std

should be kept on hand. Use this undiluted at the beginning of the run and after every tenth sample. Each week, prepare an ICMIX LOW solution from the ICMIX HIGH solution as follows: Using a 100 ml volumetric flask add 1 ml if ICMIX HIGH using the 1 ml volumetric pipet and fill to mark with nanopure water. Record date made in the IC logbook under Quality Control. Run the IC LOW at the beginning of the days run and after every 10^{th} sample after the IC HIGH. The percent recovery for each anion should be between 90 and 110%.

Duplicate spikes - Duplicate spikes should be run after every tenth sample. The spike should not be less than four times the MDL and it should increase each anion concentration by more than 25% of the background value. A suitable spike can be prepared by adding one part ICMIX HIGH to three parts sample. The average percent recovery for each anion should be between 80 and 120%. The duplicate spikes should be within 10% of each other. Record average percent recovery of spikes and duplicate percent difference on worksheets. Note: if the concentration of the spike is less than 25% of the background concentration, the spike recovery should not be calculated.

If any of the above control criteria are not met, do not report sample results until the problem has been resolved.

External controls & chart analysis - In addition to the control standards tested with each batch of samples, an external reference standard (i.e. SPEX IC standard or WS proficiency sample) should be tested on a quarterly basis; however we like to run one at the end of each run.

CALIBRATION FOR GOUNDWATER (DRINKING WATER AND MONITORING WELLS):
Calibration for groundwater samples is described below. Calibration should be performed whenever: 1) controls are out of range; 2) a new batch/lot of eluent/regenerant is made or 3) when a column, suppressor or detector is changed.

1. Prepare 1/10, 1/100, 1/1000 dilutions of the calibration standard ordered from Dionex, which contains 20 mg/l fluoride, 100mg/l chloride, 100 mg/L nitrite, 100 mg/L bromide, 100 mg/l nitrate, 200 mg/L phosphate and 100 mg/l sulfate.

2. Run calibration standards beginning with the highest dilution (1/1000) first.

3. Create calibration sequence: File – New – Sequence – Standards – Next. Skip section on Choosing Timebase – name the sequence *calibMMDDYEAR* and initials – Next – Done.

4. Add sequence to batch file before starting

5. After all four calibration standards have been ran, check the calibration curve.

   a) Double click on any of the calibration standards (Cal Std 1). You will get a chromatograph

   b) Click on Calibration Plot icon, upper right corner or click on VIEW – Calibration Plot. You will see a graph of the first analyte along with the correlation coefficient percentage for each analyte. Only anaytes with percentage of 99.5 or greater are acceptable. Generally try for a 99.98% for an average of all seven analytes to pass quality control checks. See the principle analyst if the result is a lesser value.

   c) The mean retention times and detection range are automatic on the DX-80 Ion Analyzer and can not be changed or edited.

PREPARE MDL STUDY
The Method Detection Limit is the lowest concentration of a substance that can be identified with accuracy and confidence by a certain method or analysis.

1) Prepare a Cal Std 1 level each analyte separately using the secondary standards (not Dionex mix)
2) Make seven replicates of this dilution and run through the Ion Analyzer under the Unknown Method.
3) Collect data and calculate the standard deviation for the seven replicates. Multiply the standard deviation values by 3.143. This number will be the Method Detection Limit.

GENERATE BACKLOG REPORT:

1) On a network computer – not the Instrument computer. Double click on LABWORKS icon. Enter password. Click on OK. Click on backlog. Click on analysis code. Click on OK. Type in #ICANION. Click on OK. Click on display report. Click on print. Click on exit until you are out.

2) Check the clipboard to see if a worksheet has been initiated listing samples that need repeat testing; if so, append worksheet with samples on backlog report.
   a) Account for all specimens on backlog report
      i) Samples may have been tested in a previous run but not recorded. Record these results and give to the clerk.
      ii) If a sample appears on the backlog but needs to be tested by a different method (i.e. wastewater), inform the clerk so that the analysis ordered can be modified.
   b) Include any "new" samples on the I.C. bench that have not yet been entered into the computer.

SAMPLE PREPARATION

Groundwater (drinking water and monitoring wells) should be filtered through 0.45 um membrane filters before injection:

1) Rinse the syringe once with the sample water. Then fill syringe with about 10 ml of sample water.
2) Filter a minimum of 2 ml of sample through the 0.45 membrane into a labeled autosampler vial discarding the first few drops.
3) Place autosampler cap on vial and press down using the provided tool. Make sure the cap goes in straight and remove any air bubbles seen in the vial (invert or knock gently).
4) Place sample in autosampler rack. The order in the rack must match that on the schedule. Note: If you suspect the result of a sample to be above that of the calibration standard for an analyte, make an appropriate dilution. Check by measuring conductivity -- anything greater than 700 uS will need to be diluted.
5) Include duplicate spikes for every 10^{th} sample. Add 1 part ICMIX high to 3 parts filtered sample. Then IC HIGH, LRB, IC LOW. The laboratory reagent blank (LRB) is necessary to minimize carry over as the IC low is 100 times less than the High. Double check any samples where analyte concentrations are low after a high sample to verify analyte is even detected.

Samples which may contain high concentrations of chloride or organic contaminants (Carmel Area Wastewater District and ESF), are run on the DX-100 and require additional filtering through Dionex OnGuard P, Dionex OnGuard Ag, and Dionex OnGuard H filters before injection. See supplemental procedures.

SYSTEM START-UP:

1) Ensure the **eluent** bottle is at least ¼ full. If it is less, depending on size of run, prepare new eluent (and regenerant):
   a) Prepare 2 liters of a final eluent concentration of 8.0 mM Sodium Carbonate and 1.0 mM Sodium Bicarbonate by diluting one Dionex AS 14A Eluent Concentrate bottle (P/N 057060) into two 1L-volumetric flasks. Bring each to volume (1000 ml) with nanopure water. Makes 2 liters.
   b) Use the designated filter/vacuum flask, a filter funnel, a clean 0.45um membrane filter, and a large magnetic stir bar to degas the eluent. Pour the eluent into the filter funnel and turn on the vacuum. Set the magnetic sticker at medium to high speed. Once all the eluent has been filtered, keep the vacuum and magnetic stirrer on for 15-20 minutes, allowing the eluent to degas.
   c) Turn off the magnetic stirrer and the vacuum. Remove the filter funnel. Carefully decant the degassed eluent into the eluent bottle, without aerating. Make sure the cap is on tightly, and the tubes are securely attached.

2) Whenever new eluent is prepared, new **regenerant** must also be made.
   a) Prepare 2 liters of a final anion regenerant concentration of 72 mN Sulfuric Acid by adding one Dionex Anion Regenerant Concentrate bottle (P/N 057559) to two liters of nanopure water.
   b) Mix in the regenerant in the designated filter flask using the stir bar and degas for 15-20 minutes.
   c) Turn off the magnetic stirrer and the vacuum. Remove the filter funnel. Carefully decant the degassed regenerant into the REGEN bottle, without aerating. Make sure the cap is on tightly, and the tubes are securely attached.

DX-80 OPERATION

1) Turn on nitrogen gas cylinder (main knob only), autosampler (rear right hand corner), ion analyzer (rear panel right hand side) and computer.

2) Double click on Peaknet to open computer program. **File – Panels\Dionex DX-80 System** for the Control Panel.

3) Under the DX-80 Status click on **CONNECT** to connect analyzer to computer

4) Turn on the pump by clicking the **ON** button on the DX-80 Control Panel. **Prime** the pump by turning the pump head waste valve knob counter clockwise and leaving it open for about 5 seconds. Close the pump valve knob by turning clockwise until secure. After changing to new eluent, it is a good idea to leave pump valve open until all air bubbles have been purged – look for the air bubbles coming out the eluent bottle until it reaches the waste line at the pump. This will allow any air bubbles to be pumped to waste instead of through the columns.

5) Allow the system to **equilibrate** for 30 minutes minimum, generally one hour if new eluent is used. Once ready, the **operating pressure** should be 2000 -- 300 psi (usu 2100

psi); and the operating **total conductivity** background should be < 30 uS (usually 25.00uS). You can offset the background and zero the reading by clicking the Autozero button on the Control Panel.

6) To begin a run, create a sequence worksheet by clicking on **File – New – Sequence**. (May have to do this twice if worksheet is not already open.)
   a. It will then prompt you to choose Standard or Unknowns. Choose **Unknowns - Next**
   b. Skip **next** screen where it prompts you to specify timebase.
   c. **Estimate** number of unknowns (you can always add or delete samples from sequence when done.
   d. Fill out file name you wish to save the file We save under ***MMDDYEAR*** and **initials**: (*05052002rt*) and press **enter.**
   e. Press **Done** when prompted to exit wizard.
   f. A worksheet will appear where sample identifications can be added after the calibration data (line #5). Follow printed worksheet -- first include a *blank, ic low, ic high, lrb,* then the samples. Note for the first set, the lrb is listed as a sample. *Duplicate spikes* are required for every 10th sample or a minimum of 10% of samples. Finish off sequence with a known quality control standard, usually a proficiency standard such as *WS 60* or Ultra QC and another blank (LRB).
   g. Change *dilution factor* if sample was diluted; default is one. Save by pressing the SAVE icon (floppy disk).

7) To start the run – click on **Batch – Edit – Add** – double click on the newly created sequence, or the one you want run – then **Start** to begin.

8) Make sure autosampler vials are in order and the green light is on 'Run' not 'Hold'.

9) Record date, total conductivity and pressure in the log notebook at which the run has started.

10) During or after the run, verify that the blank and QCs (IC HIGH, IC LOW, IC CHECK) are within range. If not stop the run by clicking on **Batch – Stop - after current sample**, and notify principal analyst to investigate and solve the problem before resuming the run.

REPORTING RESULTS

1) When run is complete the analyst performing the run is responsible for recording and reporting results. Review each chromatogram to verify that the peaks were properly identified. Retention times may shift if there was a sudden change in pressure. Changes to the peak name can be made by a right click on the peak and choosing the correct analyte then save.

2) The results are found on the worksheet next to the sample ID and can be exported to an excel file for accuracy calculation:
   a) Click on any sample cell -- i.e. ic low, cell will be outlined.

b) Click on **File – Batch Report – Export** (unclick the Printout option- computer is not connected to any printer) **Excel file format**
c) For sheets to be exported, choose only " **Summary – INJ vs. Area, Ht, Amt**." Unclick the Integration, Calibration, Peak analysis, Summary-INJ vs. Anion, and Audit Trail options as they are extra and rarely needed for our purpose.
d) Click on **Finish** then **OK** on batch menu. Status will appear and when transfer is complete, press **OK** to exit.

3) To copy exported file onto a floppy, right click on Start icon on lower left screen and choose EXPLORE for Windows Explorer. Under **C:\Chromel\Export** folders are the files just exported. Highlight the correct sequence and drag to **A:** drive to copy file. (Make sure you have a floppy disk inserted).

4) Open exported file under an EXCEL program – the instrument computer does not have one so use a network computer. You will see three types of charts: first- Sample vs. Area, second - Sample vs. Height, and third - Sample vs. Amount. Copy all of the **Sample vs. Amount** table to an old/previous excel file.

5) The Excel Results worksheet is permanently saved under **G:\Laboratory\Data\Water\IC Data\2002** under the correct month. It is also saved in Tess' computer under **C:\My Documents\IC Data** and correct year and month. Easiest way to create the worksheet is to open a previously saved file (of the same year and month) and then cut and paste the data. There are two worksheets in each file, one for the complete results, the other for the raw data (the Sample vs Amount table exported from peaknet).
a) Before any changes are made, save the file under a new name: MMDDYY and initials
b) On RAW worksheet, delete old table and replace with recently ran sequence data. Add a column between Sample ID and Fluoride Amount for the dilution factor.
c) Change Date Analyzed and Analyst if applicable. Calibrations are generally done once a month with the most recent noted under Date of Calibration – change if necessary.
d) **Copy** and paste data results from raw worksheet onto Results worksheet under correct sample name. Use the **Paste Special option – Values -** to retain similar fonts on results worksheet. **% Recoveries** will be automatically calculated as will **% Differences**, and **Averages** for the duplicate spikes but references to certain cells may need to be changed for the correct result.
e) Verify that all QC are accurate before entering into labworks.

6) For drinking water, results should be recorded as ND – Not Detected for levels below DLR (Detection Limit for Reporting) as follows:
a) Fluoride 0.1 mg/L
b) Nitrate 2.0 mg/L
c) Sulfate 0.5 mg/L
d) Bromide 0.1 mg/L
e) Chloride, Nitrite, Phosphate 1.0 mg/L

f) Any samples with readings above the calibration range (20 mg/L fluoride, 100 mg/l chloride, nitrite, bromide, nitrate, sulfate, and 200 mg/l phosphate) needs to be diluted and repeated in the next run. List these samples on a new worksheet with the appropriate dilution and place the worksheet on the clipboard.

7) Do not report results if control/spike values do not fall within limits (refer to section on quality control). If controls, spikes, etc. are out of range, notify the principal analyst. If controls are within limits, date and initial the worksheet and give the worksheet to the clerk for data entry. When the worksheet and backlog are returned place them in the binder.

SHUT DOWN

After the run is complete the Ion Analyzer can be shut down. The IC should be shut down on weekends if the system is not in operation on Friday night so as not to damage the suppressor unit:

1) On the Control Panel screen of Peaknet - turn **OFF** pump and **DISCONNECT** DX-80
2) Close Peaknet.
3) Turn off DX-80, autosampler and close nitrogen cylinder valve.

PREVENTIVE MAINTENANCE:

1) Each quarter, replace the bed supports on guard column
2) Maintain the following spare parts. These items are considered consumables:
   a) Anion Refill Kit (Part No. 057069) contains 4 bottles each of AS14A eluent and anion regenerant concentrate.
   b) AS14A anion separator column, 3 mm (Part No. 056901)
   c) AS14G anion guard column (Part No. 056899)
   d) AMMS III suppressor (Part No. 056751)
   e) DS5 Detection Stabilizer (Part No. 057290T)

DOS AND DON'TS

* Try to make additions, changes, and deletions to the sequence during the middle of a run and then save immediately. If the changes are not saved immediately, the program may get confused on which sequence to use and will freeze. If this happens, wait until the current sample is completed, turn off all equipment and wait for about 15 minutes before restarting.

* Be gentle when loading samples onto the autosampler, especially the first rack. If racks are installed too roughly, conveyor belt may get stuck and samples will not be injected in the proper sequence.

REFERENCES:

1) DX-80 Ion Chromatograph with SRS Control Operator's Manual, Dionex Corporation. 2002.
2) Methods for the Determination of Inorganic Substances in Environmental Samples. Method Number 300.0. Determination of Inorganic Anions by Ion Chromatography. John D. Pfaff. U.S. Environmental Protection Agency. 1993.
3) Standard Methods, 18th Edition. 1992. Part 4110.

Originally written by: Johanna Rosen for DX-100
Date: 12-96
Updated by: Theresa Lam for DX-80 Ion Analyzer
Date: 05-02

Approved by: ______________________
(Lab Director's signature)

APPENDIX 7D

CONTOURING PROTOCOLS FOR CHLORIDE ISOCONTOUR MAPS

WATER RESOURCES AGENCY

M E M O R A N D U M

Monterey County

DATE: April 17, 2018

FROM: Sean Noble

TO: Water Quality

SUBJECT: How to Contour SWI in ArcGIS

Background

The purpose of this memo is to describe the process of creating the initial seawater intrusion contours using ArcGIS. This is an attempt to standardize the process. Contours are based on chloride (Cl) data sampled from coastal wells in the Pressure 400-Foot and Pressure 180-Foot Aquifers. This data for comes from three primary sources. First, coastal wells are sampled twice each summer by Agency staff. Second, monitoring wells are sampled once each summer, using a portable pump. Finally, data from outside sources are pulled in to supplement the data and create better geospatial coverage. Historically contours are generated on every odd year, using even year data to fill any data gaps. Data is used to create contours that are then added to the historical seawater intrusion maps. The maps are as follows:

P180 Sea Water Intrusion Map

P400 Sea Water Intrusion Map

(In the future the deep aquifer may be added to the process)

After reviewing all the data and uploading it to the WRAIMS database, we are ready to move on to ArcGIS.

**** The 2017 year Pressure 400 will be used as an example ****

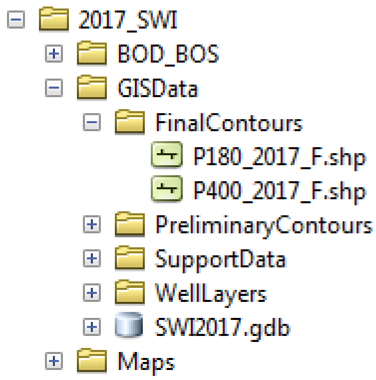
ArcCatalog

Open ArcCatalog and navigate to R:\Workspace\Common\WaterQuality\SWI. Notice that the folders are labeled by year with the exception of the CommonDirectories. This folder stores GIS data that can be used for any year that is contoured. It contains commonly used boundaries, databases, and layers.

In ArcCatalog copy/paste folder of the last year contoured (2015_SWI) and rename current year (2017_SWI).

This will be the naming convention for naming files:

Aquifer_Year _Version(if applicable), examples:



Within each year there are two main folders:

GISData

FinalContours, storage of approved shapefiles

PreliminaryContours – primary exported contour shapefiles

SupportData – secondary export shapefiles, database tables, and imagery

Maps

Stores final project maps and products

<u>ArcMap</u>

<u>Step 1 – Project Formatting</u>

Rename the ArcMap contour projects stored in the Maps folder:

R:\Workspace\Common\WaterQuality\SWI\2017_SWI\Maps**P400_2015.mxd** ->
R:\Workspace\Common\WaterQuality\SWI\2017_SWI\Maps**P400_2017.mxd**

By using the previous project, all of the background shapefiles can stay and be reused for the new project.

<u>Step 2 – Database Formatting</u>

Navigate to:
R:\Workspace\Common\WaterQuality\SWI\CommonDirectories\Databases
And open the **SWIContours (Current).mdb** database
First, make sure that all relevant data has been reviewed and loaded to WRAIMS. Open the **_Contouring_Start_** table and edit the year to the year being contoured.

Run the macro: **SWI_ContourTables**

The macro SWI_ContourTables runs four make table queries to produce these tables:

SWI180_ALL
SWI400_ALL
SWI_180_CONTOUR_WELLS

SWI_400_CONTOUR_WELLS

The '…_ALL' tables include all wells that are in the Monthly Water Quality program and in the appropriate aquifers. Some wells have the aquifer designation PRESSURE BOTH. These well are included in both '…_ALL' tables, but are not included in the contouring. The '…_CONTOUR_WELLS' tables are a subsection of the '…_ALL' tables and only include wells to be used in contouring for the respective aquifers.

If certain wells need to be excluded, modify the **tblExcludedWells** table. Wells are excluded based on facility code and aquifer (180 or 400), so make sure both of those fields are filled out correctly. This table is used dictate which wells are excluded and to document which wells have been excluded and why. It should be kept updated as changes to the dataset are made. After adding new wells to tblExcludedWells, rerun the macros to update the tables.

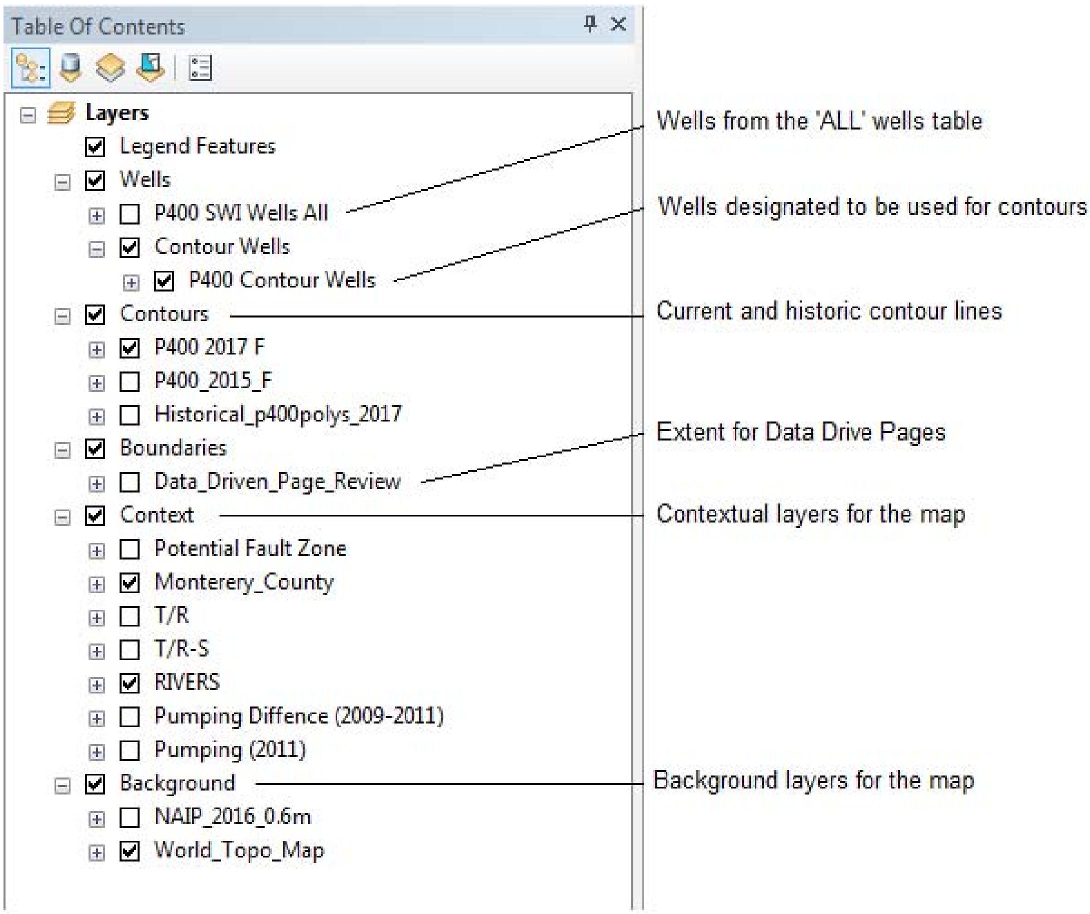
The **ExternalData** table can be used to add data that is not stored in WRAIMS but has been approved to be used for contouring. In the 2017 example, the data from the Monterey Peninsula Water Supply Project monitoring wells was added this way. Only wells with a FACILITY_CODE and in the WellsAll GIS layer can be utilized in this manner (R:\Workspace\Common\MapElements\WellsAll.lyr).

The tables include both present and past measurements and automatically include data [illegible] ear if the current year is missing data.

Field Name	Description
FACILITY_CODE	Facility Code of the well
FACILITY_NAME	State Well ID based on township and range
BASIN_NAME	Aquifer designation
ContourValue	Value used to contour as a year average of all samples taken during the most recent year
ContourValYr	Year that the value used to contour was sampled
ConYrCl	Contour year average of Cl data
ConYrStDev	Contour year standard deviation of Cl data
1yrBackCl	Previous year average of Cl data (2016)
1YrStDev	Previous year standard deviation of Cl data (2016)
2yrBackCl	Two years prior average of Cl data (2015)
2YrStDev	Two years prior standard deviation of Cl data (2015)
3yrBackCl	Three years prior average of Cl data (2014)
3YrStDev	Three years prior standard deviation of Cl data (2014)
PERF_START	Start of recorded perforation in well casing
PERF_END	End of recorded perforation in well casing
Use	Abbreviation of the wells primary uses
WATER_USE_DESCRIPTION	Description of the wells primary uses
FACILITY_STATUS_NAME	The status of the well

Step 3 – Data Labeling & Symbology

In ArcGIS:
All of the well layers in the ArcMap projects should automatically update to the 'Current' database values. The projects should be laid out in similar formats as demonstrated below. Compare the values and dates of various wells with recorded values in WRAIMS to ensure the correct data is being used.



Step 4 – Draft 1

To generate profiles run the tool
ArcToolbox -> SWIContouringTools -> SWI_Spline_Coastal_Contouring

And fill out the fields

Contour Wells:	Wells\Contour Wells\P180 Contour Wells
Z value field:	SWI_400_CONTOUR_WELLS.ContourValue
Spline type:	TENSION
Number of points:	4
Weight:	0.01

Contour Output:
R:\Workspace\Common\WaterQuality\SWI\2017_SWI\GISData\PreliminaryContours\p400_2017_v1.shp

In Layout view change any labels and titles to match the current year and draft, and make any appropriate changes to the legends.

Export to PDF, R:\Workspace\Common\WaterQuality\SWI\2017_SWI\GISData\PreliminaryContours\p400_2017_V1.pdf. From PDF, print to 11x17 and review. If all the data is there and the labels and symbology are correct then Print to Plotter, 30x30.

<u>Steps Summary</u>

Version 1 is the computers attempt to contour the data based on all the data that has been collected and reviewed for the appropriate aquifer. The next set of versions are created through careful examination of the data to establish what wells will be excluded from the contouring. Use past exclusion to help with wells with ambiguous aquifer designations and refer to well logs, well measurement histories, piper diagrams, and sample notes for wells that don't seem to fit the general trend. Once the list of wells to exclude is agreed upon, run the tool again. This process is iterated until **tblExcludedWells** is agreed to be final by the project supervisor. The next step is to generate the last set of computer generated lines (AT_2017_F) and edit them to match previous contours and represent the general trend of seawater intrusion.

<u>Editing Contour Lines</u>

The computer generated AT_2017_F needs to stay intact incase it has to be referenced at some point. The first thing to do is copy/paste AT_2017_F into the R:\Workspace\Common\WaterQuality\SWI\2017_SWI\GISData\FinalContours folder (this will be the version you edit). In ArcGIS:

Right click on the layer you wish to edit
Go to **Edit Features**
Click **Start Editing**

It sometimes makes editing easier to make the edited layer the only selectable layer.

Right click on layer
Go to **Selection**
Click on **Make This The Only Selectable Layer**

Double-click on the contour line you wish to modify. Many vertices will appear on the line as boxes. These are the points to drag in order to modify the line. When adding lines remember to edit the attribute table to add the appropriate contour value. Due to the limited data the contours will have to be heavily edited to achieve a general representation of sea water intrusion into the aquifers. As a general rule, lines will not recede approved by the project lead. Unless otherwise directed, lines that are seaward of past contours will default to the furthest inland historical extent (use the historical contour lines). Judgement will have to be used to decide how to alter lines to represent general seawater intrusion: work with the project lead on hand kriging and editing.

<u>Final Clean Up</u>

Once the list of excluded wells has been finalized copy the “Current” database and rename it with the contour year. This creates a backup and documents which wells were used and what values. Similarly, ensure that all shape files are in the correct places and properly labeled, especially the final contours.

APPENDIX 7E

DEPARTMENT OF DRINKING WATER SUPPLY WELLS FOR WATER QUALITY MONITORING NETWORK

GAMA Groundwater Quality Monitoring Network Wells

GAMA Well ID	Water System Name	Well Screen Info			Coordinates		Monitoring Date Range	
		Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Screen Length (ft)	Latitude (NAD83)	Longitude (NAD83)	First Year	Last Year
2700547-001	DESMOND RD WS #03	248	288	40	36.8030	-121.7005	2003	2018
2700548-001	DOLAN RD MWC	246	321	75	36.7959	-121.7371	1997	2019
2700577-001	ELKHORN SCHOOL WS	N/A	N/A	N/A	36.7971	-121.7181	1998	2019
2700579-001	ELKHORN RD WS #04	140	150	10	36.8400	-121.7206	2002	2019
2700594-001	HIDDEN VALLEY WA	404	444	40	36.8372	-121.7041	2004	2018
2700624-001	LEAFWOOD COMMUNITY WA	240	296	56	36.8084	-121.7046	2002	2018
2700674-002	PARADISE LAKE MUTUAL WATER CO.	398	438	40	36.8164	-121.7055	2004	2019
2700674-003	PARADISE LAKE MUTUAL WATER CO.	340	400	60	36.8164	-121.7055	2004	2019
2700842-002	BAUMANN RD WS #01	290	310	20	36.7870	-121.7214	2003	2018
2700850-001	Not Available	225	580	355	36.7465	-121.6945	2003	2019
2700992-001	MILLER'S LODGE WS	14	24	10	36.6242	-121.6300	2003	2018
2701057-001	Not Available	325	378	53	36.5713	-121.5222	2004	2016
2701109-001	ASSOCIATED TAGLINE WS	N/A	N/A	N/A	36.7156	-121.7191	1987	2018
2701152-001	FLORICULTURA PACIFIC WS	508	580	72	36.5931	-121.5390	2003	2018
2701153-001	GROWERS TRANSPLANTING WS	410	485	75	36.7355	-121.6848	2001	2018
2701202-002	CAL AM WATER COMPANY - CHUALAR	750	900	150	36.5703	-121.5150	1998	2019
2701202-004	CAL AM WATER COMPANY - CHUALAR	760	900	140	36.5696	-121.5137	2002	2019
2701214-001	FIRESTONE BUSINESS PARK WS	524	548	24	36.6267	-121.5929	1987	2015
2701214-002	FIRESTONE BUSINESS PARK WS	517	545	28	36.6267	-121.5930	2003	2019
2701232-001	OLD NATIVIDAD RD WS #01	390	490	100	36.6591	-121.6229	1986	2018
2701325-001	SAN CLEMENTE RANCHO WS	N/A	N/A	N/A	36.5042	-121.5067	2002	2018
2701364-001	PEDRAZZI MWC	474	508	34	36.6000	-121.6300	1999	2018
2701452-002	MONTEREY DUNES MWA	1323	1383	60	36.7694	-121.7953	2002	2018
2701452-004	MONTEREY DUNES MWA	N/A	N/A	N/A	36.7582	-121.8010	2008	2018
2701498-001	HARBOR VIEW WA	220	230	10	36.8173	-121.7153	1997	2018
2701515-001	MOSS LANDING HARBOR WS	400	750	350	36.7988	-121.7457	1986	2018
2701542-001	GONZALES GAS STATION WS	332	392	60	36.5231	-121.4645	2004	2016
2701575-001	BUENA VISTA CENTER WS	N/A	N/A	N/A	36.5889	-121.6048	1987	2015
2701575-002	BUENA VISTA CENTER WS	N/A	N/A	N/A	36.5903	-121.6064	2018	2018
2701622-001	Not Available	N/A	N/A	N/A	36.8000	-121.7000	2001	2017
2701630-001	PRUNEDALE CHEVRON WS	N/A	N/A	N/A	36.5889	-121.6048	2001	2018
2701647-001	GREEN ACRES WA	220	260	40	36.7963	-121.7324	1998	2019
2701820-001	CORDA RD WS	520	560	40	36.5181	-121.4604	2003	2018
2701825-001	GLEN OAKS WS #01	N/A	N/A	N/A	36.5181	-121.4604	2003	2015
2701897-001	BERRY DR WS #02	408	600	192	36.6000	-121.6317	1998	2018
2701926-001	MORO RD WS #09	445	485	40	36.8030	-121.7005	2002	2016
2702121-001	ROSEHART INDUSTRIAL PARK WS	520	572	52	36.6961	-121.7007	2002	2018
2702135-001	FOOTHILL WA	N/A	N/A	N/A	36.5606	-121.5628	2005	2019
2702180-001	GRAVES SCHOOL WS	370	430	60	36.6961	-121.7007	1987	2018
2702226-002	CDFW ELKHORN SLOUGH ECOLOGICAL RESERVE	350	490	140	36.8240	-121.7358	1990	2018
2702320-001	HITCHCOCK RD WS #01	560	640	80	36.6643	-121.7008	2003	2018
2702431-001	FOOTHILL RD WS #01	200	N/A	N/A	36.5604	-121.5639	2003	2019
2702444-001	RIVER RD WS #28	430	N/A	N/A	36.5967	-121.6242	2004	2018
2702452-001	EL CAMINO MACHINE & WELDING WS	N/A	N/A	N/A	36.6367	-121.6019	2004	2018
2702452-002	EL CAMINO MACHINE & WELDING WS	N/A	N/A	N/A	36.6365	-121.6018	2013	2018
2702453-001	MARINA LANDFILL WS	40	250	210	36.7127	-121.7691	2002	2019
2702456-001	MONTEREY ONE WATER (FORMERLY MRWPCA)	N/A	N/A	N/A	36.7054	-121.7692	2017	2018
2702456-002	MONTEREY ONE WATER (FORMERLY MRWPCA)	670	750	80	36.6365	-121.6018	2004	2017
2702466-001	SAN VICENTE MWC	60	100	40	36.6367	-121.6019	2003	2018
2702482-001	COLOR SPOT NURSERY WS #02	300	400	100	36.7456	-121.6866	2002	2018
2702484-003	GROWERS SERVICE ASSN WS (ICE)	604	632	28	36.6511	-121.6322	2003	2019
2702704-001	HARRIS RD WS #10	N/A	N/A	N/A	36.6242	-121.6300	2009	2019
2710003-001	Not Available	224	360	136	36.7719	-121.7392	1974	2015
2710003-004	Not Available	180	340	160	36.7720	-121.7391	2002	2015
2710005-003	CASTROVILLE COMMUNITY SERVICES DISTRICT	N/A	N/A	300	36.7712	-121.7543	1986	2019
2710005-004	CASTROVILLE COMMUNITY SERVICES DISTRICT	N/A	N/A	160	36.7554	-121.7438	1986	2019
2710005-005	CASTROVILLE COMMUNITY SERVICES DISTRICT	N/A	N/A	85	36.7568	-121.7366	1986	2019
2710007-004	GONZALES, CITY OF	400	660	260	36.4990	-121.4359	1987	2019
2710007-006	GONZALES, CITY OF	440	660	220	36.5056	-121.4464	1998	2019
2710010-009	CWSC SALINAS	357	437	80	36.6611	-121.6607	1983	2019
2710010-015	CWSC SALINAS	330	393	63	36.6508	-121.6201	1982	2019
2710010-017	CWSC SALINAS	451	517	66	36.6646	-121.6702	1983	2019
2710010-019	CWSC SALINAS	360	504	144	36.6504	-121.6307	1982	2019
2710010-020	CWSC SALINAS	462	523	61	36.7026	-121.6635	1983	2019
2710010-023	CWSC SALINAS	330	465	135	36.6702	-121.6795	1983	2019

GAMA Groundwater Quality Monitoring Network Wells

GAMA Well ID	Water System Name	Well Screen Info			Coordinates		Monitoring Date Range	
		Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Screen Length (ft)	Latitude (NAD83)	Longitude (NAD83)	First Year	Last Year
2710010-026	CWSC SALINAS	420	580	160	36.6975	-121.6670	1983	2019
2710010-027	CWSC SALINAS	350	540	190	36.6654	-121.6806	1984	2018
2710010-028	CWSC SALINAS	420	600	180	36.6910	-121.6643	1983	2016
2710010-030	CWSC SALINAS	490	640	150	36.6883	-121.6659	1986	2019
2710010-077	CWSC SALINAS	385	605	220	36.6551	-121.6488	2002	2018
2710012-002	CWSC SALINAS HILLS	413	465	52	36.6049	-121.6394	1984	2019
2710012-003	CWSC SALINAS HILLS	410	730	320	36.6023	-121.6386	1983	2018
2710012-009	CWSC SALINAS HILLS	360	740	380	36.6238	-121.6659	1991	2018
2710012-016	CWSC SALINAS HILLS	453	489	36	36.6002	-121.6317	2002	2018
2710012-017	CWSC SALINAS HILLS	N/A	N/A	N/A	36.6012	-121.6334	1997	2018
2710019-001	CWSC OAK HILLS	300	600	300	36.7813	-121.7081	1982	2018

APPENDIX 7F

CENTRAL COAST AG ORDER 3.0 MONITORING AND REPORTING PROGRAM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

MONITORING AND REPORTING PROGRAM
ORDER NO. R3-2017-0002-01

TIER 1

DISCHARGERS ENROLLED UNDER CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM IRRIGATED LANDS

This Monitoring and Reporting Program Order No. R3-2017-0002-01 (MRP) is issued pursuant to California Water Code (Water Code) sections 13267 and 13269, which authorize the California Regional Water Quality Control Board, Central Coast Region (hereafter Central Coast Water Board) to require preparation and submittal of technical and monitoring reports. Water Code section 13269 requires a waiver of waste discharge requirements to include as a condition the performance of monitoring and the public availability of monitoring results. *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands*, Order No. R3-2017-0002 (Order) includes criteria and requirements for three tiers. This MRP sets forth monitoring and reporting requirements for **Tier 1 Dischargers** enrolled under the Order. A summary of the requirements is shown below.

SUMMARY OF MONITORING AND REPORTING REQUIREMENTS FOR TIER 1:

Part 1: Surface Receiving Water Monitoring and Reporting *(cooperative or individual)*
Part 2: Groundwater Monitoring and Reporting *(cooperative or individual)*

Pursuant to Water Code section 13269(a)(2), monitoring requirements must be designed to support the development and implementation of the waiver program, including, but not limited to, verifying the adequacy and effectiveness of the waiver's conditions. The monitoring and reports required by this MRP are to evaluate effects of discharges of waste from irrigated agricultural operations and individual farms/ranches on waters of the state and to determine compliance with the Order.

MONITORING AND REPORTING BASED ON TIERS

The Order and MRP include criteria and requirements for three tiers, based upon those characteristics of individual farms/ranches at the operation that present the highest level of waste discharge or greatest risk to water quality. Dischargers must meet conditions of the Order and MRP for the appropriate tier that applies to their land and/or the individual farm/ranch. Within a tier, Dischargers comply with requirements based on the specific level of discharge and threat to water quality from individual farms/ranches. The lowest tier, Tier 1, applies to dischargers who discharge the lowest level of waste (amount or concentration) or pose the lowest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. The highest tier, Tier 3, applies to dischargers who discharge the highest level of waste or pose the greatest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. Tier 2 applies to dischargers whose discharge has a moderate threat to water quality. Water quality is defined in terms of regional, state, or federal numeric or narrative water quality standards. Per the Order, Dischargers may submit a request to the Executive Officer to approve transfer to a lower tier. If the Executive Officer approves a transfer to a lower tier, any interested person may request that the Central Coast Water Board conduct a review of the Executive Officer's determination.

PART 1. SURFACE RECEIVING WATER MONITORING AND REPORTING REQUIREMENTS

The surface receiving water monitoring and reporting requirements described herein are generally a continuation of the surface receiving water monitoring and reporting requirements of Monitoring and Reporting Program Order No. 2012-0011-01, as revised August 22, 2016, with the intent of uninterrupted regular monitoring and reporting during the transition from Order No. R3-2012-0011-01 to Order No. R3-2017-0002-01.

Monitoring and reporting requirements for surface receiving water identified in Part 1.A. and Part 1.B. apply to Tier 1 Dischargers. Surface receiving water refers to water flowing in creeks and other surface waters of the State. Surface receiving water monitoring may be conducted through a cooperative monitoring program on behalf of Dischargers, or Dischargers may choose to conduct surface receiving water monitoring and reporting individually. Key monitoring and reporting requirements for surface receiving water are shown in Tables 1 and 2.

A. Surface Receiving Water Quality Monitoring

1. Dischargers must elect a surface receiving water monitoring option (cooperative monitoring program or individual receiving water monitoring) to comply with surface receiving water quality monitoring requirements, and identify the option selected on the Notice of Intent (NOI).

2. Dischargers are encouraged to choose participation in a cooperative monitoring program (e.g., the existing Cooperative Monitoring Program or a similar program) to comply with receiving water quality monitoring requirements. Dischargers not participating in a cooperative monitoring program must conduct surface receiving water quality monitoring individually that achieves the same purpose.

3. Dischargers (individually or as part of a cooperative monitoring program) must conduct surface receiving water quality monitoring to a) assess the impacts of their waste discharges from irrigated lands to receiving water, b) assess the status of receiving water quality and beneficial use protection in impaired waterbodies dominated by irrigated agricultural activity, c) evaluate status, short term patterns and long term trends (five to ten years or more) in receiving water quality, d) evaluate water quality impacts resulting from agricultural discharges (including but not limited to tile drain discharges), e) evaluate stormwater quality, f) evaluate condition of existing perennial, intermittent, or ephemeral streams or riparian or wetland area habitat, including degradation resulting from erosion or agricultural discharges of waste, and g) assist in the identification of specific sources of water quality problems.

<u>Surface Receiving Water Quality Sampling and Analysis Plan</u>

4. **By March 1, 2018, or as directed by the Executive Officer**, Dischargers (individually or as part of a cooperative monitoring program) must submit a surface receiving water quality Sampling and Analysis Plan (SAAP) and Quality Assurance Project Plan (QAPP); this requirement is satisfied if an approved SAAP and QAPP addressing all surface receiving water quality monitoring requirements described in this Order has been submitted pursuant to Order No. R3-2012-0011 and associated Monitoring and Reporting Programs. Dischargers (or a third party cooperative monitoring program) must develop the Sampling and Analysis Plan to describe how the proposed monitoring will achieve the objectives of the MRP and evaluate compliance with the Order. The Sampling and Analysis Plan may propose alternative monitoring site locations, adjusted monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water. The Executive Officer must approve the Sampling and Analysis Plan and QAPP.

5. The Sampling and Analysis Plan must include the following minimum required components:
    a. Monitoring strategy to achieve objectives of the Order and MRP;
    b. Map of monitoring sites with GIS coordinates;
    c. Identification of known water quality impairments and impaired waterbodies per the 2010 Clean Water Act 303(d) List of Impaired Waterbodies (List of Impaired Waterbodies);
    d. Identification of beneficial uses and applicable water quality standards;
    e. Identification of applicable Total Maximum Daily Loads;
    f. Monitoring parameters;
    g. Monitoring schedule, including description and frequencies of monitoring events;

h. Description of data analysis methods;

6. The QAPP must include receiving water and site-specific information, project organization and responsibilities, and quality assurance components of the MRP. The QAPP must also include the laboratory and field requirements to be used for analyses and data evaluation. The QAPP must contain adequate detail for project and Water Board staff to identify and assess the technical and quality objectives, measurement and data acquisition methods, and limitations of the data generated under the surface receiving water quality monitoring. All sampling and laboratory methodologies and QAPP content must be consistent with U.S. EPA methods, State Water Board's Surface Water Ambient Monitoring Program (SWAMP) protocols and the Central Coast Water Board's Central Coast Ambient Monitoring Program (CCAMP). Following U.S. EPA guidelines[1] and SWAMP templates[2], the receiving water quality monitoring QAPP must include the following minimum required components:
    a. Project Management. This component addresses basic project management, including the project history and objectives, roles and responsibilities of the participants, and other aspects.
    b. Data Generation and Acquisition. This component addresses all aspects of project design and implementation. Implementation of these elements ensures that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and quality control activities are employed and are properly documented. Quality control requirements are applicable to all the constituents sampled as part of the MRP, as described in the appropriate method.
    c. Assessment and Oversight. This component addresses the activities for assessing the effectiveness of the implementation of the project and associated QA and QC activities. The purpose of the assessment is to provide project oversight that will ensure that the QA Project Plan is implemented as prescribed.
    d. Data Validation and Usability. This component addresses the quality assurance activities that occur after the data collection, laboratory analysis and data generation phase of the project is completed. Implementation of these elements ensures that the data conform to the specified criteria, thus achieving the MRP objectives.

[1] USEPA. 2001 (2006) USEPA Requirements for Quality Assurance Project Plans (QA/R-5) Office of Environmental Information, Washington, D.C. USEPA QA/R-5
[2] http://waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa

7. The Central Coast Water Board may conduct an audit of contracted laboratories at any time in order to evaluate compliance with the QAPP.

8. The Sampling and Analysis Plan and QAPP, and any proposed revisions are subject to approval by the Executive Officer. The Executive Officer may also revise the Sampling and Analysis Plan, including adding, removing, or changing monitoring site locations, changing monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water.

Surface Receiving Water Quality Monitoring Sites

9. The Sampling and Analysis Plan must, at a minimum, include monitoring sites to evaluate waterbodies identified in Table 1, unless otherwise approved by the Executive Officer. The Sampling and Analysis Plan must include sites to evaluate receiving water quality impacts most directly resulting from areas of agricultural discharge (including areas receiving tile drain discharges). Site selection must take into consideration the existence of any long term monitoring sites included in related monitoring programs (e.g. CCAMP and the existing CMP). Sites may be added or modified, subject to prior approval by the Executive Officer, to better assess the pollutant loading from individual sources or the impacts to receiving waters caused by individual discharges. Any modifications must consider sampling consistency for purposes of trend evaluation.

Surface Receiving Water Quality Monitoring Parameters

10. The Sampling and Analysis Plan must, at a minimum, include the following types of monitoring and evaluation parameters listed below and identified in Table 2:

    a. Flow Monitoring;
    b. Water Quality (physical parameters, metals, nutrients, pesticides);
    c. Toxicity (water and sediment);
    d. Assessment of Benthic Invertebrates.

11. All analyses must be conducted at a laboratory certified for such analyses by the State Department of Public Health (CDPH) or at laboratories approved by the Executive Officer. Unless otherwise noted, all sampling, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, U.S. EPA, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link: http://www.cdph.ca.gov/certlic/labs/Documents/ELAPLablist.xls

12. Water quality and flow monitoring is used to assess the sources, concentrations, and loads of waste discharges from individual farms/ranches and groups of Dischargers to surface waters, to evaluate impacts to water quality and beneficial uses, and to evaluate the short term patterns and long term trends in receiving water quality. Monitoring data must be compared to existing numeric and narrative water quality objectives.

13. Toxicity testing is to evaluate water quality relative to the narrative toxicity objective. Water column toxicity analyses must be conducted on 100% (undiluted) sample. At sites where persistent unresolved toxicity is found, the Executive Officer may require concurrent toxicity and chemical analyses and a Toxicity Identification Evaluation (TIE) to identify the individual discharges causing the toxicity.

<u>Surface Receiving Water Quality Monitoring Frequency and Schedule</u>

14. The Sampling and Analysis Plan must include a schedule for sampling. Timing, duration, and frequency of monitoring must be based on the land use, complexity, hydrology, and size of the waterbody. Table 2 includes minimum monitoring frequency and parameter lists. Agricultural parameters that are less common may be monitored less frequently. Modifications to the receiving water quality monitoring parameters, frequency, and schedule may be submitted for Executive Officer consideration and approval. At a minimum, the Sampling and Analysis Plan schedule must consist of monthly monitoring of common agricultural parameters in major agricultural areas, including two major storm events during the wet season (October 1 – April 30).

15. Storm event monitoring must be conducted within 18 hours of storm events, preferably including the first flush run-off event that results in significant increase in stream flow. For purposes of this MRP, a storm event is defined as precipitation producing onsite runoff (surface water flow) capable of creating significant ponding, erosion or other water quality problem. A significant storm event will generally result in greater than 1-inch of rain within a 24-hour period.

16. Dischargers (individually or as part of a cooperative monitoring program) must perform receiving water quality monitoring per the Sampling and Analysis Plan and QAPP approved by the Executive Officer.

B. Surface Receiving Water Quality Reporting

<u>Surface Receiving Water Quality Data Submittal</u>

1. Dischargers (individually or as part of a cooperative monitoring program) must submit water quality monitoring data to the Central Coast Water Board electronically, in a format specified by the Executive Officer and compatible with SWAMP/CCAMP electronic submittal guidelines, each January 1, April 1, July 1, and October 1.

Surface Receiving Water Quality Monitoring Annual Report

2. **By July 1, 2017,** and every July 1 annually thereafter, Dischargers (individually or as part of a cooperative monitoring program) must submit an Annual Report, electronically, in a format specified by the Executive Officer including the following minimum elements:

a. Signed Transmittal Letter;
b. Title Page;
c. Table of Contents;
d. Executive Summary;
e. Summary of Exceedance Reports submitted during the reporting period;
f. Monitoring objectives and design;
g. Monitoring site descriptions and rainfall records for the time period covered;
h. Location of monitoring sites and map(s);
i. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
j. Summary of water quality data for any sites monitored as part of related monitoring programs, and used to evaluate receiving water as described in the Sampling and Analysis Plan.
k. Discussion of data to clearly illustrate compliance with the Order and water quality standards;
l. Discussion of short term patterns and long term trends in receiving water quality and beneficial use protection;
m. Evaluation of pesticide and toxicity analyses results, and recommendation of candidate sites for Toxicity Identification Evaluations (TIEs);
n. Identification of the location of any agricultural discharges observed discharging directly to surface receiving water;
o. Laboratory data submitted electronically in a SWAMP/CCAMP comparable format;
p. Sampling and analytical methods used;
q. Copy of chain-of-custody forms;
r. Field data sheets, signed laboratory reports, laboratory raw data;
s. Associated laboratory and field quality control samples results;
t. Summary of Quality Assurance Evaluation results;

u. Specify the method used to obtain flow at each monitoring site during each monitoring event;
v. Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date;
w. Conclusions.

PART 2. GROUNDWATER MONITORING AND REPORTING REQUIREMENTS

Groundwater monitoring may be conducted through a cooperative monitoring and reporting program on behalf of growers, or Dischargers may choose to conduct groundwater monitoring and reporting individually. Qualifying cooperative groundwater monitoring and reporting programs must implement the groundwater monitoring and reporting requirements described in this Order, unless otherwise approved by the Executive Officer. An interested person may seek review by the Central Coast Water Board of the Executive Officer's approval or denial of a cooperative groundwater monitoring and reporting program.

Key monitoring and reporting requirements for groundwater are shown in Table 3.

A. Groundwater Monitoring

1. Dischargers must sample private domestic wells and the primary irrigation well on their farm/ranch to evaluate groundwater conditions in agricultural areas, identify areas at greatest risk for nitrogen loading and exceedance of drinking water standards, and identify priority areas for follow up actions.

2. Dischargers must sample at least one groundwater well for each farm/ranch on their operation, including groundwater wells that are located within the property boundary of the enrolled county assessor parcel numbers (APNs). For farms/ranches with multiple groundwater wells, Dischargers must sample all domestic wells and the primary irrigation well. For the purposes of this MRP, a "domestic well" is any well that is used or may be used for domestic use purposes, including any groundwater well that is connected to a residence, workshop, or place of business that may be used for human consumption, cooking, or sanitary purposes. Groundwater monitoring parameters must include well screen interval depths (if available), general chemical parameters, and general cations and anions listed in Table 3.

3. Dischargers must conduct two rounds of monitoring of required groundwater wells during calendar year 2017; one sample collected during spring (**March - June)** and one sample collected during fall **(September - December)**.

4. Groundwater samples must be collected by a qualified third party (e.g., consultant, technician, person conducting cooperative monitoring) using proper sampling methods, chain-of-custody, and quality assurance/quality

control protocols. Groundwater samples must be collected at or near the well head before the pressure tank and prior to any well head treatment. In cases where this is not possible, the water sample must be collected from a sampling point as close to the pressure tank as possible, or from a cold-water spigot located before any filters or water treatment systems.

5. Laboratory analyses for groundwater samples must be conducted by a State certified laboratory according to U.S. EPA approved methods; unless otherwise noted, all monitoring, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, United States Environmental Protection Agency, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link below: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/docs/resources4growers/2016_04_11_labs.pdf

6. If a discharger determines that water in any domestic well exceeds 10 mg/L of nitrate as N, the discharger or third party must provide notice to the Central Coast Water Board within 24 hours of learning of the exceedance. For domestic wells on a Discharger's farm/ranch that exceed 10 mg/L nitrate as N, the Discharger must provide written notification to the users within 10 days of learning of the exceedance and provide written confirmation of the notification to the Central Coast Water Board.

   The drinking water notification must include the statement that the water poses a human health risk due to elevated nitrate concentration, and include a warning against the use of the water for drinking or cooking. In addition, Dischargers must also provide prompt written notification to any new well users (e.g. tenants and employees with access to the affected well), whenever there is a change in occupancy.

   For all other domestic wells not on a Discharger's farm/ranch but that may be impacted by nitrate, the Central Coast Water Board will notify the users promptly.

   The drinking water notification and confirmation letters required by this Order are available to the public.

B. Groundwater Reporting

1. **Within 60 days of sample collection,** Dischargers must coordinate with the laboratory to submit the following groundwater monitoring results and information, electronically, using the Water Board's GeoTracker electronic deliverable format (EDF):
   a. GeoTracker Ranch Global Identification Number

b. Field point name (Well Name)
c. Field Point Class (Well Type)
d. Latitude
e. Longitude
f. Sample collection date
g. Analytical results
h. Well construction information (e.g., total depth, screened intervals, depth to water), as available

2. Dischargers must submit groundwater well information required in the electronic Notice of Intent (eNOI) for each farm/ranch and update the eNOI to reflect changes in the farm/ranch information within 30 days of the change. Groundwater well information reported on the eNOI includes, but is not limited to:

a. Number of groundwater wells present at each farm/ranch
b. Identification of any groundwater wells abandoned or destroyed (including method destroyed) in compliance with the Order
c. Use for fertigation or chemigation
d. Presence of back flow prevention devices
e. Number of groundwater wells used for agricultural purposes
f. Number of groundwater wells used for or may be used for domestic use purposes (domestic wells).

PART 3. GENERAL MONITORING AND REPORTING REQUIREMENTS

A. Submittal of Technical Reports

1. Dischargers must submit reports in a format specified by the Executive Officer. A transmittal letter must accompany each report, containing the following penalty of perjury statement signed by the Discharger or the Discharger's authorized agent:

   "In compliance with Water Code §13267, I certify under penalty of perjury that this document and all attachments were prepared by me, or under my direction or supervision following a system designed to assure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment".

2. If the Discharger asserts that all or a portion of a report submitted pursuant to this Order is subject to an exemption from public disclosure (e.g. trade secrets or secret processes), the Discharger must provide an explanation of how those portions of the reports are exempt from public disclosure. The

Discharger must clearly indicate on the cover of the report (typically an electronic submittal) that the Discharger asserts that all or a portion of the report is exempt from public disclosure, submit a complete report with those portions that are asserted to be exempt in redacted form, submit separately (in a separate electronic file) unredacted pages (to be maintained separately by staff). The Central Coast Water Board staff will determine whether any such report or portion of a report qualifies for an exemption from public disclosure. If the Central Coast Water Board staff disagrees with the asserted exemption from public disclosure, the Central Coast Water Board staff will notify the Discharger prior to making such report or portions of such report available for public inspection.

B. Central Coast Water Board Authority

1. Monitoring reports are required pursuant to section 13267 of the California Water Code. Pursuant to section 13268 of the Water Code, a violation of a request made pursuant to section 13267 may subject you to civil liability of up to $1000 per day.

2. The Water Board needs the required information to determine compliance with Order No.R3-2017-0002. The evidence supporting these requirements is included in the findings of Order No.R3-2017-0002.

John M. Robertson
Executive Officer

March 8, 2017
Date

Table 1. Major Waterbodies in Agricultural Areas[1]

Hydrologic SubArea	Waterbody Name	Hydrologic SubArea	Waterbody Name
30510	Pajaro River	30920	Quail Creek
30510	Salsipuedes Creek	30920	Salinas Reclamation Canal
30510	Watsonville Slough	31022	Chorro Creek
30510	Watsonville Creek[2]	31023	Los Osos Creek
30510	Beach Road Ditch[2]	31023	Warden Creek
30530	Carnadero Creek	31024	San Luis Obispo Creek
30530	Furlong Creek[2]	31024	Prefumo Creek
30530	Llagas Creek	31031	Arroyo Grande Creek
30530	Miller's Canal	31031	Los Berros Creek
30530	San Juan Creek	31210	Bradley Canyon Creek
30530	Tesquisquita Slough	31210	Bradley Channel
30600	Moro Cojo Slough	31210	Green Valley Creek
30910	Alisal Slough	31210	Main Street Canal
30910	Blanco Drain	31210	Orcutt Solomon Creek
30910	Old Salinas River	31210	Oso Flaco Creek
30910	Salinas River (below Gonzales Rd.)	31210	Little Oso Flaco Creek
30920	Salinas River (above Gonzales Rd. and below Nacimiento R.)	31210	Santa Maria River
30910	Santa Rita Creek[2]	31310	San Antonio Creek[2]
30910	Tembladero Slough	31410	Santa Ynez River
30920	Alisal Creek	31531	Bell Creek
30920	Chualar Creek	31531	Glenn Annie Creek
30920	Espinosa Slough	31531	Los Carneros Creek[2]
30920	Gabilan Creek	31534	Arroyo Paredon Creek
30920	Natividad Creek	31534	Franklin Creek

[1] At a minimum, monitoring sites must be included for these waterbodies in agricultural areas, unless otherwise approved by the Executive Officer. Monitoring sites may be proposed for addition or modification to better assess the impacts of waste discharges from irrigated lands to surface water. Dischargers choosing to comply with surface receiving water quality monitoring, individually (not part of a cooperative monitoring program) must only monitor sites for waterbodies receiving the discharge.
[2] These creeks are included because they are newly listed waterbodies on the 2010 303(d) list of Impaired Waters that are associated with areas of agricultural discharge.

Table 2. Surface Receiving Water Quality Monitoring Parameters

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Photo Monitoring		
Upstream and downstream photographs at monitoring location		With every monitoring event
WATER COLUMN SAMPLING		
Physical Parameters and General Chemistry		
Flow (field measure) (CFS) following SWAMP field SOP[9]	.25	Monthly, including 2 stormwater events
pH (field measure)	0.1	”
Electrical Conductivity (field measure) (µS/cm)	2.5	”
Dissolved Oxygen (field measure) (mg/L)	0.1	”
Temperature (field measure) (^{o}C)	0.1	”
Turbidity (NTU)	0.5	”
Total Dissolved Solids (mg/L)	10	”
Total Suspended Solids (mg/L)	0.5	”
Nutrients		
Total Nitrogen (mg/L)	0.5	Monthly, including 2 stormwater events
Nitrate + Nitrite (as N) (mg/L)	0.1	”
Total Ammonia (mg/L)	0.1	”
Unionized Ammonia (calculated value, mg/L))		”
Total Phosphorus (as P) (mg/L)	0.02	
Soluble Orthophosphate (mg/L)	0.01	”
Water column chlorophyll a (µg/L)	1.0	“
Algae cover, Floating Mats, % coverage	-	“
Algae cover, Attached, % coverage	-	“
Water Column Toxicity Test		
Algae - *Selenastrum capricornutum (*96-hour chronic; Method1003.0 in EPA/821/R-02/013)	-	4 times each year, twice in dry season, twice in wet season
Water Flea – *Ceriodaphnia dubia* (7-day chronic; Method 1002.0 in EPA/821/R-02/013)	-	”
Midge - *Chironomus spp.* (96-hour acute; Alternate test species in EPA 821-R-02-012)	-	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Toxicity Identification Evaluation (TIE)	-	As directed by Executive Officer
Pesticides[2] /Herbicides (µg/L)		
Organophosphate Pesticides		
Azinphos-methyl	0.02	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Chlorpyrifos	0.005	”
Diazinon	0.005	”
Dichlorvos	0.01	”
Dimethoate	0.01	”
Dimeton-s	0.005	”
Disulfoton (Disyton)	0.005	”
Malathion	0.005	”
Methamidophos	0.02	”
Methidathion	0.02	“
Parathion-methyl	0.02	“
Phorate	0.01	“
Phosmet	0.02	“
Neonicotinoids		
Thiamethoxam	.002	“
Imidacloprid	.002	“
Thiacloprid	.002	“
Dinotefuran	.006	“
Acetamiprid	.01	“
Clothianidin	.02	“
Herbicides		
Atrazine	0.05	“
Cyanazine	0.20	“
Diuron	0.05	“
Glyphosate	2.0	“
Linuron	0.1	“
Paraquat	0.20	“
Simazine	0.05	“
Trifluralin	0.05	“
Metals (µg/L)		
Arsenic (total) [5,7]	0.3	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Boron (total) [6,7]	10	“
Cadmium (total & dissolved) [4.5,7]	0.01	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Copper (total and dissolved) [4,7]	0.01	“
Lead (total and dissolved) [4,7]	0.01	“
Nickel (total and dissolved) [4,7]	0.02	“
Molybdenum (total) [7]	1	“
Selenium (total)[7]	0.30	“
Zinc (total and dissolved) [4.5,7]	0.10	“
Other (µg/L)		
Total Phenolic Compounds[8]	5	2 times in 2017, once in spring (April-May) and once in fall (August-September)
Hardness (mg/L as CaCO3)	1	“
Total Organic Carbon (ug/L)	0.6	“
SEDIMENT SAMPLING		
Sediment Toxicity - *Hyalella azteca* 10-day static renewal (EPA, 2000)		2 times each year, once in spring (April-May) and once in fall (August-September)
Pyrethroid Pesticides in Sediment (µg/kg)		
Gamma-cyhalothrin	2	2 times in both 2017 and 2018, once in spring (April-May) and once in fall (August-September) of each year, concurrent with sediment toxicity sampling
Lambda-cyhalothrin	2	“
Bifenthrin	2	“
Beta-cyfluthrin	2	“
Cyfluthrin	2	“
Esfenvalerate	2	“
Permethrin	2	“
Cypermethrin	2	“
Danitol	2	“
Fenvalerate	2	“
Fluvalinate	2	“
Other Monitoring in Sediment		
Chlorpyrifos (µg/kg)	2	“
Total Organic Carbon	0.01%	“
		“
Sediment Grain Size Analysis	1%	“

[1]Monitoring frequency may be used as a guide for developing alternative Sampling and Analysis Plans implemented by individual growers.
[2]Pesticide list may be modified based on specific pesticide use in Central Coast Region. Analytes on this list must be reported, at a minimum.
[3] Reporting Limit, taken from SWAMP where applicable.
[4] Holmgren, Meyer, Cheney and Daniels. 1993. Cadmium, Lead, Zinc, Copper and Nickel in Agricultural Soils of the United States. J. of Environ. Quality 22:335-348.

[5]Sax and Lewis, ed. 1987. Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987. Zinc arsenate is an insecticide.
[6]Http://www.coastalagro.com/products/labels/9%25BORON.pdf; Boron is applied directly or as a component of fertilizers as a plant nutrient.
[7]Madramootoo, Johnston, Willardson, eds. 1997. Management of Agricultural Drainage Water Quality. International Commission on Irrigation and Drainage. U.N. FAO. SBN 92-6-104058.3.
[8]http://cat.inist.fr/?aModele=afficheN&cpsidt=14074525; Phenols are breakdown products of herbicides and pesticides. Phenols can be directly toxic and cause endocrine disruption.
[9]See SWAMP field measures SOP, p. 17
mg/L – milligrams per liter; ug/L – micrograms per liter; ug/kg – micrograms per kilogram;
NTU – Nephelometric Turbidity Units; CFS – cubic feet per second.

Table 3. Groundwater Sampling Parameters

Parameter	RL	Analytical Method[3]	Units
pH	0.1	Field or Laboratory Measurement EPA General Methods	pH Units
Specific Conductance	2.5		μS/cm
Total Dissolved Solids	10		mg/L
Total Alkalinity as $CaCO_3$		EPA Method 310.1 or 310.2	
Calcium	0.05	General Cations[1] EPA 200.7, 200.8, 200.9	
Magnesium	0.02		
Sodium	0.1		
Potassium	0.1		
Sulfate (SO4)	1.0	General Anions EPA Method 300 or EPA Method 353.2	
Chloride	0.1		
Nitrate + Nitrite (as N)[2] or Nitrate as N	0.1		

[1]General chemistry parameters (major cations and anions) represent geochemistry of water bearing zone and assist in evaluating quality assurance/quality control of groundwater monitoring and laboratory analysis.
[2]The MRP allows analysis of "nitrate plus nitrite" to represent nitrate concentrations (as N). The "nitrate plus nitrite" analysis allows for extended laboratory holding times and relieves the Discharger of meeting the short holding time required for nitrate.
[3]Dischargers may use alternative analytical methods approved by EPA.
RL – Reporting Limit; μS/cm – micro siemens per centimeter

Table 4. Tier 1 - Time Schedule for Key Monitoring and Reporting Requirements (MRPs)

REQUIREMENT	TIME SCHEDULE[1]
Submit Sampling And Analysis Plan and Quality Assurance Project Plan (SAAP/QAPP) for Surface Receiving Water Quality Monitoring *(individually or through cooperative monitoring program)*	By March 1, 2018, or as directed by the Executive Officer; satisfied if an approved SAAP/QAPP has been submitted pursuant to Order No. R3-2012-0011 and associated MRPs
Initiate surface receiving water quality monitoring *(individually or through cooperative monitoring program)*	Per an approved SAAP and QAPP
Submit surface receiving water quality monitoring data *(individually or through cooperative monitoring program)*	Each January 1, April 1, July 1, and October 1

Submit surface receiving water quality Annual Monitoring Report *(individually or through cooperative monitoring program)*	By July 1 2017; annually thereafter by July 1
Initiate monitoring of groundwater wells	First sample from March-June 2017, second sample from September-December 2017
Submit groundwater monitoring results	Within 60 days of the sample collection

[1] Dates are relative to adoption of this Order, unless otherwise specified.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

MONITORING AND REPORTING PROGRAM
ORDER NO. R3-2017-0002-02

TIER 2

DISCHARGERS ENROLLED UNDER
THE CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS FOR
DISCHARGES FROM IRRIGATED LANDS

This Monitoring and Reporting Program Order No. R3-2017-0002-02 (MRP) is issued pursuant to California Water Code (Water Code) sections 13267 and 13269, which authorize the California Regional Water Quality Control Board, Central Coast Region (hereafter Central Coast Water Board) to require preparation and submittal of technical and monitoring reports. Water Code section 13269 requires a waiver of waste discharge requirements to include as a condition the performance of monitoring and the public availability of monitoring results. *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands*, Order No. R3-2017-0002 (Order) includes criteria and requirements for three tiers. This MRP sets forth monitoring and reporting requirements for **Tier 2 Dischargers** enrolled under the Order. A summary of the requirements is shown below.

SUMMARY OF MONITORING AND REPORTING REQUIREMENTS FOR TIER 2:

Part 1: Surface Receiving Water Monitoring and Reporting *(cooperative or individual)*
Part 2: Groundwater Monitoring and Reporting *(cooperative or individual)*
Total Nitrogen Applied Reporting *(required for subset of Tier 2 Dischargers if farm/ranch growing any crop with high nitrate loading risk to groundwater);*
Part 3: Annual Compliance Form

Pursuant to Water Code section 13269(a)(2), monitoring requirements must be designed to support the development and implementation of the waiver program, including, but not limited to, verifying the adequacy and effectiveness of the waiver's conditions. The monitoring and reports required by this MRP are to evaluate effects of discharges of waste from irrigated agricultural operations and individual farms/ranches on waters of the state and to determine compliance with the Order.

MONITORING AND REPORTING BASED ON TIERS

The Order and MRP include criteria and requirements for three tiers, based upon those characteristics of the individual farms/ranches at the operation that present the highest level of waste discharge or greatest risk to water quality. Dischargers must meet conditions of the Order and MRP for the appropriate tier that applies to their land and/or the individual farm/ranch. Within a tier, Dischargers comply with requirements based on the specific level of discharge and threat to water quality from individual farms/ranches. The lowest tier, Tier 1, applies to dischargers who discharge the lowest level of waste (amount or concentration) or pose the lowest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. The highest tier, Tier 3, applies to dischargers who discharge the highest level of waste or pose the greatest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. Tier 2 applies to dischargers whose discharge has a moderate threat to water quality. Water quality is defined in terms of regional, state, or federal numeric or narrative water quality standards. Per the Order, Dischargers may submit a request to the Executive Officer to approve transfer to a lower tier. If the Executive Officer approves a transfer to a lower tier, any interested person may request that the Central Coast Water Board conduct a review of the Executive Officer's determination.

PART 1. SURFACE RECEIVING WATER MONITORING AND REPORTING REQUIREMENTS

The surface receiving water monitoring and reporting requirements described herein are generally a continuation of the surface receiving water monitoring and reporting requirements of Monitoring and Reporting Program Order No. 2012-0011-02, as revised August 22, 2016, with the intent of uninterrupted regular monitoring and reporting during the transition from Order No. R3-2012-0011-02 to Order No. R3-2017-0002-02.

Monitoring and reporting requirements for surface receiving water identified in Part 1.A. and Part 1.B. apply to Tier 2 Dischargers. Surface receiving water refers to water flowing in creeks and other surface waters of the State. Surface receiving water monitoring may be conducted through a cooperative monitoring program on behalf of Dischargers, or Dischargers may choose to conduct surface receiving water monitoring and reporting individually. Key monitoring and reporting requirements for surface receiving water are shown in Tables 1 and 2. Time schedules are shown in Table4.

A. Surface Receiving Water Quality Monitoring

1. Dischargers must elect a surface receiving water monitoring option (cooperative monitoring program or individual receiving water monitoring) to comply with surface receiving water quality monitoring requirements, and identify the option selected on the Notice of Intent (NOI).

2. Dischargers are encouraged to choose participation in a cooperative monitoring program (e.g., the existing Cooperative Monitoring Program or a similar program) to comply with receiving water quality monitoring requirements. Dischargers not participating in a cooperative monitoring program must conduct surface receiving water quality monitoring individually that achieves the same purpose.

3. Dischargers (individually or as part of a cooperative monitoring program) must conduct surface receiving water quality monitoring to a) assess the impacts of their waste discharges from irrigated lands to receiving water, b) assess the status of receiving water quality and beneficial use protection in impaired waterbodies dominated by irrigated agricultural activity, c) evaluate status, short term patterns and long term trends (five to ten years or more) in receiving water quality, d) evaluate water quality impacts resulting from agricultural discharges (including but not limited to tile drain discharges), e) evaluate stormwater quality, f) evaluate condition of existing perennial, intermittent, or ephemeral streams or riparian or wetland area habitat, including degradation resulting from erosion or agricultural discharges of waste, and g) assist in the identification of specific sources of water quality problems.

Surface Receiving Water Quality Sampling and Analysis Plan

4. **By March 1, 2018, or as directed by the Executive Officer**, Dischargers (individually or as part of a cooperative monitoring program) must submit a surface receiving water quality Sampling and Analysis Plan (SAAP) and Quality Assurance Project Plan (QAPP); this requirement is satisfied if an approved SAAP and QAPP addressing all surface receiving water quality monitoring requirements described in this Order has been submitted pursuant to Order No.R3-2012-0011 and associated Monitoring and Reporting Programs. Dischargers (or a third party cooperative monitoring program) must develop the Sampling and Analysis Plan to describe how the proposed monitoring will achieve the objectives of the MRP and evaluate compliance with the Order. The Sampling and Analysis Plan may propose alternative monitoring site locations, adjusted monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water. The Executive Officer must approve the Sampling and Analysis Plan and QAPP.

5. The Sampling and Analysis Plan must include the following minimum required components:
    a. Monitoring strategy to achieve objectives of the Order and MRP;
    b. Map of monitoring sites with GIS coordinates;

c. Identification of known water quality impairments and impaired waterbodies per the 2010 Clean Water Act 303(d) List of Impaired Waterbodies (List of Impaired Waterbodies);
d. Identification of beneficial uses and applicable water quality standards;
e. Identification of applicable Total Maximum Daily Loads;
f. Monitoring parameters;
g. Monitoring schedule, including description and frequencies of monitoring events;
h. Description of data analysis methods;

6. The QAPP must include receiving water and site-specific information, project organization and responsibilities, and quality assurance components of the MRP. The QAPP must also include the laboratory and field requirements to be used for analyses and data evaluation. The QAPP must contain adequate detail for project and Water Board staff to identify and assess the technical and quality objectives, measurement and data acquisition methods, and limitations of the data generated under the surface receiving water quality monitoring. All sampling and laboratory methodologies and QAPP content must be consistent with U.S. EPA methods, State Water Board's Surface Water Ambient Monitoring Program (SWAMP) protocols and the Central Coast Water Board's Central Coast Ambient Monitoring Program (CCAMP). Following U.S. EPA guidelines[1] and SWAMP templates[2], the receiving water quality monitoring QAPP must include the following minimum required components:
   a. Project Management. This component addresses basic project management, including the project history and objectives, roles and responsibilities of the participants, and other aspects.
   b. Data Generation and Acquisition. This component addresses all aspects of project design and implementation. Implementation of these elements ensures that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and quality control activities are employed and are properly documented. Quality control requirements are applicable to all the constituents sampled as part of the MRP, as described in the appropriate method.
   c. Assessment and Oversight. This component addresses the activities for assessing the effectiveness of the implementation of the project and associated QA and QC activities. The purpose of the assessment is to provide project oversight that

[1] USEPA 2001 (2006) USEPA requirements for Quality Assurance Project Plans (QA/R-5) Office of Environmental Information, Washington, D.C. USEPA QA/R-5
[2] http://waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa

will ensure that the QA Project Plan is implemented as prescribed.

d. Data Validation and Usability. This component addresses the quality assurance activities that occur after the data collection, laboratory analysis and data generation phase of the project is completed. Implementation of these elements ensures that the data conform to the specified criteria, thus achieving the MRP objectives.

7. The Central Coast Water Board may conduct an audit of contracted laboratories at any time in order to evaluate compliance with the QAPP.

8. The Sampling and Analysis Plan and QAPP, and any proposed revisions are subject to approval by the Executive Officer. The Executive Officer may also revise the Sampling and Analysis Plan, including adding, removing, or changing monitoring site locations, changing monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water.

Surface Receiving Water Quality Monitoring Sites

9. The Sampling and Analysis Plan must, at a minimum, include monitoring sites to evaluate waterbodies identified in Table 1, unless otherwise approved by the Executive Officer. The Sampling and Analysis Plan must include sites to evaluate receiving water quality impacts most directly resulting from areas of agricultural discharge (including areas receiving tile drain discharges). Site selection must take into consideration the existence of any long term monitoring sites included in related monitoring programs (e.g. CCAMP and the existing CMP). Sites may be added or modified, subject to prior approval by the Executive Officer, to better assess the pollutant loading from individual sources or the impacts to receiving waters caused by individual discharges. Any modifications must consider sampling consistency for purposes of trend evaluation.

Surface Receiving Water Quality Monitoring Parameters

10. The Sampling and Analysis Plan must, at a minimum, include the following types of monitoring and evaluation parameters listed below and identified in Table 2:

    a. Flow Monitoring;
    b. Water Quality (physical parameters, metals, nutrients, pesticides);
    c. Toxicity (water and sediment);
    d. Assessment of Benthic Invertebrates.

11. All analyses must be conducted at a laboratory certified for such analyses by the State Department of Public Health (CDPH) or at laboratories approved by the Executive Officer. Unless otherwise noted, all sampling, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, U.S. EPA, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link: http://www.cdph.ca.gov/certlic/labs/Documents/ELAPLablist.xls

12. Water quality and flow monitoring is used to assess the sources, concentrations, and loads of waste discharges from individual farms/ranches and groups of Dischargers to surface waters, to evaluate impacts to water quality and beneficial uses, and to evaluate the short term patterns and long term trends in receiving water quality. Monitoring data must be compared to existing numeric and narrative water quality objectives.

13. Toxicity testing is to evaluate water quality relative to the narrative toxicity objective. Water column toxicity analyses must be conducted on 100% (undiluted) sample. At sites where persistent unresolved toxicity is found, the Executive Officer may require concurrent toxicity and chemical analyses and a Toxicity Identification Evaluation (TIE) to identify the individual discharges causing the toxicity.

Surface Receiving Water Quality Monitoring Frequency and Schedule

14. The Sampling and Analysis Plan must include a schedule for sampling. Timing, duration, and frequency of monitoring must be based on the land use, complexity, hydrology, and size of the waterbody. Table 2 includes minimum monitoring frequency and parameter lists. Agricultural parameters that are less common may be monitored less frequently. Modifications to the receiving water quality monitoring parameters, frequency, and schedule may be submitted for Executive Officer consideration and approval. At a minimum, the Sampling and Analysis Plan schedule must consist of monthly monitoring of common agricultural parameters in major agricultural areas, including two major storm events during the wet season (October 1 – April 30).

15. Storm event monitoring must be conducted within 18 hours of storm events, preferably including the first flush run-off event that results in significant increase in stream flow. For purposes of this MRP, a storm event is defined as precipitation producing onsite runoff (surface water flow) capable of creating significant ponding, erosion or other water quality problem. A

significant storm event will generally result in greater than 1-inch of rain within a 24-hour period.

16. Dischargers (individually or as part of a cooperative monitoring program) must perform receiving water quality monitoring per the Sampling and Analysis Plan and QAPP approved by the Executive Officer.

B. Surface Receiving Water Quality Reporting

Surface Receiving Water Quality Data Submittal

1. Dischargers (individually or as part of a cooperative monitoring program) must submit water quality monitoring data to the Central Coast Water Board electronically, in a format specified by the Executive Officer and compatible with SWAMP/CCAMP electronic submittal guidelines, each January 1, April 1, July 1, and October 1.

Surface Receiving Water Quality Monitoring Annual Report

2. **By July 1, 2017,** and every July 1 annually thereafter, Dischargers (individually or as part of a cooperative monitoring program) must submit an Annual Report, electronically, in a format specified by the Executive Officer including the following minimum elements:
   a. Signed Transmittal Letter;
   b. Title Page;
   c. Table of Contents;
   d. Executive Summary;
   e. Summary of Exceedance Reports submitted during the reporting period;
   f. Monitoring objectives and design;
   g. Monitoring site descriptions and rainfall records for the time period covered;
   h. Location of monitoring sites and map(s);
   i. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
   j. Summary of water quality data for any sites monitored as part of related monitoring programs, and used to evaluate receiving water as described in the Sampling and Analysis Plan.
   k. Discussion of data to clearly illustrate compliance with the Order and water quality standards;
   l. Discussion of short term patterns and long term trends in receiving water quality and beneficial use protection;
   m. Evaluation of pesticide and toxicity analyses results, and recommendation of candidate sites for Toxicity Identification Evaluations (TIEs);

n. Identification of the location of any agricultural discharges observed discharging directly to surface receiving water;
o. Laboratory data submitted electronically in a SWAMP/CCAMP comparable format;
p. Sampling and analytical methods used;
q. Copy of chain-of-custody forms;
r. Field data sheets, signed laboratory reports, laboratory raw data;
s. Associated laboratory and field quality control samples results;
t. Summary of Quality Assurance Evaluation results;
u. Specify the method used to obtain flow at each monitoring site during each monitoring event;
v. Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date;
w. Conclusions.

PART 2. GROUNDWATER MONITORING AND REPORTING REQUIREMENTS

Groundwater monitoring may be conducted through a cooperative monitoring and reporting program on behalf of growers, or Dischargers may choose to conduct groundwater monitoring and reporting individually. Qualifying cooperative groundwater monitoring and reporting programs must implement the groundwater monitoring and reporting requirements described in this Order, unless otherwise approved by the Executive Officer. An interested person may seek review by the Central Coast Water Board of the Executive Officer’s approval or denial of a cooperative groundwater monitoring and reporting program.

Key monitoring and reporting requirements for groundwater are shown in Table 3.

A. Groundwater Monitoring

1. Dischargers must sample private domestic wells and the primary irrigation well on their farm/ranch to evaluate groundwater conditions in agricultural areas, identify areas at greatest risk for nitrogen loading and exceedance of drinking water standards, and identify priority areas for follow up actions.

2. Dischargers must sample at least one groundwater well for each farm/ranch on their operation, including groundwater wells that are located within the property boundary of the enrolled county assessor parcel numbers (APNs). For farms/ranches with multiple groundwater wells, Dischargers must sample all domestic wells and the primary irrigation well. For the purposes of this MRP, a “domestic well” is any well that is used or may be used for domestic use purposes, including any groundwater well that is connected to a residence, workshop, or place of business that may be used for human consumption, cooking, or sanitary purposes. Groundwater monitoring

parameters must include well screen interval depths (if available), general chemical parameters, and general cations and anions listed in Table 3.

3. Dischargers must conduct two rounds of monitoring of required groundwater wells during calendar year 2017; one sample collected during spring (**March - June)** and one sample collected during fall **(September - December)**.

4. Groundwater samples must be collected by a qualified third party (e.g., consultant, technician, person conducting cooperative monitoring) using proper sampling methods, chain-of-custody, and quality assurance/quality control protocols. Groundwater samples must be collected at or near the well head before the pressure tank and prior to any well head treatment. In cases where this is not possible, the water sample must be collected from a sampling point as close to the pressure tank as possible, or from a cold-water spigot located before any filters or water treatment systems.

5. Laboratory analyses for groundwater samples must be conducted by a State certified laboratory according to U.S. EPA approved methods; unless otherwise noted, all monitoring, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, United States Environmental Protection Agency, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link below: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/docs/resources4growers/2016_04_11_labs.pdf

6. If a discharger determines that water in any domestic well exceeds 10 mg/L of nitrate as N, the discharger or third party must provide notice to the Central Coast Water Board within 24 hours of learning of the exceedance. For domestic wells on a Discharger's farm/ranch, that exceed 10 mg/L of nitrate as N, the Discharger must provide written notification to the users within 10 days of learning of the exceedance and provide written confirmation of the notification to the Central Coast Water Board.

   The drinking water notification must include the statement that the water poses a human health risk due to elevated nitrate concentration, and include a warning against the use of the water for drinking or cooking. In addition, Dischargers must also provide prompt written notification to any new well users (e.g. tenants and employees with access to the affected well), whenever there is a change in occupancy.

   For all other domestic wells not on a Discharger's farm/ranch but that may be impacted by nitrate, the Central Coast Water Board will notify the users promptly.

The drinking water notification and confirmation letters required by this Order are available to the public.

B. Groundwater Reporting

1. **Within 60 days of sample collection,** Dischargers must coordinate with the laboratory to submit the following groundwater monitoring results and information, electronically, using the Water Board's GeoTracker electronic deliverable format (EDF):
    a. GeoTracker Ranch Global Identification Number
    b. Field point name (Well Name)
    c. Field Point Class (Well Type)
    d. Latitude
    e. Longitude
    f. Sample collection date
    g. Analytical results
    h. Well construction information (e.g., total depth, screened intervals, depth to water), as available

2. Dischargers must submit groundwater well information required in the electronic Notice of Intent (eNOI) for each farm/ranch and update the eNOI to reflect changes in the farm/ranch information within 30 days of the change. Groundwater well information reported on the eNOI includes, but is not limited to:
    a. Number of groundwater wells present at each farm/ranch
    b. Identification of any groundwater wells abandoned or destroyed (including method destroyed) in compliance with the Order
    c. Use for fertigation or chemigation
    d. Presence of back flow prevention devices
    e. Number of groundwater wells used for agricultural purposes
    f. Number of groundwater wells used for or may be used for domestic use purposes (domestic wells).

C. Total Nitrogen Applied Reporting

1. By March 1, 2018, and by March 1 annually thereafter, Tier 2 Dischargers growing any crop with a high potential to discharge nitrogen to groundwater must record and report total nitrogen applied for each specific crop that was irrigated and grown for commercial purposes on that farm/ranch during the preceding calendar year (January through December).

    Crops with a high potential to discharge nitrogen to groundwater are: beet, broccoli, cabbage, cauliflower, celery, Chinese cabbage (napa), collard, endive, kale, leek, lettuce (leaf and head), mustard, onion (dry and green), spinach, strawberry, pepper (fruiting), and parsley.

Total nitrogen applied must be reported on the Total Nitrogen Applied Report form as described in the Total Nitrogen Applied Report form instructions.

Total nitrogen applied includes any product containing any form or concentration of nitrogen including, but not limited to, organic and inorganic fertilizers, slow release products, compost, compost teas, manure, and extracts.

2. The Total Nitrogen Applied Report form includes the following information:
    a. General ranch information such as GeoTracker file numbers, name, location, acres.
    b. Nitrogen concentration of irrigation water
    c. Nitrogen applied in pounds per acre with irrigation water
    d. Nitrogen present in the soil
    e. Nitrogen applied with compost and amendments
    f. Specific crops grown
    g. Nitrogen applied in pounds per acre with fertilizers and other materials to each specific crop grown
    h. Crop acres of each specific crop grown
    i. Whether each specific crop was grown organically or conventionally
    j. Basis for the nitrogen applied
    k. Explanation and comments section
    l. Certification statement with penalty of perjury declaration
    m. Additional information regarding whether each specific crop was grown in a nursery, greenhouse, hydroponically, in containers, and similar variables.

PART 3. ANNUAL COMPLIANCE FORM

Tier 2 Dischargers must submit annual compliance information, electronically, on the Annual Compliance Form. The purpose of the electronic Annual Compliance Form is to provide information to the Central Coast Water Board to assist in the evaluation of threat to water quality from individual agricultural discharges of waste and measure progress towards water quality improvement and verify compliance with the Order and MRP. Time schedules are shown in Table 4.

A. Annual Compliance Form

1. **By March 1, 2018, and updated annually thereafter by March 1**, Tier 2 Dischargers must submit an Annual Compliance Form electronically, in a

format specified by the Executive Officer. The electronic Annual Compliance Form includes, but is not limited to the following minimum requirements[1]:

a. Question regarding consistency between the Annual Compliance Form and the electronic Notice of Intent (eNOI);
b. Information regarding type and characteristics of discharge (e.g., number of discharge points, estimated flow/volume, number of tailwater days);
c. Identification of any direct agricultural discharges to a stream, lake, estuary, bay, or ocean;
d. Identification of specific farm water quality management practices completed, in progress, and planned to address water quality impacts caused by discharges of waste including irrigation management, pesticide management, nutrient management, salinity management, stormwater management, and sediment and erosion control to achieve compliance with this Order; and identification of specific methods used, and described in the Farm Plan consistent with Order Provision 44.g., for the purposes of assessing the effectiveness of management practices implemented and the outcomes of such assessments;
e. Proprietary information question and justification;
f. Authorization and certification statement and declaration of penalty of perjury.

PART 5. GENERAL MONITORING AND REPORTING REQUIREMENTS

A. Submittal of Technical Reports

1. Dischargers must submit reports in a format specified by the Executive Officer. A transmittal letter must accompany each report, containing the following penalty of perjury statement signed by the Discharger or the Discharger's authorized agent:

   "In compliance with Water Code §13267, I certify under penalty of perjury that this document and all attachments were prepared by me, or under my direction or supervision following a system designed to assure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment".

[1] Items reported in the Annual Compliance Form are due by March 1, 2018, and annually thereafter, unless otherwise specified.

2. If the Discharger asserts that all or a portion of a report submitted pursuant to this Order is subject to an exemption from public disclosure (e.g. trade secrets or secret processes), the Discharger must provide an explanation of how those portions of the reports are exempt from public disclosure. The Discharger must clearly indicate on the cover of the report (typically an electronic submittal) that the Discharger asserts that all or a portion of the report is exempt from public disclosure, submit a complete report with those portions that are asserted to be exempt in redacted form, submit separately (in a separate electronic file) unredacted pages (to be maintained separately by staff). The Central Coast Water Board staff will determine whether any such report or portion of a report qualifies for an exemption from public disclosure. If the Central Coast Water Board staff disagrees with the asserted exemption from public disclosure, the Central Coast Water Board staff will notify the Discharger prior to making such report or portions of such report available for public inspection.

B. Central Coast Water Board Authority

1. Monitoring reports are required pursuant to section 13267 of the California Water Code. Pursuant to section 13268 of the Water Code, a violation of a request made pursuant to section 13267 may subject you to civil liability of up to $1000 per day.

2. The Water Board needs the required information to determine compliance with Order No. R3-2017-0002. The evidence supporting these requirements is included in the findings of Order No. R3-2017-0002.

John M. Robertson
Executive Officer

March 8, 2017
Date

Table 1. Major Waterbodies in Agricultural Areas[1]

Hydrologic SubArea	Waterbody Name	Hydrologic SubArea	Waterbody Name
30510	Pajaro River	30920	Quail Creek
30510	Salsipuedes Creek	30920	Salinas Reclamation Canal
30510	Watsonville Slough	31022	Chorro Creek
30510	Watsonville Creek[2]	31023	Los Osos Creek
30510	Beach Road Ditch[2]	31023	Warden Creek
30530	Carnadero Creek	31024	San Luis Obispo Creek
30530	Furlong Creek[2]	31024	Prefumo Creek
30530	Llagas Creek	31031	Arroyo Grande Creek
30530	Miller's Canal	31031	Los Berros Creek
30530	San Juan Creek	31210	Bradley Canyon Creek
30530	Tesquisquita Slough	31210	Bradley Channel
30600	Moro Cojo Slough	31210	Green Valley Creek
30910	Alisal Slough	31210	Main Street Canal
30910	Blanco Drain	31210	Orcutt Solomon Creek
30910	Old Salinas River	31210	Oso Flaco Creek
30910	Salinas River (below Gonzales Rd.)	31210	Little Oso Flaco Creek
30920	Salinas River above Gonzales Rd. and below Nacimiento R.)	31210	Santa Maria River
30910	Santa Rita Creek[2]	31310	San Antonio Creek[2]
30910	Tembladero Slough	31410	Santa Ynez River
30920	Alisal Creek	31531	Bell Creek
30920	Chualar Creek	31531	Glenn Annie Creek
30920	Espinosa Slough	31531	Los Carneros Creek[2]
30920	Gabilan Creek	31534	Arroyo Paredon Creek
30920	Natividad Creek	31534	Franklin Creek

[1] At a minimum, monitoring sites must be included for these waterbodies in agricultural areas, unless otherwise approved by the Executive Officer. Monitoring sites may be proposed for addition or modification to better assess the impacts of waste discharges from irrigated lands to surface water. Dischargers choosing to comply with surface receiving water quality monitoring, individually (not part of a cooperative monitoring program) must only monitor sites for waterbodies receiving the discharge.
[2] These creeks are included because they are newly listed waterbodies on the 2010 303(d) list of Impaired Waters that are associated with areas of agricultural discharge.

Table 2. Surface Receiving Water Quality Monitoring Parameters

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Photo Monitoring		
Upstream and downstream photographs at monitoring location		With every monitoring event
WATER COLUMN SAMPLING **Physical Parameters and General Chemistry**		
Flow (field measure) (CFS) following SWAMP field SOP[9]	.25	Monthly, including 2 stormwater events
pH (field measure)	0.1	”
Electrical Conductivity (field measure) (µS/cm)	2.5	”
Dissolved Oxygen (field measure) (mg/L)	0.1	”
Temperature (field measure) (^{o}C)	0.1	”
Turbidity (NTU)	0.5	”
Total Dissolved Solids (mg/L)	10	”
Total Suspended Solids (mg/L)	0.5	”
Nutrients		
Total Nitrogen (mg/L)	0.5	Monthly, including 2 stormwater events
Nitrate + Nitrite (as N) (mg/L)	0.1	”
Total Ammonia (mg/L)	0.1	”
Unionized Ammonia (calculated value, mg/L))		”
Total Phosphorus (as P) (mg/L)	0.02	
Soluble Orthophosphate (mg/L)	0.01	”
Water column chlorophyll a (µg/L)	1.0	“
Algae cover, Floating Mats, % coverage	-	“
Algae cover, Attached, % coverage	-	“
Water Column Toxicity Test		
Algae - *Selenastrum capricornutum (*96-hour chronic; Method1003.0 in EPA/821/R-02/013)	-	4 times each year, twice in dry season, twice in wet season
Water Flea – *Ceriodaphnia dubia* (7-day chronic; Method 1002.0 in EPA/821/R-02/013)	-	”
Midge - *Chironomus spp.* (96-hour acute; Alternate test species in EPA 821-R-02-012)	-	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Toxicity Identification Evaluation (TIE)	-	As directed by Executive Officer
Pesticides[2] /Herbicides (µg/L)		
Organophosphate Pesticides		
Azinphos-methyl	0.02	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Chlorpyrifos	0.005	”
Diazinon	0.005	”
Dichlorvos	0.01	”
Dimethoate	0.01	”
Dimeton-s	0.005	”
Disulfoton (Disyton)	0.005	”
Malathion	0.005	”
Methamidophos	0.02	”
Methidathion	0.02	“
Parathion-methyl	0.02	“
Phorate	0.01	“
Phosmet	0.02	“
Neonicotinoids		
Thiamethoxam	.002	“
Imidacloprid	.002	“
Thiacloprid	.002	“
Dinotefuran	.006	“
Acetamiprid	.01	“
Clothianidin	.02	
Herbicides		
Atrazine	0.05	“
Cyanazine	0.20	“
Diuron	0.05	“
Glyphosate	2.0	“
Linuron	0.1	“
Paraquat	0.20	“
Simazine	0.05	“
Trifluralin	0.05	“
Metals (µg/L)		
Arsenic (total) [5,7]	0.3	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Boron (total) [6,7]	10	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Cadmium (total & dissolved) [4,5,7]	0.01	"
Copper (total and dissolved) [4,7]	0.01	"
Lead (total and dissolved) [4,7]	0.01	"
Nickel (total and dissolved) [4,7]	0.02	"
Molybdenum (total) [7]	1	"
Selenium (total)[7]	0.30	"
Zinc (total and dissolved) [4,5,7]	0.10	"
Other (µg/L)		
Total Phenolic Compounds[8]	5	2 times in 2017, once in spring (April-May) and once in fall (August-September)
Hardness (mg/L as CaCO3)	1	"
Total Organic Carbon (ug/L)	0.6	"
SEDIMENT SAMPLING		
Sediment Toxicity - *Hyalella azteca* 10-day static renewal (EPA, 2000)		2 times each year, once in spring (April-May) and once in fall (August-September)
Pyrethroid Pesticides in Sediment (µg/kg)		
Gamma-cyhalothrin	2	2 times in both 2017 and 2018, once in spring (April-May) and once in fall (August-September) of each year, concurrent with sediment toxicity sampling
Lambda-cyhalothrin	2	"
Bifenthrin	2	"
Beta-cyfluthrin	2	"
Cyfluthrin	2	"
Esfenvalerate	2	"
Permethrin	2	"
Cypermethrin	2	"
Danitol	2	"
Fenvalerate	2	"
Fluvalinate	2	"
Other Monitoring in Sediment		
Chlorpyrifos (µg/kg)	2	"
Total Organic Carbon	0.01%	"
		"
Sediment Grain Size Analysis	1%	"

[1]Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative Sampling and Analysis Plan.
[2]Pesticide list may be modified based on specific pesticide use in Central Coast Region. Analytes on this list must be reported, at a minimum.

[3] Reporting Limit, taken from SWAMP where applicable.
[4] Holmgren, Meyer, Cheney and Daniels. 1993. Cadmium, Lead, Zinc, Copper and Nickel in Agricultural Soils of the United States. J. of Environ. Quality 22:335-348.
[5] Sax and Lewis, ed. 1987. Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987. Zinc arsenate is an insecticide.
[6] Http://www.coastalagro.com/products/labels/9%25BORON.pdf; Boron is applied directly or as a component of fertilizers as a plant nutrient.
[7] Madramootoo, Johnston, Willardson, eds. 1997. Management of Agricultural Drainage Water Quality. International Commission on Irrigation and Drainage. U.N. FAO. SBN 92-6-104058.3.
[8] http://cat.inist.fr/?aModele=afficheN&cpsidt=14074525; Phenols are breakdown products of herbicides and pesticides. Phenols can be directly toxic and cause endocrine disruption.
[9] See SWAMP field measures SOP, p. 17
mg/L – milligrams per liter; ug/L – micrograms per liter; ug/kg – micrograms per kilogram;
NTU – Nephelometric Turbidity Units; CFS – cubic feet per second;

Table 3. Groundwater Monitoring Parameters

Parameter	RL	Analytical Method[3]	Units
pH	0.1	Field or Laboratory Measurement EPA General Methods	pH Units
Specific Conductance	2.5		μS/cm
Total Dissolved Solids	10		mg/L
Total Alkalinity as CaCO3	1	EPA Method 310.1 or 310.2	
Calcium	0.05	General Cations[1] EPA 200.7, 200.8, 200.9	
Magnesium	0.02		
Sodium	0.1		
Potassium	0.1		
Sulfate (SO4)	1.0	General Anions EPA Method 300 or EPA Method 353.2	
Chloride	0.1		
Nitrate + Nitrite (as N)[2] or Nitrate as N	0.1		

[1] General chemistry parameters (major cations and anions) represent geochemistry of water bearing zone and assist in evaluating quality assurance/quality control of groundwater sampling and laboratory analysis.
[2] The MRP allows analysis of "nitrate plus nitrite" to represent nitrate concentrations (as N). The "nitrate plus nitrite" analysis allows for extended laboratory holding times and relieves the Discharger of meeting the short holding time required for nitrate.
[3] Dischargers may use alternative analytical methods approved by EPA.
RL – Reporting Limit; μS/cm – micro siemens per centimeter

Table4. Tier 2 - Time Schedule for Key Monitoring and Reporting Requirements (MRPs)

REQUIREMENT	TIME SCHEDULE[1]
Submit Sampling And Analysis Plan and Quality Assurance Project Plan (SAAP/QAPP) for Surface Receiving Water Quality Monitoring (*individually or through cooperative monitoring program*)	By March 1, 2018, or as directed by the Executive Officer; satisfied if an approved SAAP/QAPP has been submitted pursuant to Order No. R3-2012-0011 and associated MRPs
Initiate surface receiving water quality monitoring (*individually or through cooperative monitoring program*)	Per an approved SAAP and QAPP
Submit surface receiving water quality monitoring data (*individually or through cooperative monitoring program*)	Each January 1, April 1, July 1, and October 1
Submit surface receiving water quality Annual Monitoring Report *(individually or through cooperative monitoring program*)	By July 12017: annually thereafter by July 1
Initiate monitoring of groundwater wells	First sample from March-June 2017, second sample from September-December 2017
Submit electronic Annual Compliance Form	March 1, 2018 and every March 1 annually thereafter
Submit groundwater monitoring results	Within 60 days of the sample collection
Tier 2 Dischargers with farms/ranches growing high risk crops: Report total nitrogen applied on the Total Nitrogen Applied form	March 1, 2018 and every March 1annually thereafter

[1] Dates are relative to adoption of this Order or enrollment date for Dischargers enrolled after the adoption of this Order, unless otherwise specified.

California Regional Water Quality Control Board
Central Coast Region

Monitoring and Reporting Program
Order No. R3-2017-0002-03

TIER 3

Dischargers Enrolled Under
Conditional Waiver of Waste Discharge Requirements For
Discharges from Irrigated Lands

This Monitoring and Reporting Program Order No. R3-2017-0002-03 (MRP) is issued pursuant to California Water Code (Water Code) sections 13267 and 13269, which authorize the California Regional Water Quality Control Board, Central Coast Region (hereafter Central Coast Water Board) to require preparation and submittal of technical and monitoring reports. Water Code section 13269 requires a waiver of waste discharge requirements to include as a condition, the performance of monitoring and the public availability of monitoring results. *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands,* Order No. R3-2017-0002 (Order), includes criteria and requirements for three tiers. This MRP sets forth monitoring and reporting requirements for **Tier 3 Dischargers** enrolled under the Order. A summary of the requirements is shown below.

SUMMARY OF MONITORING AND REPORTING REQUIREMENTS FOR TIER 3:

Part 1:	Surface Receiving Water Monitoring and Reporting *(cooperative or individual)*
Part 2:	Groundwater Monitoring and Reporting *(cooperative or individual)* Total Nitrogen Applied Reporting *(required for subset of Tier 3 Dischargers if farm/ranch growing any crop with high nitrate loading risk to groundwater);*
Part 3:	Annual Compliance Form
Part 5:	Individual Surface Water Discharge Monitoring and Reporting
Part 6:	Irrigation and Nutrient Management Plan *(required for subset of Tier 3 Dischargers if farm/ranch has High Nitrate Loading Risk)*
Part 7:	Water Quality Buffer Plan *(required for subset of Tier 3 Dischargers if farm/ranch contains or is adjacent to a waterbody impaired for temperature, turbidity or sediment)*

Pursuant to Water Code section 13269(a)(2), monitoring requirements must be designed to support the development and implementation of the waiver program, including, but not limited to, verifying the adequacy and effectiveness of the waiver's conditions. The monitoring and reports required by this MRP are to evaluate effects of discharges of waste from irrigated agricultural operations and individual farms/ranches on waters of the state and to determine compliance with the Order.

MONITORING AND REPORTING BASED ON TIERS

The Order and MRP includes criteria and requirements for three tiers, based upon those characteristics of the individual farms/ranches at the operation that present the highest level of waste discharge or greatest risk to water quality. Dischargers must meet conditions of the Order and MRP for the appropriate tier that applies to their land and/or the individual farm/ranch. Within a tier, Dischargers comply with requirements based on the specific level of discharge and threat to water quality from individual farms/ranches. The lowest tier, Tier 1, applies to dischargers who discharge the lowest level of waste (amount or concentration) or pose the lowest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. The highest tier, Tier 3, applies to dischargers who discharge the highest level of waste or pose the greatest potential to cause or contribute to an exceedance of water quality standards in waters of the State or of the United States. Tier 2 applies to dischargers whose discharge has a moderate threat to water quality. Water quality is defined in terms of regional, state, or federal numeric or narrative water quality standards. Per the Order, Dischargers may submit a request to the Executive Officer to approve transfer to a lower tier. If the Executive Officer approves a transfer to a lower tier, any interested person may request that the Central Coast Water Board conduct a review of the Executive Officer's determination.

PART 1. SURFACE RECEIVING WATER MONITORING AND REPORTING REQUIREMENTS

The surface receiving water monitoring and reporting requirements described herein are generally a continuation of the surface receiving water monitoring and reporting requirements of Monitoring and Reporting Program Order No. 2012-0011-03, as revised August 22, 2016, with the intent of uninterrupted regular monitoring and reporting during the transition from Order No. R3-2012-0011-03 to Order No. R3-2017-0002-03.

Monitoring and reporting requirements for surface receiving water identified in Part 1.A. and Part 1.B. apply to Tier 3 Dischargers. Surface receiving water refers to water flowing in creeks and other surface waters of the State. Surface receiving water monitoring may be conducted through a cooperative monitoring program on behalf of Dischargers, or Dischargers may choose to conduct surface receiving water monitoring and reporting individually. Key monitoring and reporting requirements for surface receiving water are shown in Tables 1 and 2. Time schedules are shown in Table 5.

A. Surface Receiving Water Quality Monitoring

1. Dischargers must elect a surface receiving water monitoring option (cooperative monitoring program or individual receiving water monitoring) to comply with surface receiving water quality monitoring requirements, and identify the option selected on the Notice of Intent (NOI).

2. Dischargers are encouraged to choose participation in a cooperative monitoring program (e.g., the existing Cooperative Monitoring Program or a similar program) to comply with receiving water quality monitoring requirements. Dischargers not participating in a cooperative monitoring program must conduct surface receiving water quality monitoring individually that achieves the same purpose.

3. Dischargers (individually or as part of a cooperative monitoring program) must conduct surface receiving water quality monitoring to a) assess the impacts of their waste discharges from irrigated lands to receiving water, b) assess the status of receiving water quality and beneficial use protection in impaired waterbodies dominated by irrigated agricultural activity, c) evaluate status, short term patterns and long term trends (five to ten years or more) in receiving water quality, d) evaluate water quality impacts resulting from agricultural discharges (including but not limited to tile drain discharges), e) evaluate stormwater quality, f) evaluate condition of existing perennial, intermittent, or ephemeral streams or riparian or wetland area habitat, including degradation resulting from erosion or agricultural discharges of waste, and g) assist in the identification of specific sources of water quality problems.

Surface Receiving Water Quality Sampling and Analysis Plan

4. **By March 1, 2018, or as directed by the Executive Officer**, Dischargers (individually or as part of a cooperative monitoring program) must submit a surface receiving water quality Sampling and Analysis Plan (SAAP) and Quality Assurance Project Plan (QAPP); this requirement is satisfied if an approved SAAP and QAPP addressing all surface receiving water quality monitoring requirements described in this Order has been submitted pursuant to Order No.R3-2012-0011 and associated Monitoring and Reporting Programs. Dischargers (or a third party cooperative monitoring program) must develop the Sampling and Analysis Plan to describe how the proposed monitoring will achieve the objectives of the MRP and evaluate compliance with the Order. The Sampling and Analysis Plan may propose alternative monitoring site locations, adjusted monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water. The Executive Officer must approve the Sampling and Analysis Plan and QAPP.

5. The Sampling and Analysis Plan must include the following minimum required components:
    a. Monitoring strategy to achieve objectives of the Order and MRP;
    b. Map of monitoring sites with GIS coordinates;

c. Identification of known water quality impairments and impaired waterbodies per the 2010 Clean Water Act 303(d) List of Impaired Waterbodies (List of Impaired Waterbodies);
d. Identification of beneficial uses and applicable water quality standards;
e. Identification of applicable Total Maximum Daily Loads;
f. Monitoring parameters;
g. Monitoring schedule, including description and frequencies of monitoring events;
h. Description of data analysis methods;

6. The QAPP must include receiving water and site-specific information, project organization and responsibilities, and quality assurance components of the MRP. The QAPP must also include the laboratory and field requirements to be used for analyses and data evaluation. The QAPP must contain adequate detail for project and Water Board staff to identify and assess the technical and quality objectives, measurement and data acquisition methods, and limitations of the data generated under the surface receiving water quality monitoring. All sampling and laboratory methodologies and QAPP content must be consistent with U.S. EPA methods, State Water Board's Surface Water Ambient Monitoring Program (SWAMP) protocols and the Central Coast Water Board's Central Coast Ambient Monitoring Program (CCAMP). Following U.S. EPA guidelines[1] and SWAMP templates[2], the receiving water quality monitoring QAPP must include the following minimum required components:
   a. Project Management. This component addresses basic project management, including the project history and objectives, roles and responsibilities of the participants, and other aspects.
   b. Data Generation and Acquisition. This component addresses all aspects of project design and implementation. Implementation of these elements ensures that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and quality control activities are employed and are properly documented. Quality control requirements are applicable to all the constituents sampled as part of the MRP, as described in the appropriate method.
   c. Assessment and Oversight. This component addresses the activities for assessing the effectiveness of the implementation of the project and associated QA and QC activities. The purpose of the assessment is to provide project oversight that

[1] USEPA. 2001 (2006) USEPA Requirements for Quality Assurance Project Plans (QA/R-5) Office of Environmental Information, Washington, D.C. USEPA QA/R-5
[2] http://waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa

will ensure that the QA Project Plan is implemented as prescribed.

d. Data Validation and Usability. This component addresses the quality assurance activities that occur after the data collection, laboratory analysis and data generation phase of the project is completed. Implementation of these elements ensures that the data conform to the specified criteria, thus achieving the MRP objectives.

7. The Central Coast Water Board may conduct an audit of contracted laboratories at any time in order to evaluate compliance with the QAPP.

8. The Sampling and Analysis Plan and QAPP, and any proposed revisions are subject to approval by the Executive Officer. The Executive Officer may also revise the Sampling and Analysis Plan, including adding, removing, or changing monitoring site locations, changing monitoring parameters, and other changes as necessary to assess the impacts of waste discharges from irrigated lands to receiving water.

Surface Receiving Water Quality Monitoring Sites

9. The Sampling and Analysis Plan must, at a minimum, include monitoring sites to evaluate waterbodies identified in Table 1, unless otherwise approved by the Executive Officer. The Sampling and Analysis Plan must include sites to evaluate receiving water quality impacts most directly resulting from areas of agricultural discharge (including areas receiving tile drain discharges). Site selection must take into consideration the existence of any long term monitoring sites included in related monitoring programs (e.g. CCAMP and the existing CMP). Sites may be added or modified, subject to prior approval by the Executive Officer, to better assess the pollutant loading from individual sources or the impacts to receiving waters caused by individual discharges. Any modifications must consider sampling consistency for purposes of trend evaluation.

Surface Receiving Water Quality Monitoring Parameters

10. The Sampling and Analysis Plan must, at a minimum, include the following types of monitoring and evaluation parameters listed below and identified in Table 2:

    a. Flow Monitoring;
    b. Water Quality (physical parameters, metals, nutrients, pesticides);
    c. Toxicity (water and sediment);
    d. Assessment of Benthic Invertebrates.

11. All analyses must be conducted at a laboratory certified for such analyses by the State Department of Public Health (CDPH) or at laboratories approved by the Executive Officer. Unless otherwise noted, all sampling, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, U.S. EPA, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link: http://www.cdph.ca.gov/certlic/labs/Documents/ELAPLablist.xls

12. Water quality and flow monitoring is used to assess the sources, concentrations, and loads of waste discharges from individual farms/ranches and groups of Dischargers to surface waters, to evaluate impacts to water quality and beneficial uses, and to evaluate the short term patterns and long term trends in receiving water quality. Monitoring data must be compared to existing numeric and narrative water quality objectives.

13. Toxicity testing is to evaluate water quality relative to the narrative toxicity objective. Water column toxicity analyses must be conducted on 100% (undiluted) sample. At sites where persistent unresolved toxicity is found, the Executive Officer may require concurrent toxicity and chemical analyses and a Toxicity Identification Evaluation (TIE) to identify the individual discharges causing the toxicity.

Surface Receiving Water Quality Monitoring Frequency and Schedule

14. The Sampling and Analysis Plan must include a schedule for sampling. Timing, duration, and frequency of monitoring must be based on the land use, complexity, hydrology, and size of the waterbody. Table 2 includes minimum monitoring frequency and parameter lists. Agricultural parameters that are less common may be monitored less frequently. Modifications to the receiving water quality monitoring parameters, frequency, and schedule may be submitted for Executive Officer consideration and approval. At a minimum, the Sampling and Analysis Plan schedule must consist of monthly monitoring of common agricultural parameters in major agricultural areas, including two major storm events during the wet season (October 1 – April 30).

15. Storm event monitoring must be conducted within 18 hours of storm events, preferably including the first flush run-off event that results in significant increase in stream flow. For purposes of this MRP, a storm event is defined as precipitation producing onsite runoff (surface water flow) capable of creating significant ponding, erosion or other water quality problem. A

significant storm event will generally result in greater than 1-inch of rain within a 24-hour period.

16. Dischargers (individually or as part of a cooperative monitoring program) must perform receiving water quality monitoring per the Sampling and Analysis Plan and QAPP approved by the Executive Officer.

B. Surface Receiving Water Quality Reporting

Surface Receiving Water Quality Data Submittal

1. Dischargers (individually or as part of a cooperative monitoring program) must submit water quality monitoring data to the Central Coast Water Board electronically, in a format specified by the Executive Officer and compatible with SWAMP/CCAMP electronic submittal guidelines, each January 1, April 1, July 1, and October 1.

Surface Receiving Water Quality Monitoring Annual Report

2. **By July 1, 2017,** and every July 1 annually thereafter, Dischargers (individually or as part of a cooperative monitoring program) must submit an Annual Report, electronically, in a format specified by the Executive Officer including the following minimum elements:
   a. Signed Transmittal Letter;
   b. Title Page;
   c. Table of Contents;
   d. Executive Summary;
   e. Summary of Exceedance Reports submitted during the reporting period;
   f. Monitoring objectives and design;
   g. Monitoring site descriptions and rainfall records for the time period covered;
   h. Location of monitoring sites and map(s);
   i. Tabulated results of all analyses arranged in tabular form so that the required information is readily discernible;
   j. Summary of water quality data for any sites monitored as part of related monitoring programs, and used to evaluate receiving water as described in the Sampling and Analysis Plan.
   k. Discussion of data to clearly illustrate compliance with the Order and water quality standards;
   l. Discussion of short term patterns and long term trends in receiving water quality and beneficial use protection;

m. Evaluation of pesticide and toxicity analyses results, and recommendation of candidate sites for Toxicity Identification Evaluations (TIEs);
n. Identification of the location of any agricultural discharges observed discharging directly to surface receiving water;
o. Laboratory data submitted electronically in a SWAMP/CCAMP comparable format;
p. Sampling and analytical methods used;
q. Copy of chain-of-custody forms;
r. Field data sheets, signed laboratory reports, laboratory raw data;
s. Associated laboratory and field quality control samples results;
t. Summary of Quality Assurance Evaluation results;
u. Specify the method used to obtain flow at each monitoring site during each monitoring event;
v. Electronic or hard copies of photos obtained from all monitoring sites, clearly labeled with site ID and date;
w. Conclusions.

PART 2. GROUNDWATER MONITORING AND REPORTING REQUIREMENTS

Groundwater monitoring may be conducted through a cooperative monitoring and reporting program on behalf of growers, or Dischargers may choose to conduct groundwater monitoring and reporting individually. Qualifying cooperative groundwater monitoring and reporting programs must implement the groundwater monitoring and reporting requirements described in this Order, unless otherwise approved by the Executive Officer. An interested person may seek review by the Central Coast Water Board of the Executive Officer’s approval or denial of a cooperative groundwater monitoring and reporting program.

Key monitoring and reporting requirements for groundwater are shown in Table 3.

A. Groundwater Monitoring

1. Dischargers must sample private domestic wells and the primary irrigation well on their farm/ranch to evaluate groundwater conditions in agricultural areas, identify areas at greatest risk for nitrogen loading and exceedance of drinking water standards, and identify priority areas for follow up actions.

2. Dischargers must sample at least one groundwater well for each farm/ranch on their operation, including groundwater wells that are located within the property boundary of the enrolled county assessor parcel numbers (APNs). For farms/ranches with multiple groundwater wells, Dischargers must sample all domestic wells and the primary irrigation well. For the purposes of this MRP, a “domestic well” is any well that is used or may be used for domestic

use purposes, including any groundwater well that is connected to a residence, workshop, or place of business that may be used for human consumption, cooking, or sanitary purposes. Groundwater monitoring parameters must include well screen interval depths (if available), general chemical parameters, and general cations and anions listed in Table 3.

3. Dischargers must conduct two rounds of monitoring of required groundwater wells during calendar year 2017; one sample collected during spring (**March - June)** and one sample collected during fall **(September - December)**.

4. Groundwater samples must be collected by a qualified third party (e.g., consultant, technician, person conducting cooperative monitoring) using proper sampling methods, chain-of-custody, and quality assurance/quality control protocols. Groundwater samples must be collected at or near the well head before the pressure tank and prior to any well head treatment. In cases where this is not possible, the water sample must be collected from a sampling point as close to the pressure tank as possible, or from a cold-water spigot located before any filters or water treatment systems.

5. Laboratory analyses for groundwater samples must be conducted by a State certified laboratory according to U.S. EPA approved methods; unless otherwise noted, all monitoring, sample preservation, and analyses must be performed in accordance with the latest edition of *Test Methods for Evaluating Solid Waste*, SW-846, United States Environmental Protection Agency, and analyzed as specified herein by the above analytical methods and reporting limits indicated. Certified laboratories can be found at the web link below: http://www.waterboards.ca.gov/centralcoast/water_issues/programs/ag_waivers/docs/resources4growers/2016_04_11_labs.pdf

6. If a discharger determines that water in any domestic well exceeds 10 mg/L of nitrate as N, the discharger or third party must provide notice to the Central Coast Water Board within 24 hours of learning of the exceedance. For domestic wells on a Discharger's farm/ranch that exceed 10 mg/L nitrate as N, the Discharger must provide written notification to the users within 10 days of learning of the exceedance and provide written confirmation of the notification to the Central Coast Water Board.

   The drinking water notification must include the statement that the water poses a human health risk due to elevated nitrate concentration, and include a warning against the use of the water for drinking or cooking. In addition, Dischargers must also provide prompt written notification to any new well users (e.g. tenants and employees with access to the affected well), whenever there is a change in occupancy.

For all other domestic wells not on a Discharger's property, the Central Coast Water Board will notify the users promptly.

The drinking water notification and confirmation letters required by this Order are available to the public.

B. Groundwater Reporting

1. **Within 60 days of sample collection,** Dischargers must coordinate with the laboratory to submit the following groundwater monitoring results and information, electronically, using the Water Board's GeoTracker electronic deliverable format (EDF):
   a. GeoTracker Ranch Global Identification Number
   b. Field point name (Well Name)
   c. Field Point Class (Well Type)
   d. Latitude
   e. Longitude
   f. Sample collection date
   g. Analytical results
   h. Well construction information (e.g., total depth, screened intervals, depth to water), as available

2. Dischargers must submit groundwater well information required in the electronic Notice of Intent (eNOI) for each farm/ranch and update the eNOI to reflect changes in the farm/ranch information within 30 days of the change. Groundwater well information reported on the eNOI includes, but is not limited to:
   a. Number of groundwater wells present at each farm/ranch
   b. Identification of any groundwater wells abandoned or destroyed (including method destroyed) in compliance with the Order
   c. Use for fertigation or chemigation
   d. Presence of back flow prevention devices
   e. Number of groundwater wells used for agricultural purposes
   f. Number of groundwater wells used for or may be used for domestic use purposes (domestic wells)

C. Total Nitrogen Applied Reporting

1. By March 1, 2018, and by March 1 annually thereafter, Tier 3 Dischargers growing any crop with a high potential to discharge nitrogen to groundwater must record and report total nitrogen applied for each specific crop that was irrigated and grown for commercial purposes on that farm/ranch during the preceding calendar year (January through December).

   Crops with a high potential to discharge nitrogen to groundwater are: beet, broccoli, cabbage, cauliflower, celery, Chinese cabbage (napa), collard, endive, kale, leek, lettuce (leaf and head), mustard, onion (dry and green), spinach, strawberry, pepper (fruiting), and parsley.

Total nitrogen applied must be reported on the Total Nitrogen Applied Report form as described in the Total Nitrogen Applied Report form instructions.

Total nitrogen applied includes any product containing any form or concentration of nitrogen including, but not limited to, organic and inorganic fertilizers, slow release products, compost, compost teas, manure, and extracts.

2. The Total Nitrogen Applied Report form includes the following information:
    a. General ranch information such as GeoTracker file numbers, name, location, acres.
    b. Nitrogen concentration of irrigation water
    c. Nitrogen applied in pounds per acre with irrigation water
    d. Nitrogen present in the soil
    e. Nitrogen applied with compost and amendments
    f. Specific crops grown
    g. Nitrogen applied in pounds per acre with fertilizers and other materials to each specific crop grown
    h. Crop acres of each specific crop grown
    i. Whether each specific crop was grown organically or conventionally
    j. Basis for the nitrogen applied
    k. Explanation and comments section
    l. Certification statement with penalty of perjury declaration
    m. Additional information regarding whether each specific crop was grown in a nursery, greenhouse, hydroponically, in containers, and similar variables.

PART 3. ANNUAL COMPLIANCE FORM

Tier 3 Dischargers must submit annual compliance information, electronically, on the Annual Compliance Form. The purpose of the electronic Annual Compliance Form is to provide information to the Central Coast Water Board to assist in the evaluation of threat to water quality from individual agricultural discharges of waste and measure progress towards water quality improvement and verify compliance with the Order and MRP. Time schedules are shown in Table 5.

A. Annual Compliance Form

1. **By March 1, 2018, and updated annually thereafter by March 1**, Tier 3 Dischargers must submit an Annual Compliance Form electronically, in a format specified by the Executive Officer. The electronic Annual Compliance Form includes, but is not limited to the following minimum requirements[1]:
    a. Question regarding consistency between the Annual Compliance Form and the electronic Notice of Intent (eNOI);
    b. Information regarding type and characteristics of discharge (e.g., number of discharge points, estimated flow/volume, number of tailwater days);
    c. Identification of any direct agricultural discharges to a stream, lake, estuary, bay, or ocean;
    d. Identification of specific farm water quality management practices completed, in progress, and planned to address water quality impacts caused by discharges of waste including irrigation management, pesticide management, nutrient management, salinity management, stormwater management, and sediment and erosion control to achieve compliance with this Order; and identification of specific methods used, and described in the Farm Plan consistent with Order Provision 44.g., for the purposes of assessing the effectiveness of management practices implemented and the outcomes of such assessments:
    e. Proprietary information question and justification;
    f. Authorization and certification statement and declaration of penalty of perjury.

PART 5. INDIVIDUAL SURFACE WATER DISCHARGE MONITORING AND REPORTING REQUIREMENTS

Monitoring and reporting requirements for individual surface water discharge identified in Part 5.A. and Part 5.B. apply to Tier 3 Dischargers with irrigation water or stormwater discharges to surface water from an outfall. Outfalls are locations where irrigation water and stormwater exit a farm/ranch, or otherwise leave the control of the discharger, after being conveyed by pipes, ditches, constructed swales, tile drains, containment structures, or other discrete structures or features that transport the water. Discharges that have commingled with discharges from another farm/ranch are considered to have left the control of the discharger. Key monitoring and reporting requirements for individual surface water discharge are shown in Tables 4A and 4B. Time schedules are shown in Table 5.

[1] Items reported in the Annual Compliance Form are due by March 1 2018, and annually thereafter, unless otherwise specified.

A. Individual Surface Water Discharge Monitoring

1. Tier 3 Dischargers must conduct individual surface water discharge monitoring to a) evaluate the quality of individual waste discharges, including concentration and load of waste (in kilograms per day) for appropriate parameters, b) evaluate effects of waste discharge on water quality and beneficial uses, and c) evaluate progress towards compliance with water quality improvement milestones in the Order.

Individual Sampling and Analysis Plan

2. **By March 1, 2018, or as directed by the Executive Officer**, Tier 3 Dischargers must submit an individual surface water discharge Sampling and Analysis Plan (SAAP) and QAPP to monitor individual discharges of irrigation water and stormwater that leaves their farm/ranch from an outfall. The Sampling and Analysis Plan and QAPP must be submitted to the Executive Officer; this requirement is satisfied if an approved SAAP and QAPP addressing all individual surface water discharge monitoring requirements described in this Order has been submitted pursuant to Order No.R3-2012-0011 and associated Monitoring and Reporting Programs.

3. The Sampling and Analysis Plan must include the following minimum required components to monitor irrigation water and stormwater discharges:
   a. Number and location of outfalls (identified with latitude and longitude or on a scaled map);
   b. Number and location of monitoring points;
   c. Description of typical irrigation runoff patterns;
   d. Map of discharge and monitoring points;
   e. Sample collection methods;
   f. Monitoring parameters;
   g. Monitoring schedule and frequency of monitoring events;

4. The QAPP must include appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, quality control activities, and documentation.

5. The Sampling and Analysis Plan and QAPP, and any proposed revisions are subject to approval by the Executive Officer. The Executive Officer may require modifications to the Sampling and Analysis Plan or Tier 3 Dischargers may propose Sampling and Analysis Plan modifications for Executive Officer approval, when modifications are justified to accomplish the objectives of the MRP.

Individual Surface Water Discharge Monitoring Points

6. Tier 3 Dischargers must select monitoring points to characterize at least 80% of the estimated maximum irrigation run-off discharge volume from each farm/ranch based on that farm's/ranch's typical discharge patterns[1], including tailwater discharges and discharges from tile drains. Sample must be taken when irrigation activity is causing maximal run-off. Load estimates will be generated by multiplying flow volume of discharge by concentration of contaminants. Tier 3 Dischargers must include at least one monitoring point from each farm/ranch which drains areas where chlorpyrifos or diazinon are applied, and monitoring of runoff or tailwater must be conducted within one week of chemical application. If discharge is not routinely present, Discharger may characterize typical run-off patterns in the Annual Report. See Table 4A for additional details.

7. Tier 3 Dischargers must also monitor storage ponds and other terminal surface water containment structures that collect irrigation and stormwater runoff, unless the structure is (1) part of a tail-water return system where a major portion of the water in such structure is reapplied as irrigation water, or (2) the structure is primarily a sedimentation pond by design with a short hydraulic residence time (96 hours or less) and a discharge to surface water when functioning. If multiple ponds are present, sampling must cover at least those structures that would account for 80% of the maximum storage volume of the containment features. See Table 4B for additional details. Where water is reapplied as irrigation water. Dischargers shall document reuse in the Farm Plan.

Individual Surface Water Discharge Monitoring Parameters, Frequency, and Schedule

8. Tier 3 Dischargers must conduct monitoring for parameters, laboratory analytical methods, frequency and schedule described in Tables 4A and 4B. Dischargers may utilize in-field water testing instruments/equipment as a substitute for laboratory analytical methods if the method is approved by U.S. EPA, meets reporting limits (RL) and practical quantitation limits (PQL) specifications in the MRP, and appropriate sampling methodology and quality assurance checks can be applied to ensure that QAPP standards are met to ensure accuracy of the test.

[1] The requirement to select monitoring points to characterize at least 80% of the estimated maximum irrigation run-off based on typical discharge patterns is for the purposes of attempting to collect samples that represent a majority of the volume of irrigation run-off discharged; however the Board recognizes that predetermining these locations is not always possible and that sampling results may vary. The MRP does not specify the number or location of monitoring points to provide maximum flexibility for growers to determine how many sites necessary and exact locations are given the anticipated site-specific conditions.

9. Tier 3 Dischargers must initiate individual surface water discharge monitoring per an approved Sampling and Analysis Plan and QAPP, unless otherwise directed by the Executive Officer.

B. Individual Surface Water Discharge Reporting

Individual Surface Water Discharge Monitoring Data Submittal

By March 1, 2018, and annually thereafter by March 1, Tier 3 Dischargers must submit individual surface water discharge monitoring data and information to the Central Coast Water Board electronically, in a pdf format, containing at least the following items, or as otherwise approved by the Executive Officer:

a. Electronic laboratory data
- All reports of results must contain Ranch name and Global ID, site name(s), project contact, and date.
- Electronic laboratory data reports of chemical results shall include analytical results, as well as associated quality assurance data including method detection limits, reporting limits, matrix spikes, matrix spike duplicates, laboratory blanks, and other quality assurance results required by the analysis method.
- Electronic laboratory data reports of toxicity results shall include summary results comparable to those required in a CEDEN file delivery, including test and control results. For each test result, the mean, associated control performance, calculated percent of control, statistical test results and determination of toxicity, must be included. Test results must specify the control ID used to calculate statistical outcomes.
- Field data results, including temperature, pH, conductivity, turbidity and flow measurements, any field duplicates or blanks, and field observations.
- Calculations of un-ionized ammonia concentrations
- Calculations of total flow and pollutant loading (for nitrate, pesticides if sampled, total ammonia, and turbidity) (include formulas);

b. Narrative description of typical irrigation runoff patterns;
c. Location of sampling sites and map(s);
d. Sampling and analytical methods used;
e. Specify the method used to obtain flow at each monitoring site during each monitoring event;
f. Photos obtained from all monitoring sites, clearly labeled with location and date;
g. Sample chain-of-custody forms do not need to be submitted but must be made available to Central Coast Water Board staff, upon request.

PART 6. IRRIGATION AND NUTRIENT MANAGEMENT PLAN

Monitoring and reporting requirements related to the Irrigation and Nutrient Management Plan (INMP) identified in Part 6.A., and 6.B, apply to Tier 3 Dischargers identified by the Executive Officer that are newly enrolled in Order No. R3-2017-0002, and Tier 3 Dischargers that were subject to Irrigation and Nutrient Management Plan Requirements in Order R3-2012-0011 per MRP Order No. R3-2012-0011-03 Time schedules are shown in Table 5.

A. Irrigation and Nutrient Management Plan Monitoring

1. Tier 3 Dischargers required in Order No. R3-2012-0011 to develop and initiate implementation of an Irrigation and Nutrient Management Plan (INMP) certified by a Professional Soil Scientist, Professional Agronomist, or Crop Advisor certified by the American Society of Agronomy, or similarly qualified professional, are required to update (as necessary) and implement their INMP throughout the term of this Order.

2. The Executive Officer will assess whether an INMP is required for new Tier 3 Dischargers that enroll in Order No. R3-2017-0002 during the term of the Order. The Executive Officer will use the criteria established in Order No. R3-2012-0011 to make this assessment. If a Tier 3 Discharger is required to develop an INMP, the Tier 3 discharger must develop and initiate implementation of an Irrigation and Nutrient Management Plan (INMP) certified by a Professional Soil Scientist, Professional Agronomist, or Crop Advisor certified by the American Society of Agronomy, or similarly qualified professional, **within 18 months** of the Executive Officer's assessment of the INMP requirement.
3. The purpose of the INMP is to budget and manage the nutrients applied to each farm/ranch considering all sources of nutrients, crop requirements, soil types, climate, and local conditions in order to minimize nitrate loading to surface water and groundwater in compliance with this Order. The professional certification of the INMP must indicate that the relevant expert has reviewed all necessary documentation and testing results, evaluated total nitrogen applied relative to typical crop nitrogen uptake and nitrogen removed at harvest, with consideration to potential nitrate loading to groundwater, and conducted field verification to ensure accuracy of reporting.
4. Tier 3 Dischargers required to develop and initiate implementation an (INMP) must include the following elements in the INMP. The INMP is not submitted to the Central Coast Water Board, with the exception of the INMP Effectiveness Report:
    a. Proof of INMP certification;
    b. Map locating each farm/ranch;
    c. Identification of crop nitrogen uptake values for use in nutrient balance calculations;

d. Record keeping annually by either Method 1 or Method 2:

e. To meet the requirement to record total nitrogen in the soil,dischargers may take a nitrogen soil sample (e.g. laboratory analysis or nitrate quick test) or use an alternative method to evaluate nitrogen content in soil, prior to planting or seeding the field or prior to the time of pre-sidedressing, or at an alternative time when it is most effective to determine nitrogen present in the soil that is available for the next crop and to minimize nitrate leaching to groundwater. The amount of nitrogen remaining in the soil must be accounted for as a source of nitrogen when budgeting, and the soil sample or alternative method results must be maintained in the INMP.

f. Identification of irrigation and nutrient management practices in progress (identify start date), completed (identify completion date), and planned (identify anticipated start date) to reduce nitrate loading to groundwater to achieve compliance with this Order.

g. Description of methods Discharger will use to verify overall effectiveness of the INMP.

5. Tier 3 Dischargers must evaluate the effectiveness of the INMP. Irrigation and Nutrient Management Plan effectiveness monitoring must evaluate reduction in new nitrogen[1] loading potential based on minimized fertilizer use and improved irrigation and nutrient management practices in order to minimize new nitrogen loading to surface water and groundwater. Evaluation methods used may include, but are not limited to analysis of groundwater well monitoring data or soil sample data, or analysis of trends in new nitrogen application data.

B. Irrigation and Nutrient Management Plan Reporting

1. **By March 1, 2019**, Tier 3 Dischargers required to develop and initiate implementation of an INMP must submit an INMP Effectiveness Report to evaluate reductions in nitrate loading to surface water and groundwater based on the implementation of irrigation and nutrient management practices in a format specified by the Executive Officer. Dischargers in the same groundwater basin or subbasin may choose to comply with this requirement as a group by submitting a single report that evaluates the overall effectiveness of the broad scale implementation of irrigation and nutrient management practices identified in individual INMPs to protect groundwater. Group efforts must use data from each farm/ranch (e.g., data from individual groundwater wells, soil samples, or nitrogen application). The INMP

[1] New nitrogen is nitrogen from fertilizers, amendments, and other nitrogen sources applied other than nitrogen present in groundwater.

Effectiveness Report must include a description of the methodology used to evaluate and verify effectiveness of the INMP.

PART 7. WATER QUALITY BUFFER PLAN

Monitoring and reporting requirements related to the Water Quality Buffer Plan identified in Part 7.A. and Part 7.B. apply to Tier 3 Dischargers that have farms/ranches *that contain or are adjacent to waterbody identified on the List of Impaired Waterbodies as impaired for temperature, turbidity, or sediment).* Time schedules are shown in Table 5.

A. **Water Quality Buffer Plan**

1. **By 18 months following enrollment in Order No. R3-2017-0002 of a Tier 3 farm/ranch**, Tier 3 Dischargers adjacent to or containing a waterbody identified on the List of Impaired Waterbodies as impaired for temperature, turbidity or sediment must submit a Water Quality Buffer Plan (WQBP) to the Executive Officer that protects the listed waterbody and its associated perennial and intermittent tributaries. The purpose of the Water Quality Buffer Plan is to prevent waste discharge, comply with water quality standards (e.g., temperature, turbidity, sediment), and protect beneficial uses in compliance with this Order and the following Basin Plan requirement:

   Basin Plan (Chapter 5, p. V-13, Section V.G.4 – Erosion and Sedimentation, *"A filter strip of appropriate width, and consisting of undisturbed soil and riparian vegetation or its equivalent, must be maintained, wherever possible, between significant land disturbance activities and watercourses, lakes, bays, estuaries, marshes, and other water bodies. For construction activities, minimum width of the filter strip must be thirty feet, wherever possible…."*

2. The Water Quality Buffer Plan must include the following or the functional equivalent, to address discharges of waste and associated water quality impairments:

   a. A minimum 30 foot buffer (as measured horizontally from the top of bank on either side of the waterway, or from the high water mark of a lake and mean high tide of an estuary);
   b. Any necessary increases in buffer width to adequately prevent the discharge of waste that may cause or contribute to any excursion above or outside the acceptable range for any Regional, State, or Federal numeric or narrative water quality standard (e.g., temperature, turbidity);

c. Any buffer less than 30 feet must provide equivalent water quality protection and be justified based on an analysis of site-specific conditions and be approved by the Executive Officer;
d. Identification of any alternatives implemented to comply with this requirement, that are functionally equivalent to described buffer;
e. Schedule for implementation;
f. Maintenance provisions to ensure water quality protection;
g. Annual photo monitoring;

2. The WQPB must be submitted using the Water Quality Buffer Plan form, or, if an alternative to the WQBP is submitted, in a format approved by the Executive Officer.

3. **By March 1, 2019**, Tier 3 Dischargers that submitted a WQBP pursuant to Order No. R3-2012-0011 or Order No. R3-2017-0002, are required to update (as necessary) and implement their WQBP, and annually submit a WQBP Status Report of their WQBP implementation using the Water Quality Buffer Plan form, or, if an alternative to the WQBP was submitted, an Alternative to WQBP Status Report, electronically, in a format approved by the Executive Officer.

PART 8. GENERAL MONITORING AND REPORTING REQUIREMENTS

A. Submittal of Technical Reports

1. Dischargers must submit reports in a format specified by the Executive Officer (reports will be submitted electronically, unless otherwise specified by the Executive Officer). A transmittal letter must accompany each report, containing the following penalty of perjury statement signed by the Discharger or the Discharger's authorized agent:

   "In compliance with Water Code §13267, I certify under penalty of perjury that this document and all attachments were prepared by me, or under my direction or supervision following a system designed to assure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, this document and all attachments are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment".

2. If the Discharger asserts that all or a portion of a report submitted pursuant to this Order is subject to an exemption from public disclosure (e.g. trade secrets or secret processes), the Discharger must provide an explanation of how those portions of the reports are exempt from public disclosure. The

Discharger must clearly indicate on the cover of the report (typically an electronic submittal) that the Discharger asserts that all or a portion of the report is exempt from public disclosure, submit a complete report with those portions that are asserted to be exempt in redacted form, submit separately (in a separate electronic file) unredacted pages (to be maintained separately by staff). The Central Coast Water Board staff will determine whether any such report or portion of a report qualifies for an exemption from public disclosure. If the Central Coast Water Board staff disagrees with the asserted exemption from public disclosure, the Central Coast Water Board staff will notify the Discharger prior to making such report or portions of such report available for public inspection.

B. Central Coast Water Board Authority

1. Monitoring reports are required pursuant to section 13267 of the California Water Code. Pursuant to section 13268 of the Water Code, a violation of a request made pursuant to section 13267 may subject you to civil liability of up to $1000 per day.

2. The Water Board needs the required information to determine compliance with Order No.R3-2017-0002. The evidence supporting these requirements is included in the findings of Order No.R3-2017-0002.

____
John M. Robertson
Executive Officer

____
Date

Table 1. Major Waterbodies in Agricultural Areas[1]

Hydrologic SubArea	Waterbody Name	Hydrologic SubArea	Waterbody Name
30510	Pajaro River	30920	Quail Creek
30510	Salsipuedes Creek	30920	Salinas Reclamation Canal
30510	Watsonville Slough	31022	Chorro Creek
30510	Watsonville Creek[2]	31023	Los Osos Creek
30510	Beach Road Ditch[2]	31023	Warden Creek
30530	Carnadero Creek	31024	San Luis Obispo Creek
30530	Furlong Creek[2]	31024	Prefumo Creek
30530	Llagas Creek	31031	Arroyo Grande Creek
30530	Miller's Canal	31031	Los Berros Creek
30530	San Juan Creek	31210	Bradley Canyon Creek
30530	Tesquisquita Slough	31210	Bradley Channel
30600	Moro Cojo Slough	31210	Green Valley Creek
30910	Alisal Slough	31210	Main Street Canal
30910	Blanco Drain	31210	Orcutt Solomon Creek
30910	Old Salinas River	31210	Oso Flaco Creek
30910	Salinas River (below Gonzales Rd.)	31210	Little Oso Flaco Creek
30920	Salinas River (above Gonzales Rd. and below Nacimiento R.)	31210	Santa Maria River
30910	Santa Rita Creek[2]	31310	San Antonio Creek[2]
30910	Tembladero Slough	31410	Santa Ynez River
30920	Alisal Creek	31531	Bell Creek
30920	Chualar Creek	31531	Glenn Annie Creek
30920	Espinosa Slough	31531	Los Carneros Creek[2]
30920	Gabilan Creek	31534	Arroyo Paredon Creek
30920	Natividad Creek	31534	Franklin Creek

[1] At a minimum, monitoring sites must be included for these waterbodies in agricultural areas, unless otherwise approved by the Executive Officer. Monitoring sites may be proposed for addition or modification to better assess the impacts of waste discharges from irrigated lands to surface water. Dischargers choosing to comply with surface receiving water quality monitoring, individually (not part of a cooperative monitoring program) must only monitor sites for waterbodies receiving the discharge.
[2] These creeks are included because they are newly listed waterbodies on the 2010 303(d) list of Impaired Waters that are associated with areas of agricultural discharge.

Table 2. Surface Receiving Water Quality Monitoring Parameters

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Photo Monitoring		
Upstream and downstream photographs at monitoring location		With every monitoring event
WATER COLUMN SAMPLING		
Physical Parameters and General Chemistry		
Flow (field measure) (CFS) following SWAMP field SOP[9]	.25	Monthly, including 2 stormwater events
pH (field measure)	0.1	”
Electrical Conductivity (field measure) (µS/cm)	2.5	”
Dissolved Oxygen (field measure) (mg/L)	0.1	”
Temperature (field measure) (^{o}C)	0.1	”
Turbidity (NTU)	0.5	”
Total Dissolved Solids (mg/L)	10	”
Total Suspended Solids (mg/L)	0.5	”
Nutrients		
Total Nitrogen (mg/L)	0.5	Monthly, including 2 stormwater events
Nitrate + Nitrite (as N) (mg/L)	0.1	”
Total Ammonia (mg/L)	0.1	”
Unionized Ammonia (calculated value, mg/L))		”
Total Phosphorus (as P) (mg/L)	0.02	
Soluble Orthophosphate (mg/L)	0.01	”
Water column chlorophyll a (µg/L)	1.0	“
Algae cover, Floating Mats, % coverage	-	“
Algae cover, Attached, % coverage	-	“
Water Column Toxicity Test		
Algae - *Selenastrum capricornutum (*96-hour chronic; Method1003.0 in EPA/821/R-02/013)	-	4 times each year, twice in dry season, twice in wet season
Water Flea – *Ceriodaphnia dubia* (7-day chronic; Method 1002.0 in EPA/821/R-02/013)	-	”
Midge - *Chironomus spp.* (96-hour acute; Alternate test species in EPA 821-R-02-012)	-	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Toxicity Identification Evaluation (TIE)	-	As directed by Executive Officer
Pesticides[2] /Herbicides (µg/L)		
Organophosphate Pesticides		
Azinphos-methyl	0.02	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Chlorpyrifos	0.005	”
Diazinon	0.005	”
Dichlorvos	0.01	”
Dimethoate	0.01	”
Dimeton-s	0.005	”
Disulfoton (Disyton)	0.005	”
Malathion	0.005	”
Methamidophos	0.02	”
Methidathion	0.02	“
Parathion-methyl	0.02	“
Phorate	0.01	“
Phosmet	0.02	“
Neonicotinoids		
Thiamethoxam	.002	“
Imidacloprid	.002	“
Thiacloprid	.002	“
Dinotefuran	.006	“
Acetamiprid	.01	“
Clothianidin	.02	
Herbicides		
Atrazine	0.05	“
Cyanazine	0.20	“
Diuron	0.05	“
Glyphosate	2.0	“
Linuron	0.1	“
Paraquat	0.20	“
Simazine	0.05	“
Trifluralin	0.05	“
Metals (µg/L)		
Arsenic (total) [5,7]	0.3	2 times in both 2017 and 2018, once in dry season and once in wet season of each year, concurrent with water toxicity monitoring
Boron (total) [6,7]	10	“
Cadmium (total & dissolved) [4.5,7]	0.01	“

Parameters and Tests	RL[3]	Monitoring Frequency[1]
Copper (total and dissolved) [4,7]	0.01	“
Lead (total and dissolved) [4,7]	0.01	“
Nickel (total and dissolved) [4,7]	0.02	“
Molybdenum (total) [7]	1	“
Selenium (total)[7]	0.30	“
Zinc (total and dissolved) [4.5,7]	0.10	“
Other (µg/L)		
Total Phenolic Compounds[8]	5	2 times in 2017, once in spring (April-May) and once in fall (August-September)
Hardness (mg/L as CaCO3)	1	“
Total Organic Carbon (ug/L)	0.6	“
SEDIMENT SAMPLING		
Sediment Toxicity - *Hyalella azteca* 10-day static renewal (EPA, 2000)		2 times each year, once in spring (April-May) and once in fall (August-September)
Pyrethroid Pesticides in Sediment (µg/kg)		
Gamma-cyhalothrin	2	2 times in both 2017 and 2018, once in spring (April-May) and once in fall (August-September) of each year, concurrent with sediment toxicity sampling
Lambda-cyhalothrin	2	“
Bifenthrin	2	“
Beta-cyfluthrin	2	“
Cyfluthrin	2	“
Esfenvalerate	2	“
Permethrin	2	“
Cypermethrin	2	“
Danitol	2	“
Fenvalerate	2	“
Fluvalinate	2	“
Other Monitoring in Sediment		
Chlorpyrifos (µg/kg)	2	“
Total Organic Carbon	0.01%	“
		“
Sediment Grain Size Analysis	1%	“

[1]Monitoring is ongoing through all five years of the Order, unless otherwise specified. Monitoring frequency may be used as a guide for developing alternative Sampling and Analysis Plan.
[2]Pesticide list may be modified based on specific pesticide use in Central Coast Region. Analytes on this list must be reported, at a minimum.
[3] Reporting Limit, taken from SWAMP where applicable.

[4] Holmgren, Meyer, Cheney and Daniels. 1993. Cadmium, Lead, Zinc, Copper and Nickel in Agricultural Soils of the United States. J. of Environ. Quality 22:335-348.
[5]Sax and Lewis, ed. 1987. Hawley's Condensed Chemical Dictionary. 11th ed. New York: Van Nostrand Reinhold Co., 1987. Zinc arsenate is an insecticide.
[6]Http://www.coastalagro.com/products/labels/9%25BORON.pdf; Boron is applied directly or as a component of fertilizers as a plant nutrient.
[7]Madramootoo, Johnston, Willardson, eds. 1997. Management of Agricultural Drainage Water Quality. International Commission on Irrigation and Drainage. U.N. FAO. SBN 92-6-104058.3.
[8]http://cat.inist.fr/?aModele=afficheN&cpsidt=14074525; Phenols are breakdown products of herbicides and pesticides. Phenols can be directly toxic and cause endocrine disruption.
[9]See SWAMP field measures SOP, p. 17
mg/L – milligrams per liter; ug/L – micrograms per liter; ug/kg – micrograms per kilogram;
NTU – Nephelometric Turbidity Units; CFS – cubic feet per second;

Table 3. Groundwater Monitoring Parameters

Parameter	RL	Analytical Method[3]	Units
pH	0.1	Field or Laboratory Measurement EPA General Methods	pH Units
Specific Conductance	2.5		μS/cm
Total Dissolved Solids	10		mg/L
Total Alkalinity as $CaCO_3$	1	EPA Method 310.1 or 310.2	
Calcium	0.05	General Cations[1] EPA 200.7, 200.8, 200.9	
Magnesium	0.02		
Sodium	0.1		
Potassium	0.1		
Sulfate (SO_4)	1.0	General Anions EPA Method 300 or EPA Method 353.2	
Chloride	0.1		
Nitrate + Nitrite (as N)[2] *or* Nitrate as N	0.1		

[1]General chemistry parameters (major cations and anions) represent geochemistry of water bearing zone and assist in evaluating quality assurance/quality control of groundwater monitoring and laboratory analysis.
[2]The MRP allows analysis of "nitrate plus nitrite" to represent nitrate concentrations (as N). The "nitrate plus nitrite" analysis allows for extended laboratory holding times and relieves the Discharger of meeting the short holding time required for nitrate.
[3]Dischargers may use alternative analytical methods approved by EPA.
RL – Reporting Limit; μS/cm – micro siemens per centimeter

Table 4A. Individual Discharge Monitoring for Tailwater, Tile drain, and Stormwater Discharges

Parameter	Analytical Method[1]	Maximum PQL	Units	Min Monitoring Frequency
Discharge Flow or Volume	Field Measure	---	CFS	(a) (d)
Approximate Duration of Flow	Calculation	---	hours/month	
Temperature (water)	Field Measure	0.1	°Celsius	
pH	Field Measure	0.1	pH units	

Electrical Conductivity	Field Measure	100	µS/cm	
Turbidity	SM 2130B, EPA 180.1	1	NTUs	
Nitrate + Nitrite (as N)	EPA 300.1, EPA 353.2	0.1	mg/L	
Ammonia	SM 4500 NH3, EPA 350.3	0.1	mg/L	
Chlorpyrifos[2]	EPA 8141A, EPA 614	0.02	ug/L	(b) (c) (d)
Diazinon[2]				
Ceriodaphnia Toxicity (96-hr acute)	EPA-821-R-02-012	NA	% Survival	
Hyalella Toxicity in Water (96-hr acute)	EPA-821-R-02-012	NA	% Survival	

[1] In-field water testing instruments/equipment as a substitute for laboratory analysis if the method is approved by EPA, meets RL/PQL specifications in the MRP, and appropriate sampling methodology and quality assurance checks can be applied to ensure that QAPP standards are met to ensure accuracy of the test.
[2]If chlorpyrifos or diazinon is used at the farm/ranch, otherwise does not apply. The Executive Officer may require monitoring of other pesticides based on results of downstream receiving water monitoring.
(a) Two times per year during primary irrigation season for farms/ranches less than or equal to 500 acres, and four times per year during primary irrigation season for farms/ranches greater than 500 acres. Executive Officer may reduce sampling frequency based on water quality improvements.
(b) Once per year during primary irrigation season for farms/ranches less than or equal to 500 acres, and two times per year during primary irrigation season for farms/ranches greater than 500 acres.
(c) Sample must be collected within one week of chemical application, if chemical is applied on farm/ranch;
(d) Once per year during wet season (October – March) for farms/ranches less than or equal to 500 acres, and two times per year during wet season for farms/ranches greater than 500 acres, within 18 hours of major storm events;
CFS – Cubic feet per second; NTU – Nephelometric turbidity unit; PQL – Practical Quantitation Limit;
NA – Not applicable

Table 4B. Individual Discharge Monitoring for Tailwater Ponds and other Surface Containment Features

Parameter	Analytical Method[1]	Maximum PQL	Units	Minimum Monitoring Frequency
Volume of Pond	Field Measure	1	Gallons	(a) (d)
Nitrate + Nitrite (as N)	EPA 300.1, EPA 353.2	50	mg/L	

[1] In-field water testing instruments/equipment as a substitute for laboratory analysis if the method is approved by EPA, meets RL/PQL specifications in the MRP, and appropriate sampling methodology and quality assurance checks can be applied to ensure that QAPP standards are met to ensure accuracy of the test.
(a) Four times per year during primary irrigation season; Executive Officer may reduce monitoring frequency based on water quality improvements.
(d) Two times per year during wet season (October – March, within 18 hours of major storm events)

Table 5. Tier 3 - Time Schedule for Key Monitoring and Reporting Requirements (MRPs)

REQUIREMENT	TIME SCHEDULE[1]
Submit Sampling And Analysis Plan and Quality Assurance Project Plan (SAAP/QAPP) for Surface Receiving Water Quality Monitoring (*individually or*	By March 1, 2018, or as directed by the Executive Officer; satisfied if an approved SAAP/QAPP has been submitted pursuant

through cooperative monitoring program)	to Order No. R3-2012-0011 and associated MRPs
Initiate surface receiving water quality monitoring (*individually or through cooperative monitoring program*)	Per an approved SAAP and QAPP
Submit surface receiving water quality monitoring data (*individually or through cooperative monitoring program*)	Each January 1, April 1, July 1, and October 1
Submit surface receiving water quality Annual Monitoring Report (*individually or through cooperative monitoring program*)	By July 1 2017; annually thereafter by July 1
Initiate monitoring of groundwater wells	First sample from March-June 2017, second sample from September-December 2017
Submit individual surface water discharge SAAP and QAPP	By March 1, 2018 or as directed by the Executive Officer; waived if an approved SAAP and QAPP has been submitted and being implemented pursuant to Order No. R3-2012-0011.
Initiate individual surface water discharge monitoring	As described in an approved SAAP and QAPP
Submit individual surface water discharge monitoring data	March 1, 2018, and every March 1 annually thereafter
Submit electronic Annual Compliance Form	March 1, 2018 and every March 1 annually thereafter
Submit groundwater monitoring results	Within 60 days of the sample collection
Submit Water Quality Buffer Plan or alternative	Within 18 months of enrolling new Tier 3 farm/ranch in Order
Submit Status Report on Water Quality Buffer Plan or alternative	March 1, 2019
Tier 3 Dischargers with farms/ranches growing high risk crops:	
Report total nitrogen applied on the Total Nitrogen Applied form	March 1, 2018 and every March 1 annually thereafter
Submit INMP Effectiveness Report	March 1, 2019

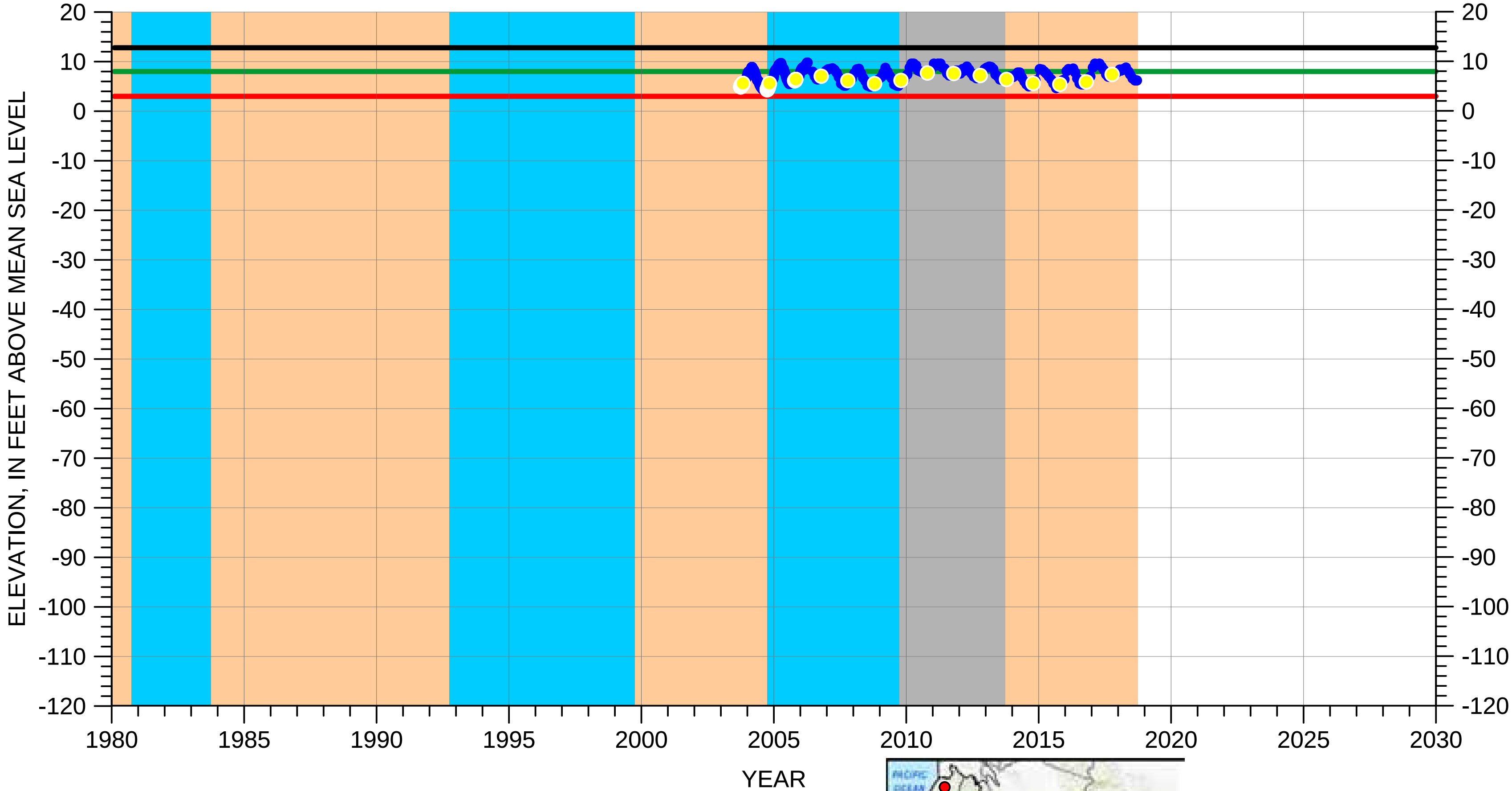
[1] Dates are relative to adoption of this Order, unless otherwise specified.

APPENDIX 8A

HYDROGRAPHS

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-21Q01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

CLIMATE PERIOD CLASSIFICATION

DRY
AVERAGE/ALTERNATING
WET

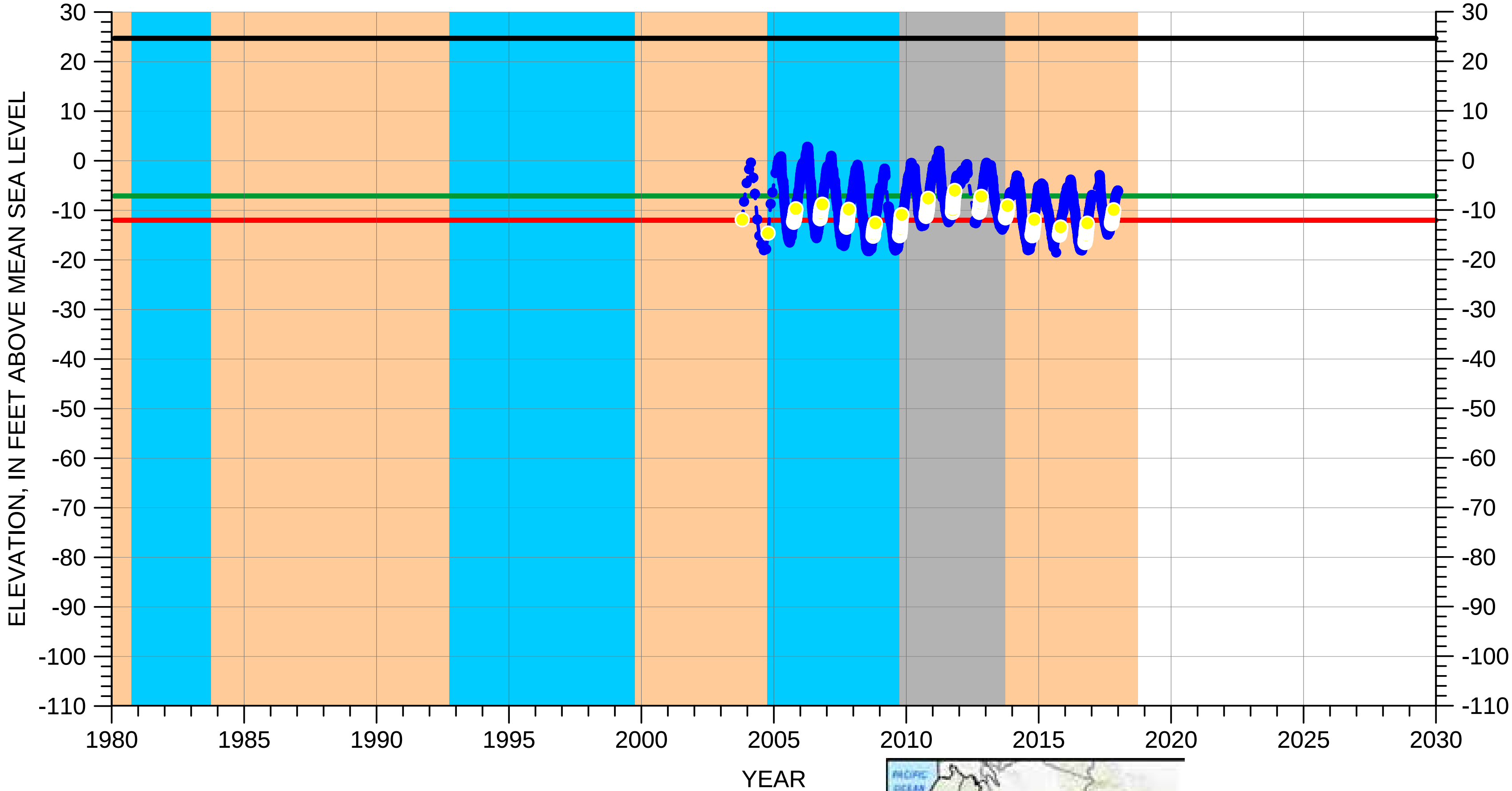
Perforated from
-92.2 to -142.2 feet msl

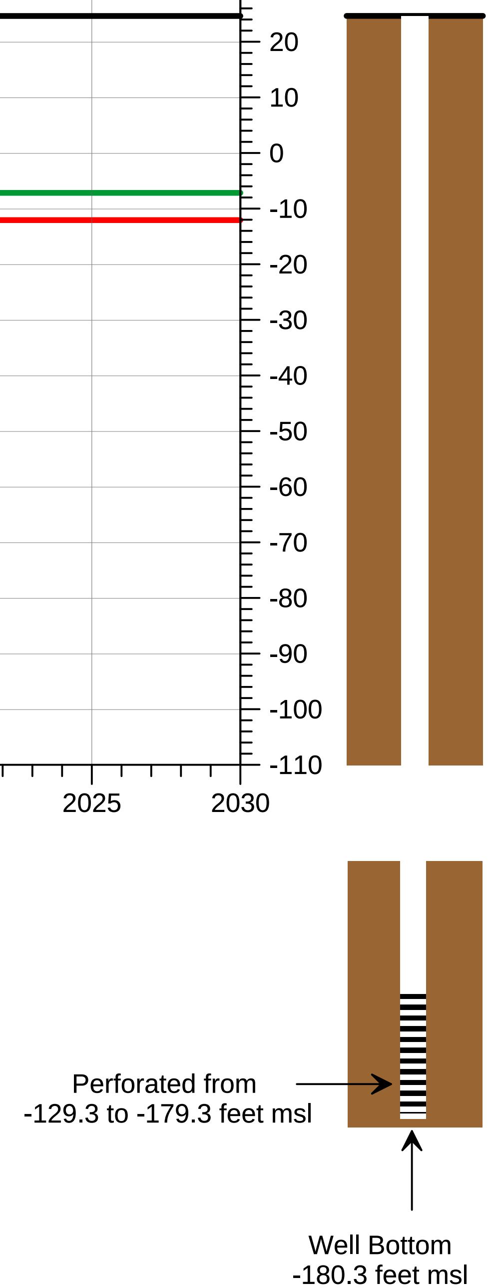
Well Bottom
-144.2 feet msl

H:\Salinas Valley\GSP\analysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\13S_02E-21Q01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

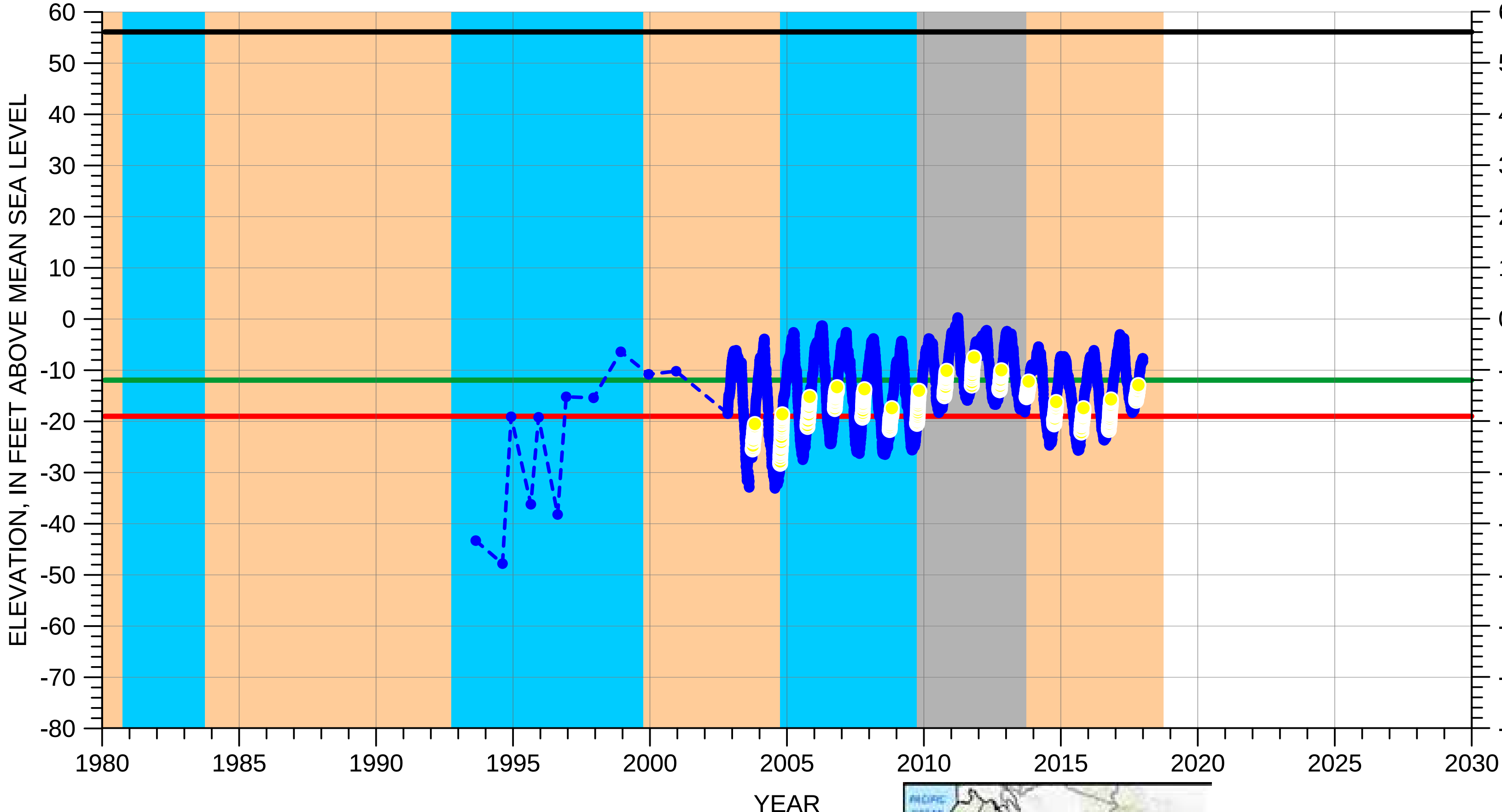
CLIMATE PERIOD CLASSIFICATION

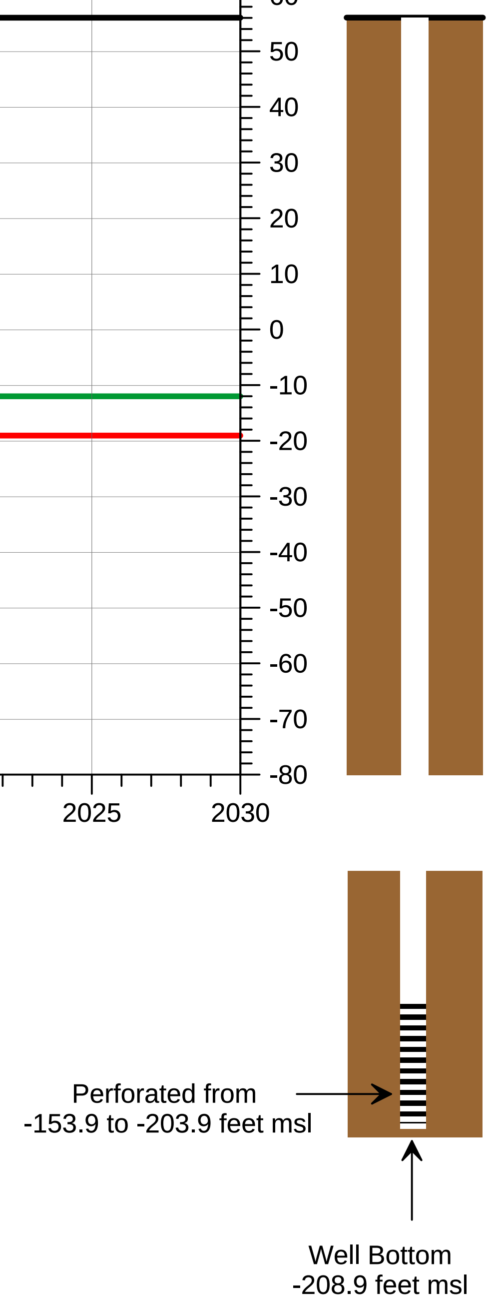
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-03F04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

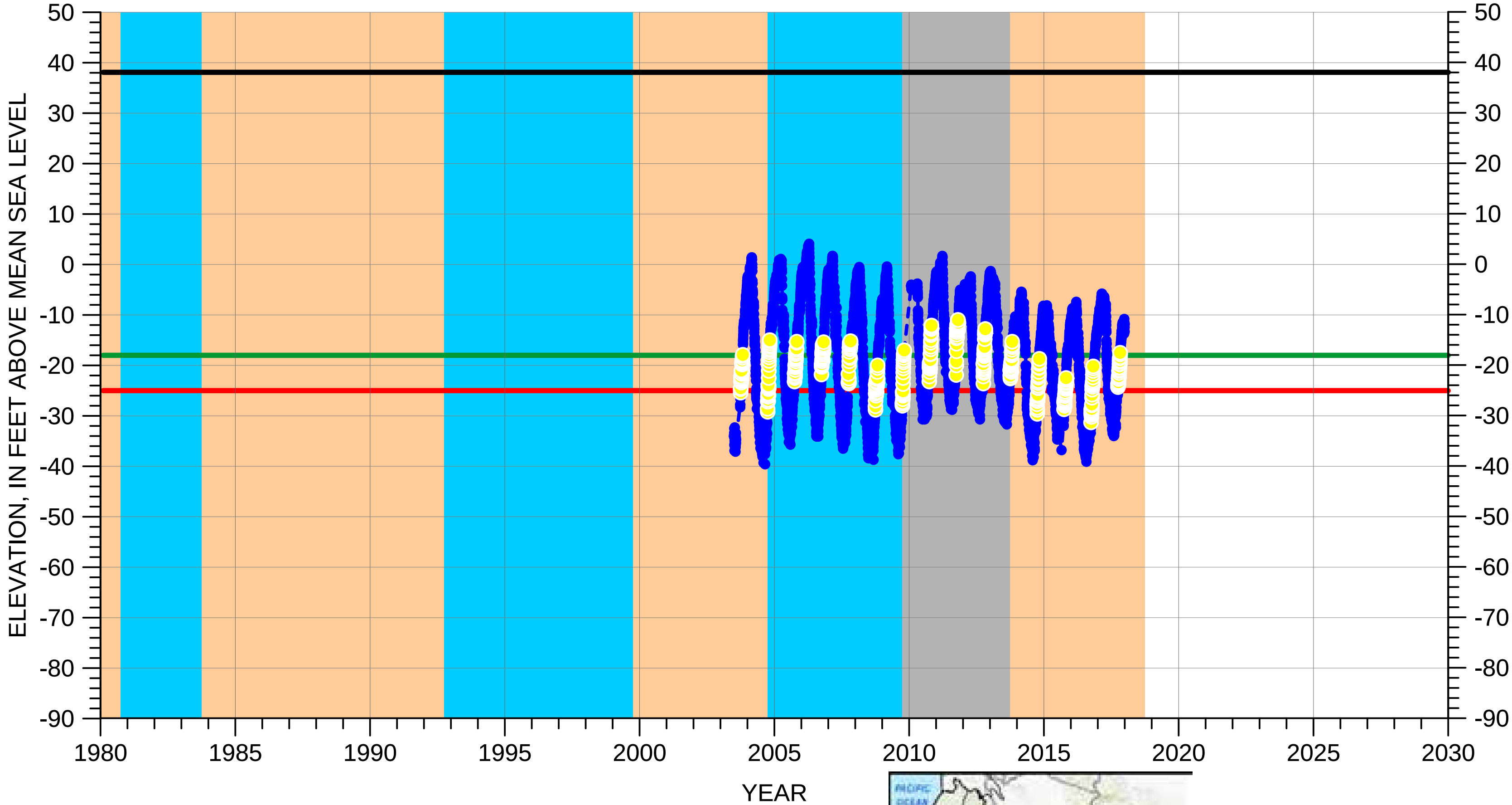
CLIMATE PERIOD CLASSIFICATION

DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-12B02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-26H01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



Perforated from
-248.9 to -298.9 feet msl

Well Bottom
-300.9 feet msl

EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

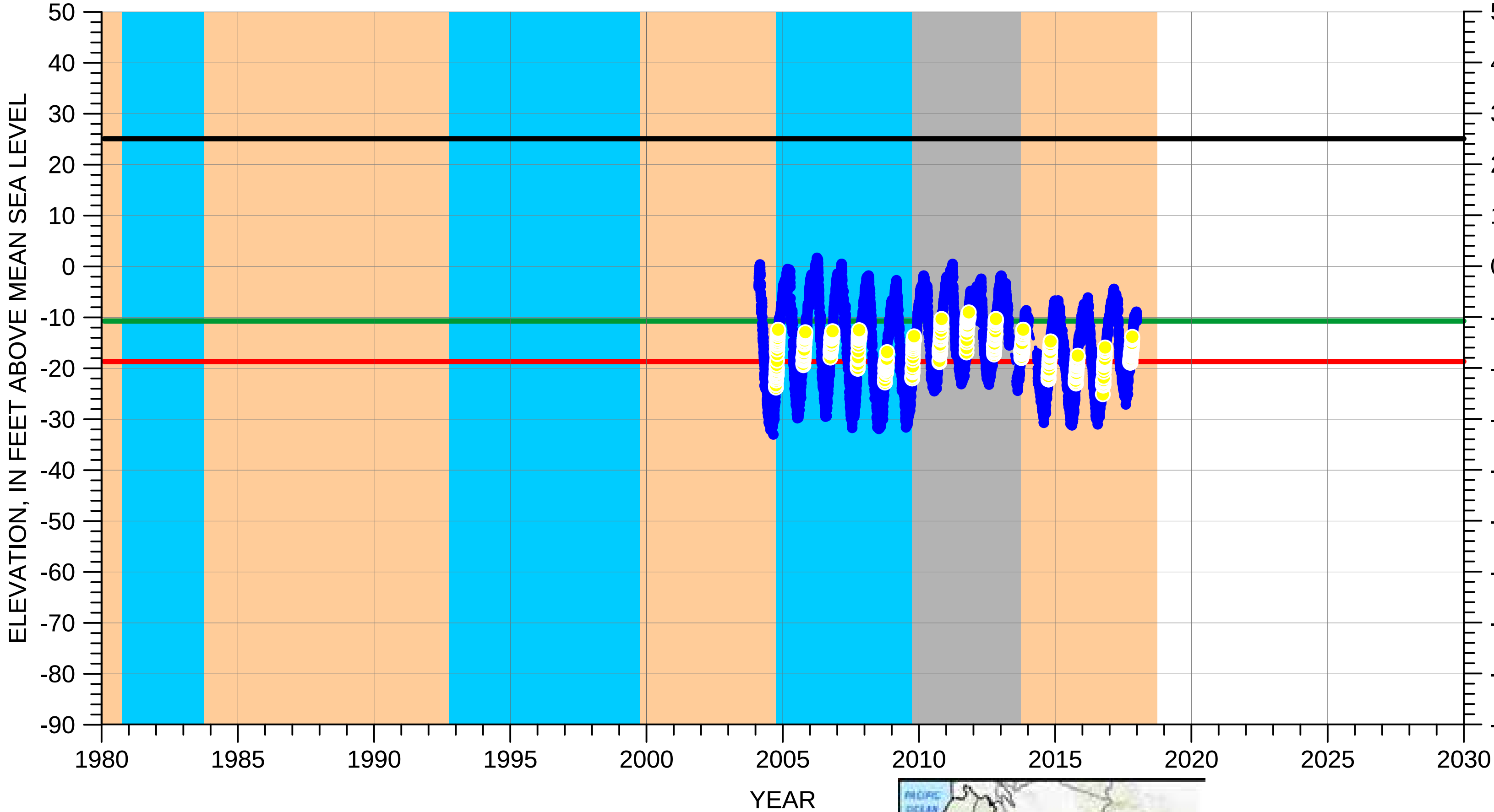
CLIMATE PERIOD CLASSIFICATION

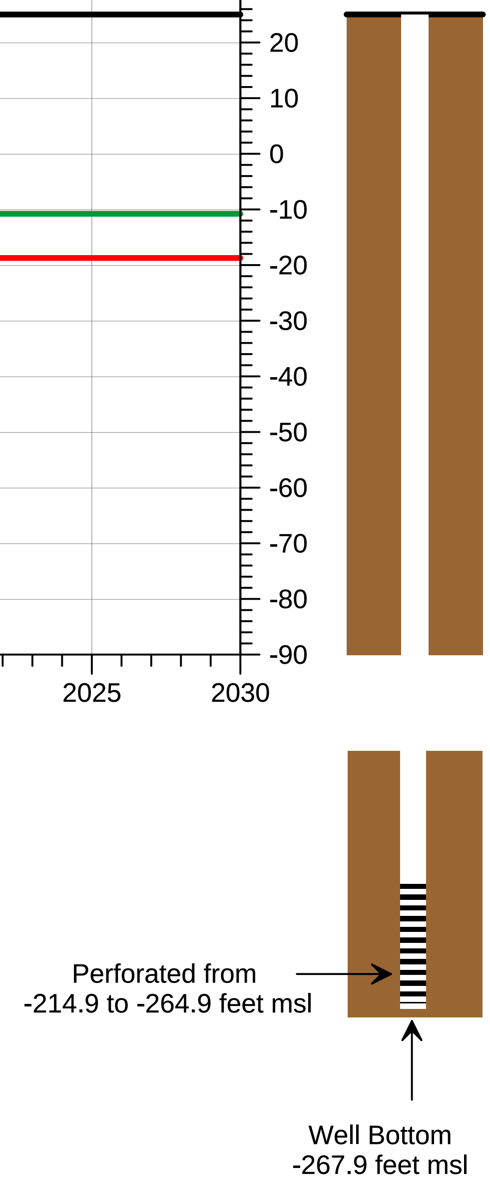
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-26H01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-27A01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

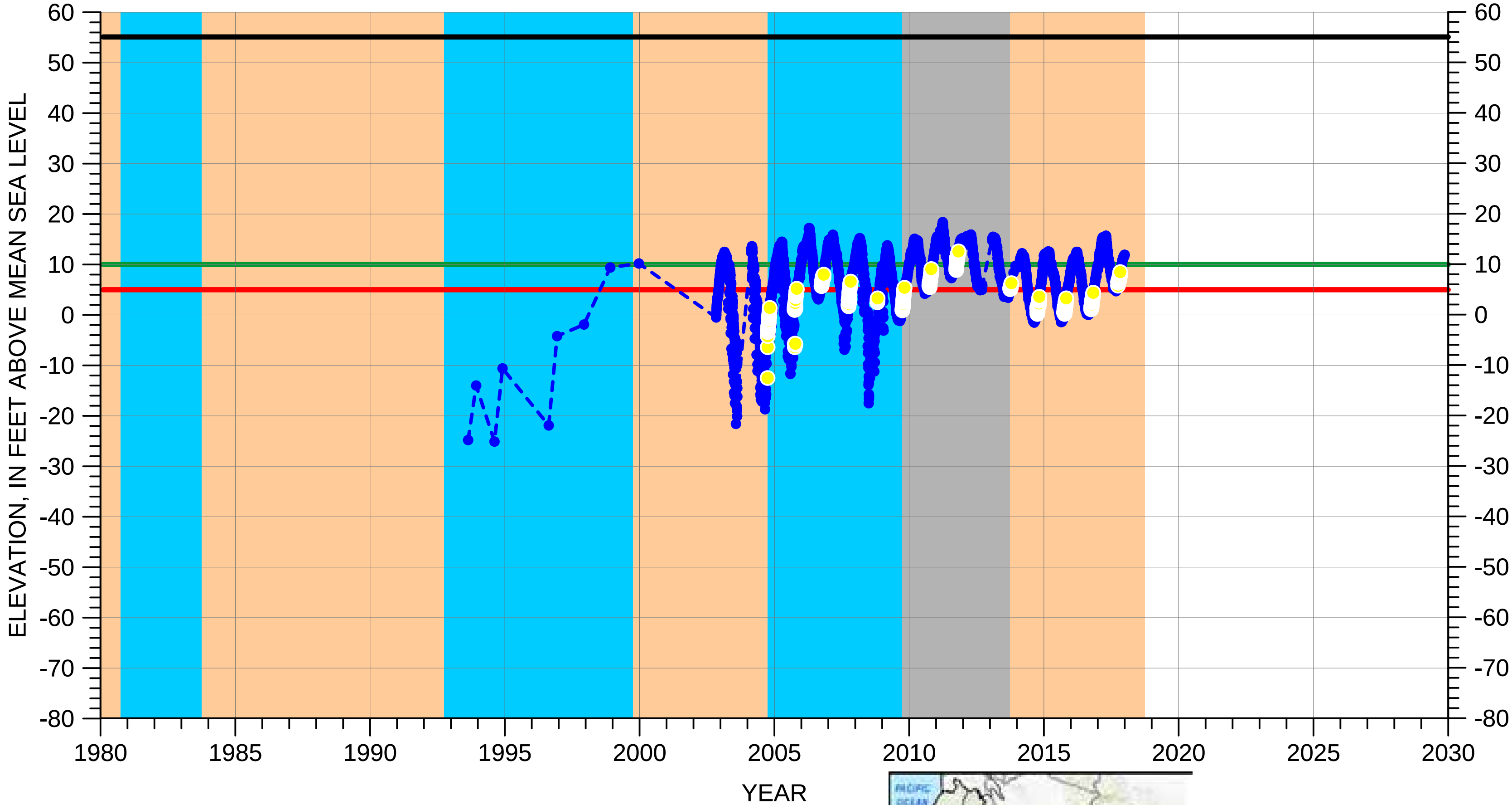
CLIMATE PERIOD CLASSIFICATION

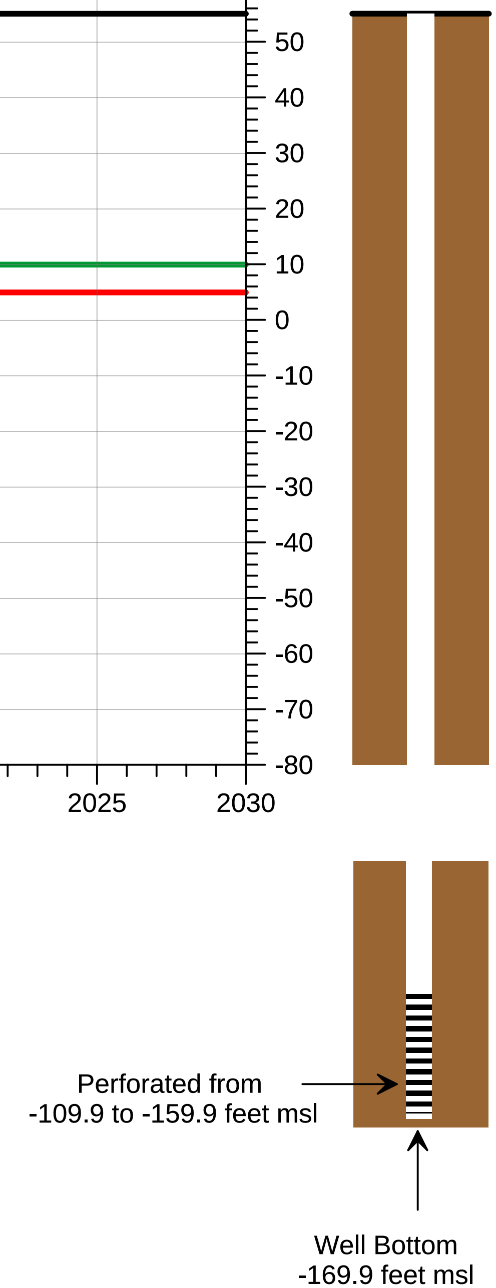
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSP\analysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-27A01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

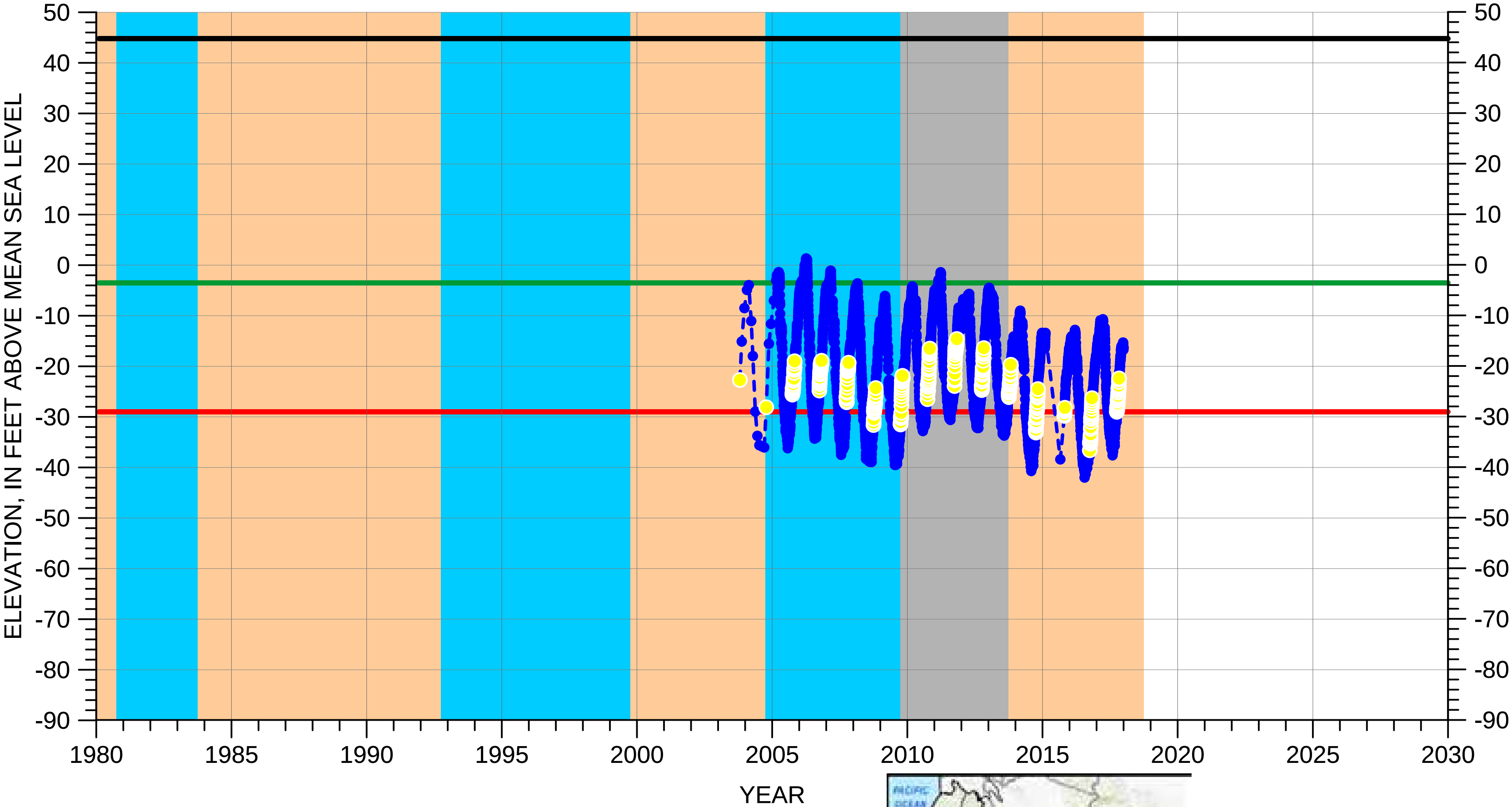
CLIMATE PERIOD CLASSIFICATION

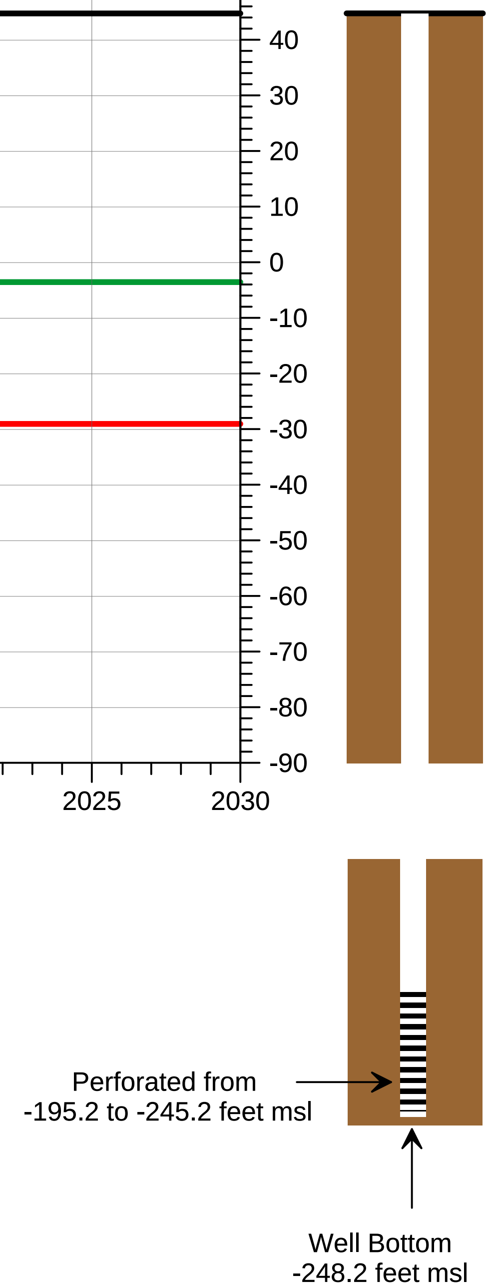
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_03E-18C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-30G08

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

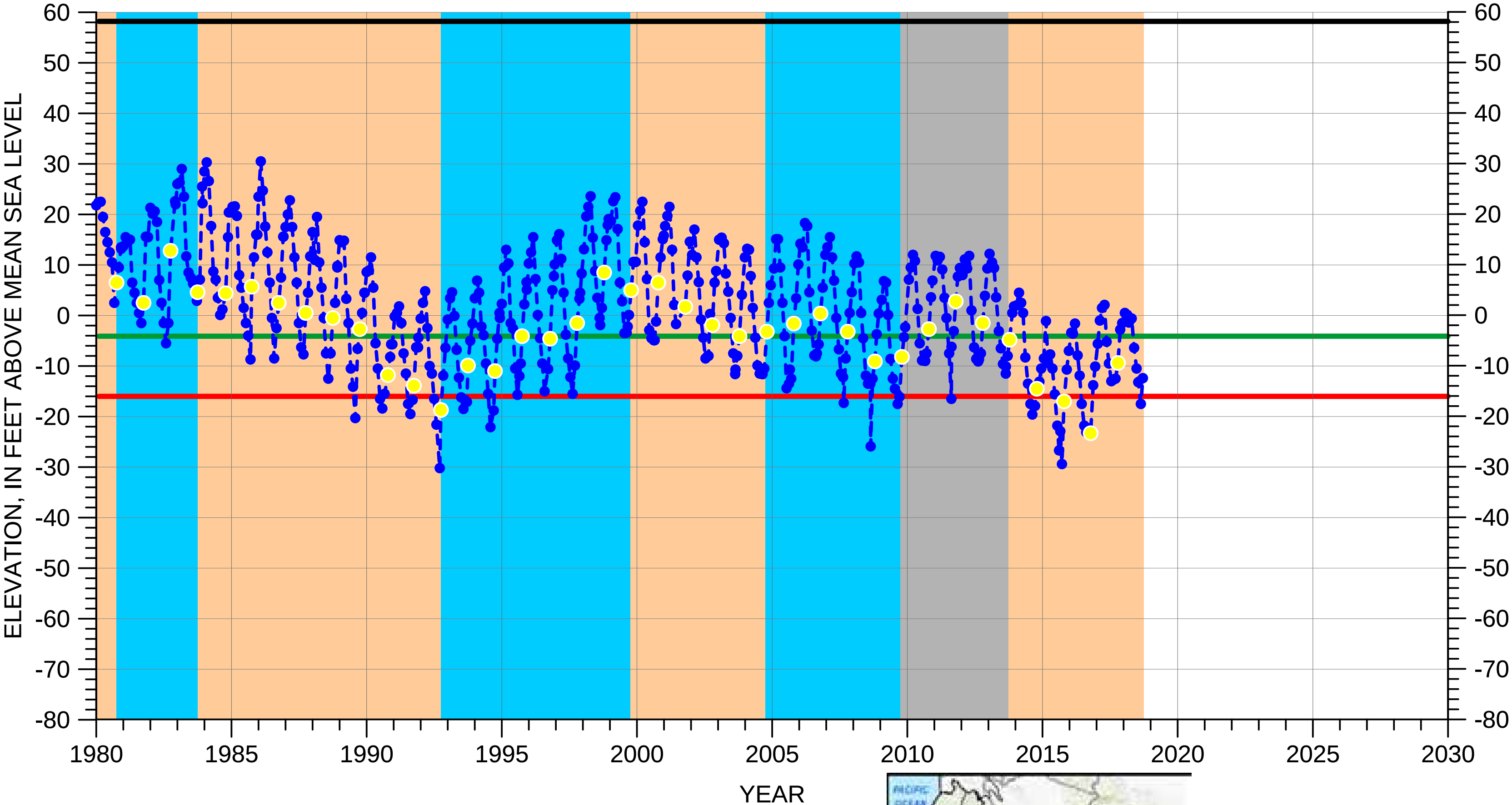
CLIMATE PERIOD CLASSIFICATION

- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_03E-30G08.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-16M01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

CLIMATE PERIOD CLASSIFICATION

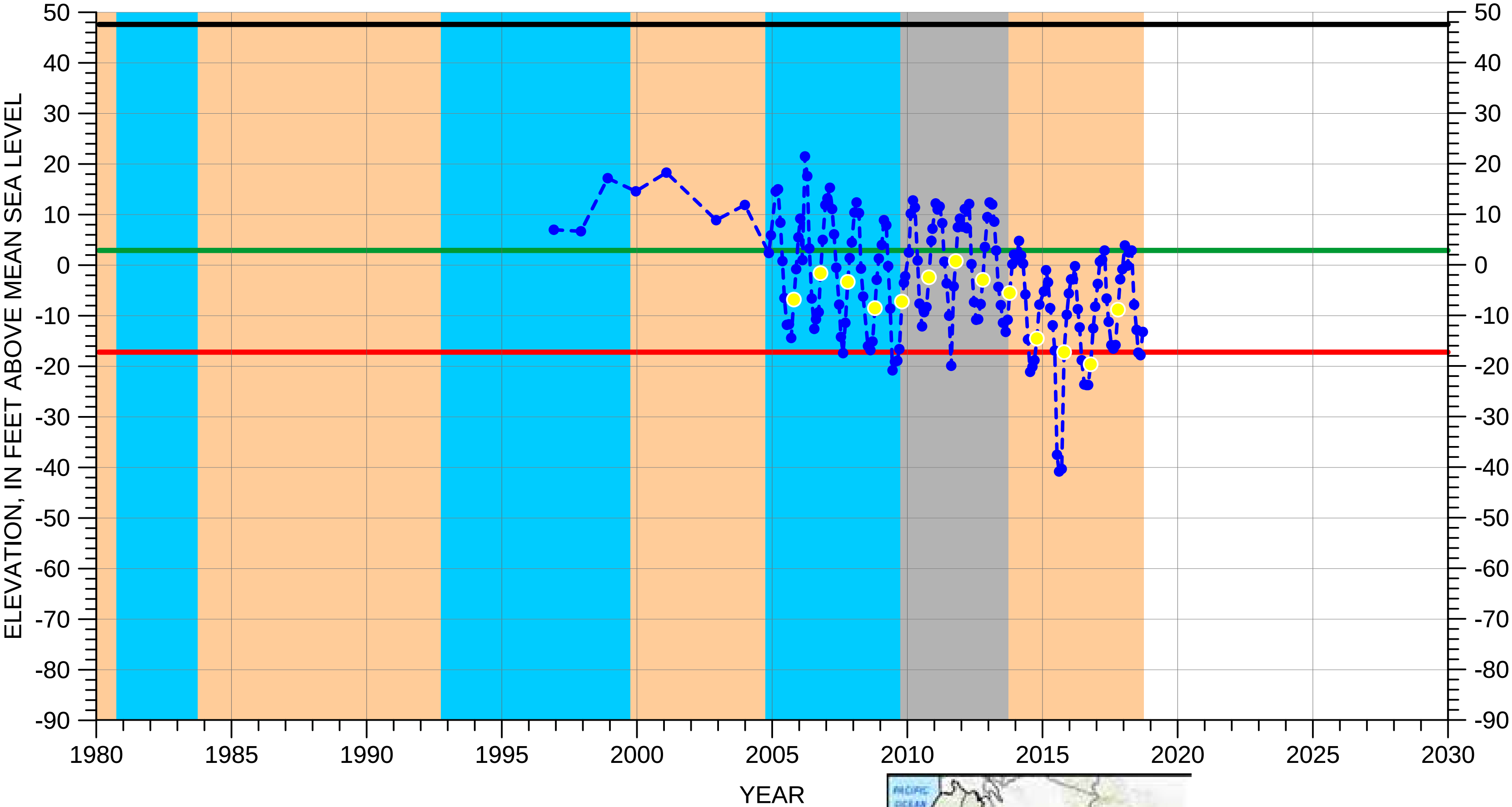
- DRY
- AVERAGE/ALTERNATING
- WET

Perforated interval unknown

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\15S_03E-16M01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-17M01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)



EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

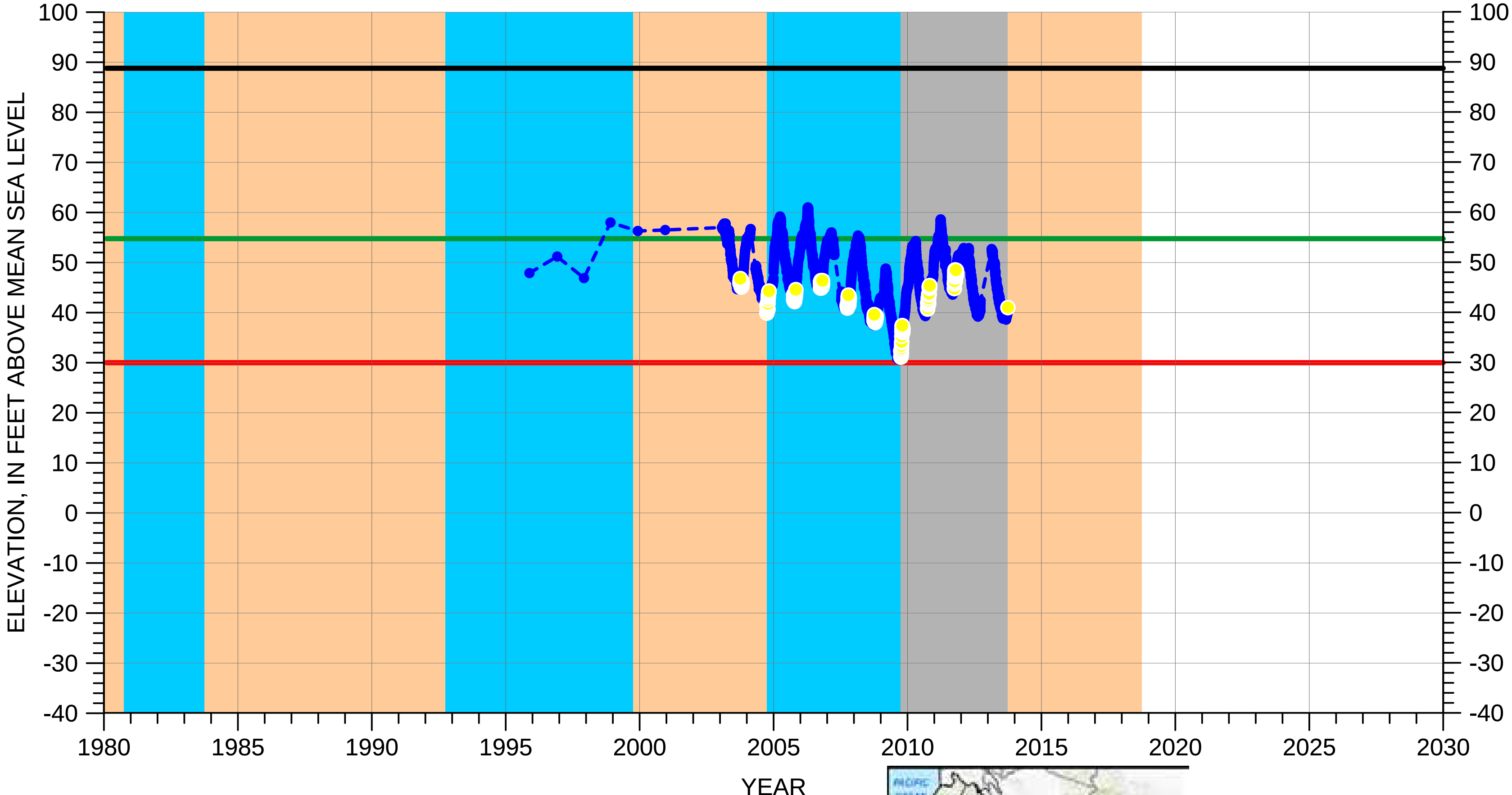
CLIMATE PERIOD CLASSIFICATION

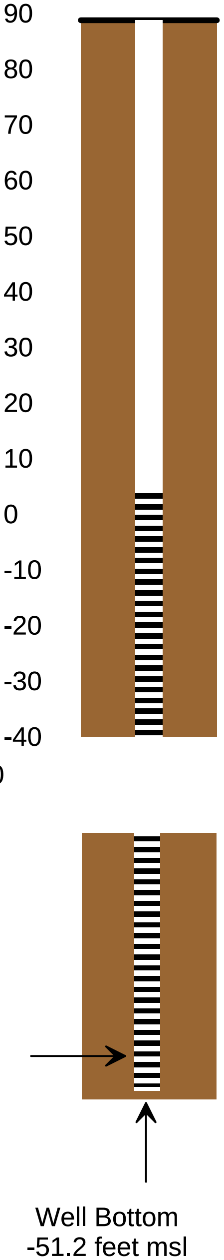
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\15S_03E-17M01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H04

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

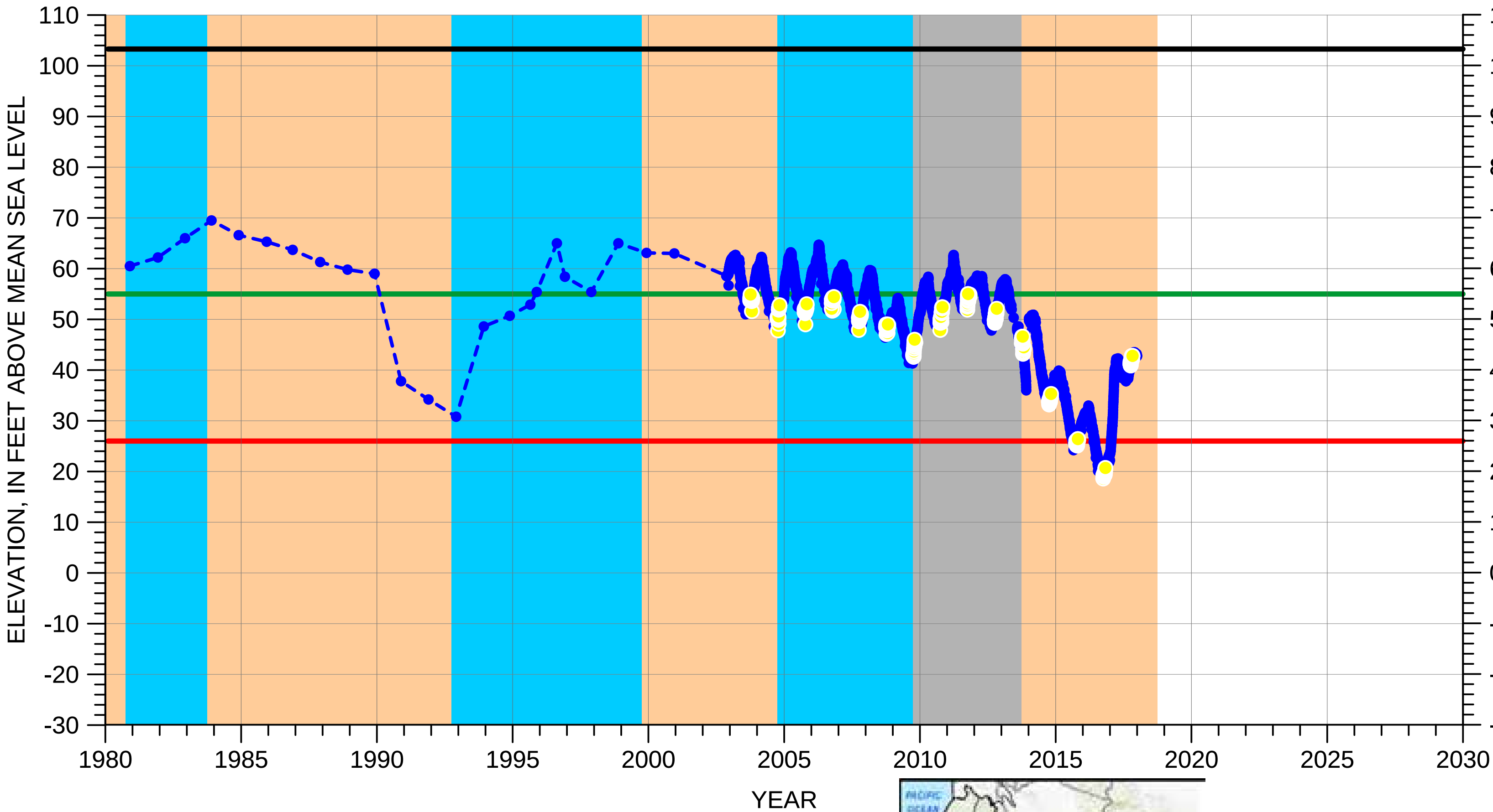
CLIMATE PERIOD CLASSIFICATION

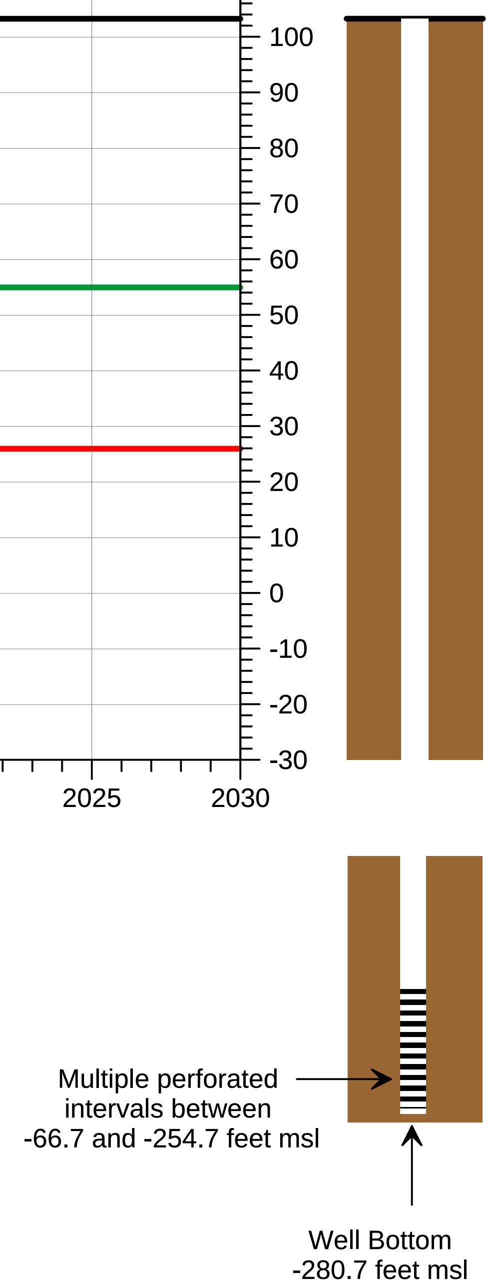
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\16S_04E-08H04.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-15D01

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

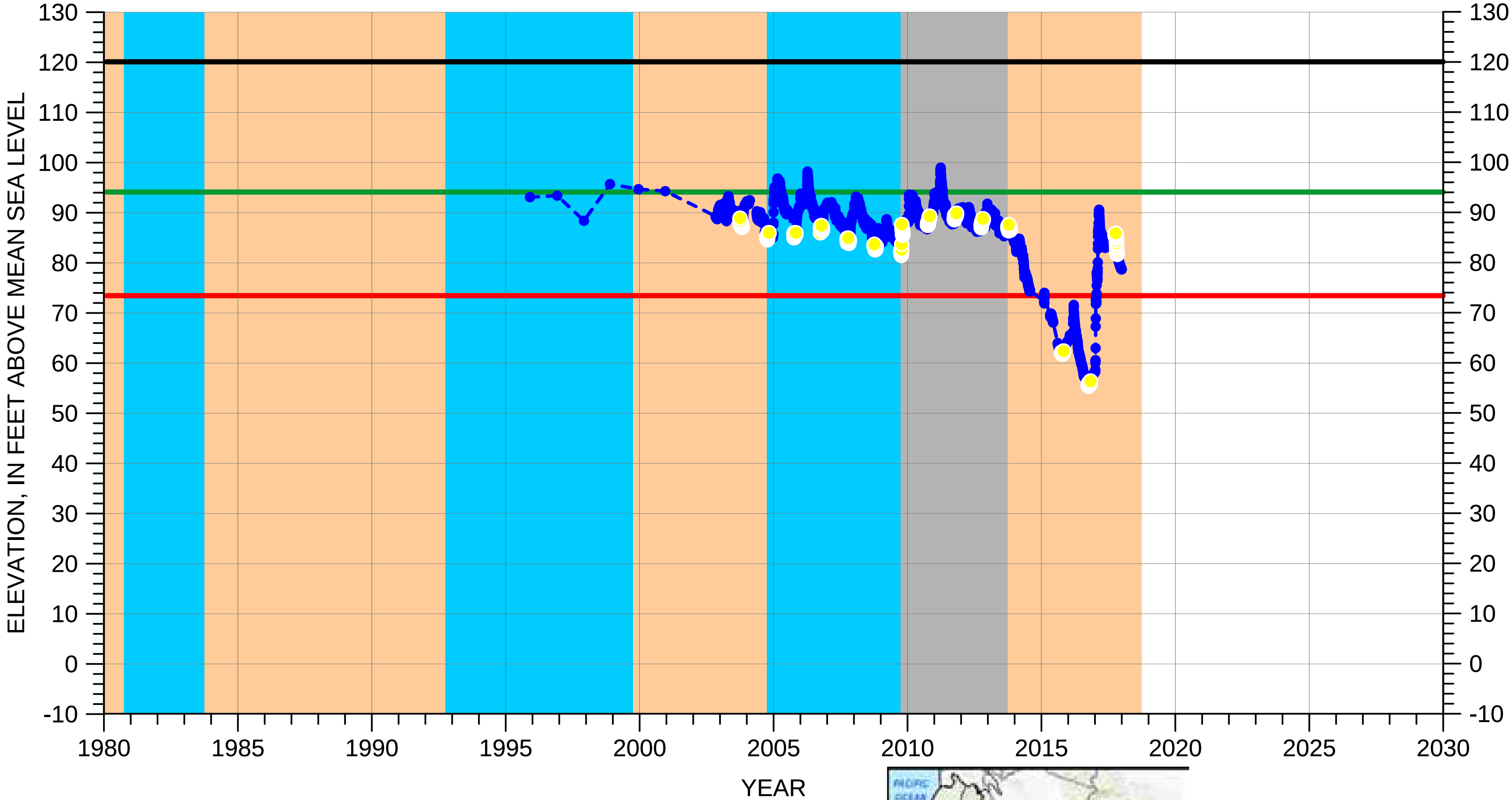
CLIMATE PERIOD CLASSIFICATION

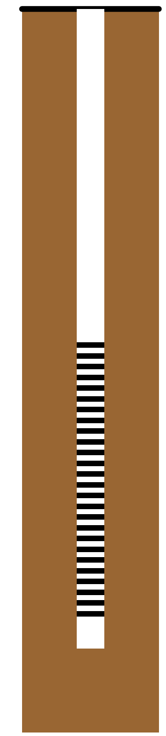
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\16S_04E-15D01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C02

180/400-Foot Aquifer Subbasin
(180-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

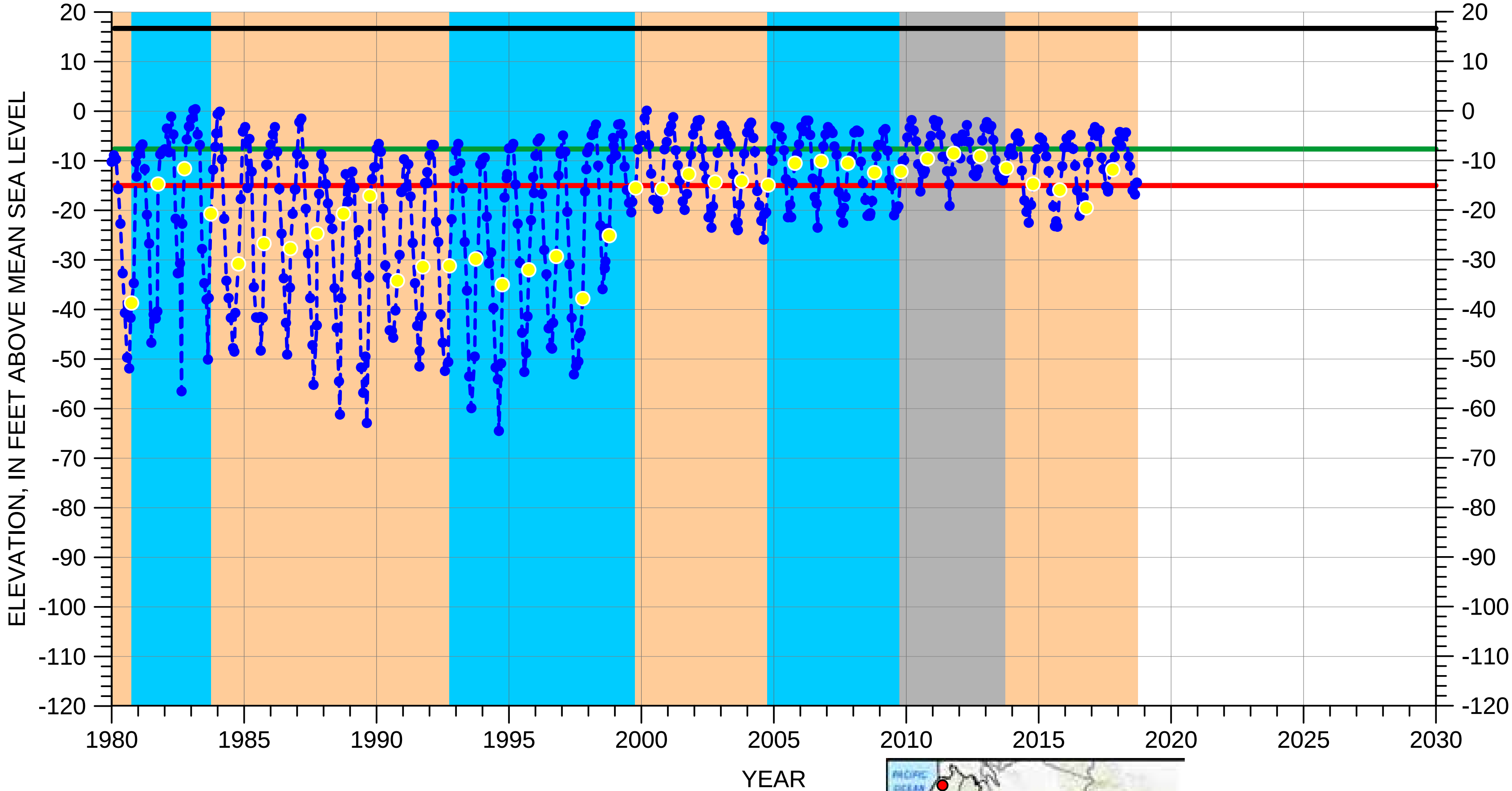
CLIMATE PERIOD CLASSIFICATION

- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\17S_05E-06C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-21N01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)

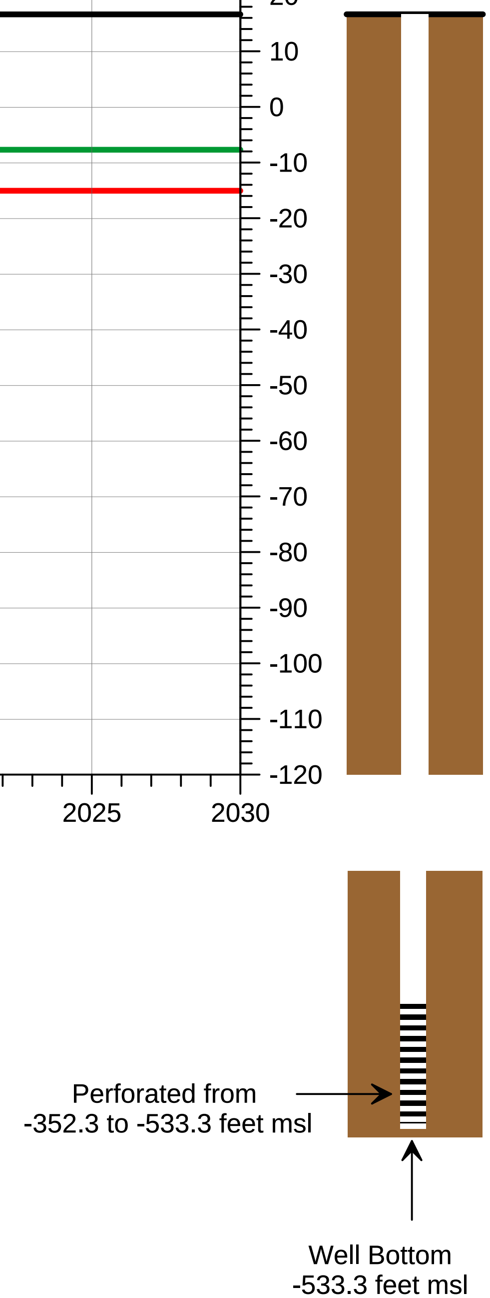


EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

CLIMATE PERIOD CLASSIFICATION

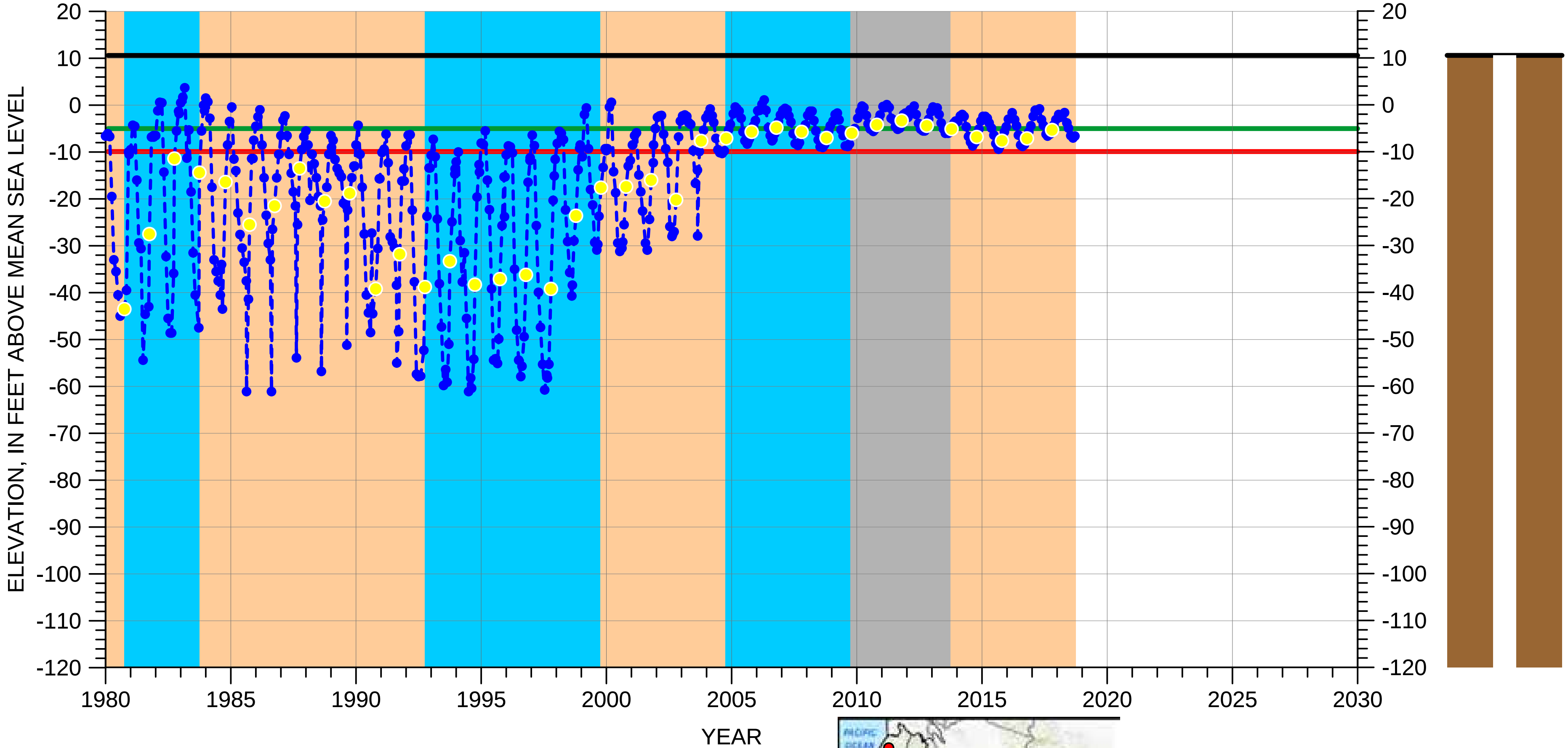
DRY
AVERAGE/ALTERNATING
WET

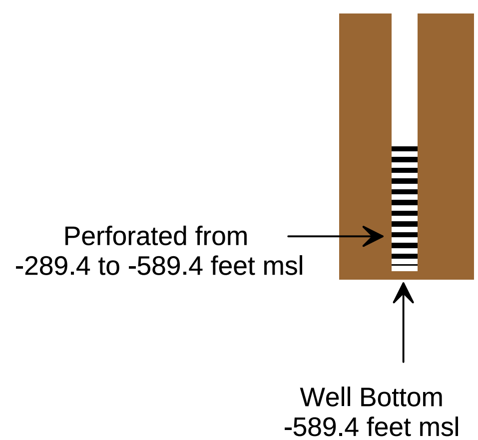


H:\Salinas Valley\GSPanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\13S_02E-21N01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-32A02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

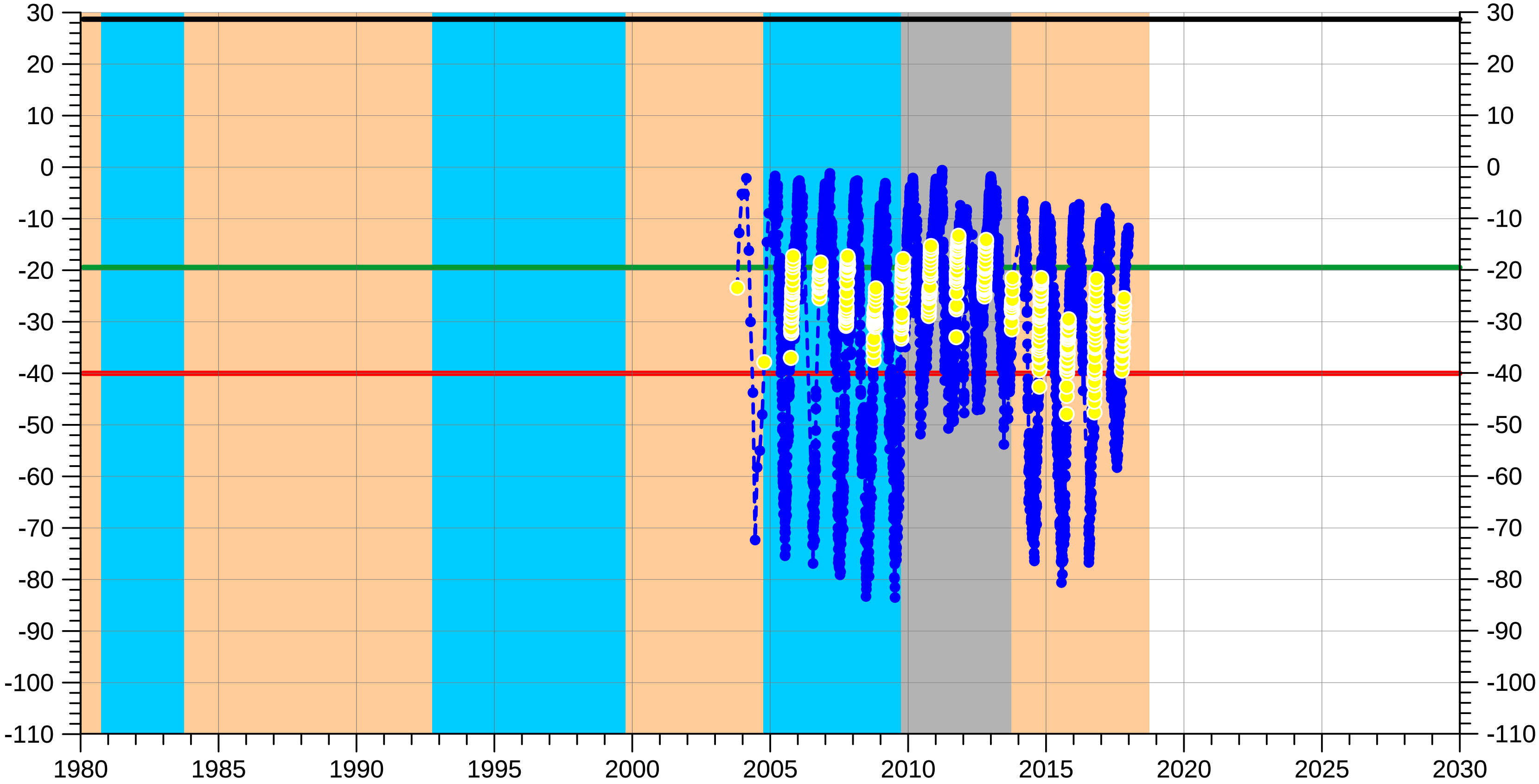
CLIMATE PERIOD CLASSIFICATION

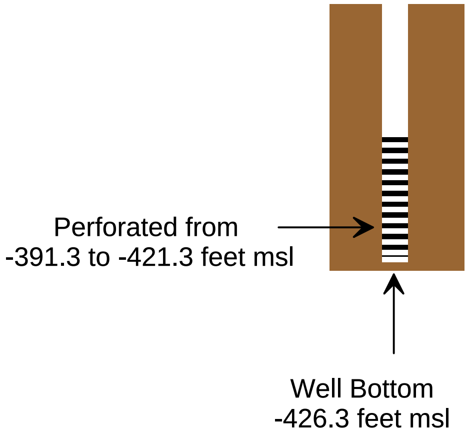
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSP\analysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\13S_02E-32A02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-03F03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

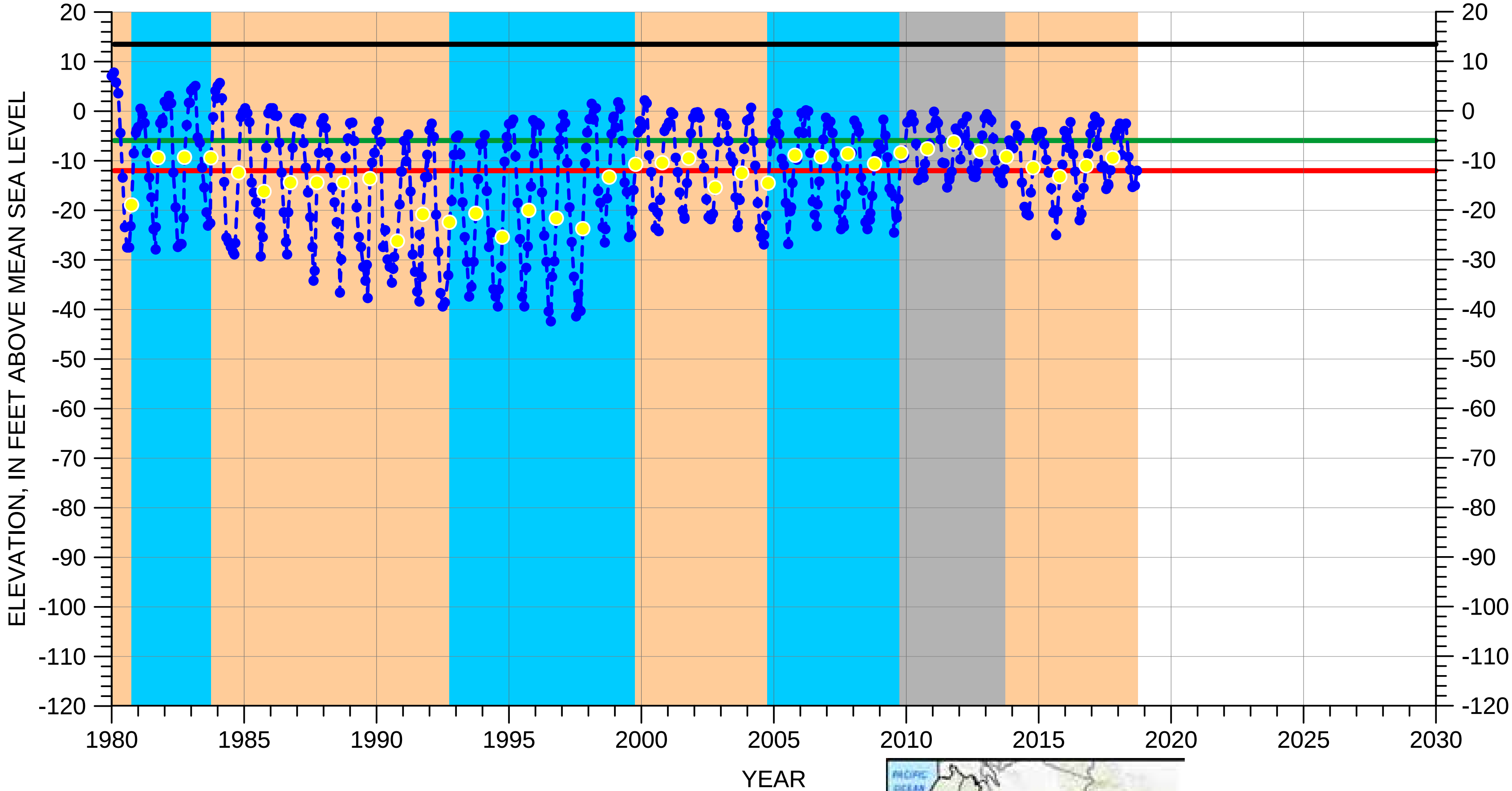
CLIMATE PERIOD CLASSIFICATION

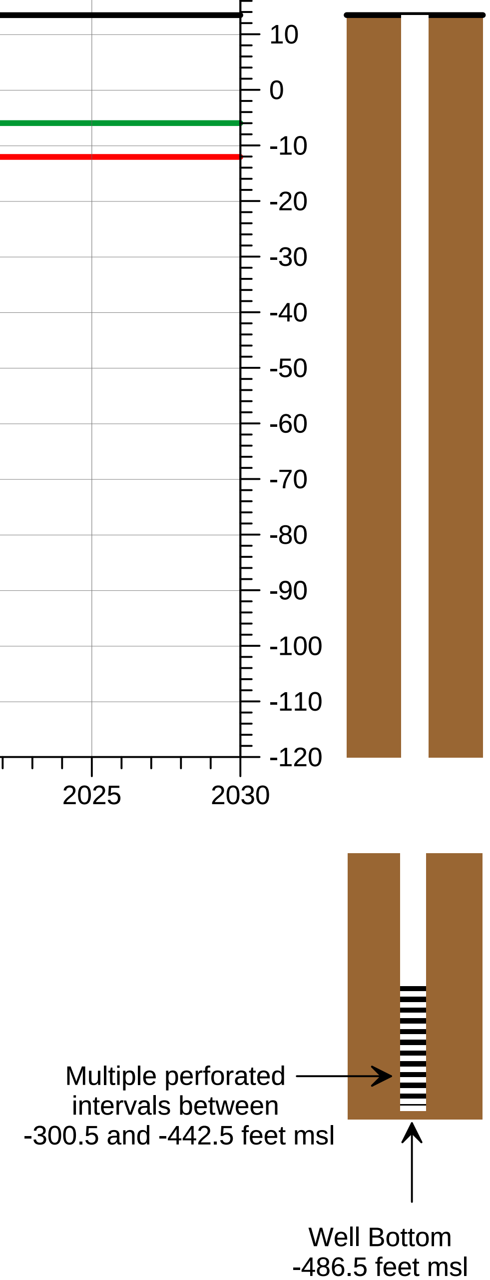
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-03F03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-08M02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

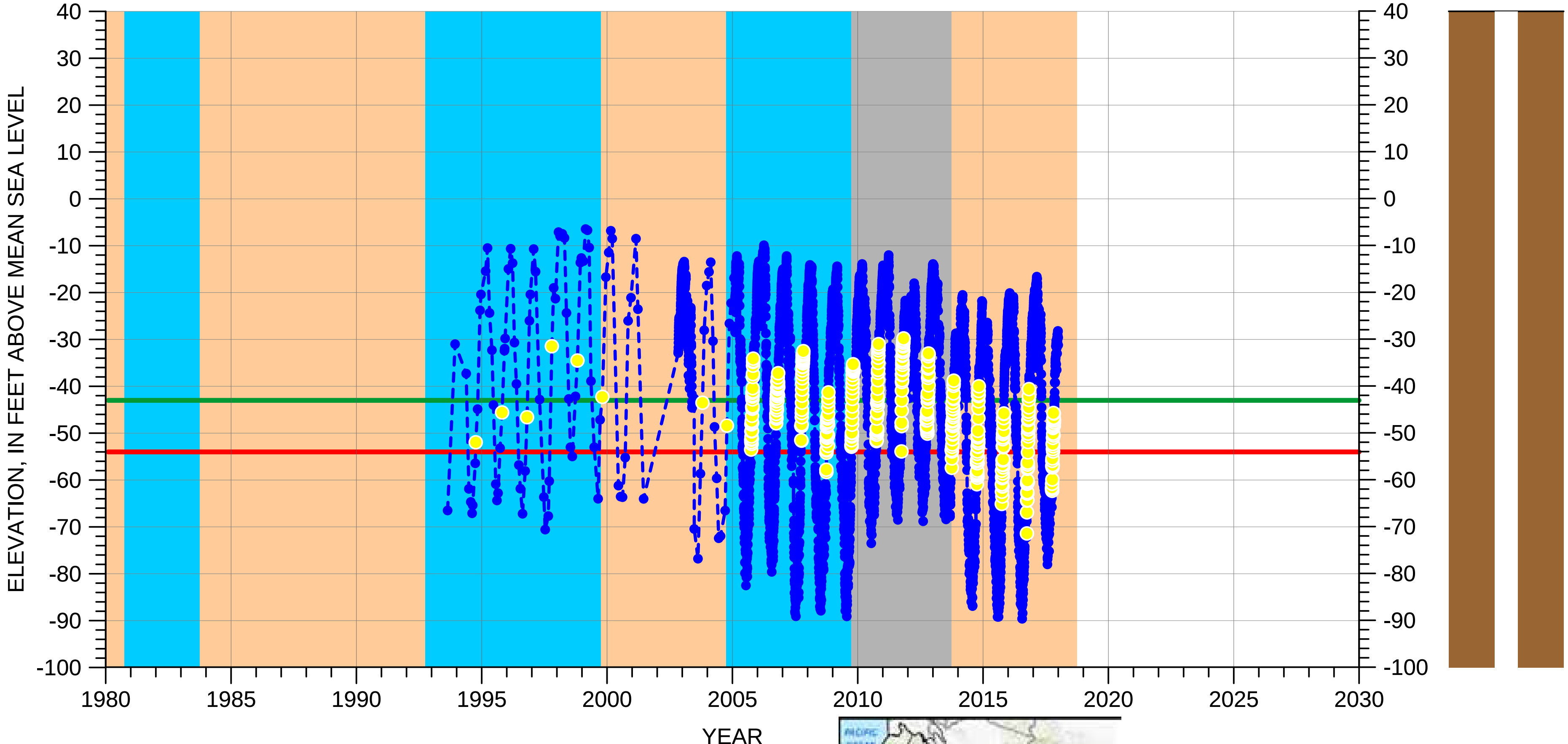
CLIMATE PERIOD CLASSIFICATION

DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-08M02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12B03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)

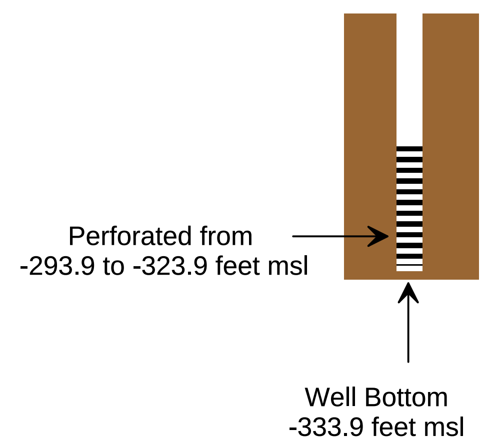


EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE (56.1 FT MSL)
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

CLIMATE PERIOD CLASSIFICATION

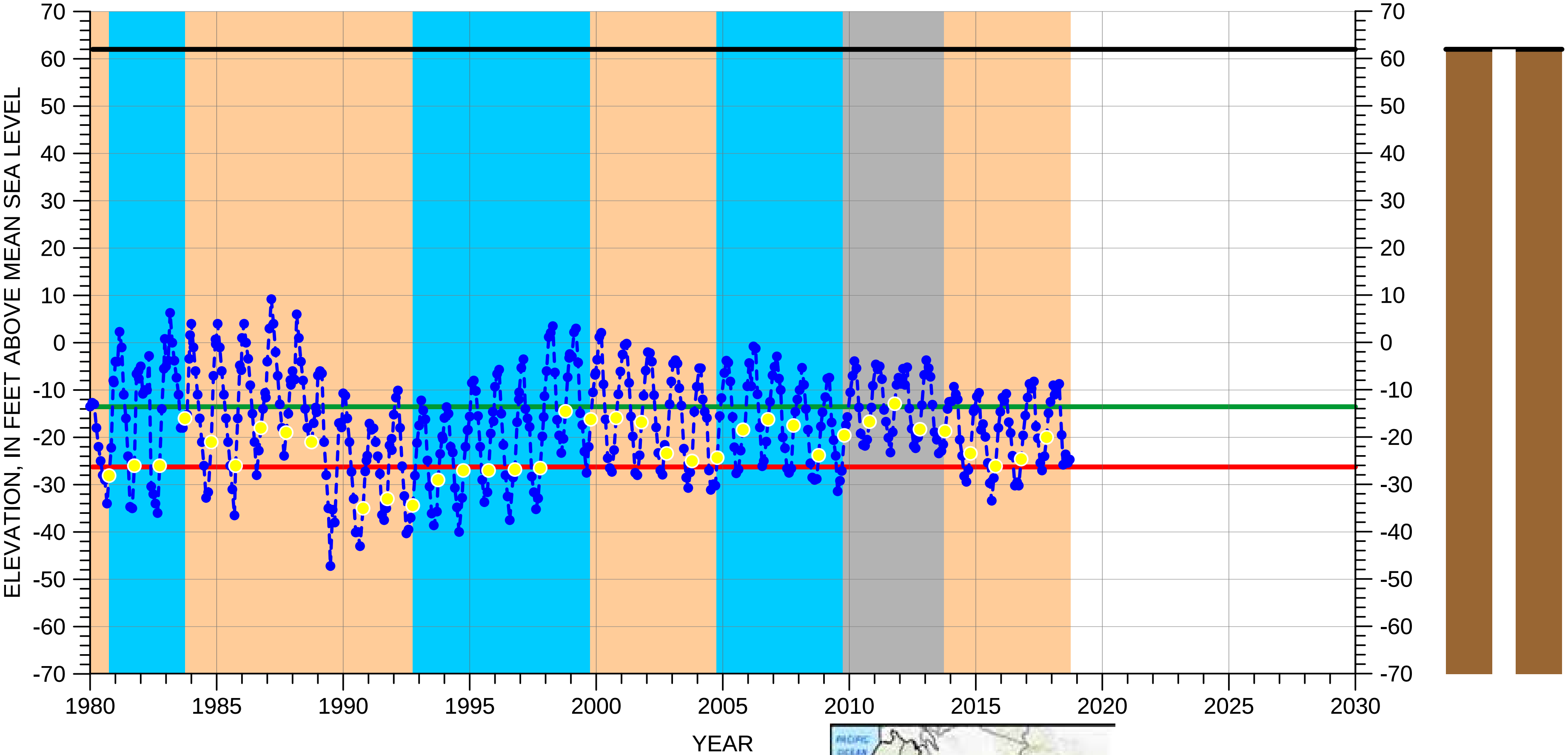
DRY
AVERAGE/ALTERNATING
WET

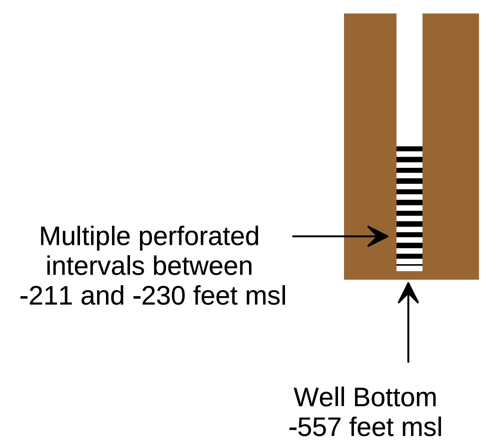


H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-12B03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/02E-12Q01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

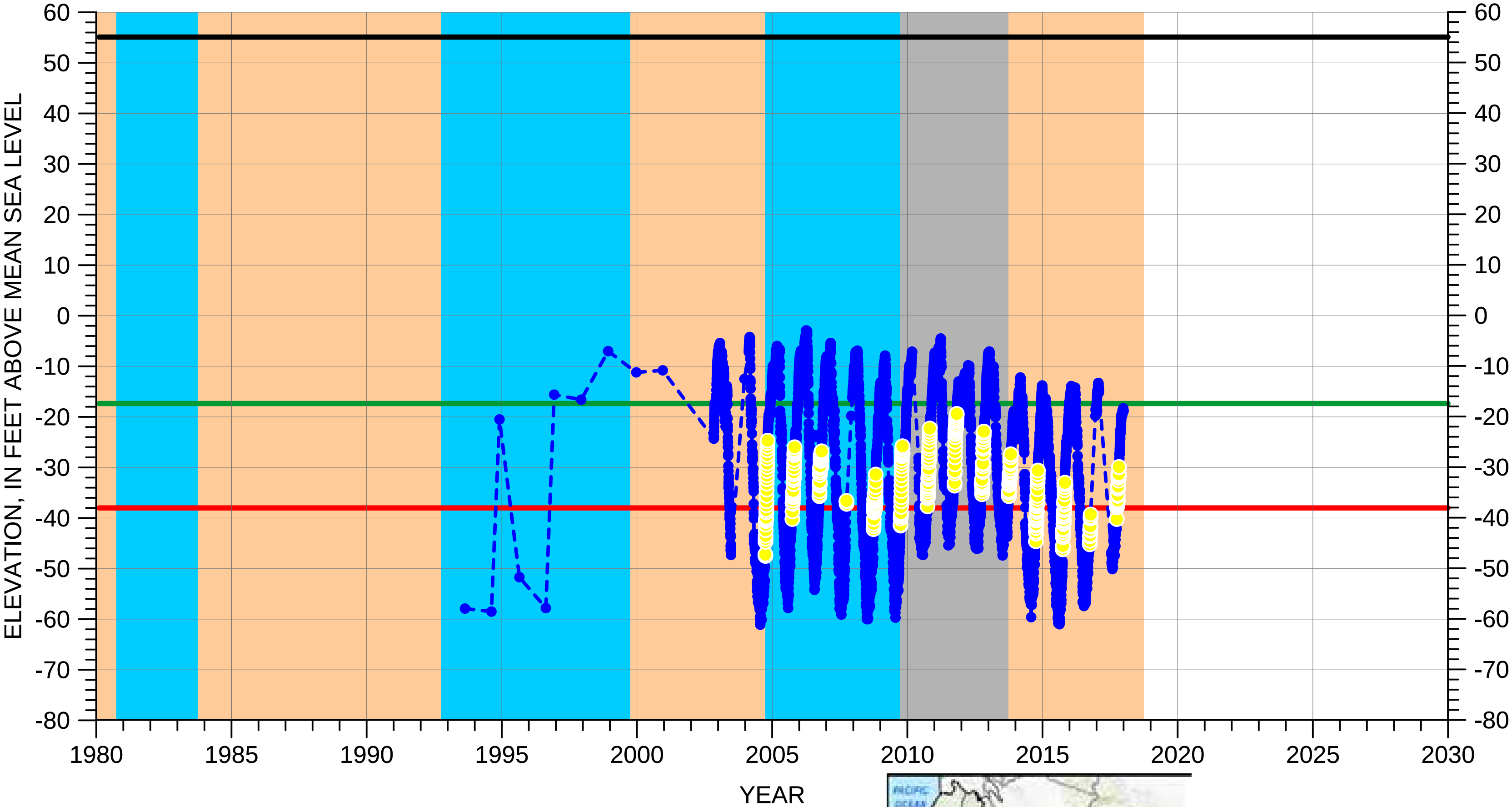
CLIMATE PERIOD CLASSIFICATION

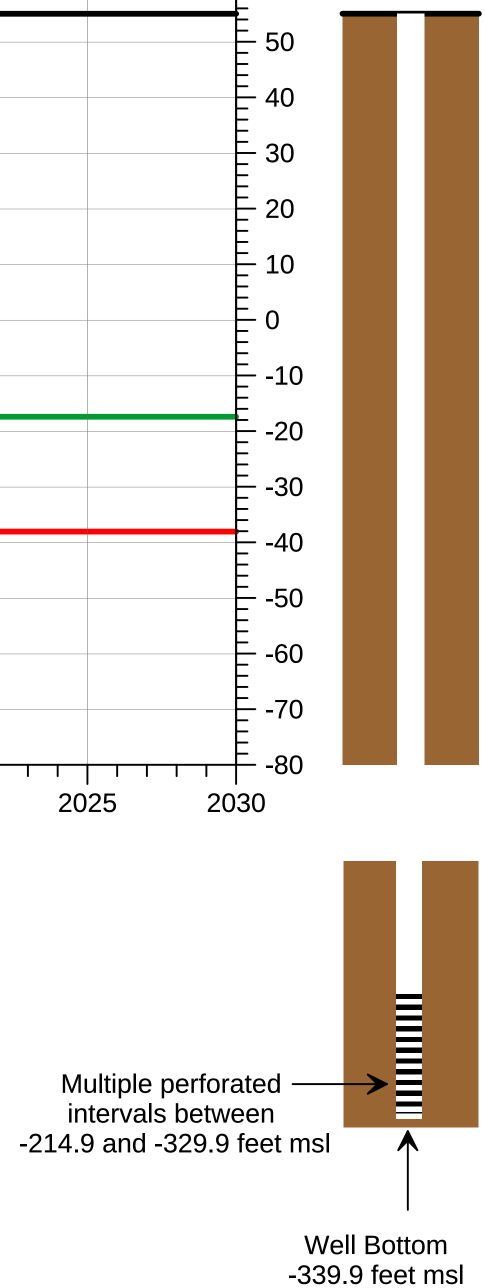
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_02E-12Q01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 14S/03E-18C02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

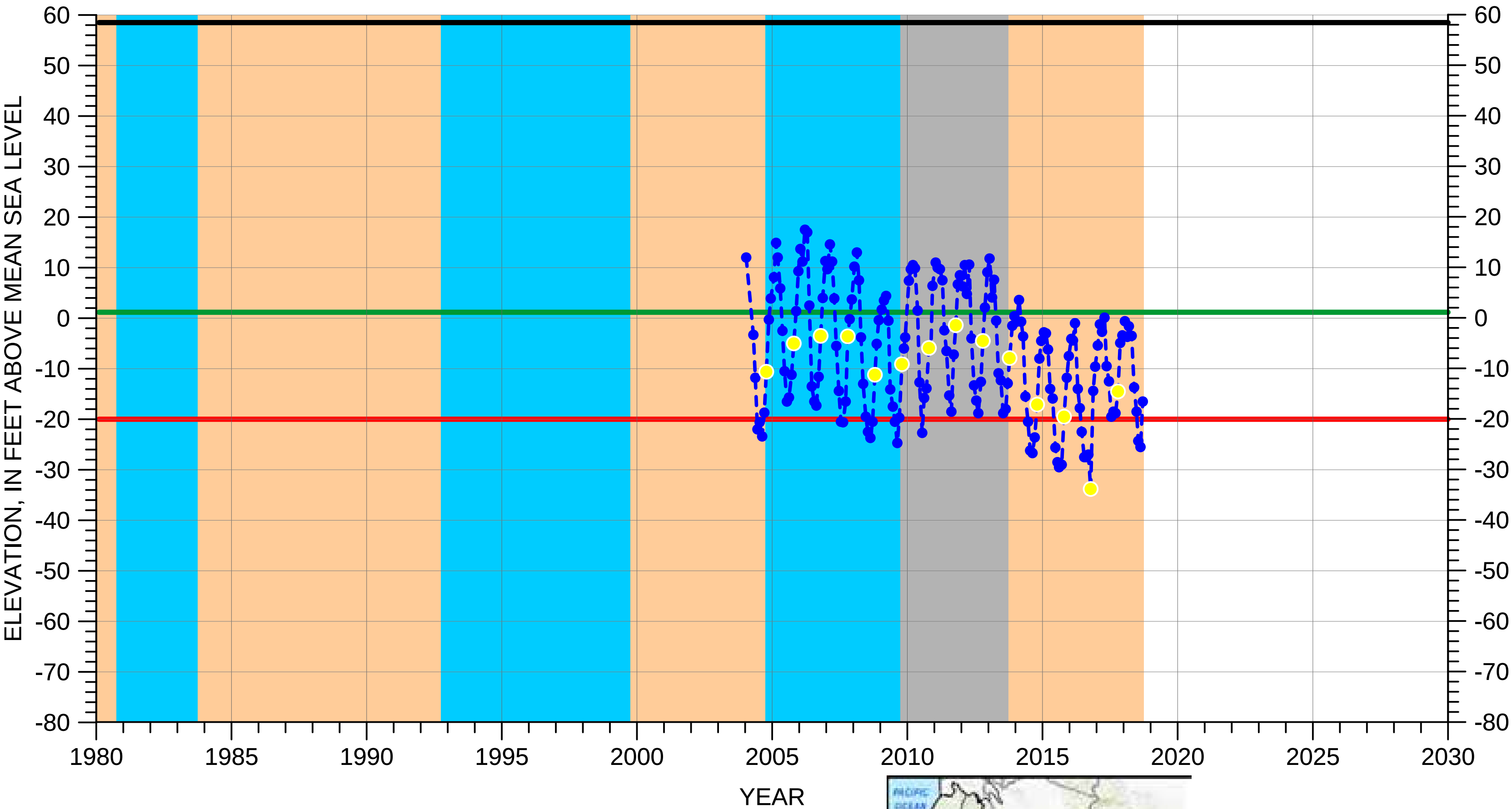
CLIMATE PERIOD CLASSIFICATION

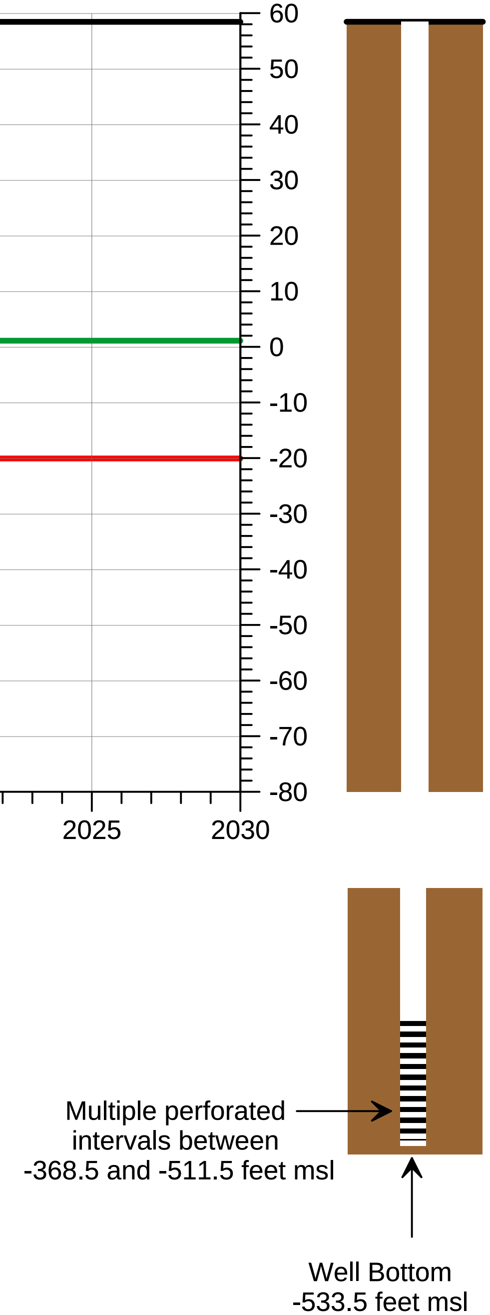
DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\14S_03E-18C02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 15S/03E-16F02

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

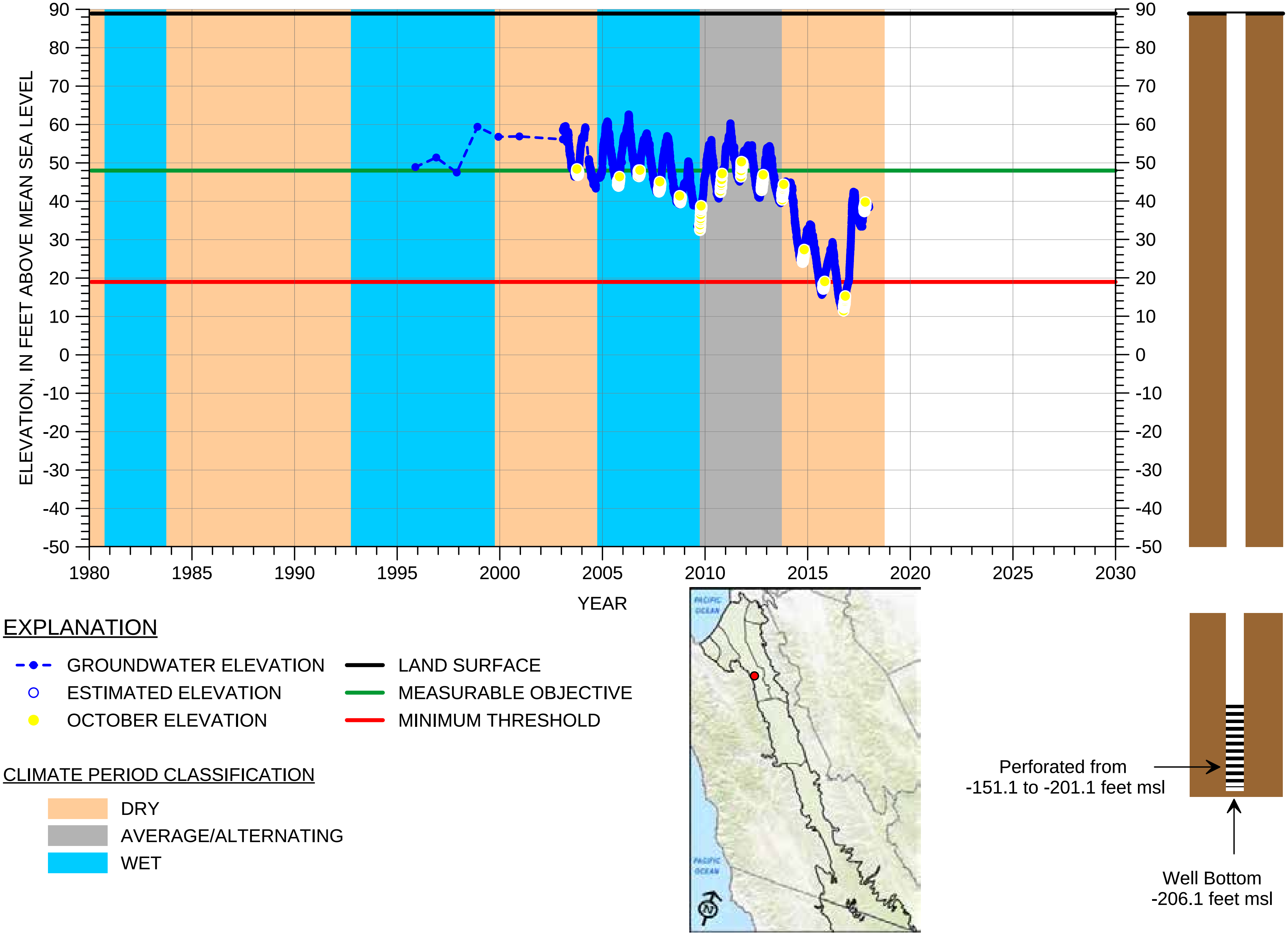
CLIMATE PERIOD CLASSIFICATION

DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\15S_03E-16F02.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 16S/04E-08H03

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)



EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

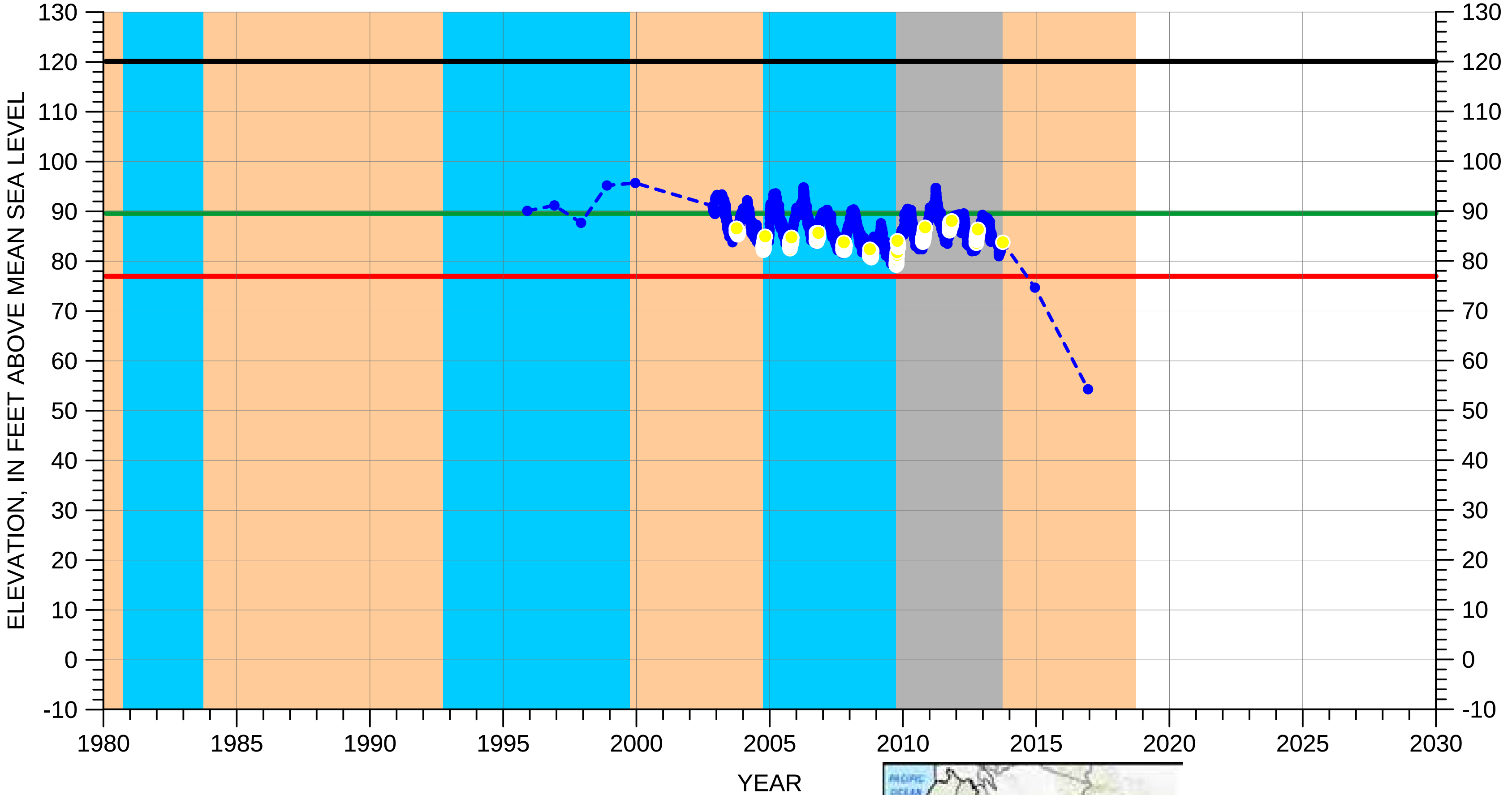
CLIMATE PERIOD CLASSIFICATION

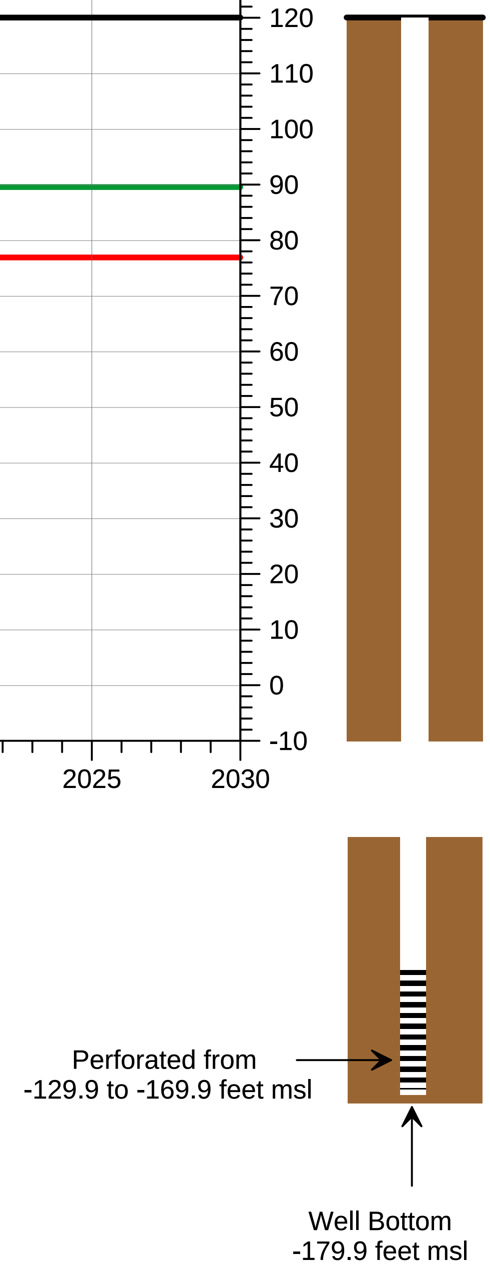
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\16S_04E-08H03.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 17S/05E-06C01

180/400-Foot Aquifer Subbasin
(400-Foot Aquifer)





EXPLANATION

- GROUNDWATER ELEVATION
- ESTIMATED ELEVATION
- OCTOBER ELEVATION
- LAND SURFACE
- MEASURABLE OBJECTIVE
- MINIMUM THRESHOLD

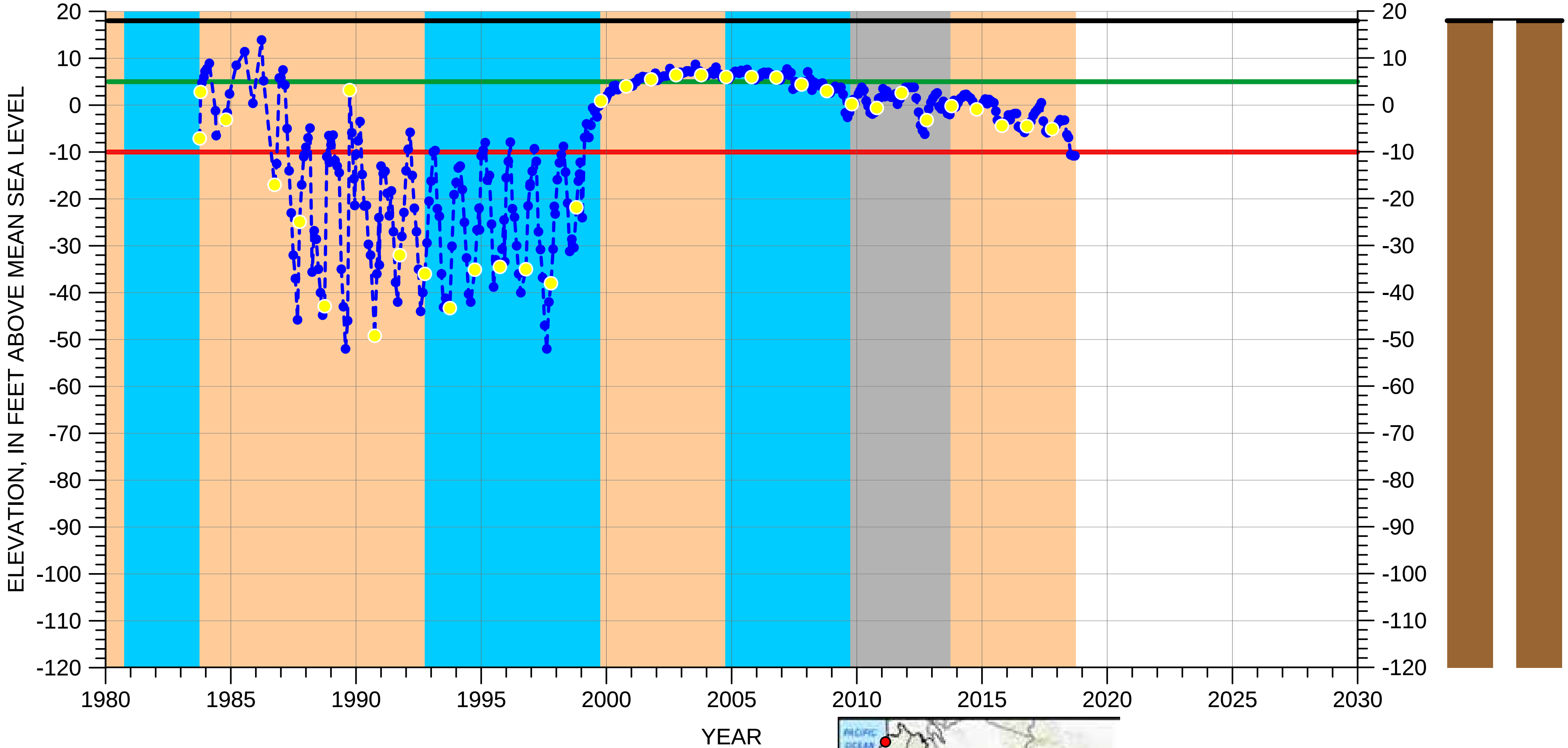
CLIMATE PERIOD CLASSIFICATION

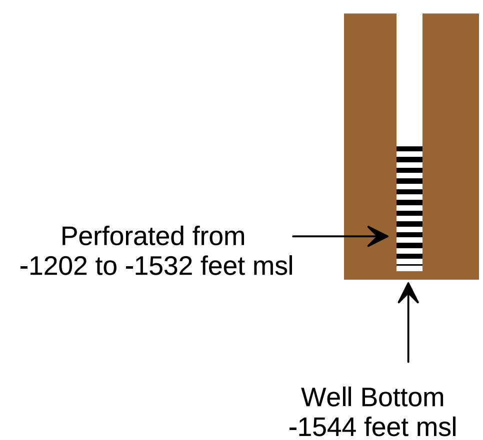
- DRY
- AVERAGE/ALTERNATING
- WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\17S_05E-06C01.grf

HYDROGRAPH OF MEASURED GROUNDWATER ELEVATION FOR 13S/02E-19Q03

180/400-Foot Aquifer Subbasin
(Deep Aquifer)





EXPLANATION

GROUNDWATER ELEVATION
ESTIMATED ELEVATION
OCTOBER ELEVATION
LAND SURFACE
MEASURABLE OBJECTIVE
MINIMUM THRESHOLD

CLIMATE PERIOD CLASSIFICATION

DRY
AVERAGE/ALTERNATING
WET

H:\Salinas Valley\GSPlanalysis_Copy\Hydrographs_MCWRA\SalinasDroughtIndex\grf\Ch8_OctData\13S_02E-19Q03.grf

APPENDIX 9A

ALL MANAGEMENT ACTIONS CONSIDERED FOR GROUNDWATER SUSTAINABILITY PLAN

Management Action	Description	Category
Voluntary Land Purchase/Retirement	Reduce agricultural groundwater pumping through voluntary program that compensates landowners for permanently retiring irrigated land. New land use should be for beneficial use.	
Voluntary Fallowing	Reduce agricultural groundwater pumping through voluntary program to fallow historically-irrigated land for a full year.	
Agricultural Land and Pumping Allowance Retirement	Water charges revenues may be used by the SVBGSA to acquire and retire irrigated land and/or pumping allowances (potentially including carryover credits and recharge credits) to reduce pumping. All acquisitions will be completed on a voluntary basis from willing sellers at negotiated market prices. The SVBGSA would cease irrigation on acquired land to reduce pumping.	Priority
Partial Season Irrigation	Reduce agricultural groundwater pumping through voluntary program to shorten the length of the irrigation season. In practice, this may mean growing fewer crops within a given season.	
Deficit Irrigation	Apply less water than is required for optimal yield to reduce agricultural groundwater pumping.	
Crop Conversion	Transition to less water-intensive crops to reduce agricultural groundwater pumping.	
Individual Transferable Quotas	Reduce groundwater pumping by establishing total allowable pumping allocations among individual pumpers, and authorize quota trading to minimize the economic effects of lower pumping volumes.	
Conservation Credits	Incentivize water conservation by awarding groundwater pumping credits based on reduction in use. Can be carried over for use in future years.	
Quota/Credit Buyback	Reduce annual groundwater pumping by purchasing/leasing quotas and/or conservation credits.	
Incentives for Replenishment	Offer payments and/or conservation quotas for recharge of available surface water. All or a portion of the recharge will be maintained in the aquifer.	
Land Use Restrictions/Easements	Limit future agricultural or urban groundwater pumping by restricting land use or purchasing conservation easements in targeted areas.	
Mandatory Restrictions in CSIP Area	Mandate reduced groundwater pumping in the CSIP Area by passing an ordinance preventing any pumping for irrigating agricultural lands served by CSIP.	Priority
Water Export Limitations	Limit water export from the Subbasin when it is in over-draft conditions.	
Metering/Monitoring	Measure groundwater withdrawals at individual wells to support quantification of individual transferable quotas, conservation credits, and implement withdrawal fees/tiered pricing.	
Nacimiento Water Release Management	Modify reservoir operations	
SW Education/Outreach & Municipal Enforcement	Additional education and outreach efforts for Commercial and Industrial Facilities w/ enforcement by municipalities for violators or IGP non-filers.	
Withdrawal Fees/Tiered Pricing	Charge fees per acre-foot pumped (flat, increasing block, and/or by water use type) to incentivize reductions in groundwater pumping.	
Water Conservation and Stormwater Pollution Education & Outreach	Change perceptions about water use and stormwater discharges to incentivize efficient stormwater capture.	
Fast Track Water Related Project CEQA/Permitting	Streamline permitting process to realize water enhancement projects.	
Modify watershed management practices to optimize runoff, storage and recharge	Controlled vegetation management using goat herds and prescriptive burns.	
Well and Hydrant Flushing Capture	Capture and repurpose "wastewater" associated with flushing activities.	
Forebay/Upper Valley recharge enhancements using re-operated reservoirs	Re-operate reservoirs to allow pulse flows in the Salinas River that provide additional recharge in the unconfined aquifers of the Forebay and Upper Valley.	Priority
Support and Strengthen MCWRA Restrictions on Additional Wells in the Deep Aquifer	MCWRA Ordinance 5302 restricts drilling new wells in the Deep Aquifer in an Area of Impact that is generally northwest of Davis Road. SVBGSA will work with the MCWRA to strengthen the ordinance to prevent any new wells from being drilled into the deep aquifer until more is known about the Deep Aquifer's sustainable yield	Priority
Irrigation Efficiency	Implement on-farm technology to improve irrigation efficiency and reduce groundwater pumping.	
Municipal Water System Leak Detection & Repair	Address municipal water system losses to reduce groundwater pumping or support additional recharge. For systems w/ over 12% water loss annually. (16% is average w/ 75% generally assumed to be recoverable)	
Urban Conservation (indoor/outdoor)	Mandate or incentivize urban conservation	
Municipal Water Conservation Efforts	Widespread adoption of water-saving appliances and fixtures, along with replacement of lawns with water-efficient landscapes, may reduce total residential water use by 30-40 percent in areas not currently implementing these strategies.	
Recycled Water Incentives - Industrial Facilities	Wineries, Produce Production, Breweries, & Other water intensive industrial facility types. Recycle process wastewater and site storm water for onsite reuse.	
Artificial Turf replacement inside City Limits	Subsidize as an incentive.	
Encourage proactive agricultural practices to benefit water quality and limit evaporation	Fertilizer use efficiency/management, use of cover crops, healthy soils, vegetation treatment.	

APPENDIX 9B

ALL PROJECTS CONSIDERED FOR GROUNDWATER SUSTAINABILITY PLAN

Project	Description	Category
Expansion of Castroville Seawater Intrusion Project (CSIP)	Expand the use of recycled wastewater for irrigation, offsetting the need for groundwater and slowing seawater intrusion. Potential source waters include agricultural wash water from Salinas' industrial ponds, Salinas' stormwater, Reclamation Ditch, Tembladero Slough, Blanco Drain and Monterey stormwater. Wastewater from additional municipalities in the Salinas Valley would increase the amount of water available to CSIP.	Preferred
Destroy 8 Wells in the 180/400-Foot Aquifer Subbasin	Destroy the highest priority wells that threaten to allow seawater intrusion to move between aquifers. This will slow or eliminate seawater migration and intrusion into the 400-foot and deep aquifers.	
Pursue Destruction of Additional 134 wells	Destroy the longer list of wells that threaten to allow seawater intrusion to move between aquifers. This will slow or eliminate seawater migration and intrusion into the 400-foot and deep aquifers.	
Seawater Intrusion Barrier - Injection Wells	Push seawater intrusion towards the coast by injecting water into the 180- and 400-foot aquifers. A number of injection wells would be required; as well as sufficient water (recycled) to supply the injection wells.	
Seawater Intrusion Barrier - Extraction Wells	Pull seawater back towards the coast by extracting saline groundwater from the 180- and 400-foot aquifers. Extracted water would either be disposed of in the ocean or desalinated for potable/agricultural use.	Preferred
High river flow capture and injection at mouth of Salinas River	Capture Salinas River water immediately prior to entering ocean and inject it into the 180 and 400 foot aquifers to reduce seawater intrusion. The stormwater may need to be temporarily held in large storage ponds located near the coast before it can be injected.	
Stormwater Capture and Treatment (Municipal)	Municipal agencies build decentralized stormwater recharge projects that increase groundwater recharge instead of allowing stormwater to flow into the Salinas River.	
Stormwater Capture and Treatment (Agricultural and Industrial)	Agricultural and Industrial users build decentralized stormwater recharge projects that increase groundwater recharge instead of allowing stormwater to flow into the Salinas River. This could be set up similarly to Pajaro Valley Water Agency's "net metered recharge" program.	
Rain Collector Dry Wells	A variation on the preceding recharge projects using dry wells instead of recharge basins.	
Installation of Small River Bed infiltration Basins	Small basins adjacent to the Salinas river that slow or retain high river flows for improved infiltration	
Aquifer Storage & Recovery in Salinas Valley	Temporarily inject and store available water in aquifers, either seasonally or during wet years, and recover water during dry season or dry years. Source of water not identified.	
Recharge local runoff from the Eastside	Recharge local runoff from the Gabilan Range and divert it to groundwater recharge basin(s) before it reaches the Salinas River.	Preferred (Move to Alternative)
Inject Diverted Carmel River Water	Use an existing water right held by MPWMD on the Carmel River for 15,000 AF/yr., transport the water to the Salinas Valley, and inject the water into the Salinas valley subbasins for maintenance of groundwater levels, improvement of water quality, and prevention of further seawater intrusion.	Alternative
Use the Upper Portion of the 180/400-Foot Aquifer Subbasin for Seasonal Storage	Conventional groundwater extraction well facilities would be constructed in the upper (i.e., southern) portion of the 180/400-Foot Aquifer Subbasin to provide improved off-peak irrigation season groundwater storage and peak irrigation season supplemental water for supply and environmental needs.	Alternative
Surface spreading or direct injection of Water Right Permit 11043 using SVWP diversions	Use Water Right 11043 to supply recharge ponds or injection wells in the North County. Water would be conveyed from the two Salinas Valley Water Project diversions. A temporary water storage system may be needed prior to injection.	
Surface spreading or direct injection of Water Right Permit 11043 using an eastside conveyance system	Use Water Right 11043 to supply recharge ponds or injection wells in the North County during high winter flow conditions using a dedicated pipeline from San Antonio Reservoir to North County. A temporary water storage system may be needed prior to injection.	
Conjunctive Use Transfer	Build groundwater pumping and conveyance facilities in mid-valley to deliver groundwater to the East Side and 180/400-Foot Aquifer subbasins to offset coastal pumping and seawater intrusion.	
Other Conjunctive Use - Small-scale near-source diversions and blending of surface water.	Divert Salinas River water at a small scale at appropriate locations in the 180/400 Foot Aquifer subbasin to blend with groundwater, reducing groundwater pumping.	
Add dry season conveyance pipeline to reduce need for dry season river flow	A significant amount of dry season river flow is lost to non-native riparian vegeatation. This water loss could be eliminated if dry season flows were conveyed in a pipeline instead of in the river.	
Extract winter flows using Radial collector(s) and inject into 180- and 400-Foot Aquifers	Divert winter flows from the Salinas River using a radial collector and inject the water into the 180/400-Foot Aquifer Sub-basin for maintenance of groundwater levels, improvement of water quality, and prevention of further seawater intrusion.	Alternative (May move to Preferred)

Project	Description	Category
Interlake Connection and Regional Water Conservation Project - Interlake Water Tunnel & San Antonio Spillway Modification	Build a tunnel that diverts water from Nacimiento Reservoir to San Antonio Reservoir, capturing high Nacimiento flows. This project is forecast to deliver up to 21,000 acre-feet per year of new water. This water could be used for Salinas River stream maintenance, delivered in lieu of groundwater pumping, or be injected as a seawater intrusion barrier. Delivering this water in lieu of groundwater pumping will require integration with one of the conjunctive use projects listed above.	
Build Jerrett Dam	The Jerrett dam site is on the Nacimiento River, upstream of Nacimiento Reservoir, on Fort Hunter Liggett Military Reservation property. The dam could be constructed to impound 145,000 acre-feet of water that could be released to the Nacimiento Reservoir. This water could be used for Salinas River stream maintenance; delivered in lieu of groundwater pumping, or be injected as a seawater intrusion barrier. Delivering this water in lieu of groundwater pumping will require integration with one of the conjunctive use projects listed above.	
Arroyo Seco Dam	Construct a dam in the Arroyo Seco River Watershed creating additional surface water storage that could be used in lieu of groundwater pumping. Delivering this water in lieu of groundwater pumping will require integration with one of the conjunctive use projects listed above. Location of this dam and reservoir is unknown.	
Identify Additional Surface Water Storage/Recharge Sites throughout Valley	Create additional surface water storage and recharge locations, such as Carr Lake.	
Groundwater recharge of recycled water	Use recycled wastewater from Monterey One Water for surface spreading or direct injection in the 180/400-foot aquifers to replace groundwater pumping.	
Optimize CSIP	Automate irrigation systems in CSIP to irrigate based on availability rather than on demand. This ensures that all CSIP water is used when it is available.	Preferred
Seasonal storage of of M1W winter effluent	Build storage for treated effluent not used during wet weather to offset pumping in dry season.	
Modify Monterey One Water Recycled Water Plant	Under the M1W Recycled Water Plant Modifications Project, the SVRP will be improved to allow delivery of tertiary treated wastewater to the CSIP system when recycled water demand is less than 5 mgd.	Preferred
Capture of wastewater from River Road and Toro and Pipe to Hitchcock	Increase wastewater availability by connecting new sources to M1W	
Discontinue WWTP Effluent to Ocean: 100% Recycling of all effluent	Recycle 100% of effluent leaving M1W treatment plant for enhanced availability of recycled wastewater to reduce pumping.	
Winter potable reuse water injection	Treat additional secondary wastewater effluent through an expanded Advanced Water Purification Facility (AWPF) at M1W's RTP, and injecting it into the 180/400-foot aquifer subbasin for maintenance of groundwater levels, improvement of water quality, and prevention of further seawater intrusion.	Alternative
Arundo Eradication Phase III	Eradicating Arundo lessens evapotranspiration, leaving more water in the aquifers and the river. Phase III, funded by an additional grant from the Wildlife Conservation Board, will treat an additional 350 acres downstream of Phase II (King City to Soledad). The goal of the program is to eradicate Arundo within 20 years (~1500 acres over 90 miles of river).	Preferred
Arundo Eradication Additional Phases	Eradicating Arundo lessens evapotranspiration, leaving more water in the aquifers and the river. Eradicate Arundo within 20 years (~1500 acres over 90 miles of river). ~1550 acres remaining after Phase III (Soledad to Coast)	
Sedimentation Clearing and Channel Management	Maximize surface water conveyance by removing sediment buildup in the river channels.	
Study additional vegetation evapotranspiration mitigation opportunities	Require vegetation with lower water uptake for all projects.	
Monterey Peninsula Water Supply Project	Take advantage of the MPWSP slant well pumping to pull seawater intrusion back towards the coast.	
Deepwater Desalination	Slow seawater intrusion by replacing groundwater pumping with imported desalinated water. Potential to produce up to 25,000 acre-feet per year. Requires a pipeline from Moss Landing.	
Brackish Water Treatment for Wellheads	Desalinate brackish well water for irrigation, reducing fresh water pumping and allowing more fresh water to push the seawater intrusion front towards the coast. The source of brackish water is still to be determined.	
Desalinate water from the seawater barrier extraction wells	Treat water extracted from the seawater intrusion barrier and allow for its reinjection in the 180-Foot Aquifer and 400-Foot Aquifer	Alternative
Improve SRDF Diversion	The SRDF Diversion improvements include installing a radial collector well to provide additional diversion capacity at the SRDF. The project includes installing additional water storage for the proposed 85 cfs capacity of the SRDF.	Preferred
11043 Diversion Facilities	Construct extraction facilities at both diversion locations and pump the water to the eastside where the water can then be infiltrated into the groundwater basin at known pumping depressions.	Preferred

Project	Description	Category
Forebay/Upper Valley recharge enhancements using Water Right Permit 11043	Use Water Right 11043 for additional stream recharge or flood plain recharge in the unconfined aquifers of the Forebay and Upper Valley.	

APPENDIX 9C

SUMMARY OF PROJECT COST ESTIMATES

Capital and Annualized Costs
Summary Sheet
(Preliminary Cost Estimate)

	Project	Capital Cost	Annual O&M	Total Annualized Cost	Projected Yield (AF/yr.)	Unit Cost/AF
PP1	Invasive Species Eradication	$35,230,000	$325,000	$3,125,000	20,000	$160
PP2	Optimize CSIP Operations	$16,400,000	$200,000	$1,483,000	5,500	$270
PP3	Modify M1W - Winter Modifications	--	--	--	1,300	--
PP4	Expand Area Served By CSIP	$73,366,000	$480,000	$6,219,400	9,900	$630
PP5	Maximize Existing SRDF Diversion	$0	$2,538,600	$2,538,600	11,600	$220
PP6	Seawater Intrusion Pumping Barrier	$102,389,000	$9,776,400	$17,786,300	-30,000	$590
PP7	11043 Diversion Facilities Phase I: Chualar	$47,654,000	$2,296,000	$6,024,000	8,000	$750
PP8	11043 Diversion Facilities Phase II: Soledad	$60,578,000	$2,295,500	$7,034,500	8,000	$880
PP9	SRDF Winter Flow Injection	$51,191,000	$3,624,000	$7,629,000	12,900	$590
AP1	Desalinate Water from Extraction Wells	$341,472,000	$9,890,000	$36,603,400	15,000	$2,440
AP2	Recharge Local Runoff from Eastside Range	$30,049,500	$1,261,000	$3,611,800	3,500	$1,032
AP3	Winter Potable Reuse Water Injection	$35,300,000	$500,000	$3,261,500	2,250	$1,450
AP4	Seasonal Storage in the Upper 180/400-Foot A	$4,937,500	$723,000	$1,109,300	3,000	$370

General Assumptions

Markups

Plumbing Appurtenance Contingency	30%
General Conditions	15%
Contractor Overhead and Profit	15%
Sales Tax	8.75%
Engineering, Legal, Admininstrative, Co	30%

General Unit Costs

Electrical Power Rate	0.15	$/kWh	
Labor Rate	100	$/hr	
Land Costs	$45,000	$/acre	
Pipeline Install Costs,<12"	$200	$/LF	
Pipeline Material Costs, 16" PVC	$60	$/LF	Contractor (Garney) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-
Pipeline Install Costs, 16" PVC	$130	$/LF	Contractor (Garney) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-
Pipeline Material Costs,>12"	$130	$/LF	
Pipeline Install Costs,>12"	$130	$/LF	
Pipeline Material Costs,36"	$130	$/LF	Contractor (Garney) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-
Pipeline Install Costs,36"	$320	$/LF	Contractor (Garney) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-
Concrete	$1,500	$/CY	
Monterey Pump Station No. 1	$2,527,325	$/Pump Sta	Contractor (Monterey Peninsual Engineerig) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-of-procure-archive
Valley Greens Pump Station	$1,898,100	$/Pump Sta	Contractor (Monterey Peninsual Engineerig) Bid, Construction of Feed Water Pipeline and Transfer Pipeline, https://www.watersupplyproject.org/copy-of-procure-archive

Capital and Annualized Costs
PP.1 Invasive Species Eradication
(Preliminary Cost Estimate)

SUMMARY					
Line No.	**Description**		**Units**		**Total**
1	Project Yield		acre-feet per year		20,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$35,230,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$2,800,000
7	Annual O&M Cost		$		$325,000
8	Total Annualized Cost		$		$3,125,000
9	Unit Cost		$/AF/yr.		$160
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Phase I - Initial Treatment	1800	Acres	$13,500	$24,300,000
11	Phase II - Re-Treatment	500	Acres	$5,500	$2,800,000
12	Phase III - On-Going Monitoring & Maintenance (See O&M)				$0
13	***Subtotal***				$27,100,000
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
14	Engineering, Legal, Admininstrative, Contingencies			30%	$8,130,000
15	***Total Capital Cost***				$35,230,000
OPERATIONS AND MAINTENANCE					
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
16	O&M Estmate	1	LS	$325,000	$325,000
17	***Total O&M Cost***				$325,000

NOTES:
1. "Project Yield" based on: Range of 6,000 to 36,000 AF, assumed an average of 20,000 AF
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on: Phase I and Phase II.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.
7. "Annual O&M Cost" estimate based on average annual needs for on going monitoring and maintenance (checmical treatment every 3 to 5 years).

Capital and Annualized Costs
PP 2. Optimize CSIP Operations
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		5,500
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$16,400,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$1,283,000
7	Annual O&M Cost		$		$200,000
8	Total Annualized Cost		$		$1,483,000
9	Unit Cost		$/AF/yr.		**$270**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Hydraulic Modeling	1	EA	$0	$0
11	Irrigation Scheduling System	1	EA	$1,000,000	$1,000,000
12	Additional Storage Reservoirs, 75 AF	1	EA	$1,200,000	$1,200,000
13	Pipeline - 36" Turnout Into New Basin	400	LF	$400	$160,000
14	Pipeline - 51" Pipe from Basin to CSIP Distribution	6,200	LF	$600	$3,720,000
15	Pipeline - Unknown Size	5,000	LF	$500	$2,500,000
16	Land Cost	12.5	AC	$45,000	$562,500
17	***Subtotal***				$9,142,500
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
18	Plumbing Appurtenance Contingency			30%	$1,524,000
19	General Conditions			15%	$1,371,400
20	Contractor Overhead and Profit			15%	$1,371,400
21	Sales Tax			8.75%	$240,000
22	Engineering, Legal, Admininstrative, Contingencies			30%	$2,742,800
23	***Total Capital Cost***				$16,400,000
OPERATIONS AND MAINTENANCE					
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
24	Irrigation Scheduling System (I&	1	LS	$40,000	$40,000
25	Labor	1	LS	$115,200	$115,200
26	Contingency			30%	$46,600
27	***Total O&M Annual Cost***				$200,000

NOTES:
1. "Project Yield" based on: 3700 AFY from avoided well pumping, 11880 AFY from additional extraction from SRDF.
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" does not include additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.
7. "Annual O&M Cost" estimate does not include O&M cost for treatment components of project.
8. "Unit Cost" estimate does not include unit cost for treatment components of project.

Capital and Annualized Costs
PP3. Modify M1W Recycled Water Plant - Winter Modifications
(Preliminary Cost Estimate)

Line No.	**Description**		**Units**		**Total**
1	Project Yield		acre-feet per year		1,300
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$1,492,500
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$116,800
7	Annual O&M Cost		$		--
8	Total Annualized Cost		$		$116,800
9	**Unit Cost**		$/AF/yr.		**$90**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Construction	1	LS	$1,194,000	$1,194,000
11	Design, CM, Proj Admin, Environmental Review (25% Construction)	1	LS	$298,500	$298,500
12	***Total Capital Cost***				$1,492,500

NOTES:
1. "Project Yield" based on: avoided wet weather groundwater pumping based on historical pumping records in the CSIP area.
2. "Facility Life" selected based on 25-yr anticipated life .
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on Raftelis, 2018. MCWRA New Source Water Supply Study, Final Report, September.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annual O&M Cost" based on marginal amount assumed in Raftelis, 2018. MCWRA New Source Water Supply Study, Final Report, September.
7. "Unit Cost" estimate does not include unit cost for treatment components of project.

Capital and Annualized Costs
PP 4. Expanded Area Served by CSIP
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		9,900
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$73,366,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$5,739,400
7	Annual O&M Cost		$		$480,000
8	Total Annualized Cost		$		$6,219,400
9	Unit Cost		$/AF/yr.		**$630**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Pipeline	68,640	LF	$500	$34,320,000
11	Booster Pump System, 5 MGD	3	EA	$34,139	$102,400
12	Turnouts	26	EA	$2,500	$65,000
13	Booster Station	2	EA	$1,500,000	$3,000,000
14	HDD	800	LF	$750	$600,000
15	***Subtotal***				$38,087,400
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
16	Plumbing Appurtenance Contingency			30%	$11,426,200
17	General Conditions			15%	$5,713,100
18	Contractor Overhead and Profit			15%	$5,713,100
19	Sales Tax			8.75%	$999,800
20	Engineering, Legal, Admininstrative, Contingencies			30%	$11,426,200
21	***Total Capital Cost***				$73,366,000
OPERATIONS AND MAINTENANCE					
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
22	Distribution System Maintenance	3500	Acre	$138	$480,000
22	***Total O&M Annual Cost***				$480,000

NOTES:
1. "Project Yield" based on: avoided wet weather groundwater pumping based on historical puming records.
2. "Facility Life" selected based on 25-yr anticipated life .
3. "Interest Rate" selected within expected range for public-financing options.
4. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
5. "Unit Cost" estimate does not include unit cost for treatment components of project.

Capital and Annualized Costs
PP 5. Maximize Existing SRDF Diversion
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		11,600
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$0
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$0
7	Annual O&M Cost		$		$2,538,600
8	Total Annualized Cost		$		$2,538,600
9	**Unit Cost**		$/AF/yr.		**$220**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	SRDF Power	1	LS	$441,800	$441,800
11	Treatment Chemicals	1	LS	$155,800	$155,800
12	Treatment other O&M	1	LS	$224,600	$224,600
13	Labor (SRDF, Treatment, Basins)	1	LS	$710,400	$710,400
14	Equipment Repair & Replacement	1	LS	$213,100	$213,100
29	Miscellaneous Allowance	1	LS	$207,100	$207,100
30	Contingency			30%	$585,800
31	***Total O&M Cost***				$2,538,600

NOTES:
1. "Project Yield" based on: 49 cfs pumping 214 days per year at the SRDF with new radial collector well.
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" includes additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.

Capital and Annualized Costs
PP 6. Seawater Intrusion Pumping Barrier
(Preliminary Cost Estimate)

Line No.	**Description**		**Units**		**Total**
1	Project Yield		acre-feet per year		-30,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$102,389,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$8,009,900
7	Annual O&M Cost		$		$9,776,400
8	Total Annualized Cost		$		$17,786,300
9	**Unit Cost**		$/AFY		**$590**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Well Construction	18	EA	$750,000	$13,500,000
11	Well Pumps and Motors	18	EA	$150,000	$2,700,000
12	Well Head Infrastructure	18	EA	$125,000	$2,250,000
13	Electrical and Instrumentation	1	EA	$3,500,000	$3,500,000
14	Piping (8" to 36")	44,000	LF	$600	$26,400,000
15	Rehab Outfall	1	LS	$2,500,000	$2,500,000
16	Land Access	18	25%	$187,500	$3,375,000
17	Total				$54,225,000
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
18	Plumbing Appurtenance Contingency			30%	$14,205,000
19	General Conditions			15%	$8,133,800
20	Contractor Overhead and Profit			15%	$8,133,800
21	Sales Tax			8.75%	$1,423,400
22	Engineering, Legal, Admininstrative, Contingencies			30%	$16,267,500
23	**Total**				$102,389,000
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
24	Power	1	LS	$2,652,590	$2,652,600
25	Equipment Repair & Replacement	1	LS	$1,366,200	$1,366,200
26	Operations Labor	1	LS	$3,324,420	$3,324,400
27	Miscellaneous	1	LS	$803,758	$803,800
28	Contingency			20%	$1,629,400
29	Total				$9,776,400

NOTES:
1. "Project Yield" based on: 1000 gpm/well, 22 wells, 365 days project operation (Jan - Dec), 100% project operational utilization.
2. "Facility Life" selected based on 25-yr anticipated life of extraction wells.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on: construction $750,000/well, 22 wells, land acquisition at @25%, pumps & motors $150,000/well, wellhead infrastructure $125,000/well, electrical & instrumentation $3,500,000.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on well facilities only; estimate does not include capital costs for conveyance and treatment components of project.
7. "Annual O&M Cost" based on well operations and maintenance only; estimate does not include O&M cost for conveyance and treatment components of project.
7. "Unit Cost" based on well facilities only; estimate does not include unit cost for conveyance and treatment components of project.

Capital and Annualized Costs
PP 7. 11043 Diversion Facilities Phase I: Chualar
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		8,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$47,654,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$3,728,000
7	Annual O&M Cost		$		$2,296,000
8	Total Annualized Cost		$		$6,024,000
9	**Unit Cost**		$/AF/yr.		**$750**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Phase I - Chualar Diversion					
10	Pipeline	23,750	LF	$720	$17,100,000
11	Radial Collector, Booster Pump System (27 MGD firm capacity)	4	EA	$65,000	$260,000
12	Radial Collector, Electrical and Controls	1	LS	$260,000	$260,000
13	Radial Collector, Concrete Structures and Laterals	1	LS	$5,119,000	$5,119,000
14	Infiltration Basins (including land costs)	1	EA	$2,000,000	$2,000,000
15	*Subtotal*				$24,739,000
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
16	Plumbing Appurtenance Contingency			30%	$7,421,700
17	General Conditions			15%	$3,710,900
18	Contractor Overhead and Profit			15%	$3,710,900
19	Sales Tax			8.75%	$649,400
20	Engineering, Legal, Admininstrative, Contingencies			30%	$7,421,700
21	***Total Capital Cost***				$47,654,000
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
22	Power	1	LS	$441,800	$441,800
23	Other O&M	1	LS	$224,600	$224,600
24	Labor (Diversion Facilities, Basins)	1	LS	$710,400	$710,400
25	Equipment Repair & Replacement	1	LS	$213,100	$213,100
29	Miscellaneous Allowance	1	LS	$175,900	$175,900
30	Contingency			30%	$529,700
31	***Total O&M Cost***				$2,296,000

NOTES:
1. "Project Yield" based on: 42 cfs pumping 120 days per year at both Chualar and Soledad with new radial collector well.
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" includes additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.
7. "Unit Cost" estimate includes unit cost for treatment components of project.

Capital and Annualized Costs
PP 8. 11043 Diversion Facilities Phase II: Soledad
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		8,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$60,578,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$4,739,000
7	Annual O&M Cost		$		$2,295,500
8	Total Annualized Cost		$		$7,034,500
9	**Unit Cost**		$/AF/yr.		**$880**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Phase II - Soledad Diversion					
10	Pipeline	31,680	LF	$720	$22,809,600
11	Radial Collector, Booster Pump System (27 MGD firm capacity)	4	EA	$65,000	$260,000
12	Radial Collector, Electrical and Controls	1	LS	$260,000	$260,000
13	Radial Collector, Concrete Structures and Laterals	1	LS	$5,119,000	$5,119,000
14	Infiltration Basins (including land costs)	1	EA	$3,000,000	$3,000,000
15	*Subtotal*				$31,448,600
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
16	Plumbing Appurtenance Contingency			30%	$9,434,600
17	General Conditions			15%	$4,717,300
18	Contractor Overhead and Profit			15%	$4,717,300
19	Sales Tax			8.75%	$825,500
20	Engineering, Legal, Admininstrative, Contingencies			30%	$9,434,600
21	***Total Capital Cost***				$60,578,000
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
22	Power	1	LS	$441,800	$441,800
23	Other O&M	1	LS	$224,600	$224,600
24	Labor (Diversion Facilities, Basins)	1	LS	$710,400	$710,400
25	Equipment Repair & Replacement	1	LS	$213,100	$213,100
29	Miscellaneous Allowance	1	LS	$175,900	$175,900
30	Contingency			30%	$529,700
31	***Total O&M Cost***				$2,295,500

NOTES:
1. "Project Yield" based on: 42 cfs pumping 120 days per year at both Chualar and Soledad with new radial collector well.
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" includes additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.
7. "Unit Cost" estimate includes unit cost for treatment components of project.

Capital and Annualized Costs
PP9 SRDF Winter Flow Injection
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		12,900
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$51,191,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$4,005,000
7	Annual O&M Cost		$		$3,624,000
8	Total Annualized Cost		$		$7,629,000
9	**Unit Cost**		$/AF/yr.		**$590**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Well Construction	16	EA	$618,340	$9,893,400
11	Well Pumps and Motors	16	EA	$150,000	$2,400,000
12	Well Head Infrastructure	16	EA	$125,000	$2,000,000
13	Electrical and Instrumentation	16	10%	$61,800	$988,800
14	Percolation Basins, Site Civil Work	16	25%	$154,600	$2,473,600
15	Land Access	16	25%	$154,600	$2,473,600
16	Distribution Pipeline (4 mile)	21,120	LF	$650	$13,728,000
17	***SubTotal***				$33,957,400
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
18	General Conditions			15%	$5,093,600
19	Contractor Overhead and Profit			18%	$6,112,300
20	Sales Tax			8.75%	$2,971,300
21	Engineering, Legal, Admininstrative, Contingencies			20%	$2,037,400
22	Bonds and Insurance			3%	$1,018,700
23	***Total Capital Cost***				$51,191,000
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
24	Power	1	LS	$1,152,800	$1,152,800
25	Equipment Repair & Replacement	1	LS	$1,188,000	$1,188,000
26	Operations Labor	1	LS	$211,200	$211,200
27	Miscellaneous	1	LS	$468,200	$468,200
28	Contingency			20%	$604,000
29	***Total O&M Annual Cost***				$3,624,000

NOTES:
1. "Project Yield" based on: 49 CFS radial collector (22,000 GPM) and 50% facility up time.
2. "Facility Life" selected based on 25-yr anticipated life of extraction wells.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on: construction $750,000/well, 22 wells, land acquisition at @25%, pumps & motors $150,000/well, wellhead infrastructure $125,000/well, electrical & instrumentation $3,500,000.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on well facilities only; estimate does not include capital costs for conveyance and treatment components of project.
7. "Annual O&M Cost" based on well operations and maintenance only; estimate does not include O&M cost for conveyance and treatment components of project.
7. "Unit Cost" based on well facilities only; estimate does not include unit cost for conveyance and treatment

Capital and Annualized Costs
AP 1. Desalinate Water from the Seawater Barrier Extraction Wells
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		15,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$341,472,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$26,713,400
7	Annual O&M Cost		$		$9,890,000
8	Total Annualized Cost		$		$36,603,400
9	**Unit Cost**		$/AF/yr.		**$2,440**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	SWRO Facility	13	MGD	$14,000,000	$182,000,000
11	Source Water Pipeline	58,080	LF	$400	$23,232,000
12	Desalinated Water Pipeline	47,520	LF	$400	$19,008,000
13	Distribution Pump Station	13	MGD	$175,000	$2,275,000
14	***Subtotal***				$226,515,000
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
15	General Conditions			15%	$33,977,300
16	Contractor Overhead and Profit			18%	$40,772,700
17	Sales Tax			8.75%	$19,820,100
18	Engineering, Legal, Admininstrative, Contingencies			20%	$13,590,900
19	Bonds and Insurance			3%	$6,795,500
20	***Total Capital Cost***				$341,472,000
OPERATIONS AND MAINTENANCE					
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
21	Desalination O&M	9.3	MGD	$913,400	$8,494,600
22	Electrical power - distibution of	9300000	GPD	$0.15	$1,395,000
23	***Total O&M Annual Cost***				$9,890,000

NOTES:
1. "Facility Life" selected based on 25-yr anticipated life of extraction wells.
2. "Interest Rate" selected within expected range for public-financing options.

Capital and Annualized Costs
AP2. Recharge Local Runoff from Eastside Range
(Preliminary Cost Estimate)

Line No.	Description		Units		Total
1	Project Yield		acre-feet per year		3,500
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$30,049,500
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$2,350,800
7	Annual O&M Cost		$		$1,261,000
8	Total Annualized Cost		$		$3,611,800
9	**Unit Cost**		$/AF/yr.		**$1,032**
CAPITAL COSTS					
Line No.	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Pipeline	10,000	LF	$720	$7,200,000
11	Infiltration Basins (including land costs)	8	EA	$650,000	$5,200,000
12	Diversion Facilities	8	LS	$400,000	$3,200,000
13	*Subtotal*				$15,600,000
Line No.	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
14	Plumbing Appurtenance Contingency			30%	$4,680,000
15	General Conditions			15%	$2,340,000
16	Contractor Overhead and Profit			15%	$2,340,000
17	Sales Tax			8.75%	$409,500
18	Engineering, Legal, Admininstrative, Contingencies			30%	$4,680,000
19	***Total Capital Cost***				$30,049,500
OPERATIONS AND MAINTENANCE					
Line No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
20	Other O&M	1	LS	$150,000	$150,000
21	Labor (Diversion Facilities, Basins)	8	LS	$100,000	$800,000
22	Equipment Repair & Replacement	1	LS	$20,000	$20,000
23	Contingency			30%	$291,000
24	***Total O&M Cost***				$1,261,000

NOTES:
1. "Project Yield" based on: average diversion available during a normal year.
2. "Facility Life" selected based on 25-yr anticipated life of facilities.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" includes additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on facility life and interest rate.
7. "Unit Cost" estimate includes unit cost for treatment components of project.

Capital and Annualized Costs
AP 3. Winter Potable Reuse Water Injection
(Preliminary Cost Estimate)

Line No	Description		Units		Total
1	(Preliminary Cost Estimate)		acre-feet per year		2,250
2	Facility Life		years		25
3	PP 3. SRDF Radial Collector Project		%		6
4	Capital Cost		$		$35,300,000
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$2,761,500
7	Annual O&M Cost		$		$500,000
8	Total Annualized Cost		$		$3,261,500
9	Unit Cost		$/AF/yr.		$1,450
CAPITAL COSTS					
Line No	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Injection Well Construction	6	EA	$618,300	$3,709,800
11	Injection Well Pumps and Motors	6	EA	$150,000	$900,000
12	Injection Well Head Infrastructure	6	EA	$125,000	$750,000
13	Electrical and Instrumentation	6	EA	$30,900	$185,400
14	Percolation Basins, Site Civil Work	9	EA	$154,600	$1,391,400
15	Land Access	22	EA	$77,300	$1,700,600
16	Distribution Pipeline (6 mile)	31,680	LF	$400	$12,672,000
17	***Subtotal***				$21,309,200
Line No	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
18	General Conditions			15%	$3,196,400
19	Contractor Overhead and Profit			15%	$3,196,400
20	Sales Tax			8.75%	$559,400
21	Engineering, Legal, Admininstrative, Contingencies			30%	$6,392,800
	Bonds and Insurance			3%	$639,300
22	***Total Capital Cost***				$35,300,000
OPERATIONS AND MAINTENANCE					
Line No	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
23	Power	1	LS	$3,700	$3,700
24	Equipment Repair & Replacer	1	LS	$324,000	$324,000
25	Operations Labor	1	LS	$24,000	$24,000
26	Miscellaneous	1	LS	$65,500	$65,500
27	Contingency			20%	$83,400
28	***Total O&M Annual Cost***				$500,000

NOTES:
1. "Project Yield" based on: Expanded PWM GWR Expanded project description.
2. "Facility Life" selected based on 25-yr anticipated life of extraction wells.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on: construction $618,000/injection well, 6 wells, land acquisition at @25%, pumps & motors $150,000/well, wellhead infrastructure $125,000/well, electrical & instrumentation $3,500,000.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on well facilities only; estimate does not include capital costs for conveyance and treatment components of project.
7. "Annual O&M Cost" based on well operations and maintenance only; estimate does not include O&M cost for conveyance and treatment components of project.
7. "Unit Cost" based on well facilities only; estimate does not include unit cost for conveyance and treatment components of project.

Capital and Annualized Costs
AP 4. Seasonal Storage in the Upper 180/400-Foot Aquifer Subbasin
(Preliminary Cost Estimate)

Line N	Description		Units		Total
1	Project Yield		acre-feet per year		3,000
2	Facility Life		years		25
3	Interest Rate		%		6
4	Capital Cost		$		$4,937,500
5	Cost Recovery Factor		--		0.078
6	Annualized Capital Cost		$		$386,300
7	Annual O&M Cost		$		$723,000
8	Total Annualized Cost		$		$1,109,300
9	**Unit Cost**		$/AF/yr.		**$370**
CAPITAL COSTS					
Line N	**Capital**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
10	Well Construction	3	EA	$750,000	$2,250,000
11	Well Pumps and Motors	3	EA	$200,000	$600,000
12	Well Head Infrastructure	3	EA	$125,000	$375,000
13	Electrical and Instrumentation	1	EA	$725,000	$725,000
14	Land Access	1	25%	$987,500	$987,500
15	***SubTotal***				$4,937,500
Line N	**Markups**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
16	General Conditions			15%	$740,600
17	Contractor Overhead and Profit			18%	$888,800
18	Sales Tax			8.75%	$142,600
19	Engineering, Legal, Admininstrative, Contingencies			20%	$987,500
20	Bonds and Insurance			3%	$148,100
24	***Total Capital Cost***				$7,845,000
OPERATIONS AND MAINTENANCE					
Line N	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
25	Electrical power	1	LS	$659,800	$659,800
26	Labor	1	LS	$28,800	$28,800
27	Other ancillary services, equip	1	LS	$34,400	$34,400
28	***Total O&M Annual Cost***				$723,000

NOTES:
1. "Project Yield" based on: 3700 AFY from avoided well pumping, 11880 AFY from additioanl extraction from SRDF.
2. "Facility Life" selected based on 25-yr anticipated life of extraction wells.
3. "Interest Rate" selected within expected range for public-financing options.
4. "Capital Cost" based on: detail below; does not include additional treatment costs.
5. "Cost Recovery Factor" based on anticipated Facility Life and Interest Rate.
6. "Annualized Capital Cost" based on detail below.
7. "Annual O&M Cost" based on well operations and maintenance only; estimate does not include O&M cost for treatment components of project.
7. "Unit Cost" estimate does not include unit cost for treatment components of project.

APPENDIX 9D: MODELING AND ANALYTICAL TOOLS FOR ANALYZING PROJECT BENEFITS

9D.1 Introduction

Chapter 9 of the GSP includes a set of projects and management actions designed to achieve and maintain sustainability in the 180/400-Foot Aquifer Subbasin over the SGMA implementation horizon. To assess the benefits of individual projects, and combinations of projects, to achieve sustainability, quantitative analyses were performed through simplified groundwater model simulations. These simulations included predicted climate change conditions with and without the proposed projects. In addition, a simplified analytical analysis was developed to evaluate the potential design for a seawater intrusion barrier and its capability to stop seawater intrusion.

A numerical groundwater flow model allows for a simplified mathematical representation of the subbasin. Estimated future flow conditions such as pumping rates and recharge rates are model inputs, and an estimate of the resulting groundwater levels and groundwater flow rates are the output from the model.

The purpose of the groundwater flow model analysis is to develop an estimate of the basin conditions after twenty years of GSP implementation for major projects identified in Chapter 9. Comparing model outputs from various future scenarios provides a means of estimating the project impacts on water levels and groundwater flow rates.

9D.2 Background

The groundwater flow model for simulating project impacts should ideally have the following characteristics:

- Model code should be open-source and publicly available
- Data to develop and calibrate the model should be readily available
- The model should have been calibrated to historical and current data

The USGS has been working closely with MCWRA and other stakeholders in the Salinas Valley since 2016 to develop the Salinas Valley Integrated Hydrologic Model (SVIHM) (MCWRA, 2017). The SVIHM is a combined groundwater and surface water flow model based on a publicly available MODFLOW model code. The SVIHM covers the entire Salinas Valley Groundwater Basin. As described by the USGS, the purpose of the SVIHM is tightly aligned with the numerical analysis needs of the GSP, including:

- Assessing water budgets, groundwater level elevations, and the extent of sweater intrusion,
- Assessing potential future conditions in the Salinas Valley, including analysis of future scenarios

The SVBGSA anticipated that the SVIHM would be the primary tool for developing water budgets and assessing project impacts for the 180/400-Foot Aquifer Subbasin GSP. The USGS and MCWRA both believed that the SVIHM model would be completed and available for the GSP, and the SVBGSA entered into an agreement with MCWRA and USGS to use the SVIHM model for GSP development. However, due to unforeseen circumstances, the SVIHM was not available for developing the180/400-Foot Aquifer Subbasin GSP. The USGS did provide a version of the SVIHM to estimate the future water budgets with climate change assumptions. However, this model was not available for assessing project impacts.

Because the SVIHM was not available, the SVBGSA developed a simpler modeling tool for assessing projects and actions. Although the SVIHM remains the preferred model for long-term use by the SVGSA for GSP implementation, the GSP deadline for the 180/400-Foot Aquifer Subbasin GSP required that an alternative model be developed quickly as a screening tool for purposes of assessing project benefits. This screening tool, referred to as the North Salinas Valley (NSV) Model, is a simplified alternative model that is limited to the northern portion of Salinas Valley, and is only intended to be an initial screening tool to evaluate certain individual and combined projects and actions on the 180/400-Foot Aquifer Subbasin.

When the SVIHM model is released for use by the USGS, the SVBGSA will use the SVIHM to confirm and reassess the water budgets and project benefits for the 180/400-Foot Aquifer Subbasin. The SVBGSA expects that the SVIHM will be available sufficiently in advance of the January 2022 deadline for the other Salinas Valley subbasin GSPs, and therefore the SVIHM model will be used develop the other subbasin GSPs and integrate the proposed projects in a valley-wide, programmatic approach.

9D.3 NSV Groundwater Model Description

Recognizing that the SVIHM will be used when it becomes available, the approach to developing the NSV model was to keep the model simple and to rely on previously developed models for the model input data.

The NSV Model uses the MODFLOW 2000 model code (Harbaugh et. al, 2000), a public domain finite-difference model code developed by the USGS that is widely used and well documented. The model was developed using the Visual MODFLOW graphical user interface (Waterloo Hydrologic, version 4.6.0.168) for ease of data manipulation and output visualization.

9D.3.1 Model Domain

Figure 9D-1 illustrates the model domain and the distribution of active cells in relation to the 180/400-Foot Aquifer Subbasin, other subbasins of the northern Salinas Valley, Monterey Bay, and the bounding mountains. Although the results of model simulations are only needed for the 180/400-Foot Aquifer Subbasin, the model was constructed across the entire valley width because some of the subbasin boundaries are transitional, or not easily defined hydrogeologic boundaries. Therefore, the model includes all of the Eastside, Langley, Monterey, and Seaside subbasins. A small strip of the Forebay subbasin is included to ensure that the entire southern boundary of the 180/400-Foot Subbasin is included in the model.

The finite difference grid varies in cell dimensions range from approximately 50 ft to 2,600 feet (Figure 9D-1).

9D.3.2 Model Layers

The NSV Model uses 8 model layers to represent the full aquifer thickness of the northern Salinas Valley. Figure 9D-2 shows a simplified diagram illustrating the model layers and the hydrostratigraphic layers they represent. Model layer 1 is used only to represent sea level in the area of Monterey Bay and is inactive through the rest of the model. Model layers 2, 4, 6, and 8 represent the Shallow water-bearing sediments, the 180-Foot Aquifer, the 400-Foot Aquifer, and Deep Aquifers respectively. Model layers 3, 5, and 7 represent the intervening aquitards between water bearing zones.

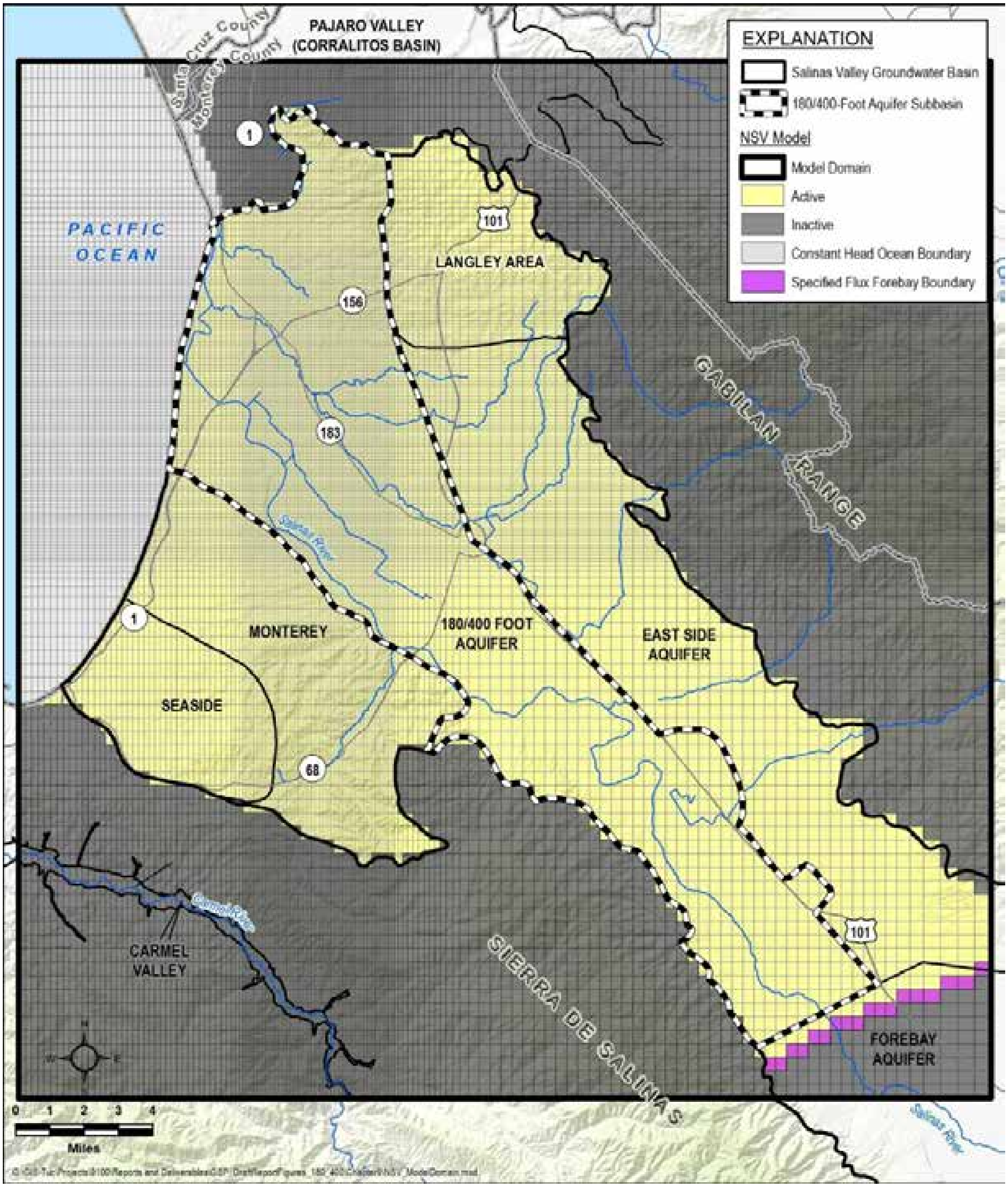


Figure 9D-1. NSV Model Domain and Boundary Conditions

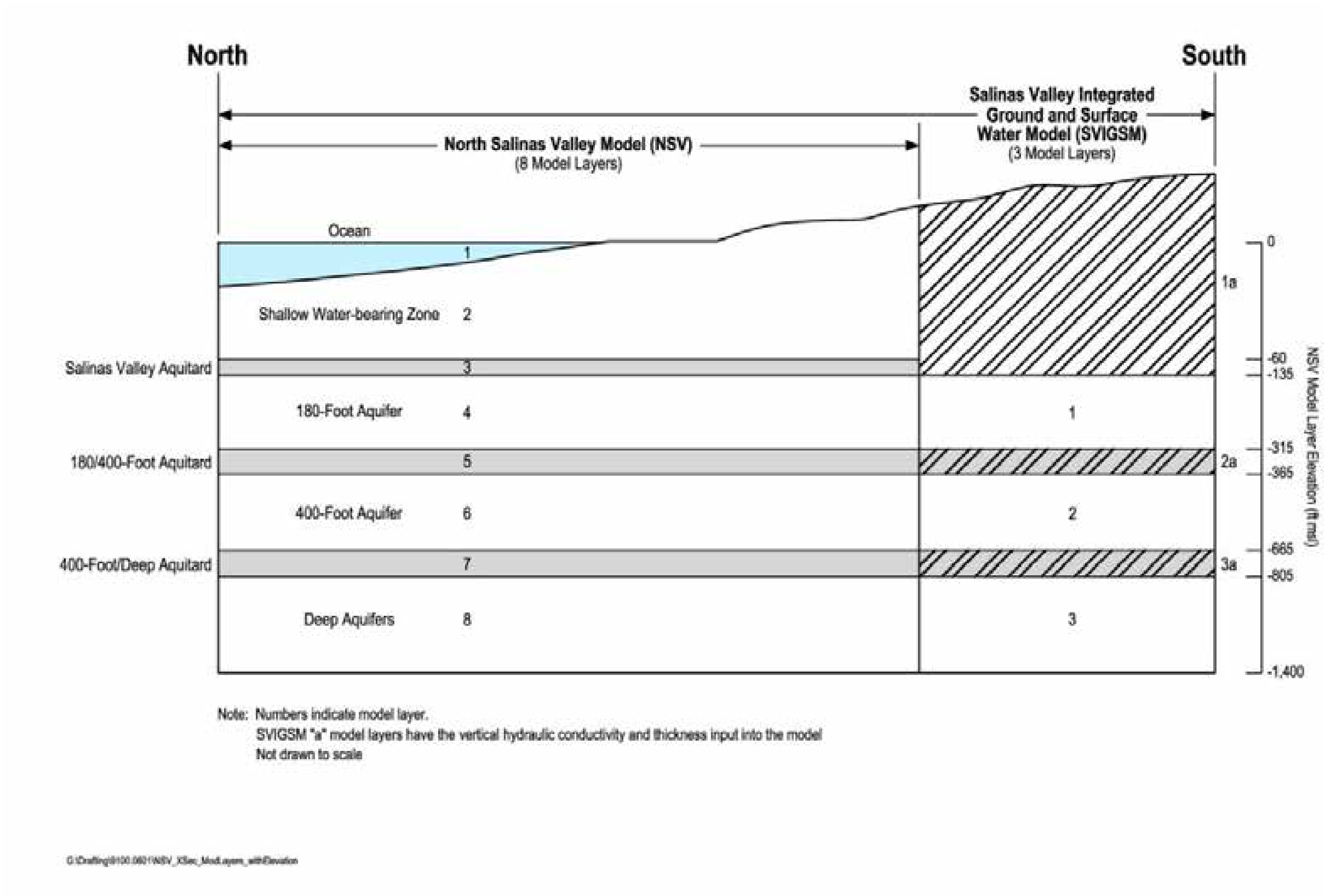


Figure 9D-2: Simplified Diagram of Model Hydrostratigraphic Layers (modified from Geoscience, 2015).

9D.3.3 Hydrogeologic Properties

The model layering and assigned material properties of the NSV model are based on the North Marina Groundwater Models (NMGWM) that were developed by Geoscience (2015) and Hydrofocus (2017) and the SVIGSM model that was updated by Luhdorff and Scalmanini Consulting Engineers (LSCE, 2015) for the Monterey Peninsula Water Project (Environmental Science Associates [ESA], 2015 and 2018). Table 9D-1 summarizes the hydraulic conductivity distribution in the NSV model.

Table 9D-1: NSV Model Hydraulic Conductivity Distribution

Layer	Location	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
1	Ocean	100	100
2	Shallow Water-bearing Zone	25	0.65
3	Salinas Valley Aquitard	5	0.055
4	180-Foot Aquifer in the 180/400-Foot Aquifer Subbasin	100	0.45
4	180-Foot Aquifer in the East Side Subbasin	10	0.1
5	180/400-Foot Aquitard	7.5	0.075
6	400-Foot Aquifer in the 180/400-Foot Aquifer Subbasin	70	0.7
6	400-Foot Aquifer in the East Side Subbasin	15	1.5
7	400-Foot/Deep Aquitard	2.75	0.0275
8	Deep Aquifers – basin center	37.5	0.275
8	Deep Aquifers – basin margins	10	0.1
2,4,6, and 8	Border between 180/400-Foot Aquifer Subbasin and East Side Subbasin	1	0.1

9D.3.4 Model Boundaries

The model's boundary conditions are based on the hydrogeologic conceptual model for the 180/400-Foot Aquifer Subbasin and are illustrated in Figure 9D-1:

- The southern boundary of the model has a specified flow boundary in layers 4 and 6, representing the northern flow of groundwater from the Forebay Subbasin into the 180/400-Foot Aquifer and the East Side Subbasins. The groundwater flow across this boundary was initially set at a constant annual rate based on average flows from the SVIHM future water budget. The groundwater was later adjusted to match observed water levels as described below.

- The eastern and western boundaries of the model are no-flow boundaries reflecting the negligible flow of groundwater into the basin from the mountain fronts.
- The northern boundary of the model corresponds to the coastline of Monterey Bay and is simulated by specifying a constant water level of 0.5 ft MSL for of the cells in model layer 1 over the Monterey Bay. The representation allows the seawater intrusion flux to be dependent on water levels in the groundwater basin.

The SVIHM includes internal boundaries that divide the model into subareas known to as farms. In this usage, the word farm does not necessarily imply a particular owner, crop type, or land use. Rather, the word farm is used to identify an area for which the model produces a unified water budget. The SVIHM includes 31 farms; 19 of those intersect the NSV model, as shown in Figure 9D-3. Farm ID 31 represents the Monterey Bay area within the model domain.

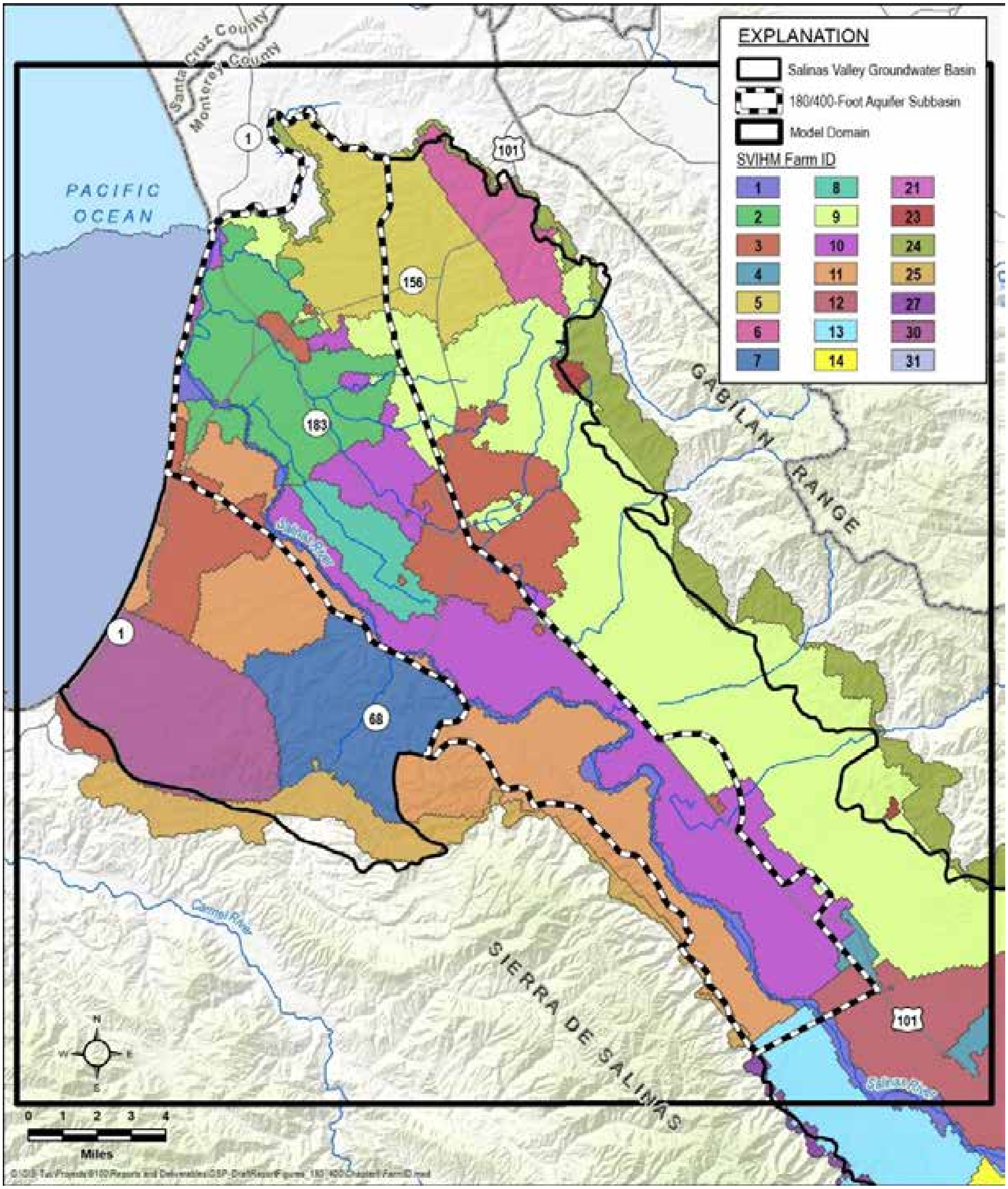


Figure 9D-3. Map View of Farm IDs Within the NSV Model

9D.3.5 Pumping and Recharge

Pumping and recharge values in the NSV model represent average projected baseline conditions. The distributions of pumping and recharge in the model were based on values exported from a version of the SVIHM operational model that incorporates estimated climate change adjustments for the year 2030. For the simplified NSV Model, all pumping and recharge was simulated as constant values reflecting the averages of the 47-year modeling period of SVIHM. Although SVIHM is not yet available for use in simulating the project benefits on a fully transient basis, the estimated pumping and recharge rates in SVIHM were considered the most applicable available estimates for use in the NSV model. The NSV model applies the average annual pumping and recharge rates to 50 annual stress periods representing 50 years of projected conditions.

Groundwater pumping rates were input to the model in two groups to differentiate agricultural and municipal pumping estimates:

- Agricultural pumping rates were estimated using the SVIHM model. This model uses the USGS Farm Package that generates net pumping rates per acre based on land use and crop type. Pumping per acre is specified for each farm ID. Figure 9D-3 illustrates the farm ID designations used in the model input.

- Specified individual municipal wells were input at specific locations and depths in the model with a specified pumping rate for each well based on historical pumping records. These wells are in addition to the groundwater pumping represented by the farm ID pumping, and represent the known pumping for urban use from both municipal and industrial sources.

- Domestic pumping estimates are considered negligible and are not included in the model.

Groundwater recharge was input to the model in two ways:

- The same farm ID designations used for input of pumping were used to specify average annual areal recharge rates per acre, with a specific value assigned to each farm ID based on land use. These recharge estimates were derived from SVIHM output. This recharge value represents the combined influences of precipitation, excess irrigation, and leaking pipelines.

- Salinas River recharge was specified as an averaged per acre value along the Salinas River riparian corridor. A total recharge rate of 70,000 AF/yr. was specified for the Salinas River, based on the average value estimated in SVIHM for the projected water budget. Farm ID 1 represents the riparian corridor and was used to input the river recharge rate into the model.

Table 9D-2 shows the average annual pumping and farm recharge rates by Farm ID.

Table 9D-2: Average Annual Pumping and Recharge Values by Farm ID

Farm ID	Municipal Pumping (AF/yr.)	Farm (agricultural) pumping (AF/yr.)	Farm Recharge (AF/yr.)
1	0	0	2,400
2	819	6,500	13,400
3	35,600	0	900
4	3,500	0	24
5	1,600	110	5,700
6	130	90	1,800
7	1,000	440	2,300
8	0	7,300	4,300
9	1,800	55,000	35,000
10	3,100	50,000	27,000
11	6,600	10,500	9,900
12	426	4,500	2,300
13	0	2,300	1,200
21	76	110	69
23	0	0	86
24	0	0	340
25	100	2	960
27	0	0	20
30	2,300	0	3,400
Total	57,200	136,400	111,800

Note: values are rounded to the nearest 100 AF/yr., and do not necessarily add up to the shown totals.

9D.3.6 Model Adjustments

After the model was constructed based on the NMGWM layering and material properties, and the pumping and recharge rates were input from the SVIHM, the model was run with starting water level conditions approximated to the water level contours of Fall 2017. Based on this initial model simulation, the groundwater flow entering the model at the southern boundary was adjusted to 10,000 AF/yr. so that the simulated water levels were approximately in equilibrium with the observed water levels. No other model calibration was performed.

9D.4 Projects and Actions Simulations

The NSV model was used to simulate the effects of potential projects on the Subbasin and develop quantitative estimates of the potential benefits of the projects. Although the GSP anticipates implementing multiple projects to achieve and maintain sustainability, the initial analysis of project benefits is performed on each project individually to assess relative benefits of each project. All of the CSIP improvement projects were combined into a single simulation.

The benefit of each project was estimated by comparing a project simulation to a baseline, no-project simulation and quantifying the differences in water levels and seawater intrusion rates due to the project. The baseline simulation was the same for all projects. Each project was then simulated with specific modifications to the recharge and pumping inputs to create a simple approximation of the project.

For each project, the potential benefit of the project was quantified by two metrics:

- Maps of the difference in water level between the project and baseline simulations
    - At a model simulation period of 20 years
    - Maps generated for each of the 180-ft and 400-ft aquifer model layers
- The difference in seawater intrusion between the project and baseline simulations
    - At a model simulation period of 20 years
    - Flux into the subbasin at the coastline using a zone budget analysis

Table 9D-3 summarizes the project simulations for each of the simulated projects.

Table 9D-3: Simulation of Project Benefits

	Simulated Project/Scenario	Simulation Approach
1	Invasive Species Eradication	Increase groundwater recharge by 12,000 AF/yr. in Farm ID 1 (riparian corridor)
2	All projects within current CSIP area	Turn off all groundwater pumping in Farm ID 2 (CSIP Area) – 7,300 AF/yr. (6,500 AF/yr. from agricultural and 820 AF/yr. from municipal pumping)
3	CSIP Expansion	Turn off all pumping in Farm ID 2 and Farm ID 8 (total of 14,600 AF/yr.)
5	Salinas River Diversion at Chualar (11043 Water Rights)	Inject 5,000 AF/yr. in the portion of Farm ID 3 (City of Salinas) that is in the East Side Subbasin
6	Salinas River Diversion at Soledad (11043 Water Rights)	Inject 5,000 AF/yr. in southern half of Farm ID 9 (East Side Subbasin)
7	SRDF Winter Injection	Inject 8,000 AF/yr. to Farm ID 10 (180/400-Ft Aquifer Subbasin) and 8,000 AF/yr. to portion of Farm ID 3 in the Monterey Subbasin

The anticipated CSIP expansion area for simulations 3 does not correspond to a specific Farm ID in the model. Farm ID 8 was used to simulate CSIP Expansion because it is in the approximately correct location in the basin and the total pumping rate of 7,300 AF/yr. is approximately equal to the anticipated impact of the CSIP Expansion project.

9D.5 Seawater Intrusion Barrier Evaluation

A seawater intrusion barrier could be designed to either to extract groundwater and produce a hydraulic trough that would intercept seawater intrusion, or to inject groundwater and produce a hydraulic mound that would block seawater intrusion. A barrier project would transect the 180/400-Ft Aquifer Subbasin and the Monterey Subbasin, with an estimated length of 8.5 miles and approximately 75% of the barrier within the 180/400-ft Aquifer Subbasin.

A full evaluation of the barrier sizing in consideration of other projects will require use of the full transient SVIHM model. For the initial estimation of barrier size and cost, the seawater intrusion barrier project was evaluated using analytical methods with the goal of estimating the well spacing and flow rates needed for a hydraulic barrier to prevent seawater intrusion.

The seawater intrusion barrier sizing was developed in the absence of any of the other future projects included in the GSP. The effect of the other projects would be to improve the water balance in the Subbasin and decrease the rate of seawater intrusion, thereby decreasing the flow required at the barrier.

An extraction barrier was evaluated using the analytical solution published by Javandel and Tsang (1987). This solution uses the ambient hydraulic gradient, aquifer transmissivity, and pumping rate per well to calculate the optimal distance for three or more wells on a line to prevent water from flowing between the wells. The hydraulic gradient is based on MCWRA Fall 2017 groundwater contours: 0.0006 in the 180-ft aquifer and 0.001 in the 400-ft aquifer. Transmissivity is based on values in the NSV model: 18,000 ft^2/day in the 180-ft Aquifer and 21,000 ft^2/day in the 400-ft Aquifer.

Using these input values, an 8.5-mile long barrier requires total extraction of approximately 30,000 AF/yr. to produce a trough that prevents flow of groundwater through the barrier. This would require extraction of approximately 22,500 AF/yr. from the 180/400-Ft Aquifer Subbasin, with 7,500 AF/yr. from the 180-ft aquifer and 15,000 AF/yr. from the 400-ft aquifer.

The extraction rate for each well is a function of the well spacing and can be adjusted to fit design requirements for the final barrier. For example, an extraction barrier with 9 wells spaced 5,000 feet apart would require approximately 700 gpm per well in the 180-ft aquifer and 1,400 gpm per well in the 400-ft aquifer. For a barrier with 22 wells spaced 2,000 feet apart, the rates per well would decrease to approximately 300 gpm in the 180-ft aquifer and 600 gpm in the 400-ft aquifer.

The injection barrier was evaluated using the Theis equation and the principle of superposition to estimate the height of mounding produced by a line of several injection wells. The Theis equation was used to estimate the height of hydraulic mounding as a function of distance from a single injection well and then the estimated mounding height at each distance along the barrier was estimated as the sum of the influences from all the wells in the barrier.

Input for this analysis required a designation of the height of the mounding, transmissivity, storage coefficient, pumping rate per well, and an estimated time to reach equilibrium conditions. The minimum mounding height was estimated to be 6.75 ft for the 180-Ft Aquifer and 13.75 ft for the 400-Ft Aquifer in order to compensate for seawater density and the depth of the aquifers below sea level. Transmissivity values of 18,000 ft^2/day for the 180-Foot Aquifer and 21,000 ft^2/day for the 400-Foot Aquifer, and storage coefficient of 0.003 are based on the NSV model. The time to equilibrium mounding was estimated as 30 days. Based on these input parameters and an 8.5-mile barrier with 9 wells (5,00-ft spacing), the estimated injection rate is approximately 46,000 AF/yr., with 34,500 AF/yr. of injection in the 180/400-ft Aquifer Subbasin; divided into 8,700 AF/yr. in the 180-Foot Aquifer and 25,500 AF/yr. in the 400-Foot Aquifer).

9D.6 References

Driscoll, F., 1986, *Groundwater and Wells*, Johnson Division, 1089pp.

Environmental Science Associates (ESA), 2015. *Draft Environmental Impact Report/Environmental Impact Statement, CalAm Monterey Peninsula Water Supply Project*. April.

ESA, 2018. *Final Environmental Impact Report/Environmental Impact Statement, CalAm Monterey Peninsula Water Supply Project*, SCH# 2006101004. March.

Geoscience Support Services, Inc. (Geoscience), 2015. *Monterey Peninsula Water Supply Project Groundwater Modeling and Analysis*. Appendix E2 of ESA, 2015. April 17.

Harbaugh, A.W., E.R. Banta, M.C. Hill and M.G. McDonald. 2000. *MODFLOW-2000, The US Geological Survey modular ground-water model- user guide to modularization concepts and the ground-water flow process*, USGS Open-File Report 00-92. https://water.usgs.gov/nrp/gwsoftware/modflow2000/ofr00-92.pdf

Hydrofocus Inc. (Hydrofocus), 2017. *Draft North Marina Groundwater Model Review, Revision, and Implementation for Future Slant Well Pumping Scenarios*. Appendix E2 of ESA, 2018. August 31.

Javandel, I., and Tsang, C., 1987. Capture-Zone Type Curves: A Tool for Aquifer Cleanup. Groundwater. 24(5). pp. 616-625.

Ludorff and Scalmanini Consulting Engineers (LSCE), 2015. *Hydrologic Modeling of the Monterey Peninsula Water Supply Project Using the Salinas Valley Integrated Ground and Surface Water Model.* Appendix A of Geoscience, 2015. March

MCWRA, 2017. Salinas Valley Integrated Hydrologic Model Frequently Asked Questions. July. https://www.co.monterey.ca.us/home/showdocument?id=31292

Waterloo Hydrologic. Visual Modflow v. 4.6.0.168 downloaded from: https://www.waterloohydrogeologic.com/visual-modflow-flex/#

APPENDIX 11A
BOARD MEMBER ROSTER

LAST NAME	FIRST NAME	REPRESENTING	APPOINTING AUTHORITY	Appt./Reappt.
Brennan	Janet	Environmental Directors	Monterey County Board	3 yr. to 7/1/20
Lipe	Bill	Ag Interest, (Upper Valley)	Monterey County Board	3 yr. to 7/1/22
Stefani	Ron	Disadv. Comm./Public Water System	Castroville CSD	3 yr. to 7/1/22
Adcock	Tom	CPUC regulated representative	Salinas City Council	2 yr. to 7/1/21
McHatten	Michael	South County Cities	So. Co. City/City Selection SubComm. Nom.	3 yr to 7/1/22
Gunter	Joseph	Salinas	Salinas City Council	3 yr. to 7/1/20
McIntyre	Steve	Ag Interest (Forebay)	Monterey County Board	3 yr to 7/1/20
Alejo	Luis	Other GSA Eligible Entity**	Monterey County Board	3 yr to 7/1/20
Chapin Hodges	Caroline	Public Member	Monterey County (SVBGSA nominee)	3 yr. to 7/1/22
Pereira	Colby	Ag Interest (East Side/Langley)	Monterey County Board	3 yr. to 7/1/22
Secondo	Adam	Ag Interest (Pressure)	Monterey County Board	3 yr. to 7/1/20

* Following staggered terms, Directors serve 3 yr. terms, with exception of 2 yr. regular term for CPUC Water regulated company; JPA §6.3

**Not including cities of Salinas, Gonzales, Soledad, Greenfield or King City; nominated by Monterey County, Water Resources Agency, Monterey One Water

APPENDIX 11B
ADVISORY COMMITTEE ROSTER

Interest	Organization	Primary Alternate(s)
Agriculture	Driscoll Strawberry Associates	Emily Gardner Dennis Lebow
	Grower-Shipper Association of Central California	Abby Taylor-Silva
	Monterey County Farm Bureau	Norm Groot Kevin Piercy
	Monterey County Vintners & Growers	Kim Stemler
	Salinas Valley Sustainable Water Group	Chris Drew
	Salinas Valley Water Coalition	Nancy Isakson Steve McIntyre
County and City Governments	City of Salinas	Brian Frus
	City of Gonzales	Harold Wolgamott
	Monterey County	Charles McKee
Disadvantaged Communities and Housing	CHISPA	Alfred Diaz-Infante Paul Tran
	Environmental Justice Coalition for Water	Horacio Amezquita
Environmental	Environmental Caucus	Robin Lee Abigail Hart
	Environmental Caucus (2)	Beverly Bean
	Salinas River Channel Stream Maintenance Programs, River Management Unit Associates, Inc.	*Member pending Board approval*
Industrial	Chevron U.S.A.	Dallas Tubbs Jeff Johnson
Municipal Well Operators and PUC-Regulated Water Companies	Alco	Tom Adcock Adnen Chaabane
	Cal Water Service	Brenda Granillo Greg Williams Michael Bolzowski
Planning / Land Use	LandWatch	Tom Ward Janet Brennan
Rural Residential Well Owners	Rural Residential Well Owner, North County	Robert Burton
	Rural Residential Well Owner, South County	Bing Seid
Water Supply and Management	Castroville Community Service District *Note: Castroville is a disadvantaged community.*	Eric Tynan Ron Stefani
	Marina Coast Water District	Keith Van Der Maaten Patrick Breen Mike Wegley
	Monterey One Water	Mike McCullough
	Water Resources Agency	Howard Franklin
	Seaside Basin Watermaster, Technical Program Manager	Robert Jaques Jonathan Lear

APPENDIX 11C. LIST OF GOVERNANCE MEETINGS

Meeting	Date	Topic
Advisory Committee Regular Meeting	Nov 21, 2019 - 02:00 PM	Draft GSP 180-400 recommend approval to Board - Implementation Plan.
Board of Directors Regular Meeting	Nov 14, 2019 - 03:00 PM	Future palnning schedule for remaining GSP's
Board of Directors Regular Meeting	Oct 10, 2019 - 03:00 PM	Communication Plan Revisions - Marina Coordination Agreement
Executive Committee Regular Meeting	Sep 26, 2019 - 10:00 AM	MGSA Coordination Agreement- review of correspondance
Advisory Committee Regular Meeting	Sep 19, 2019 - 02:00 PM	MGSA Coordiantion Agreement
Board of Directors Regular Meeting	Sep 12, 2019 - 03:00 PM	Chapter 10 and 11 release to Public Review of CSIP projects
Executive Committee Regular Meeting	Aug 22, 2019 - 10:00 AM	MGSA Coordination Agreement
Advisory Committee Regular Meeting	Aug 15, 2019 - 02:00 PM	Chapter 10 and 11 recommend to Board for release
Board of Directors Regular Meeting	Aug 8, 2019 - 03:00 PM	Chapter 9, request County to Appoint Public Board Member
Planning Committee Regular Meeting	Aug 1, 2019 - 10:00 AM	Chapter 10 recommend to Board for release
Advisory Committee Regular Meeting	Jul 18, 2019 - 02:00 PM	Chapter 9 recommend Board to release
Board of Directors Regular Meeting	Jul 11, 2019 - 03:00 PM	Chapter 6 release to Public Arroyo Seco Presentation
Advisory Committee Regular Meeting	Jun 20, 2019 - 02:00 PM	Chapter 6 recommend Board to release
Board of Directors Special Meeting	Jun 10, 2019 - 01:00 PM	Chapter 8 recommend Board to release to public - IRWM Project Review
PLANNING COMMITTEE	Jun 6, 2019 - 10:00 AM	Chapter 6 recommend Board to release
Executive Committee Regular Meeting	May 23, 2019 - 10:00 AM	Recommend Coordination Committee with Monterey County Water Resources
Advisory Committee Regular Meeting	May 16, 2019 - 02:00 PM	Chapter 8 recommend Board to release to public - IRWM Project Review
Board of Directors Regular Meeting	May 9, 2019 - 03:00 PM	Chapter 7 release to Public.- Basin Boundary Modification Outcomes
PLANNING COMMITTEE SPECIAL MEETING	May 6, 2019 - 09:00 AM	Chapter 8 recommend Board to release to public
Planning Committee Regular Meeting	May 2, 2019 - 10:00 AM	Chapter 8 recommend Board to release to public
Executive Committee Regular Meeting	Apr 25, 2019 - 10:00 AM	Basin reprioritization update - update on Arroyo Seco/Greenfield negotiations
Advisory Committee Regular Meeting	Apr 18, 2019 - 02:00 PM	Chapter 7 release to Public.- Basin Boundary Modification Outcomes
Board of Directors Regular Meeting	Apr 11, 2019 - 03:00 PM	Budget Adoption
SVBGSA Planning Committee	Apr 4, 2019 - 10:00 AM	Chapter 7 release to advisory Committee
Executive Committee	Mar 28, 2019 - 10:00 AM	Budget Review
Board of Directors Regular Meeting	Mar 14, 2019 - 03:00 PM	Report
Advisory Committee Regular Meeting	Feb 21, 2019 - 02:00 PM	Chapter 5 release to advisory Committee - fee consdieration
Board of Directors Regular Meeting	Feb 14, 2019 - 03:00 PM	Fee Study - Hydrological Modeling
Executive Committee Regular Meeting	Jan 24, 2019 - 10:00 AM	Fee Study - Hydrological Modeling - Advisory Committee By laws update
Advisory Committee Regular Meeting	Jan 17, 2019 - 02:00 PM	Joint Meeting with Advisory Committee
Board of Directors Special Meeting	Jan 10, 2019 - 03:00 PM	Chapter 4 release to public TNC Presentation on GDE's
Advisory Committee Regular Meeting	Dec 20, 2018 - 02:00 PM	Chapter 4 to Board for reviews
Board of Directors	Dec 13, 2018 - 03:00 PM	Chapters 1-3 fro public Review - MCWD Agreement
SVBGSA PLANNING COMMITTEE REVISED AGENDA	Dec 6, 2018 - 10:00 AM	Chapter 4 to Advisory Committee for review
Advisory Committee	Nov 15, 2018 - 02:00 PM	Chapters 1-3 to Board - MCWD Agreement
SVBGSA Planning Committee	Nov 6, 2018 - 10:00 AM	Chapter 4 to Advisory Committee for review
Advisory Committee	Oct 18, 2018 - 02:00 PM	Fee Development approval - Setting GSP planning schedule
Board of Directors	Oct 11, 2018 - 03:00 PM	Planning dates, Consultant Contract - planning schedule
Executive Committee	Sep 27, 2018 - 10:00 AM	Fee Development approval - Setting GSP planning schedule
SVBGSA BOARD OF DIRECTORS AND ADVISORY COMMITTEE SPECIAL JOINT MEETING AGENDA AND SVBGSA BOARD OF DIRECTORS SPECIAL MEETING	Sep 13, 2018 - 02:00 PM	Joint meeting Board and Advisory agreement with WRA and USGSA
Executive Committee	Aug 23, 2018 - 10:00 AM	Agreement with WRA, Fee schedule, coortdination agreements
Advisory Committee	Aug 16, 2018 - 02:00 PM	Fee development
Board of Directors	Aug 9, 2018 - 03:00 PM	Report on Public Outreach for Sustainable Criteria
Advisory Committee	Jul 19, 2018 - 02:00 PM	Basin Boundary Modification
Board of Directors	Jul 12, 2018 - 03:00 PM	Interlake tunnel report, Advisory Committee appointments
Executive Committee	Jun 28, 2018 - 05:50 PM	Consultant agreement GSP planning process
Board of Directors	Jun 14, 2018 - 03:00 PM	Approval MOU with Water Resources Agency
Board of Directors	May 10, 2018 - 03:00 PM	Joint meeting Board and Advisory agreement with WRA
Board of Directors -Advisory Committee Joint Meeting	April 19, 2018 - 02:00 PM	Meeting with Planning Consultant set Directorn for GSP Development
Executive Committee	Mar 22, 2018 - 10:00 AM	Mar 8 2018 - 03:00 PM
Board of Directors	Mar 8 2018 - 03:00 PM	Consultant Agreement Status Reports Seawater Intrusion Update
Advisory Committee	Feb 15, 2018 - 02:00 PM	Water Bond Presentation Committee member confirmations
Board of Directors	Feb 8 2018 - 03:00 PM	Coordination Agreement Status Reports Seawater Intrusion Update
Advisory Committee	Jan 18, 2018 - 02:00 PM	Mar 8 2018 - 03:00 PM
Board of Directors	Jan 11, 2018 - 03:00 PM	DWR Presentation Brown Act Education
Board of Directors	Dec 14.2017 - 4:00 PM	Seawater Intrusion Report RFQ for consultant to prepare plan

APPENDIX 11D

ISSUES ASSESSMENT

Sustainable Groundwater Management Act Implementation

Salinas Valley Groundwater Stakeholder Issue Assessment

Developed by Senior Mediators Gina Bartlett and Bennett Brooks, Consensus Building Institute
February 29, 2016

Executive Summary

In fall 2015, the Consensus Building Institute, a neutral nonprofit that helps groups collaborate, conducted a stakeholder issue assessment on forming a groundwater sustainability agency in the Salinas Valley Basin. California's Sustainable Groundwater Management Act requires that the basin identify an agency or group of agencies to oversee groundwater management by 2017 and then develop a plan to manage groundwater by 2020. CBI's role is to *help facilitate* local decision-making, recommending and leading a process that brings together all affected parties in productive dialogue, on forming the groundwater sustainability agency (GSA).

To understand and reflect the range of perspectives and to develop recommendations for the process to form a GSA, CBI conducted 35 in-depth interviews and received 86 individual surveys from a range of stakeholder interests in the Salinas Valley, including governmental (cities and counties), water agencies, agriculture, disadvantaged communities, environmental, business, and community representatives. Given the importance of groundwater in the region's water supply and economy, CBI's methodology is grounded in three core principles: (1) being comprehensive in soliciting input from the range of potentially impacted stakeholders; (2) being transparent in the nature of the feedback and recommendations provided; and (3) drawing on CBI experience and best practices to recommend an approach likely to foster effective and inclusive deliberations. This report presents CBI's assessment findings and recommendations for a transparent, inclusive process on forming a GSA in the Salinas Valley.

Findings

Findings reflect a range of feedback on GSA formation, the process, challenges, and critical issues. In brief, stakeholders articulate:

- Groundwater supply is high stakes; everyone recognizes the importance of forming the GSA successfully.

- Interviewees cannot identify any one organization as a likely candidate to serve as the GSA. Many envision multiple organizations coming together under a Joint Power Authority to form a singular GSA.
- The GSA must have the trust of all the interested parties and the technical expertise to develop the plan. The GSA should draw on existing data and studies wherever possible.
- Stakeholders strongly support inclusivity and diversity to build success in the process. Fairly representing all interests would support creating a shared framework of mutual benefit.
- Given that agriculture is the primary economic driver in the area, stakeholders recommend that agriculture have a significant voice in governance and decision-making on GSA formation, yet balancing that voice with urban, cities, county, and other interests.
- Many recognize the need to act to avoid both undesirable results and state intervention.
- Interviewees readily talk about historic tensions and sources of distrust in the region that the process must manage.
- Critical issues are tied to land use and small communities losing water supply because of poor water quality.
- "The Valley is innovative and progressive – it moves ahead to address problems." While interviewees define and view groundwater supply quite differently, everyone concurs that a range of stakeholders must agree on the GSA.

Consensus Building Institute Process Recommendations

Create a Transparent, Inclusive Collaborative Process for Groundwater Sustainability Agency Formation
Stakeholders are broadly unified on several core aspects related to a process for identifying a GSA. It must be transparent. It must be inclusive. It must be accompanied by broad outreach. And it should draw on the best available data.

Convene a Groundwater Stakeholder Forum and Collaborative Work Group
The Groundwater Stakeholder Forum would be a periodic public forum with a range of interests participating that advises on GSA formation. The forum's role would be to shape the overall process. Forum membership would encompass all stakeholders who are interested in groundwater and must be considered under SGMA. The Collaborative Work Group would develop consensus on the proposed GSA structure and recommend adoption by the GSA-eligible agencies. The work group would be a representative body with a focused number of participants (12-20) representing the interests of GSA-eligible agencies and groundwater users. CBI would work with interest groups to identify work group participants. The work group would develop detailed proposals and meet regularly with the Groundwater Stakeholder Forum to share ideas and solicit feedback on proposals. The work group would commit to incorporating forum feedback to the greatest degree possible. The work group could also form ad hoc committees to carry out detailed work. For example, CBI would recommend forming an engagement committee to develop the public engagement plan and a technical committee to begin to prepare for plan development.

Confirm Work Plan

The forum and the work group would have a decision-making work plan to outline its discussion topics. Between February and November 2016, these bodies would work diligently to develop a proposal for GSA formation. These conversations would be punctuated by public engagement activities. In winter 2016/17, the Collaborative Work Group would consult with agency governing boards and the public on the proposals. In spring 2017, the forum and work group would refine the GSA structure based on those consultations. Once the GSA structure was set, the responsible entities forming the GSA would issue public notice and hold a public hearing by spring 2017 before notifying the state in advance of the June 2017 deadline.

Design and Implement a Public Engagement Plan

Given the paramount importance and level of interest in groundwater in the Salinas Valley, CBI would recommend designing and implementing a public engagement plan and suite of activities to create transparency and information about GSA formation for the general public, translating materials and creating radio spots to reach Spanish-speaking communities.

Conclusion

The overarching goal of this effort would be to reach widespread support on forming the groundwater sustainability agency for the Salinas Valley and complying successfully with the Sustainable Groundwater Management Act. The keys to success are creating a transparent, inclusive process that engages interested stakeholders, designing a governance structure that balances interests, supports a vibrant economy, manages groundwater sustainably, and meets SGMA requirements. A viable and broadly supported GSA is the essential first step towards long-term sustainable groundwater management.

Contents

Part 1: Assessment Findings

California's recently passed historic groundwater management legislation requires that groundwater be managed locally to ensure it can be a sustainable resource well into the future.

The legislation, known as the Sustainable Groundwater Management Act, prioritizes groundwater basins in significant overdraft including the Salinas Valley to move forward first. SGMA requires that such areas first identify an agency or group of agencies to oversee groundwater management by 2017 and then develop a plan to manage groundwater use by 2020.

The Consensus Building Institute (CBI) is a neutral non-profit that helps groups engage collaboratively on a wide range of issues. A consortium of interests[1] in the Salinas Valley asked CBI to help all interested parties in the region to address the legislation's initial mandate to form a Groundwater Sustainability Agency (GSA) by June 2017.

This report represents the first step in CBI's work on this effort: an in-depth assessment of stakeholder perspectives on the range of issues and opportunities tied to establishing a GSA. This report presents CBI's assessment findings and recommendations for a transparent, inclusive process on forming a GSA in the Salinas Valley. The report is presented in the following sections:

- ***Approach,*** summarizing CBI's methodology to conduct the assessment
- ***SGMA Context,*** providing a brief scan of the legislation, project impetus, and objectives
- ***Findings,*** presenting findings based on a series of interviews and surveys and a review of relevant background material
- ***Recommendations,*** putting forward a series of process design and decision-making recommendations related to GSA formation.

It is important to note that CBI's role is to *help facilitate* local decision-making on this critical issue, recommending and leading a process that brings all affected parties together in a productive dialogue. The ultimate decision on GSA structure is to be determined entirely at the local level.

Approach

CBI's assessment is intended to understand and then reflect to interested parties the range of perspectives and possible process approaches being considered by stakeholders potentially affected by implementation of the Sustainable Groundwater Management Act (SGMA) in the Salinas Valley.

[1] Consortium members comprised the representatives of the cities, Monterey County, Farm Bureau, Grower Shipper Association, Salinas Valley Water Coalition and Water Resources. Agency. The Consortium was formed solely to jump-start the process by hiring an impartial facilitator. CBI will work with a broad cross-set of interests including agriculture, cities and NGOs to manage the process moving forward.

Given the critical role groundwater plays in the region's water supply and economy and the potential impacts of any change in how groundwater is managed, CBI's methodology is grounded in three core principles: (1) being comprehensive in soliciting input from the range of potentially impacted stakeholders; (2) being transparent in the nature of the feedback and recommendations provided; and (3) drawing on CBI experience and best practices to recommend an approach likely to foster effective and inclusive deliberations.

The findings included in this report are drawn from a wide range of discussions and feedback with Salinas Valley stakeholders. CBI gathered this feedback in two primary ways:

- ***In-depth interviews.*** CBI Senior Mediators Gina Bartlett and Bennett Brooks conducted 35 in-depth interviews with 47 individuals that included cities; agriculture, environmental, and land use groups; water agencies and suppliers; individuals working with disadvantaged communities; and elected officials. Interviewees were confidential (to foster candor) and were conducted either in-person or by phone. (A list of those interviewed as part of the formal assessment process, as well as the interview protocol, is included as an appendix.)

- ***Broad-based survey.*** Given the importance of this topic and to ensure all stakeholders had an opportunity to inform this initial report, CBI also conducted a survey, available online and via email. CBI worked with a range of individuals and entities in the Salinas Valley to invite widespread participation. CBI received 86 individual survey responses. (A copy of the survey is included in the appendix.)

CBI initially worked with the consortium to identify a preliminary stakeholder list. In the initial round, CBI concentrated on interviewing representatives of the local public agencies eligible to serve as the GSA and key interested parties. Once interviews began, participants recommended other stakeholders for the assessment process, many of whom CBI then interviewed. This incremental process continued until Gina and Bennett began to hear similar information with no significant new information put forth. In addition, Gina and Bennett held brief conversations with other interested parties who contacted them or expressed interest in learning more about the process.

Both the interviews and survey focused on a common set of questions intended to provide feedback on the following broad topics: interests, issues, and challenges related to groundwater management; perspectives on GSA formation and structure; and guidance related to process structure and stakeholder involvement. In addition, CBI reviewed background materials related to both SGMA and Salinas Valley groundwater management.

After preparing this report, CBI invited interview participants to review the draft findings and provide feedback to ensure accuracy. CBI will also present the draft findings and recommendations at a public workshop in January. After this, CBI will finalize the report and its recommendations.

Please note that CBI did not attempt to independently validate the claims or concerns of the interviewees or survey respondents. Rather, this report seeks to summarize the range of views, ideas, and concerns expressed. Additionally, this brief report cannot do justice to the deep knowledge, experience, and nuances of the many stakeholders interviewed. Rather, the report tries to reflect back key themes and concerns that help shape the way forward. CBI has sought to present these findings, in our role as a neutral facilitator, as accurately and fairly as possible. Any errors or omissions are the sole responsibility of CBI.

SGMA Context

The Sustainable Groundwater Management Act is a package of three bills (AB 1739, SB 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. The State has prioritized 127 basins in the state that must comply with SGMA, including the Salinas Valley basin's eight sub-basins. The California Department of Water Resources Bulletin 118 is a report that defines the basin boundaries. Basins that must comply with SGMA have to meet several critical deadlines.

Form a Groundwater Sustainability Agency by June 30, 2017

A local agency, combination of local agencies, or county may establish a GSA. Under SGMA, local agencies with water supply, water management, or land use responsibilities are eligible to form GSAs. A water corporation regulated by the Public Utilities Commission or a mutual water company may participate in a groundwater sustainability agency through a memorandum of agreement or other legal agreement. The GSA is responsible for developing and implementing a groundwater sustainability plan that considers all beneficial uses and users of groundwater in the basin.

A GSA must cover all portions of the basin. The county is responsible for representing the unincorporated areas. Each GSA-eligible agency could form its own GSA; however, DWR will not recognize GSAs with overlapping areas. GSAs with overlap must eliminate overlap to be recognized by the state. If more than one GSA is formed in the Salinas Valley Basin, they would require a coordination agreement.

Develop a Groundwater Sustainability Plan by 2020 or 2022

GSAs must develop a groundwater sustainability plan with measurable objectives and milestones that ensure sustainability. A priority basin must have single plan or multiple coordinated plans. The Salinas Valley sub-basin has areas deemed in critical condition. Basins in critical condition must develop plans by Jan. 31, 2020. Priority basins that are not in critical condition have until Jan. 31, 2022, to develop plans.

Achieve Sustainability in 20 years

SGMA requires basins to achieve sustainability in 20 years. Sustainability is defined as avoiding undesirable results, including significant and unreasonable chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface waters.

State Backstop or Intervention
If a local agency is not managing the groundwater sustainably, SGMA directs the State Water Resources Control Board to intervene to manage the basin until a local agency is able to do so. SGMA calls for State Water Board intervention when a basin fails to meet the stated deadlines.

GSA-Eligible Agencies in the Salinas Valley Basin
A number of local public agencies are eligible to form a GSA in the Salinas Valley. California Water Code 10723.6 stipulates that a combination of local agencies may form a GSA by a joint powers agreement, a memorandum of agreement or other legal agreement. A water corporation regulated by the Public Utilities Commission or a mutual water company may participate in a groundwater sustainability agency though a memorandum of agreement or other legal agreement. Staff will identify the complete list GSA eligible agencies, including PUC-regulated and mutual water companies early in the process. Below is a partial list of agencies that are eligible in the Salinas Valley Basin.

Monterey County
San Luis Obispo County

City of Gonzales
City of Greenfield
City of King
City of Marina
City of Paso Robles
City of Salinas
City of Soledad

Castroville Water Community Service District
Marina Coast Water District
Monterey County Water Resources Agency
Monterey Peninsula Water Management District
San Ardo Water District
San Lucas Water District

Alco Water
California Water Service

Findings

The following summarizes findings from interviews and surveys conducted by the Consensus Building Institute.

GSA Formation

Groundwater supply is high stakes; everyone recognizes the importance of forming the GSA successfully. The people of the Salinas Valley rely almost solely on groundwater for their water supply and livelihoods. Interviewees articulate that sustainability will require a long-term approach: the region needs a continuous source of drinking water for communities and individual well owners. Significant agricultural production in the Valley and tourism in the Peninsula shape the economy and create a complex interdependence between production and business and water for people's daily lives, including the cities and communities that house workers essential to the region's prosperity. While interviewees define and view groundwater supply problems quite differently, everyone concurs that a range of stakeholders must agree on the groundwater sustainability agency. "Fairness and trust are the key to whatever comes out of this process."

"Our primary concern is to maintain the economic driver by managing on a sustainable basis."

No clear candidate exists for the GSA. Interviewees cannot identify any one organization as a likely candidate to serve as the GSA. One person outlined two options: a single GSA for the entire basin or multiple GSAs organized by sub-basin, suggesting that the latter might better manage the varied conditions in each sub-basin. Many anticipate that some type of Joint Powers Authority, merging the responsibilities of existing agencies, may be likely. Suggested examples are the county, one or more cities, and agriculture representatives with some type of advisory body that is inclusive of smaller water systems, domestic well owners, or the general public. One person suggested one vote per acre-owned, and another urged that the GSA avoid duplicating existing processes when possible. Also, most interviewees envision one GSA in the basin in Monterey County. At least one person suggests that one GSA cover the Salinas Valley Basin in both counties. (Many anticipate that the Paso Robles sub-basin would be split at the county line with a separate GSA forming for the San Luis Obispo County portion.) However, no one configuration or entity emerged through the interview process.

"We need an entity that has knowledge to be the GSA and trust of all the interested parties, and the technical expertise to develop the plan." Stakeholders urge that the GSA must rely on science, constructively regulate, and wisely and fairly navigate water supply politics. Interviewees recommend a process based on scientific information and a governance structure that reflects this understanding. Participants would like to see a GSA with a formal regulatory structure with repercussions for failure to abide by agreements. Most recognize that the GSA will need the power and structure to be able to regulate toward sustainability, including levying fees for projects. They would like to see a GSA that can identify and implement management decisions that would achieve sustainability and provide the ability to measure success. Questions that stakeholders recommend for consideration in forming the GSA include: How do we get better knowledge of basin functions? What projects are currently operating and anticipated in the future? What has worked or failed in other areas? How will funding be set up? What fees would the GSA charge?

"The worst situation would be if the GSA is formed without proper internal capacity to carry out its required functions."

Surveys mentioned the need for skilled staff and adequate funding for success. "It will take a skilled director to run the GSA." Interviewees suggest that GSA staff will need to exercise strong leadership and knowledge of water and politics. The GSA would need hydrologists and geo-morphologists. Interviewees suggest that the GSA should be balanced and represent the range of stakeholders in the Salinas Valley Basin. Others counter that stakeholder consensus has not worked so allowing independent experts to make decisions would be preferable. The Monterey Regional Pollution Control Agency is a model that the GSA might replicate. Interviewees suggest that it found a way to balance urban and rural interests.

"The Water Resources Agency acting alone as a GSA would probably not balance agricultural interests with urban, that's why some organizations were hesitant about WRA becoming the GSA." WRA is often mentioned as a likely GSA candidate because its service area overlies the basin, and it manages many water supply projects. However, most interviewees think that WRA needs to *participate in* rather than *serve as* the GSA. Stakeholders' reasons vary: many feel that agricultural interests are dominant, that the cities have no direct representation, and that representing diverse interests at WRA would be difficult; changing WRA's legislative intent to serve as the GSA would be arduous; and shifting WRA to a regulatory role might erode stakeholder trust.

Given that agriculture is the primary economic driver in the area, most interviewees feel that agriculture needs to have a "big voice" in governance. Most concur that balancing the importance of agriculture with all the other interests in governance is critical. Agriculture is clearly recognized as the primary economic driver; it uses "most of the water and will foot much of the bill for any changes needed to manage groundwater sustainably." Interviewees understand that others need representation as well, specifically, the cities, city water suppliers (which are California Public Utilities Commission-regulated water corporations), rural residential well owners, and small mutual water companies. Interviewees articulate the inter-connected nature and need for comprehensive water management because the cities provide the homes for agricultural workers and hospitality workers in the Peninsula. The City of Salinas has a number of residents that rely on jobs in the hospitality industry in the Peninsula. The City sees a direct line between those jobs and the corresponding revenue and supporting successful regional water management.

"Agriculture is going to be focusing in on their needs with 90% of the use in the basin. It's a big majority that you have to listen to. But it doesn't work for the 90% to pump and not be mindful of the impact on the 10%."

Interviewees express fear about achieving balance in decision-making. They express concern about the urban population "outvoting" agricultural interests, and agricultural interests using political power to "outvote" the cities.
Interviewees articulate a strong recognition of inter-dependence and recommend the following considerations for governance:

- Ensure agricultural interests have a significant voice in the dialogue, but balance that voice with urban, cities, county, and other interests
- Represent the major interests: agriculture, cities, domestic water suppliers, community interests, and environmental users of water.
- Consider population
- Consider water use and demand
- Make size of governing body manageable: not too large to be unwieldy

Stakeholder GSA-Formation Process Recommendations

"Inclusivity and diversity will build success." All interviewees suggest that an inclusive, transparent process is critical to success. Everyone agrees that all stakeholders need to come together to collaborate and reach consensus on the GSA. Some express concern that collaboration will be difficult if stakeholders fight over groundwater issues rather than trying to resolve them. Many recommend having all GSA-formation-related meetings open to the public. Also, a few people suggest the importance of holding meetings throughout the Valley to explain the need for the new organizations and request ideas on the governing board, funding, and programs. Some would like to see process agreements so interests participating in GSA formation cannot use what they have learned for lawsuits. To reach Spanish-speaking populations, the outreach effort would need to rely on Spanish radio and television, and many suggested translating all materials.

"The Valley is innovative and progressive – it moves ahead to address problems." While no one thinks collaborating on the GSA will be easy, everyone concurs that stakeholders from different interest groups must work together to figure out the best configuration for forming the GSA. One person suggests looking at cooperative efforts in Napa County as an example. Many believe that stakeholders will be able to successfully form the GSA.

"Fairly represent the interests so we can create a shared framework of mutual benefit." Participants offered a number of suggestions for designing an effective process. Some recommend a focused group to negotiate the GSA complemented by broad transparent outreach. Many suggest starting with a large, inclusive group, anticipating that after the first few meetings, many will defer to a core group to carry out the work. A few recommended establishing committees to work on detailed agreements and proposals for broader group consideration. Several recommended developing a memorandum of understanding on the process so that the public agencies commit to the process of working together, possibly in a joint meeting of the Board of Supervisors and City Councils. Many said they look to CBI to recommend a process design based on its experience and familiarity with best practices.

Stakeholders recommend drawing on existing studies when possible. To manage costs and avoid duplication of effort, people would like the GSA to draw on existing studies. An important first step would be to consider all the data that are currently available and to determine the role of Zone 2c in the GSA.

Challenges to GSA Formation

Many recognize the need to act – to avoid both undesirable results and state intervention. Many understand that groundwater levels are dropping. A few interviewees perceive that some water users, in particular some representatives of agriculture, are resistant to reducing water use. Yet others feel that agriculture has contributed significantly to reducing water use by changing irrigation practices and providing funding and support for water supply projects. Many express hope that people can move beyond their own self-interests and manage water for the region. Lastly, a lawsuit with the County of San Luis Obispo underway on the Paso Robles sub-basin continues with different views of the role of the underflow form the Salinas River, the outcome of which might affect this effort.

"GSA-forming entities [must] recognize and accept that new ways of addressing the issues are needed (i.e., the status quo is not working)."

Some interviewees suggest that a few stakeholders in the Valley would prefer an adjudicated basin. A few interviewees articulate that adjudication or state intervention is necessary to sustainably manage the basin; in other words, they do not believe the political will exists to ever curtail pumping. One or two interviewees believe that adjudication would remove politics from management, i.e. it would be easier. A few interviewees express frustration that adjudication would be costly and time consuming. Some suggest that if stakeholders are unable to reach consensus on the GSA, some may initiate the adjudicatory process. Some express concern that the State will intervene, regardless, if saltwater intrusion continues.

"If the GSA is going to have authority to impose strict measures to maintain sustainability, there has to be the political will to undertake these."

Many suggest that it is timely to rethink WRA's agreement to keep well data confidential and only provide aggregated data. The GSA will need data to demonstrate sustainability and be in compliance with SGMA. Interviewees anticipate that comprehensive monitoring data will be necessary to support implementation of the groundwater sustainability plan and would prefer to use existing well data where possible.

Interviewees readily talk about historic tensions and sources of distrust in the region. People express differing viewpoints about whether these tensions are "real" or even if they still exist. However, CBI names them here because they are part of the "water narrative" that could affect GSA representation and governance. While a few interviewees suggest strain, most articulate mutual interests among agriculture and urban interests, linking the economy and housing. Most speak of historic tensions between North and South County over water supply, including impacts to groundwater and surface water and cost sharing on water resources projects. However, stakeholders also suggest that many are working together across the whole basin to manage water supply issues. One person cites the Salinas Valley water project (rubber dam) as an example of folks coming together to address issues cooperatively. The other identified division in the county is between the Peninsula and the Valley. Some interviewees suggest that attitudes between the two shape the ability to carry out projects with perceived regional benefit. These perceptions could affect GSA formation, governance structure, and operational effectiveness.

Critical Issues: Land Use, Water Supply, Water Quality and Boundaries

Water and land use are closely connected. Some agricultural representatives suggest that many in agriculture have long believed there is sufficient water. However, with the ongoing drought and other changed conditions, supply constraints have become more evident. A few people would like to limit residential and commercial development in watershed areas to reduce groundwater depletion. Most would prefer that development occur within the cities rather than taking land out of production. Interviewees express different perceptions of how water flows throughout the sub-basins, where recharge may occur, and how pumping in one area impacts another. California Water Service and Alco Water Service, investor-owned water corporations, serve Salinas residents, and California Water serves King City residents as well. Individuals from the North County report an unprecedented dip in water levels in this fourth year of drought. One or two people would like clarification of water rights under SGMA.

Interviewees report that many small communities are losing their water supply, primarily because of water quality concerns. Interviewees identify a number of water quality issues in different parts of the Valley, primarily nitrates in domestic wells, arsenic, and seawater intrusion. Many of these communities are small systems with only several houses connected to wells that tend to be very shallow. The communities tend to be low income or impoverished. The County Department of Public Health monitors water quality in wells, and several local non-profits have been working with community residents to secure reliable potable water supplies. Stakeholders link water supply to quality issues and believe the groundwater sustainability plan has to link them as well, regardless of SGMA requirements.

ONGOING RELATED PROJECTS & STUDIES (partial list)

- Bureau of Reclamation Carmel and Salinas Rivers Study
- Bureau of Reclamation-Funded Drought Contingency Planning in North Salinas Valley
- Castroville Seawater Intrusion Project (CSIP) / Salinas Valley Reclamation Project
- Salinas River Stream Maintenance Program
- Salinas Valley Water Project
- Pure Water Monterey
- Water Resources Agency (WRA) / USGS Groundwater Model Development
- WRA Interlake Tunnel Project

While the Salinas Valley relies on groundwater, a number of projects augment supply, and studies are underway that will inform the groundwater sustainability plan. Surface storage in the Upper Valley controls releases to the Salinas River and provides recharge in that part of the basin. Recycled water projects, including the Castroville Seawater Intrusion Project and Pure Water Monterey, and the Salinas River Diversion Project (rubber dam) are underway to offset groundwater use in North Valley. A Bureau of Reclamation study will characterize the Carmel and Salinas rivers' groundwater basins. The Water Resources Agency has a technical advisory group that is working with USGS to develop a new groundwater model and is evaluating an interlake tunnel between the two surface storage facilities. Stakeholders also report the possibility of additional water available via State Permit 11403 on the Salinas River. Finally, desalination projects are at various stages of development in the region.

"Ag is the major economic engine in Monterey County. Agriculture has and will continue to pay for the largest percentage of water improvement projects in the basin."

Several discrete boundary issues might affect GSA formation. The California Department of Water Resources' (DWR) Bulletin 118 defines basin boundaries for SGMA implementation. The area known as the "Salinas Valley Basin" is actually made up of 8 sub-basins listed below. Stakeholders mentioned a number of basin boundary issues that could affect GSA formation. DWR is accepting requests to change basin boundaries for technical reasons and for jurisdictional reasons between January and March 2016. The next opportunity to request changes would be in 2018, before the groundwater sustainability plan is due for the Salinas Valley in 2020.

Salinas Valley Sub-Basins Defined by Department of Water Resources Bulletin 118

CASGEM Basin Number	Sub-Basin Name	Stakeholder-Identified Boundary Considerations
3-4.01	180/400 FOOT AQUIFER	▪ Part of Dolan Road is included in Pajaro Basin, which should be in the 180/400 Foot Aquifer. Stakeholder would consider extending 180/400 Foot Aquifer north to County line.
3-4.02	EAST SIDE AQUIFER	▪ *None mentioned.*
3-4.04	FOREBAY AQUIFER	▪ *None mentioned.*
3-4.05	UPPER VALLEY AQUIFER	▪ *None mentioned.*
3-4.06	PASO ROBLES AREA	▪ Separated by County Line. New water district forming via LAFCO in San Louis Obispo County portion. ▪ Hames Valley in Monterey County is included although some think it is a separate hydrologic system.
3-4.08	SEASIDE AREA	▪ Adjudicated. GSA would govern fringe area not covered by adjudication.
3-4.09	LANGLEY AREA	▪ *None mentioned.*
3-4.10	CORRAL DE TIERRA AREA	▪ Portion adjudicated. GSA would govern fringe area not covered by adjudication.

Part 2: Recommendations

Create a Transparent, Inclusive Collaborative Process for Groundwater Sustainability Agency Formation

Stakeholders are broadly unified on several core aspects related to a process for identifying a GSA. It must be transparent. It must be inclusive. It must be accompanied by broad outreach. And it should draw on the best available data. While stakeholders did not articulate broad agreement on a particular process for tackling GSA formation, many are looking to CBI to draw on its expertise and experience elsewhere to put forward a recommended approach. With this is in mind, CBI has crafted a suite of recommendations structured to achieve the following:

- Ensure multiple and ongoing opportunities for meaningful public input and dialogue
- Balance the need for broad participation with the imperative for focused and effective conversations
- Foster cross-interest group discussions on all aspects of GSA design to ensure participants understand and integrate each other's interests and concerns
- Provide sufficient time for thoughtful deliberations without exhausting people's time and resources
- Achieve agreements and reach outcomes within the required timeline

Convene a Groundwater Stakeholder Forum and Collaborative Work Group

Groundwater Stakeholder Forum

The Groundwater Stakeholder Forum would be a public forum with a range of interests participating that meets periodically to advise on the formation of the GSA. The forum's role is to shape the overall process. Forum membership would encompass all stakeholders who are interested in groundwater and must be considered under SGMA. Forum meetings would foster consistent participation and also provide the public an opportunity to learn about and provide input on an ad hoc basis on GSA formation. Spanish translation would be offered at forum meetings. At each forum, the Collaborative Work Group (see below) would share information about work underway and solicit feedback on proposals. Forum discussions would focus on outlining both areas of agreement and divergent views for the Collaborative Work Group to consider; consensus at the Forum would not be required. The Collaborative Work Group would incorporate forum feedback into its proposals that would ultimately become recommendations to the decision-making bodies on the GSA governance structure.

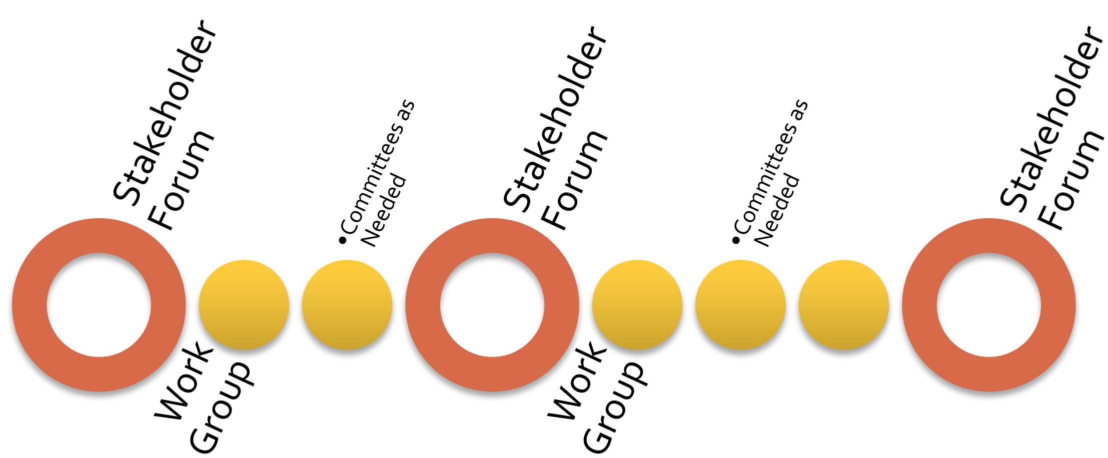
Collaborative Work Group

The Collaborative Work Group's role would be to develop consensus recommendations on the GSA structure. The GSA-eligible agencies would consider those recommendations for adoption. The Collaborative Work Group would be a representative body with a focused number of participants (12-20 individuals) representing the diverse interests of the GSA-eligible agencies and groundwater users. All Work Group deliberations would be open to the public. CBI facilitators would work with each interest to identify individual representatives able to commit to consistent participation in the Collaborative Work Group. Work group members would commit to attending meetings consistently, with relative frequency as necessary, to develop the recommendations needed to meet the state's deadlines. Representatives would need to be able to represent interests and demonstrate ability to work collaboratively with others and listen and problem solve on GSA formation and governance issues. The work group would review and finalize its membership at an early meeting.

Work Group Participation Criteria
- Strong effective advocate
- Demonstrated ability to work collaboratively with others
- Able to commit time needed for ongoing discussions
- Collectively reflect diversity of interests
- Maintain group size to support focused deliberations

The work group would carry out the detailed work of forming the GSA. The work group would strive for consensus (participants can at least live with the decision) in developing recommendations for GSA formation. Products of the work group would reflect the outcomes of its discussion. The work group would meet regularly with the Groundwater Stakeholder Forum to share ideas and solicit feedback on proposals. The work group would commit to incorporating feedback from the stakeholder forum to the greatest degree possible. Discussion at meetings would be centered on work group members, but with time built in for public comment. However, as noted above, the Groundwater Stakeholder Forum would be the primary venue for sharing information and seeking feedback on proposals for GSA formation in the Salinas Valley.

DIAGRAM: Groundwater Stakeholder Forum, Collaborative Work Group, and Committee Meetings



Committees
CBI would also recommend ad hoc committees come together periodically to manage a specific task. Ad hoc committees would develop options for the Collaborative Work Group to contemplate and refine before sharing with the Groundwater Stakeholder Forum. Ad hoc committees would be small and nimble. Participants would have expertise related to the committee's purpose. Ad hoc committees would also be open to the public.

Engagement Committee: In this initial phase, CBI would recommend an engagement committee form to work with the facilitation team on developing a communication and engagement plan and creating a project web site and public information materials about SGMA and the GSA formation process. As time progresses, materials would focus on making sure interested community members understand and can provide input on the proposed recommendations. The engagement committee would refine all public information materials.

Technical Committee: CBI would also recommend a technical committee convene to examine basin boundaries and begin preparing to develop the groundwater sustainability plan. Since the Salinas Valley Basin must complete its plan by 2020, the technical committee could develop a work plan, including plan requirements and the necessary resources, to develop the groundwater sustainability plan.

Recommended Stakeholder Representation and Participation
CBI would recommend that all stakeholder interests engage in forming the groundwater sustainability agency. CBI would work with interest groups to identify specific individuals to commit to participate in GSA formation. The key interests, that stakeholders suggest and SGMA defines, would include the following:

<u>Local Agencies Eligible to Serve as GSA</u>
- County (Monterey County & San Luis Obispo County)
- Cities
- Water Agencies
- Public Utilities Commission-Regulated Water Companies
- Other Public Agencies

<u>Beneficial Users & Uses</u>
- Agriculture
- Business
- Disadvantaged Communities
- Environmental
- Rural Residential Well Owners

Effective Participation
To conduct a successful process, the parties would commit to the following:

Everyone would agree to address the issues and concerns of the participants. Everyone who is joining in the collaborative process is doing so because she or he has a stake in the issues at hand. For the process to be successful, all the parties agree to validate the issues and concerns of the other parties and strive to reach an agreement that takes all the issues under consideration. Disagreements would be viewed as problems to be solved, rather than battles to be won. Parties are committed to making a good faith effort to find a collaborative solution (as opposed to seeking resolution in the courts).

Continuity of the conversations and building trust would be critical to the success of the work group. Everyone would agree to inform and seek feedback from their respective group's leadership and constituents about the ongoing dialogue. Meeting scheduling would allow for the work group to inform the stakeholder forum and for work group members to inform and seek advice from their leadership, attorneys, or scientific advisors about the discussions and recommendations.

Decision Making

The Collaborative Work Group and Groundwater Stakeholder Forum would be consensus seeking, striving to reach outcomes that all participants could at least "live with." The Collaborative Work Group would recommend the GSA structure to the GSA-eligible entities in the basin. If more than one agency chooses to participate in the GSA, each agency's governing board would have to adopt or approve the GSA.

If the Collaborative Work Group proved unable to reach consensus on the recommended structure, each GSA-eligible agency could move forward to comply with SGMA by forming one or more GSAs and the required coordination agreements. If no agencies step forward to form the GSA, SGMA stipulates that the county would be the default GSA. In the Salinas Valley, this would need to involve both Monterey County and San Luis Obispo County because the Paso Robles sub-basin extends into San Luis Obispo County. The GSA would be responsible for forming the groundwater sustainability plan. Based on stakeholder feedback, successful GSA formation is considered critical to the ultimate goal of plan development and implementation.

Decision-Making Road Map

The process would move through these stages of organization, information gathering, proposal development, and engagement activities to develop recommendations on forming a groundwater sustainability agency for the Salinas Valley Basin.

Jan-Feb 2016	Feb-April	March-Oct	Oct-Nov	Dec-Mar 2017	March 2017
• **Organization:** • Confirm Process Design & Stakeholder Participation • Develop Work Plan • Organize Committees	• **Information Gathering & Understanding:** • SGMA Requirements & Governance Options • Current Basin Understanding • Basin Boundaries (Applications due to DWR between Jan-March 2016) • Stakeholder Interests	• **GSA Formation Proposal Development** • **Public Enagement Plan and Activities**	• **GSA Formation Vetting Process**	• **GSA Formation Proposal Refinement and Legal Documentation**	• **Public Notice & Hearing**

GSA Formation Proposal Development

To develop and make recommendations on forming the GSA, the Collaborative Work Group would need to explore these topics, engaging the Groundwater Stakeholder Forum to guide its work. Public engagement activities would also occur to solicit input to strengthen proposals.

- Confirm GSA Authorities and Management Responsibilities
- Establish Criteria to Evaluate Options
- Identify GSA-Eligible Agencies and Interest in Participating in GSA
- Understand Potential Options for GSA
- Explore Overarching Governance Structure
- Evaluate Pros & Cons of Different Legal Structures
- Identify Potential Costs of GSA Operations
- Develop Recommendations on Representation, Voting, Financing, Fees
- Agree on Preliminary Proposals
- Vet and Refine Proposals
- Recommend GSA Structure

Design and Implement a Public Engagement Plan

Given the paramount importance of groundwater in the Salinas Valley, CBI would design and implement an outreach plan and suite of activities to create transparency and information about GSA formation for the general public. CBI recommends working with the engagement committee to develop both the plan and its materials. As recommended during the public workshop on the assessment, the engagement plan would include special efforts to reach neighborhood groups, homeowners' associations, and local landowners who own wells. As recommended during the interview process, the public engagement plan would incorporate translation and radio spots to inform Spanish-speakers in the groundwater basin.

Conclusion

The overarching goal of this effort would be to reach widespread support on forming the groundwater sustainability agency for the Salinas Valley and complying successfully with the Sustainable Groundwater Management Act. The keys to success are creating a transparent, inclusive process that engages interested stakeholders, designing a governance structure that balances interests, supports a vibrant economy, manages groundwater sustainably, and meets SGMA requirements. A viable and broadly supported GSA is the essential first step towards long-term sustainable groundwater management.

About the Consensus Building Institute

Founded in 1993, the Consensus Building Institute improves the way that community and organizational leaders collaborate to make decisions, achieve agreements, and manage multi-party conflicts and planning efforts. A nationally and internationally recognized not-for-profit organization, CBI provides collaborative problem solving, mediation and high-skilled facilitation for state and federal agencies, non-profits, communities, and international development agencies around the world. CBI senior staff are affiliated with the MIT-Hard Public Disputes Program and the MIT Department of Urban Studies and Planning. Learn more about CBI at: www.cbuilding.org

Gina Bartlett is a senior mediator at CBI. She has mediated many complex policy issues related to water resources, land use, and natural resources over the last 20 years. She is on the national roster of the U.S. Institute for Environmental Conflict Resolution and has a Master's degree in Conflict Analysis & Resolution. Ms. Bartlett is working on implementation of the Sustainable Groundwater Management Act with the California State Water Resources Control Board and Department of Water Resources, the California Water Foundation, and Sonoma County with three priority basins. You can learn more about Gina at cbuilding.org and reach Gina at 415-271-0049 or gina@cbuilding.org

Bennett Brooks is a senior practitioner who brings deep experience in water resources and high-conflict complex issues, both in California and elsewhere. Over the last 18 years, he has facilitated dozens of complex and highly contentious collaborative dialogues on issues related to water resource conflicts, ecosystem restoration, fisheries, and infrastructure improvements throughout the U.S. He has conducted numerous assessments, designed and facilitated several joint fact-finding panels, and taught a range of negotiations trainings on mutual gains bargaining. Last year, Bennett facilitated a successful dialogue among Central Valley water managers that generated many of the ideas now encompassed in California's groundbreaking groundwater management legislation. Bennett recently facilitated a series of roundtable discussions to better define measurable objectives and triggers related to the six "undesirable results" identified in SGMA. You can reach Bennett at BBrooks@cbuilding.org

Appendix A: List of Persons Interviewed

Interviews alphabetized by last name of interviewee.[2]

1. Tom Adcock, President, and Andrea Schmitz, Water Quality Manager, Alco Water
2. Lew Bauman, County Administrative Officer, Nick Chiulos, Assistant CAO, Les Girard, Chief Assistant County Counsel, and Charles McKee, County Council, Monterey County
3. Brian Boudreau and Beth Palmer, Monterey Downs, LLC
4. Dave Chardavoyne and Rob Johnson, Monterey County Water Resources Agency
5. Rob Cullen, Mayor, King City
6. John Diodati, Department Administrator, Carolyn Berg, San Luis Obispo County Department of Public Works
7. Marc Del Piero, Sherwood Darington, and Richard Nutter, Board Members, Agricultural Land Trust
8. Daisy Gonzalez and Vicente Lara, Environmental Justice Coalition for Water
9. Norm Groot, Monterey County Farm Bureau
10. Abigail Hart, The Nature Conservancy
11. Brett Harrell, Nunes Company and Grower-Shipper Association
12. Dale Huss, Ocean Mist and Sea Mist Farms
13. Nancy Isakson, Salinas Valley Water Coalition
14. Mike Jones, General Manager, California Water Service
15. Margie Kay
16. Roger Maitoso, Arroyo Seco Vineyard
17. Bob Martin, Rio Farms
18. Mike McCullough. Monterey Regional Pollution Control Agency
19. Rene Mendez, City Manager, City of Gonzales
20. Jeanette Pantoja, Environmental Justice Coalition for Water Board and Building Healthy Cities
21. Gary Petersen, Director of Public Works, City of Salinas
22. John Ramirez, Monterey County Department of Public Health
23. Jerry Rava, Rava Ranch
24. Rich Smith, Paraiso Vineyards
25. Sergio Sanchez, Office of Assemblyman Alejo and Hispanic Chamber of Commerce of the Central Coast
26. Steve Shimek, Monterey Coast Keeper and The Otter Project
27. Dennis Sites, Salinas Valley Sustainable Water Group
28. Abby Taylor Silva, Grower-Shipper Association and Monterey County Water Resources Agency Board Member
29. Simon Salinas, Supervisor, Monterey County
30. Dave Stoldt, Monterey Peninsula Water Management District
31. Eric Tynan, General Manager, and Ron Stefani, Board Member, Castroville Community Services District
32. Juan Uranga, Center for Community Advocacy
33. Keith Van Der Maaten, General Manager; Howard Gustafson and Peter Le, Board Members; and Roger Masuda, Attorney, Marina Coast Water District
34. Amy White, Executive Director, LandWatch Monterey County
35. Don Wilcox, Public Works Director, City of Soledad

[2] In addition to the formal assessment interviews, G. Bartlett and B. Brooks held brief conversations with other interested parties who contacted them or expressed interest in learning more about the process.

Appendix B: Interview Protocol & Survey Questions

NOTE: The survey varied slightly to make it easier to capture information in writing, but the questions were essentially the same. Please contact Gina@cbuilding.org or 415-271-0049 if you would like a copy of the survey questions.

Initial Exploration on GSA Formation in Salinas Valley Basin

Confidentiality: *CBI Facilitators will use what we discuss to report back findings without attributing it to interviewee personally; anything that interviewee wishes to stay confidential will remain between the facilitator and interviewee.*

Background

Tell us about your background and/or interests related to groundwater management generally?

What is the role of groundwater in your water supply? How does your organization think about groundwater as part of its water supply future?

GSA Formation and Structure

The first major requirement under SGMA is to form a GSA(s) by June 2017 for medium and high priority basins. What are your primary concerns or interests related to SGMA and GSA formation? Why are these important?

How would you (and your entity) foresee GSA formation moving forward in your basin? Why?

What configurations or options for a GSA would you envision or have you thought about? How would you organize the governance structure? What are the pros and cons related to those options?

What kind of conflict might emerge related to GSA formation? How might the conflict be resolved?

What criteria or considerations would help you evaluate GSA configurations and/or candidates? *(What specific qualities would you envision for a potential GSA? (financial, technical capacity, etc.))*

What special considerations, if any, related to basin boundaries (as outlined in Bulletin 118) should we know about? How might these considerations affect GSA formation, outreach, etc.?

Process and Decision-Making

Who should be involved in deciding on the GSA formation? How should they decide?

If a stakeholder group comes together to work on GSA formation, how would you like to be involved?

Who might be able to represent your interests in these deliberations?

How would you recommend designing a road map to a decision on GSA formation? What steps would you take?

What interest, if any, does your entity have in serving as a GSA?

What agency might you recommend or envision as serving as the GSA(s) or what agencies might come together to serve as a GSA? How might other agencies or stakeholders feel about these possibilities?

What kinds of information might be needed to support decision-making on GSA formation?

Who has credibility to provide technical information?

Internal Decision Making
How will decision making on the GSA configuration/structure occur in your entity?

Who are the key opinion leaders and thought leaders on forming the GSA and managing groundwater within your entity?

What's the best method to keep those leaders abreast of new developments and potential insights?

Stakeholder Engagement
What other stakeholders are important to inform or keep abreast in some fashion on these issues?

How would you recommend engaging those groups/individuals during this phase of the process? Once the GSA is formed?

What kinds of outreach / engagement /activities do you or others already have in place that might involve these stakeholders?

Conclusion
Is there anything else that you haven't mentioned? What advice would you offer or what else would you recommend to move this effort forward?

Who else, if anyone, would you recommend that I interview on these issues?

APPENDIX 11E. DISADVANTAGED COMMUNITIES

Introduction and Purpose of Appendix

Many of the communities in the Salinas Valley Groundwater Basin are classified as Disadvantaged Communities (DACs) and Severely Disadvantaged Communities (SDACs), as well as Economically Distressed Areas (EDAs). The SVBGSA jurisdictional area has well documented DAC-designated areas including seven Census Designated Places (CDPs), 60 Block Groups, and 20 Tracts. Additionally, work conducted by the Greater Monterey County Integrated Regional Water Management (IRWM) Program identified 25 small disadvantaged, severely disadvantaged, and suspected disadvantaged communities in unincorporated areas of the IRWMP region (Greater Monterey County Regional Water Management Group, 2018), which includes the entire SVBGSA area. As many of these communities are dependent on groundwater for drinking water, they face challenges associated with drinking water quality.

The State of California has recognized challenges in providing clean, safe, and affordable drinking water to all of its citizens, especially low-income and minority communities. In 2012, California law AB 685, the Human Right to Water, declared that every person has a right to clean, safe, and affordable drinking water. In 2019, the State further made it a priority by passing SB 200, the Safe and Affordable Drinking Water Fund. In Fiscal Year 2019-2020 alone, it will dedicate $130 million for safe drinking water solutions in DACs that do not have access to safe drinking water.

The Salinas Valley Groundwater Basin is one of the most productive agricultural regions in the world. However, over several decades seawater intrusion and intensive fertilizer use resulting in nitrate contamination have compromised drinking water quality in parts of the Basin. Nitrate contamination in groundwater can pose serious health risks to pregnant women and infants if consumed at concentrations above the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) nitrate as nitrogen (NO_3-N). Nitrate contamination not only poses health risks, but also results in major costs for small rural communities. This is particularly challenging for the many economically disadvantaged communities in the Basin.

SGMA has limited requirements with regards to improving groundwater quality; the SGMA regulations are written in terms of avoiding degradation (CWC, §354.28 (c)(4)). However, the SVBGSA seeks to engage more constructively with disadvantaged communities moving forward in the subbasin planning processes. SVBGSA maintains excellent relationships with agencies monitoring and addressing water quality issues in the Basin. The purpose of this appendix is to provide background information on the relationship between DACs (including SDACs and EDAs) and groundwater, particularly with respect to the drinking water challenges in the Basin. Unless otherwise noted, the information in this appendix is based on and much is excerpted from the Integrated Regional Water Management (IRWM) Plan for the Greater Monterey County Region (Greater Monterey Regional Water Management Group, 2018).

Identifying DACs in the Salinas Valley

A Disadvantaged Community (DAC) is defined in the California Water Code (§79505.5(a)) as a community with an annual median household income that is less than 80% of the statewide annual median household income, based on five-year estimates. Further, a Severely Disadvantaged Community (SDAC) is defined as a community with an annual median household income that is less than 60% of the statewide annual median household income, based on five-year estimates. For information on how these designations are determined, see the Greater Monterey County Integrated Regional Water Management Plan (Greater Monterey County Regional Water Management Group, 2018). These designations are significant because in order for a community to be eligible for State grant funds specially allocated for disadvantaged communities, or to be eligible for reduced matching fund requirements, a community must meet one of these strict definitions.

At the same time, the California Department of Water Resources (DWR) also recognizes the existence of communities that are economically challenged but that are not designated as being disadvantaged according to U.S. Census data. These communities have been labeled Suspected Disadvantaged Communities until their status can be proven either way.

In addition to disadvantaged communities, DWR recognizes Economically Distressed Areas. An economically distressed area (EDA) is defined as:

> *…a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less, with an annual median household income that is less than 85 percent of the statewide median household income, and with one or more of the following conditions as determined by the department: (1) financial hardship, (2) unemployment rate at least 2 percent higher than the statewide average, or (3) low population density (Water Code §79702(k)).*

Figure 1 shows the communities currently designated as DACs, SDACs, or EDAs in the Salinas Valley. This figure combines census tracts, blocks, and places to give a more complete representation of the communities within this area. Currently, the statewide median household income is $63,783. Therefore, the calculated DAC and SDAC thresholds are $51,026 and $38,270, respectively (see https://water.ca.gov/Work-With-Us/Grants-And-Loans/Mapping-Tools). For example, Castroville has a median household income of $35,000 (Rural Community Assistance Corporation, 2017). Moss Landing is not currently designated as a DAC; however, according to a survey by the California Rural Water Association (2018), its median household income is $47,600.

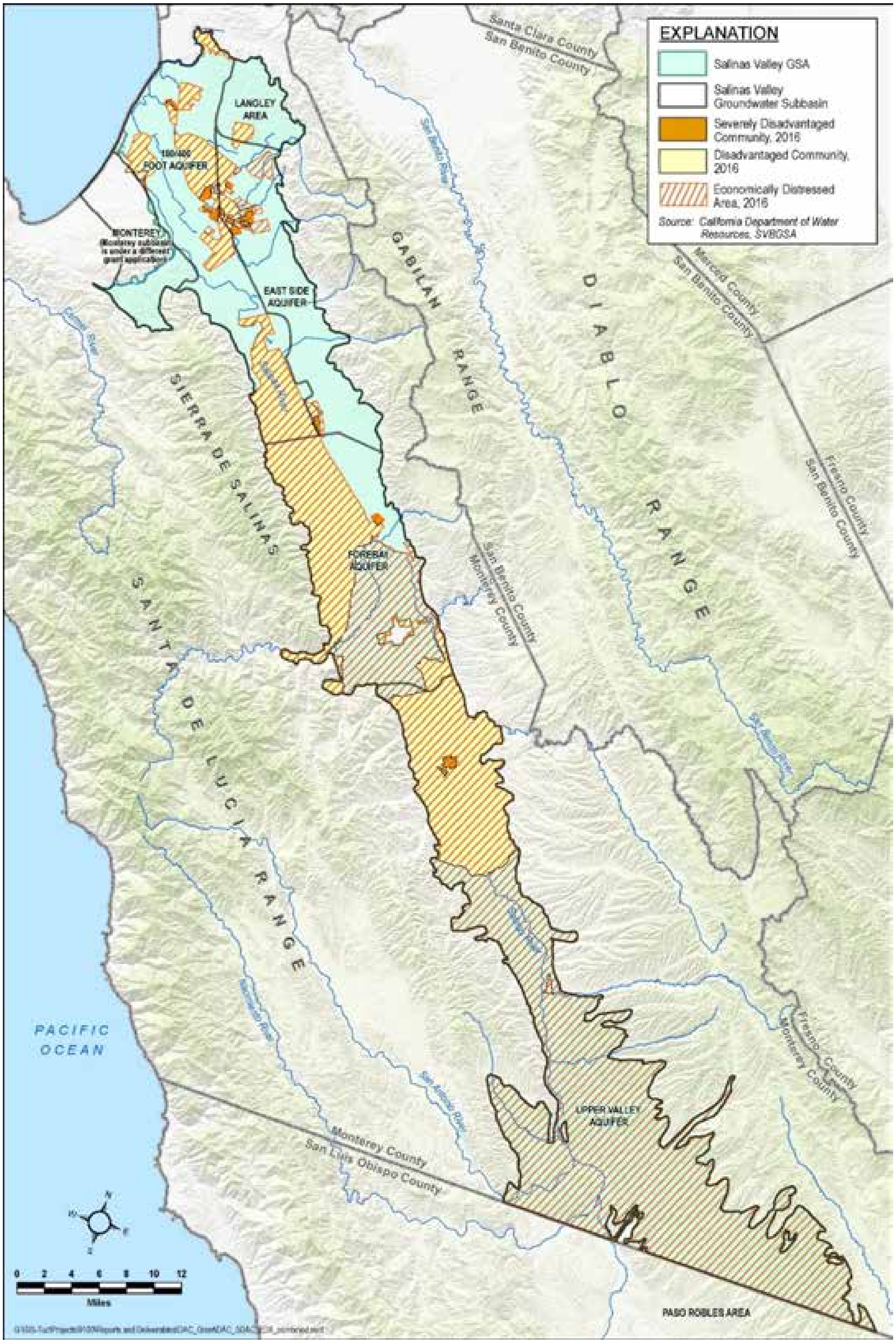


Figure 1. Map of DACs, SDACs, and EDAs in the Salinas Valley Groundwater Basin

As highlighted in the IWRM Plan, small disadvantaged communities in unincorporated areas often have small public water systems that serve fewer than 200 connections. The smallest of these communities have State Small Water Systems (SSWS), which serve between five and 14 connections); Local Small Water Systems (LSWS), which serve between two and four connections; and/or households served by private domestic groundwater wells. There is a significant difference in capacity, water supply, and infrastructure needs between a DAC served by a large water system (e.g., a large disadvantaged community of several thousand people, or a small disadvantaged community served by a large water utility) and a small disadvantaged community served by a small water system or by private wells. The State Water Resources Control Board (SWRCB) summarized these differences in its 2015 report, Safe Drinking Water Plan for California (SWRCB, 2015):

- Small water systems have the greatest difficulty in providing safe drinking water because they are least able to address the threats to public health associated with water quality.
- Larger water systems are better equipped to deal with water quality issues because they have more customers to fund the necessary improvements, have economy of scale, more technical expertise, better management skills and knowledge, are able to solve operational problems internally, and have dedicated financial and business-related staff. They generally have more sophisticated treatment and distribution system operators who are able to react to incidents and changes in treatment conditions that may occur during operations.
- On the other hand, small systems, especially those in disadvantaged communities, have only a small number of customers, which provides them with limited fiscal assets and no economy of scale. They often lack technical expertise, the ability to address many of the issues pertinent to operating a water system, as well as qualified management and financial and business personnel. In many instances, especially for very small water systems, the system operator may be just a part-time position.

Following the Greater Monterey County IRWM Plan, this Appendix includes DACs, SDACs, and EDAs and places an emphasis on small disadvantaged communities for the reasons highlighted by the SWRCB.

Jurisdictional Responsibilities

A number of agencies and groups have existing jurisdictional responsibility over groundwater quality. The SVBGSA will collaborate with these agencies and groups so as to not duplicate efforts or overstep its institutional authority. The following agencies and groups have responsibility over various aspects of groundwater (Greater Monterey County Regional Water Management Group, 2018):

- **Greater Monterey County IRWM Regional Water Management Group –** AB1630 appropriated State grant funds to enable this Group to develop solutions for DACs to be integrated into the broader IRWM planning effort. IRWM is a voluntary, collaborative effort to identify and implement water management solutions on a regional scale to increase regional self-reliance, reduce conflict, and manage water resources. The IRWM planning process brings together water and natural resource managers along with other community stakeholders to collaboratively plan for and ensure the region's continued water supply reliability, improved water quality, flood management, and healthy functioning ecosystems. The Department of Water Resources manages grant programs specifically designated for adopted IRWM Plans including funding for water quality improvement projects.
- **State Water Resources Control Board (SWRCB) –** The SWRCB administers the state's Drinking Water Program as the federally-designated Primary Agency responsible for the administration and enforcement of the Safe Drinking Water Act requirements in California. Prior to July 1, 2014, the California Department of Public Health was designated as the Primary Agency. These requirements are defined in the California Health and Safety Code and Titles 17 and 22, California Code of Regulations. The CDPH continues to maintain the State's Drinking Water and Radiation Laboratory, which serves as the state's principal laboratory as required for primacy under the Safe Drinking Water Act. The SWRCB is responsible for the regulatory oversight of over 7,600 public water systems in California. It may delegate oversight responsibility of public water systems with less than 200 service connections to local county health departments, which it has done in Monterey County.
- **Monterey County Department of Environmental Health (MCDEH) –** Delegated oversight responsibility by the SWRCB, MCDEH is the Local Primary Agency and its Drinking Water Protection Services regulates domestic water systems in the County that serve between two and 199 connections. There are approximately 160 such systems in the County regulated under this program. MCDEH also regulates all well construction in Monterey County.
- **SWRCB and Central Coast Regional Water Quality Control Board –** State policy on water quality control falls under the SWRCB, which is the state water pollution control agency for all purposes under the Clean Water Act (CWC §13160), including drinking water sources from both surface water and groundwater. The SWRCB has nine regional boards, including the Central Coast Regional Water Quality Control Board (CCRWQCB), which is responsible for the day-to-day implementation of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act in the Central Coast. Together, the State Water Board and Regional Boards are responsible for the protection of the quality of ambient surface and groundwater up to the point where the water enters a drinking water well or surface water intake. The Regional Boards are

responsible for developing and enforcing water quality objectives and implementation plans to protect the beneficial uses of the State's waters. The Regional Boards enforce water quality regulations through the following means.

- **Basin Plan –** Each Regional Board is directed to formulate a water quality control plan, called a Basin Plan, that includes water quality standards under the Clean Water Act. The CCRWQCB implements the Basin Plan in the Central Coast Region, in part by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect water quality, including surface water, groundwater, or wetlands.
- **Waste Discharge Requirements (WDRs) –** WDRs, sometimes simply known as Orders, for discharges to waters of the United States also serve as National Pollutant Discharge Elimination System (NPDES) permits. The SWRCB and CCRWQCB regulate discharges from wastewater treatment and disposal systems under general WDRs. Small, domestic wastewater treatment systems having a maximum daily flow of 100,000 gallons per day (gpd) or less that discharge to land are covered under a statewide general WDR permit for small systems (Order WQ 2014-0153-DWQ). The State and Regional Boards are also responsible for plans and permits related to other uses, such as farming, septic tanks, and larger scale sewage treatment that can also impact the quality of surface and ground waters.
- **Irrigated Lands Regulatory Program (ILRP) –** The SWRCB initiated the ILRP in 2003 to control agricultural runoff's impairment of surface waters. In 2012, groundwater regulations were added to the program. Waste discharge requirements, which protect both surface water and groundwater, address agricultural discharges throughout the Central Coast. Anyone who irrigates land to produce crops or pasture commercially must seek ILRP permit coverage and maintain in good standing with their coalitions.

- **Department of Pesticide Regulation –** The California Department of Pesticide Regulation is responsible for ensure that pesticides do not contaminate the groundwater.
- **Office of Environmental Health Hazard Assessment –** The California Office of Environmental Health Hazard Assessment is responsible for providing the SWRCB with health-based risk assessments for contaminants. These assessments are used to develop primary drinking water standards.
- **California Public Utilities Commission (CPUC) –** The CPUC is responsible for ensuring that California's investor-owned water utilities deliver clean, safe, and reliable water to their customers at reasonable rates. The Water Division regulates over 100 investor-owned water and sewer utilities under the CPUC's jurisdiction; providing water service to about 16 percent of California's residents.

- **Local Agency Formation Commissions (LAFCOs) –** These commissions oversee the expansion of service areas of public agencies, including cities that own or operate public water systems. They can review public agencies to determine if the agency is providing municipal services in a satisfactory manner, including the delivery of safe drinking water.
- **Central Coast Groundwater Coalition (CCGC) –** The CCGC is a non-profit 501(c)5 mutual benefit organization that represents landowners and growers who operate in Monterey, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, and Santa Barbara counties, as well as the northern portion of Ventura County in the Central Coast Region. The CCGC is not a governmental organization like the other jurisdictional agencies, and therefore does not have legal jurisdictional authority. However, the CCGC is the primary organization tasked with fulfilling the groundwater quality regulatory requirements in the Irrigated Lands Regulatory Program (ILRP) of the Central Coast Regional Water Quality Control Board. The organization combines the resources of its members to achieve economies of scale to comply with the regulatory requirements of the CCRWQCB. Between 2013 and 2015, the CCGC characterized the rural drinking water supply and shallow groundwater aquifer in the CCGC region which includes the previously noted six counties. In addition to using data from member wells, CCGC gathered publicly available data generated by the counties and data submitted by landowners and growers who perform individual monitoring as part of the current ILRP. Information collected on tested wells included depth to groundwater and well perforation levels where available. For many wells, quality parameters were collected, such as nitrates and total dissolved solids (TDS). In the groundwater characterization report, the information from the six counties was compiled and analyzed to produce maps showing areas where groundwater quality exceeds drinking water limits for nitrates. This information enabled CCGC to develop an accurate groundwater characterization in 2015 which provides growers, regulators and the public with a better understanding of local aquifers and geology in the six-county region.

DAC Drinking Water Challenges

Drinking water systems are categorized according to the number of service connections:

- Public water systems, which are referred to as municipal public water systems in this GSP for clarity, are water systems that provide drinking water to at least 15 service connections or serve an average of at least 25 people for at least 60 days a year,
- State small water systems are water systems that provide piped drinking water to between five and 14 service connections, and do not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year,
- Local small water systems are water systems that provide drinking water to between two and four service connections, and

- Private domestic wells usually provide water to only one or two connections.

Since state small water systems, local small water systems, and private domestic wells face more severe drinking water challenges than public water systems, they are the focus for the following discussion.

Private domestic wells are not regulated by the State. MCDEH requires one-time nitrate testing of newly installed private domestic wells, but there are no additional requirements. The SWRCB's Groundwater Ambient Monitoring and Assessment (GAMA) Domestic Well Project was developed in order to address the lack of domestic well water quality data. The GAMA Groundwater Information System includes numerous datasets that can be downloaded by users. The CCRWQCB also collects domestic well data per Irrigated Lands Regulatory Program (ILRP) groundwater monitoring requirements.

Between October 2013 and August 2014, the CCGC compiled water quality data from 229 samples from domestic and irrigation wells in the Salinas Valley. Data were collected from the GeoTracker GAMA database that includes data from the California Department of Public Health, GAMA-SWRCB data collection efforts and Regulated Sites. Additional data were collected from the USGS National Water Information System data, and data were extracted from the GAMA special study carried out by Lawrence Livermore National Laboratory. In its 2015 *Groundwater Characterization Report* (CCGC, 2015), CCGC made the following conclusions regarding nitrate in the Salinas Valley:

- 41% of wells with nitrate concentrations (or 309 of 758 total wells sampled) had maximum concentrations over the MCL.
- 34% of the land area within the Salinas Valley has nitrate concentrations over the MCL.
- 55% of domestic wells or 121 of 221 total sampled on CCGC-member properties had concentrations exceeding the MCL.

Domestic wells and wells associated with local small and state small water systems are generally more susceptible to nitrate contamination since they are typically shallow and are more likely to be located in rural areas within or adjacent to agricultural areas. They are also more susceptible to potential nitrate contamination from nearby septic systems. Public water systems, on the other hand, tend to access deeper groundwater and are more likely to be located in areas that are less susceptible nitrate contamination. Public water system operators implement regular water quality testing and treatment as necessary, and wells are usually taken out of service once they become contaminated. Funding programs are often available for public water systems, and costs are spread out over a large number of ratepayers over time. When contamination is detected in private domestic wells, treatment options are limited and the individual homeowner will typically have to bear the full cost of addressing the problem (CCGC, 2015).

According to the IRWM Plan, only a very small percentage of domestic wells in Monterey County have been tested through the Central Coast Regional Water Quality Board's groundwater monitoring programs. MCDEH has recently adopted a policy to begin requiring well testing when an application for repair or replacement of a septic system is proposed, which will provide new additional data.

MCDEH Drinking Water Protection Services regulates state small and local small water systems through their Small Water System Program. There are currently 694 local small and 276 state small water systems in Monterey County, which serve about 4,232 connections (Greater Monterey County Regional Water Management Group, 2018).

DACs in the Basin rely primarily on groundwater for their drinking water supply, except for those who rely on bottled water due to unsafe or poor water quality conditions. The primary drinking water problems experienced by small DACs in Monterey County are related to nitrate contamination, seawater intrusion, or other contaminants of concern. Numerous studies over the decades have documented these challenges.

Insufficient water quantity is generally less of a problem in the Salinas Groundwater Basin than poor or unsafe water quality; although poor water quality effectively results in insufficient water supply. During the recent prolonged drought, while Monterey County was classified as experiencing "exceptional" drought, very few water users in the Greater Monterey County IRWM region actually suffered from a lack of water availability. While the drought had immediate impacts on surface water supplies throughout the State, it tended to have a more gradual impact on groundwater supplies. Groundwater quality, rather than quantity, is of primary concern for drinking water supplies in the Salinas Valley Groundwater Basin, particularly nitrate contamination and seawater intrusion.

Nitrate Contamination

Nitrate contamination is particularly problematic in the Salinas Valley Groundwater Basin, where agriculture dominates the landscape. Nitrate is currently extensively monitored and evaluated by the CCGC and is documented in a report submitted to the CCRWQCB (CCGC, 2015). Nitrate contamination in the Salinas Valley was first documented in a report published by the Association of Monterey Bay Area Governments (AMBAG) in 1978. In 1988, a report by the State Water Board documented that nitrate levels in the Salinas Valley groundwater had impaired its beneficial use as a drinking water supply. In a July 1995 staff report, the SWRCB ranked the Salinas Valley as their number one water quality concern due to the severity of nitrate contamination. All of the Salinas Valley cities have had to replace domestic water wells due to high nitrate levels that exceed the drinking water MCL. Maps prepared by the MCWRA indicate that elevated nitrate concentrations in groundwater were locally present through the 1960s, but significantly increased in the 1970s and 1980s.

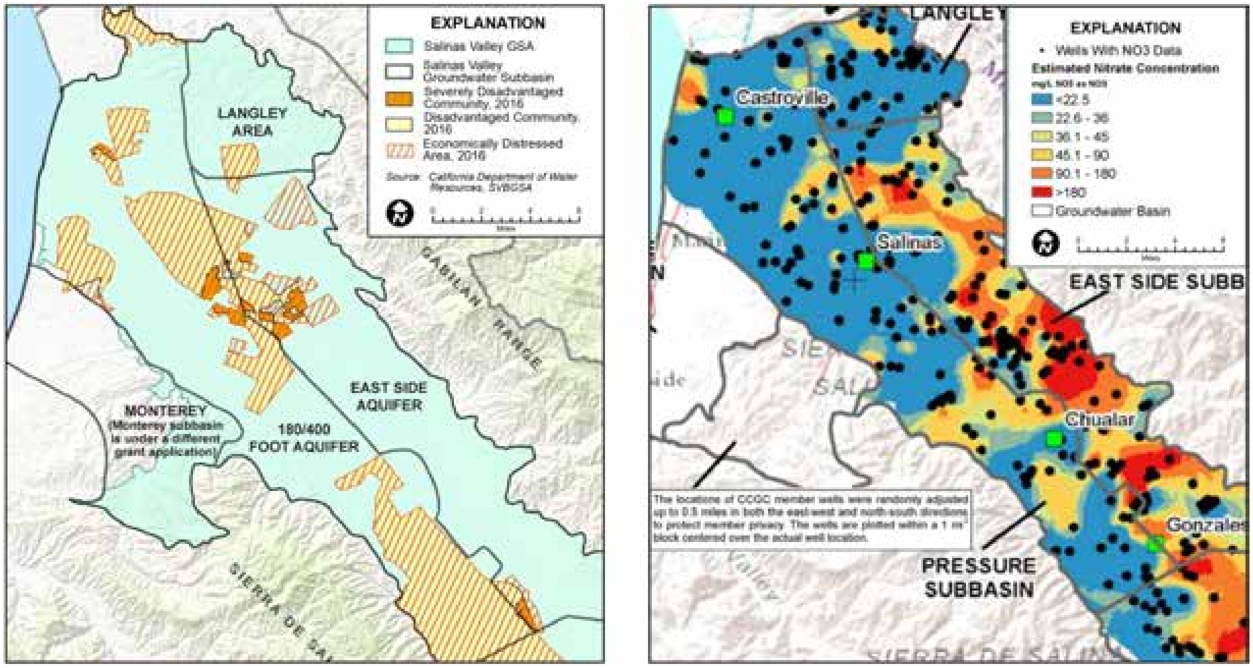


Figure 2. DACs, SDACs, and EDAs in the 180/400-Foot Aquifer Subbasin and Nitrate Concentration Map developed by CCGC (2015)

Seawater Intrusion

Seawater Intrusion is another major water quality concern for DACs and SDACs, primarily impacting coastal communities in the northern part of the Salinas Valley Groundwater Basin. Seawater intrusion has been observed in the 180-Foot and 400-Foot Aquifer Subbasin for over 70 years, and was documented in DWR Bulletin 52 in 1946. By the 1940s, many agricultural wells in the Castroville area had become so salty that they had to be abandoned (Greater Monterey County Regional Water Management Group, 2018). Seawater is high in chlorides. EPA defines the 500 mg/L threshold as an Upper Limit Secondary Maximum Contaminant Level (SMCL). Seawater intrusion is the primary threat to drinking water supplies for many DACs located in the northern coastal portion of the Basin.

Seawater has intruded inland in the 180-Foot and 400-Foot Aquifers, as shown on Figure 3 and Figure 4. Seawater intrusion in the 180-Foot Aquifer covered approximately 20,000 acres in 1995 and had expanded to approximately 28,000 acres by 2010. Since then, the rate of expansion has decreased, with an overlying area of 28,300 acres in 2017. The area overlying intrusion into the 400-Foot Aquifer is not as extensive, with an overlying area of approximately 12,000 acres in 2010. However, between 2013 and 2015, the 400-Foot Aquifer experienced a significant increase in the area of seawater intrusion, from approximately 12,500 acres to approximately 18,000 acres, likely resulting from localized downward migration between aquifers.

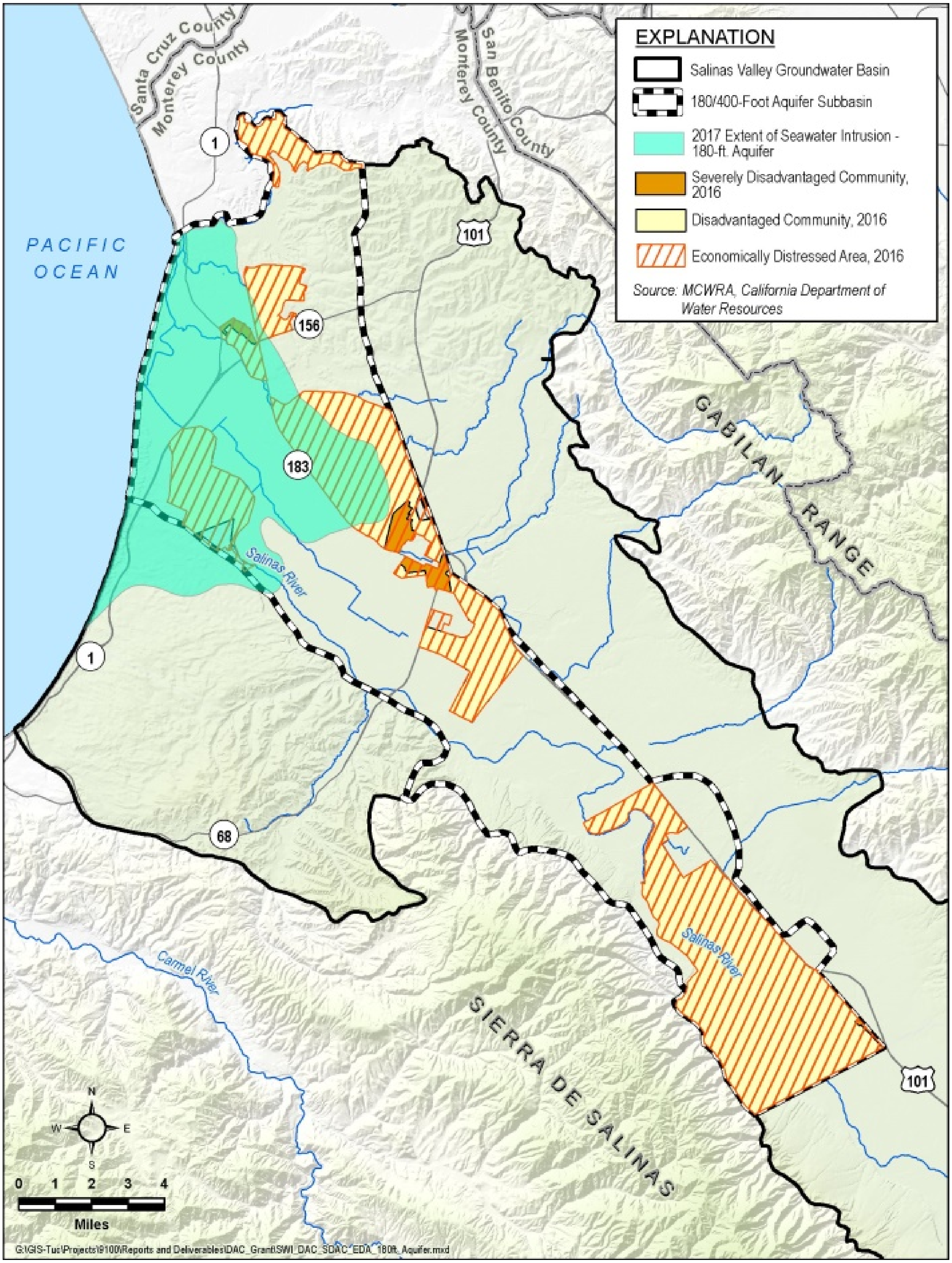


Figure 3. 2017 Extent of Seawater Intrusion in the 180-Foot Aquifer

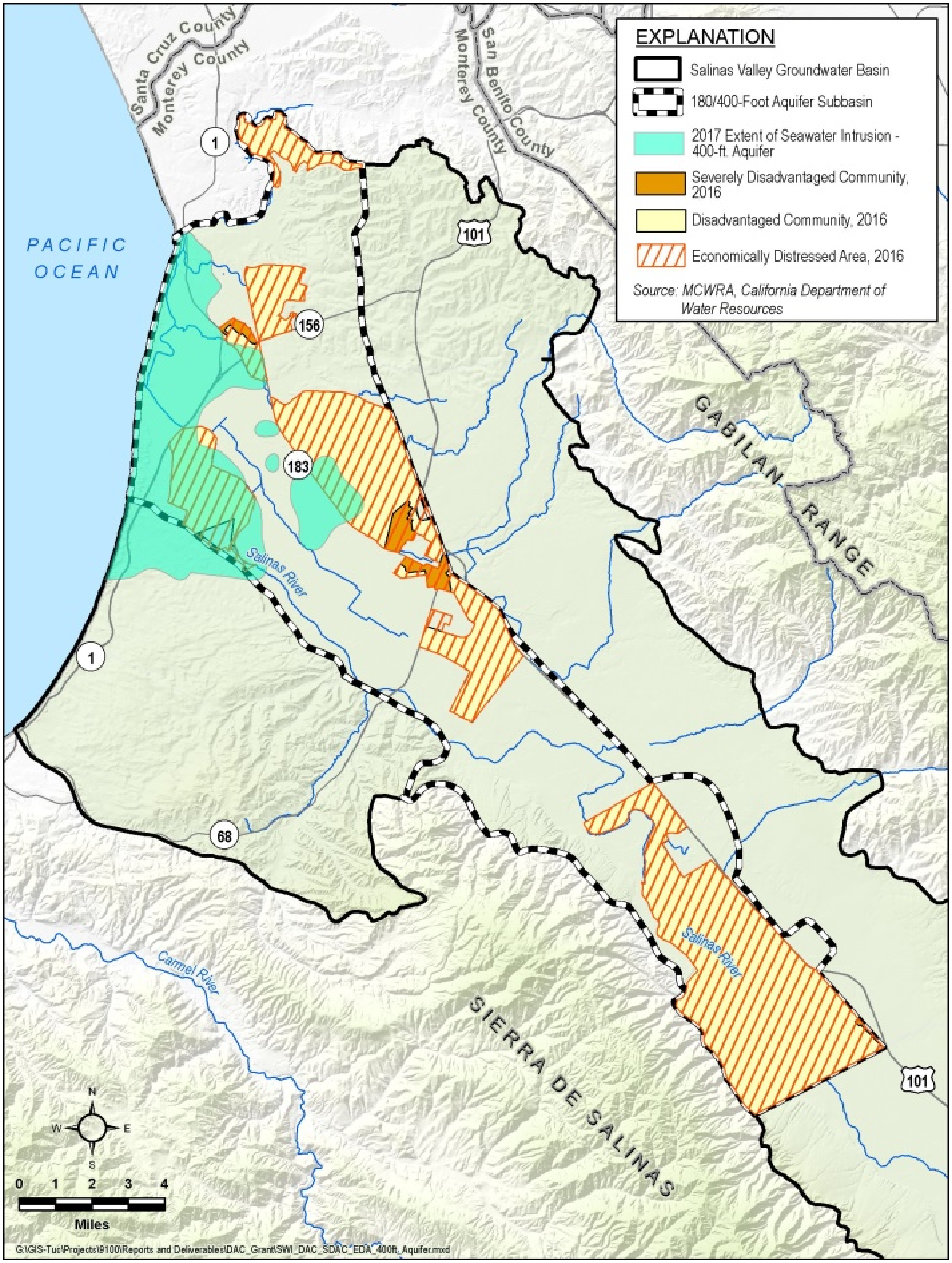


Figure 4. 2017 Extent of Seawater Intrusion in the 400-Foot Aquifer

Other Contaminants of Concern

In addition to nitrates and seawater intrusion, there are a few other contaminants of concern. With the recent passage of Assembly Bill (AB) 1249 (Salas, Chapter 717, Statutes of 2014), the State has recognized the prevalence, and urgency to address, the contamination of drinking water supplies in California by not only nitrate, but specifically by arsenic, perchlorate, and hexavalent chromium. The Greater Monterey County IRWM Regional Water Management Group is currently working with a Technical Advisory Committee, which includes MCDEH and the Central Coast Regional Water Quality Control Board, to identify the extent of nitrate, arsenic, perchlorate, and hexavalent chromium contamination in communities throughout the region. This group will develop a plan to address the contamination from these additional contaminants of concern.

Conclusion

The State of California has recognized the severity of drinking water challenges for DACs with the passage of the 2012 Human Right to Water Act (AB 685), which declared that every person has a right to clean, safe, and affordable drinking water. Further, it emphasized this state-wide focus with the Safe and Affordable Drinking Water Fund in 2019, which provides funding specifically for safe drinking water solutions in DACs that do not have access to safe drinking water.

This appendix highlights the relationship between DACs and groundwater in the Salinas Valley Groundwater Basin, particularly with respect to drinking water. It provides a base for the SVBGSA to engage DACs in a strategic dialogue and support state and local efforts related to drinking water.

References

California Rural Water Association. 2018. “Moss Landing County Sanitation District Median Household Income (MHI) Survey Final Report.” December 2018.

CCGC (Central Coast Groundwater Coalition). 2015. *Northern Counties Groundwater Characterization: Salinas Valley, Pajaro Valley and Gilroy-Hollister Valley*. Submitted to the Central Coast Regional Water Quality Control Board on June 1, 2015. Salinas, CA Prepared by Luhdorff & Scalmanini Consulting Engineers. 454 p.

Greater Monterey County Regional Water Management Group. 2018. “Integrated Regional Water Management Plan for the Greater Monterey County Region.” Accessed December 20, 2019. http://www.greatermontereyirwmp.org/documents/plan/.

Rural Community Assistance Corporation. 2017. "Castroville Community Services District Median Household Income Survey Results Prop 1 Agreement No. D1612801/TA Work Plan No. 5077-A." March 30, 2017.

SWRCB (State Water Resources Control Board). 2015. Safe Drinking Water Plan for California. Report to the Legislature in Compliance with Health & Safety Code Section 116365. Dated June 2015. Available at: https://www.waterboards.ca.gov/publications_forms/publications/legislative/docs/2015/sdwp.pdf.

APPENDIX 11F. Salinas Valley Basin Groundwater Sustainability Agency Communication & Public Engagement Plan

BACKGROUND

In 2014, the California State Legislature passed the Sustainable Groundwater Management Act (SGMA). SGMA was enacted in response to a robust scientific understanding that, throughout California, groundwater is being used faster than it's being replenished. SGMA requires that medium- and high-priority groundwater basins and subbasins develop Groundwater Sustainability Plans (GSPs) that outline how subbasins will achieve sustainability in 20 years and maintain sustainability for an additional 30 years.

The Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) was formed in 2017 to implement SGMA locally within the Salinas Groundwater Valley. The SVBGSA is governed by a local and diverse 11-member Board of Directors and relies on robust science and public involvement for decision-making. An Advisory Committee and a Planning Committee have been formed to advise the SVBGSA and these committees represent constituencies that are either not represented on the Board of Directors and/or are considered important stakeholders to developing comprehensive subbasin plans for the Salinas Valley. This governance structure provides for multiple opportunities for engagement in the planning processes the SVBGSA undertakes. Community engagement and transparency on SVBGSA decisions is paramount to building a sustainable and productive solution to groundwater sustainability.

The Salinas Groundwater Valley consists of eight groundwater subbasins, of which six fall entirely or partially under the SVBGSA jurisdiction. One of the eight subbasins, the Seaside Subbasin, is adjudicated and not within the jurisdiction of the SVGBSA. Another subbasin, the Paso Robles Subbasin, lies completely in San Luis Obispo County and is managed by other GSAs. The sixth subbasin is the Monterey Subbasin which is being cooperatively planned for by the SVBGSA and the Marine Coast Water District Groundwater Sustainability Agency (MCGSA). Together, the six Subbasin plans under the SVBGSA will be integrated into the Salinas Valley Integrated Groundwater Sustainability Plan (ISP).

The Communication and Public Engagement Plan addresses the 180/400-Foot Aquifer Subbasin which has been designated by the California Department of Water Resources as "Critically Over-Drafted" requiring a GSP be completed by January 2020 and provided to the Department of Water Resources for approval.

MISSION OF THE SALINAS VALLEY BASIN GSA

The GSA mission is two-fold:

1. Develop a groundwater sustainability plan by 2020
2. Achieve groundwater sustainability by 2040

GOALS OF THE COMMUNICATION PLAN

Ultimately, the success of the 180/400 Aquifer Subbasin Groundwater Sustainability Plan will be determined by the collective action of every groundwater user (that's all of us!). On practical level, this means that in order to meet our ongoing water supply needs, for our drinking water and for our economic livelihoods, we must balance the basin. We know that our current use is unsustainable, and the State has put us on a tight timeline to fix the problem.

Therefore, it is our intention to involve stakeholders and the public early and frequently, and to keep the internal information flow seamless among staff, consultants, committee members, and the Board regarding the goals and objectives of the 180/400-Aquifer Subbasin GSP and associated monitoring and implementation activities. The goals of this communications plan are therefore:

1. To inform the public by distributing accurate, objective, and timely information.
2. To foster open dialogue and stakeholder engagement by hosting opportunities to participate in planning processes and provide feedback.
3. To invite input and feedback from the public at every step in the decision-making process and provide transparency in outcomes and recommendations.
4. To encourage informed Committee recommendations and informed decision-making at the Board.
5. To ensure that the Board, staff, consultants, and committee members have up-to-date information and understand their roles and responsibilities.

PHASES OF COMMUNICATION

Phase 1: GSA Formation (complete)

Phase 2a: Groundwater Sustainability Plan development – 6 subbasin GSPs

- 180/400-Foot Aquifer Subbasin Groundwater Sustainability Plan completed January 2020
- Five additional Subbasin GSPs will be undertaken beginning in 2020 through 2022. The Monterey Subbasin GSP will be cooperatively developed by SVBGSA and MCWDGSA.
- Salinas Valley Integrated Sustainability Plan (ISP) development 2022-2023

Phase 2b: Analysis and Determination of Funding Options

- Groundwater Sustainability Fee instituted March 2019

Phase 3: Groundwater Sustainability Plan – Capital Project Funding

Phase 4: Salinas Valley Integrated Sustainability Plan Implementation – 2020-2054

During 2018-2019 the GSA focus was on the completion of the 180/400-Foot Aquifer Subbasin Sustainability Plan and the adopted and implementation of a Groundwater Sustainability Fee. Both these actions will be completed by January 2020. The GSA is now entering additional subbasin planning for five additional subbasins from 2020 through 2022. The focus of this Communications Plan now shifts to continuing with subbasin plan development (Phase 2a) and feasibility of project identification and funding options (Phase 2b and Phase 3 above). At the conclusion of Phase 2 and Phase 3 a Salinas Valley Integrated Groundwater Sustainability Plan will be completed that provides projects and programs for reaching sustainability throughout the entire ISP area by 2040. Phase 4 Plan Implementation will be the focus from 2020 through 2040 with annual reporting and an adaptive management approach to basin conditions, management, and project implementation for the GSPs and ISP.

KEY MESSAGES

"The GSA is on a mission to develop a Groundwater Sustainability Plan by 2020, and achieve groundwater sustainability in the Salinas Valley by 2040. Join us."

Initially, our message points focus on: (1) getting to know your GSA; (2) an overview of groundwater sustainability planning for our community; and (3) how we got here.

We'll expand on the key message as the work evolves, and our talking points will get more specific as the 180/400-Aquifier Subbasin GSP and five other GSPs unfold. These initial talking points are broad enough to consistently come back to over time and will be good pivot points for interviews.

Key Messages: Get to Know Your GSA (& why it's so important)

- The GSA is on a mission to develop a Salinas Valley Integrated Groundwater Sustainability Plan by 2023 and achieve groundwater sustainability in the Salinas Valley by 2040.
- Our groundwater basin is comprised of 6 sub-basins one of which is identified as "Critically Over-Drafted".
- We know that our current use is unsustainable. In order to meet our ongoing water supply needs now and into the future we must balance the basin.
- The State has put us on a tight timeline to fix the problem. We ambitiously accept the challenge.
- In 2020 we'll have a plan in place for the 180/400-foot aquifer and will have scoped projects and programs to bring the subbasin back into balance; then, from 2020 through 2022 we will work on specific sustainability plans for the other five basins. We then have 20 years to implement management actions and projects towards achieving sustainability.
- This matters to everyone. That's why the GSA Board and our advisory and planning committees are made up of diverse stakeholders from every walk of life in the Salinas Valley.

- We have an unprecedented opportunity, and responsibility, to work together collaboratively and develop a science-based Groundwater Sustainability Plan.
- Join us! Visit our website, sign up for updates, and attend the next meeting.

Key Message Points: Groundwater Sustainability Plan

- The 180/400-Foot Aquifer Groundwater Sustainability Plan and Salinas Valley Integrated Sustainability Plan are our 20-year plans to ensure that the Salinas Valley Groundwater Basin will be managed sustainably for our current and future generations.
- Aquifer subbasin planning is not only critical to our future - it's also mandatory. SGMA mandates that a science-based GSPs be developed for the Salinas Valley Basin by 2020 and 2022, and that the plan be implemented by 2040.
- The stakes are high. Should we choose not to act, or fail to meet the 2020, 2022, or 2040 milestones, the State can intervene with required (and hefty) pumping restrictions and extraction fees.
- To meet these milestones, the local GSA has been granted the authority to develop GSPs, monitor and measure the basin and individual wells within the basin, implement capital projects, and assess necessary fees for planning and implementation.
- Six "Sustainability Indicators" will be evaluated in the Plans and used to gauge what we need to do to bring our groundwater supply and demand back into balance.
- Given the hydrologic and geographic diversity of the Salinas Basin, the ISP will identify overlapping projects and programs which benefit the basins. Our planning process includes initiating subbasin planning committees for the subbasins and maintains our governance structure of the board of directors, advisory committee and planning committee.
- Stakeholder engagement is a key component to the development and implementation of the Plan. We encourage and invite the community to get involved. Attend our monthly Board meetings, attend a Subbasin Planning Committee meeting, sign up for our newsletter, or join Gary for one of his coffee chats.

Key Message Points: How We Got Here

- The Salinas Valley Basin GSA is firmly rooted in stakeholder engagement.
- From 2015-2017, local agencies and stakeholders worked with the Consensus Building Institute (CBI) to facilitate the formation of the GSA.
- In 2015, CBI began by conducting a Salinas Valley Groundwater Stakeholder Issue Assessment, which included interviews and surveys and resulted in recommendations for a transparent, inclusive process for the local implementation of SGMA and the formation of the GSA.
- Following the Issue Assessment, The Collaborative Work Group of stakeholders representing a broad range of interests met from March 2016 through April 2017 and developed recommendations on the governance structure, voting, and legal structure of the GSA.
- The Stakeholder Forum was simultaneously held throughout 2016 and served as a critical element for interested stakeholders and the public to learn about and provide input on the GSA.

The Collaborative Work Group integrated input received at the Stakeholder Forum into its recommendations on GSA formation.

- After nearly two years of community engagement led by the top consensus-building professionals in the nation, the Salinas Valley Basin Groundwater Sustainability Agency was formed in April 2017 with a broad and diverse foundation of support.

THE PRESS PROTOCOL

The press is an important partner for getting our message out to the community. We welcome conversations with the press. To maximize our effectiveness in working with the media, a consistent protocol should be followed by all staff, consultants, board members, and committee members.

The Spokesperson(s)

- The primary spokesperson for all media inquiries is the General Manager (GM). Media inquiries should first be directed to the GM to coordinate a response.
- Reporters may want to also interview board and community members. Some board members may enjoy media conversations, while others do not. The GSA will maintain a standby list of a few board and community members, who will be prepared and can be called on for media inquiries.
- In preparation for the interview, the GM and Public Information Officer (PIO) will work closely with the spokespeople in preparation for media interviews. Factual and coordinated talking points will be provided in advance of the interview.

Respond Quickly

- Reporters often work on tight deadlines, and we don't want an opportunity for a feature story to get away. If the media calls, return the call and refer them to the GM at the earliest possible opportunity.

The Back-Up Plan

- If the GM is unavailable and cannot be reached for comment, media inquiries should be directed to the Board's back-up media representative. The Board's representative will contact the PIO to determine whether a response is necessary. If the response is not urgent, offer the media an appointment time for when the GM is available. If it is a time sensitive and urgent matter, a statement will be released from the Board representative in close coordination with the PIO.

"In The News"

- Following the interview or statement, if published, the GM or PIO will circulate the story to the Board and committee members.

SOCIAL MEDIA

Existing well-established social media platforms of our partner agencies and organizations (e.g., Facebook) will be leveraged to share GSA updates and milestones. This action has awaited completion of the 180/400 Foot – Aquifer Subbasin GSP and will be activated in 2020-2022. The next planning phase for the five additional subbasin GSPs will be undertaken in early 2020.

The PIO will monitor social media sites for mention of the GSA and subbasin planning and implementation efforts. A social media report, including any GSA mentions, positive and negative comments, will be provided to the GM on a monthly basis. Negative posts will be shared and discussed immediately to determine what, if any, response is warranted.

COMMUNICATION GUIDELINES & RESPONSIBILITIES

Board of Directors

Board members should uphold the strongest ethics when communicating about GSA business. The GSA believes that dissenting opinions are valid and important. At the same time, it's crucial that there's no confusion about the official position and decisions of the GSA Board. By serving on the Board, directors agree to act in good faith towards the mission and goals of the GSA at all times. External communications are an inherent part of that responsibility. To avoid confusion in the public, and real or perceived conflicts of interest:

- Board members should strive to communicate fairly and in the best interest of the GSA at all times.
- Board members should not express an opinion (in writing or verbally) on behalf of, or as a member of, the GSA unless authorized by the Board to do so.
- The board-designated spokesperson should not be a spokesperson for another entity with an interest or involvement in ground water.
- Media inquiries should be immediately directed to the GM for a coordinated response.

Committee Members

The Advisory Committee and Subbasin Planning Committees are consensus-seeking and have adopted charters that include communication guidelines. The GSA values the diversity of our committees and understands how difficult it can be to reach agreement. Importantly, committee members are welcome to speak their opinions inside and outside the committee meeting room, but members should take great care to avoid the appearance of speaking on behalf of or as a spokesperson of the GSA. Further, by serving on a committee, members agree to be acting in good faith towards meeting the goals of the GSA. If contacted by the press or an external party concerning Committee discussions, participants are asked to:

- Point out that they are not speaking on behalf of the Committee (unless specifically authorized by the Committee to do so).
- Present their own views and cocientiously refrain from expressing, characterizing, or judging the views of others.
- Avoid using the press as a vehicle for negotiation, confrontation, or grandstanding.

Ambassadors

Ambassadors are community leaders that support the GSA mission and can be counted on to informally speak on-point about the GSA. While Ambassadors are GSA supporters, they also encourage divergent opinions to be shared and heard. Ambassadors may be GSA board or committee members, partner agency staff, elected officials, or members of the public with no official relationship to the GSA. If Ambassadors are approached by the media, they may follow our Media Guidelines above and we can assist with talking points and coordinated messaging as needed. We'll maintain strong relationships with Ambassadors and keep them in-the-know.

Staff & Consultants

The actions of staff and consultants, both on and off work time, are a reflection of the organization and can impact the reputation and credibility of the GSA. Staff and consultants are expected to act and speak with the highest standard of conduct both professionally and personally.

From time-to-time staff and consultants may be asked to provide formal or informal updates on the work of the GSA. All such requests should be brought to the attention of the GM for consideration. All public testimony and statements must be reviewed and pre-approved by the GM.

Affiliates of the GSA should uphold a strong duty of care to the organization's mission and reputation in all external communications, including personal social media posts, public testimonies, and casual conversations. In no circumstances should a personal opinion be misrepresented to be the official position of the GSA.

DECISION-MAKING PROCESS

The Salinas Valley Basin GSA Board of Directors meets monthly. The regularly scheduled board meetings are held on the 2nd Thursday of the month at 3:00 PM. Agendas and meeting details are available online. Board meetings are open to the public.

The GSA Board of Directors is the decision-making body. To facilitate community and stakeholder engagement in the decision-making process, a 25-member Advisory Committee was formed. The consensus-based Advisory Committee is comprised of a diverse range of interests throughout the Salinas Valley, and meets every month to provide input and recommendations to the Board. The Board appoints members to the Advisory Committee based on composition that is representative of the region. Given the hydrologic and geographic diversity of the Salinas Valley, five Subbasin Planning Committees are being developed throughout the Salinas Valley. These Subbasin Planning Committees will provide even more localized stakeholder input towards the development of the five additional GSPs.

To maintain timely information flow between the committees and the Board, a brief 1-page informational "Committee Key Outcomes" will be prepared following each committee meeting and sent to the Board.

PUBLIC ENGAGEMENT OPPORTUNITIES

Board, Advisory Committee, and Planning Committee meetings are open to the public. The foundation of the Salinas Valley Basin GSA is deeply rooted in stakeholder engagement. Beginning in 2015, local agencies and stakeholders worked with the Consensus Building Institute to conduct a Stakeholder Issue Assessment and develop a broadly supported and agreed upon road map for the establishment of the GSA. The Collaborative Work Group and Stakeholder Forum were instrumental in getting us to where we are today. We intend to continue and build upon this transparent, inclusive public engagement process as we develop the GSP and determine the funding mechanisms necessary to meet the GSA's regulatory responsibilities and achieve groundwater sustainability.

Advisory Committee: Monthly meetings of the Advisory Committee are open to the public.

Local Subbasin Planning Committees: Consultant teams will attend subbasin planning committee meetings to present their findings and interim work products, and to tailor the subbasin GSPs to management areas. Subbasin planning committees will be invited to provide feedback directly to the consultants along the way, and committee recommendations will be carefully considered, tracked, and summarized as part of the subbasin GSPs and ISP.

Interested Parties List: The GSA maintains an Interested Parties List. In addition, we continue to add interested parties to the list on an ongoing basis. Interested parties will be invited to board and committee meetings; GSA staff will also send regular updates to the Interested Parties List (via a monthly e-newsletter and timely updates/ announcements).

Website: The website, https://svbgsa.org/, will be updated and maintained to provide everything that the public will want to know about the GSA and SGMA. The website will include meeting agendas and materials, FAQs, resource links, and consultant work products. Content regarding SGMA and completed plans will be developed and posted in during 2019 – 2020. The website will link associated articles in the broader context of SGMA for additional information and education.

Facebook Page: A Facebook page could provide better real time communication for the next phase of planning for the five subbasins. The overlapping timeline and Subbasin Planning Committees could be organized into a Facebook page framework.

Leveraging Existing Channels of Communication: To expand the GSA's sphere of engagement, we'll partner with existing agencies, committees, and organizations to disseminate information and invite public involvement. GSA staff will request the opportunity to provide articles/updates/announcements for existing social media pages and newsletters (both digital and print). We'll attend board/committee meetings, brief leadership, and coordinate public outreach at key GSA milestones. External organizations include, but are not limited to:

- Water Districts and Utility Companies (California Water Service Company; Monterey Peninsula Water Management District, Cal Am; Monterey One)

- Cities and County
- Chambers of Commerce – Salinas Valley, South County/King City, Latino
- League of Women Voters
- Rotary Clubs
- Strawberry Commission; Leafy Greens Research Board
- Greater Monterey County Integrated Regional Water Management Group
- Grower-Shipper Water & Land Use Committee
- Agricultural Advisory Committee
- Agricultural Land Trust
- Land Watch Monterey County
- Center for Community Advocacy
- COPA (Communities Organized for Relational Power in Action)
- California State University Monterey Bay
- United States Geological Survey

COMMUNICATION TOOLS AND INFORMATIONAL MATERIALS

- Website with current maps, current calendar and overarching plan development flow chart
- Facebook Page regularly updated including meeting dates and Subbasin Planning updates
- Interested Party Email List
- Partner agency/organization social media pages (e.g., Facebook), newsletters (digital and print)
- Annual GSA e-Newsletter
- Timely updates to Interested Party Email List (short *hot off the press* announcements)
- Press Releases: distributed to press, elected and agency officials, and Interested Party List
- 1 to 2-page FAQs for SGMA, SVBGSA, and the GSP
- Project and Program FAQs
- Groundwater Sustainability Fee FAQs
- "In the News" circulation to Board, Committees, and List Serve
- General GSA Talking Points for Board and Committee Members; Talking Points for key milestones, findings, and updates
- Brief "Committee Key Outcomes" - circulated to board and committee members after committee meetings
- Editorial Boards and/or Letters to the Editor
- Open Houses/Forums/Field Trips (meet the consultant team, milestones, periodic GSP updates, etc.)
- Radio interviews and features, particularly Spanish radio

APPENDIX 11G

PUBLIC REVIEW COMMENTS

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW Response	Response
1-3-1			1		11/6/2018	D. Williams notes from November planning committee meeting	Clarify that the 180/400 subbasin is a subbasin.		Page 1 of the PDF and Word document both refer to the 180/400-Foot Aquifer Subbasin.
1-3-2					11/6/2018	D. Williams notes from November planning committee meeting	Clarify what a subbain is and what a GSA is.		Additional explanation added to text.
1-3-3	Section 1.2				11/6/2018	D. Williams notes from November planning committee meeting	Change description of Eastside boundary to "… between this subbasin and the 180/400…"		Text revised
1-3-4	Section 1.2				11/6/2018	D. Williams notes from November planning committee meeting	Correct text to state that the Forebay Subbasin starts at Gonzales		Acknowledged, text revised
1-3-5		Table 3-1			11/6/2018	D. Williams notes from November planning committee meeting	Explain where the Table 3-1 data come from. Describe Idle Cropland (from LandIQ)		Text revised; figure and table will be updated
1-3-6		Table 3-1			11/6/2018	D. Williams notes from November planning committee meeting	Can we discriminate permeant crops from other crops on Table 3-1. Maybe stop differentiating between vineyards and other crops.		Text revised; figure and table will be updated
1-3-7		Table 3-1		3-1	11/6/2018	D. Williams notes from November planning committee meeting	Change the land use to match model land use. Both figure and Table 3-1		Text and table will be revised to be consistent.
1-3-8	3.4.1				11/6/2018	D. Williams notes from November planning committee meeting	Acknowledge the recycled water used in Las Palmas		Text revised
1-3-9			10		11/6/2018	D. Williams notes from November planning committee meeting	the last paragraph Figure number is wrong		Should refer to Figure 2-1; text revised
1-3-10			13		11/6/2018	D. Williams notes from November planning committee meeting	Names of Jurisdictions still don't match between map and text		Text and figures will be checked for consistency
1-3-11			18		11/6/2018	D. Williams notes from November planning committee meeting	When talking about water sources, refer to the SVWP, not just CSIP		Added description of SVWP
1-3-12	3.5				11/6/2018	D. Williams notes from November planning committee meeting	When we talk about the number of existing wells, state that this is from DWR. State that there are other data sources.		Text revised
1-3-13	3.6.1.1				11/6/2018	D. Williams notes from November planning committee meeting	Elminate the "As of 2018".		Text revised
1-3-14				3-4	11/6/2018	D. Williams notes from November planning committee meeting	Remove Cal-Am from the figure		Text revised
1-3-15				3-4	11/6/2018	D. Williams notes from November planning committee meeting	Add Pajaro Sunny Mesa to the figure		The Pajaro Summay Mesa CSD will be added to Figure 3-4.
1-3-16					11/6/2018	D. Williams notes from November planning committee meeting	Always identify data sources throughout the document		Text has been revised to more clearly attribute data sources.
1-3-17	3.7.1				11/6/2018	D. Williams notes from November planning committee meeting	Find citation for Monterey GMP		Comment refes to the Monterey Groundwater Management Plan. Citation added.
1-3-18	3.7.3.2				11/6/2018	D. Williams notes from November planning committee meeting	This section should reference MCWD, not City of Marina		Text revised
1-3-19					11/6/2018	D. Williams notes from November planning committee meeting	Where does MCWD's "allocation" com from on the table that discusses their UWMP		MCWD has an allocation from the Fort Ord Reuse Authority. Text revised.
1-3-20	3.8.7				11/6/2018	D. Williams notes from November planning committee meeting	The second bullet, last sentence is confusing		Text revised
1-3-21					11/6/2018	D. Williams notes from November planning committee meeting	Ask all agencies about the status of the policies in the general plans.		The text was revised to note that plans were summarized based on publically avialable info at time of GSP preparation.
1-3-22		3-4			11/6/2018	D. Williams notes from November planning committee meeting	AMBAG just updated this, are we showing the latest.		Yes, table shows the most recent data.
1-3-23	3.10.6				11/6/2018	D. Williams notes from November planning committee meeting	3.10.6 references Greenfield as a member. It's not.		Correct, Greenfield is not a member. This section addresses all land use plans, not just members.
1-3-24			55		11/6/2018	D. Williams notes from November planning committee meeting	Page 55 references zone 2c. Remove that statement		The reference to Zone 2C is a direct quote out of the Monterey County General Plan
1-3-25					11/6/2018	D. Williams notes from November planning committee meeting	Extraction data only applies to Zones 2, 2A, and 2B. Not 2C or other areas. These will be low estimates. Be sure we state this. Theses are the ONLY extraction numbers, but they are not complete.		Text revised that MCWRA groundwater extraction data are reported for a slightly different area than the 180/400-Foot Aquifer subbasin
1-3-26					12/10/2018	Tom Virsik (PJM Law) email to G. Petersen	At part 3.8, no mention is made of the "regulatory" impact of (1) Ordinance 3790 and (2) the 2017 or 2018 moratorium ordinance on deep aquifer wells.		These are discussed in future sections.

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW Response	Response
1-3-27					12/10/2018	Tom Virsik (PJM Law) email to G. Petersen	The GSP draft seems to understand local regulation is relevant in that it is noting the MCWRA export limitation. The two ordinances may limit operational flexibility of any GSP recommended program or management action, e.g. switching from the 180/400 to the deep.		Comment noted. No change in text required.
1-3-28					12/10/2018	Tom Virsik (PJM Law) email to G. Petersen	GSP draft 3.8.7 The draft GSP includes a General Plan well destruction reference, but that does not seem to be the same as Ordinance 3790's mandatory and time-sensitive destruction. Cites: GSP Emergency Reg 354.8 ©, (d) and (f)		3.8.7 Now refers to Ordinance 3790.
1-3-29			30		12/18/2018	Mike McCullough email to D. Williams	Make sure new name Monterey One Water is used vs Monterey Regional Water Pollution Control Agency (MRWPCA)		Corrected throughout the document.
1-3-30					12/18/2018	Mike McCullough email to D. Williams	Can get an idea of how much water the industries use in and around Salinas. The City should know how much they are extracting each month.		Comment noted.
1-3-31	3.2		10		11/15/2018	Bob Jaques email to D. Williams, G. Petersen	10 under Section 3.2 and to the Management Plan on page 6 under Section 3.2, so that readers will have a general understanding of what is meant by an adjudicated basin, and some specifics about the adjudicated Seaside Basin.		Text added for clarification
1-3-32	3.9		34		11/21/2018	Paul Tran CHISPA email to G. Petersen	Should include the complete language of the settlement agreement in reference to a long-term water supply in the Zone 2C benefit assessment area. This language is contained in the amended Monterey County 2010 General Plan section PS-3.1		Comment noted. No change to text
1-3-33					11/13/2018	Tamara Voss to D. Williams, G. Petersen	Comments received as scanned hand edits in pdf.		Relevant edits in letter were made.

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
4-1	4.3.2					Adam Secondo / SVBGSA Board	Some stakeholders are indicating that there are different water qualities in the deep aquifer	We will check into this.	No public data exist on this that we can put into this report. However, this statement is now included.	
4-2	4.5					Tom Virsik	The chapters present the system as it exists today, which is not necessarily the natural system. Checklist approach vs what is actually needed for sustainability.		There is no intention to attempt to re-create the natural groundwater system.	
4-3	4.4.1					Vera Nelson / EKI for MCWD	Need to be clear about what aquifers are called principal aquifers, particularly the deep aquifer. Also the 180/400. Need to specifically state which ones are principal aquifers.		The deep aquifers are currently identified as principal aquifers. Text has been added to state that the deep aquifers exist in the Monterey subbasin. The extnet of the deep aquifer is now identified as a specific data gap	
4-4	4.4.1					Vera Nelson / EKI for MCWD	Deep aquifers not shown in cross-sections; need to identify data gaps		Deep aquifers are now included in data gaps	
4-5	4.4.2					Vera Nelson / EKI for MCWD	Include tables summarizing K and T for each zone		Data not available for this level of refinment. Chapter 10 includes a program for obtainint T and S data during implementation	
4-6						Emily Gardner	Why was the response to her comment on section 3.4.2 regarding the location of the irrigated cease of water, "no action"?	This may have been a mistake. We should revisit this.	Comment is unclear	
4-7					12/3/18	Anonymous	Should mention nitrates in document and stance of the GSA	Nitrate is in Chapter 5	Nitrate is in Chapter 5	
4-8			32-35		12/3/18	Anonymous	Surprised no mention of nitrates in water quality section. Will the state reject the Plan if it's ignored? Would like to see GSA address it rather than conferring ALL regulatory power to the RWQCB?	Nitrate is in Chapter 5	Nitrate is in Chapter 5	
4-9					12/3/18	Anonymous	Have short section explaining the nitrate problem and provide a map or data about the nitrate in GW. Perhaps carefully states how the GSA intends to work with/defer some responsibility to R3.	Nitrate is in Chapter 5	Figure 5-32 provides a map of nitrate concentrations, and it is discussed in 5.5.3.	
4-10					1/17/19	EKI	Comments received; saved		See discussions below	Draft Hydrostratigraphy Summary_MCWD_2019-01-17_EKI
4-11					2/7/19	Sandi Matsumoto/TNC	The identification of GDEs within GSPs is a required GSP element of the Basin Setting Section under the description of Current & Historical Groundwater Conditions (23 CCR §354.16). Recognizing natural points of discharge (seeps & springs) as GDEs is consistent with the SGMA definition of GDEs1, however, we recommend the identification of GDEs (GDE map Figure 4-11) for the 180-400 Foot Aquifer be moved to Chapter 5: Groundwater Conditions and elaborated upon with a description of current and historical groundwater conditions in the GDE areas.		We have opted to include the identificaiton of GDEs as part of the hydrogeologic conceptual model because GDEs represent natural discharge areas that are addressed in the HCM.	TNC_180-400ftAquifer_Chapter4
4-12					2/7/19	Sandi Matsumoto/TNC	Decisions to remove, keep, or add polygons from the NC dataset into a basin GDE map should be based on best available science in a manner that promotes transparency and accountability with stakeholders. Any polygons that are removed, added, or kept should be inventoried in the submitted shapefile to DWR, and mapped in the plan. We recommend revising Figure 4-11 to reflect this change.		Our assessment of potential GDEs followed the approach developed by TNC. The approach is detailed in Appendix 4A.	TNC_180-400ftAquifer_Chapter4

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
4-13					2/7/19	Sandi Matsumoto/TNC	Best practices for identifying GDEs in GSPs are outlined in detail in Step 1 of The Nature Conservancy's Guidance Document: "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans". Here are some highlights: • The NC dataset is a starting point for GSAs, and needs to be groundtruthed with aerial photography to screen for changes in land use that many not be reflected in the NC dataset (e.g., recent development, cultivated agricultural land, obvious human-made features). • Grouping multiple GDE polygons into larger units by location (proximity to each other) and principal aquifer will simplify the process of evaluating potential effects on GDE due to groundwater conditions under GSP Chapter 7: Sustainable Management Criteria. • Groundwater conditions within GDEs should be briefly described within the portion of the Basin Setting Section where GDEs are being identified. • When using groundwater levels to confirm that a connection to groundwater in a principal aquifer exists, please refer to Attachment C for best practices in doing so. • Not all GDEs are created equal. ...		Our assessment of potential GDEs followed the approach developed by TNC. The approach is detailed in Appendix 4A.	TNC_180-400ftAquifer_Chapter4
4-14					2/7/19	Sandi Matsumoto/TNC	The basin boundary bottom for the aquifer was determined using the 1970 USGS TDS=3,000ppm contour lines ("usable water" boundary), but groundwater extraction well depth data should also be included in the determination of the basin bottom to prevent extractors with wells deeper than the basin boundary from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary. As noted on page 9 in DWR's Hydrogeologic Conceptual Model BMP2 "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions".		As noted in Section 4.3.2, the base of the Subbasin has been set to be consistent with previous reports. While some wells may be deeper than the identified base, the previous reporets provide the most reasonable estimate of the depth of usable groundwater in the Subbasin	TNC_180-400ftAquifer_Chapter4
4-15	4.4.1				3/26/19	EKI	The GSP Regulations specifically define the term "Principal Aquifer" (California Code of Regulations (CCR) §351 (aa)) and have plan development as well as monitoring network requirements for identified Principal Aquifers. Currently, GSP Section 4.4.1 appears to have included all alluvial deposits/valley fill deposits from ground surface to the bottom of the subbasin in a single Principal Aquifer. As agreed upon during the December 6 Planning Committee Meeting, the 180/400 Foot Aquifer Subbasin GSP should define multiple Principal Aquifers given the definable layers of aquifer and aquitard units in the subbasin. At least one Principal Aquifer should be defined for the Deep Aquifers (i.e. the 900-Foot and 1,500-Foot Aquifers). Per GSP Regulations, groundwater elevation contours, hydrographs, minimum thresholds for seawater intrusion, sufficient monitoring network coverage, etc. should be developed for each Principal Aquifer identified in this GSP.		The 180/400 Foot Aquifer Subbains GSP identifies three principal aquifers: the 180-Foot Aquifer, the 400-Foot Aquifer, and the Deep Aquifers	Preliminary Comments_Chapter4_2019-3-26_EKI

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
4-16	4.4.1				3/26/19	EKI	In addition to the comment above, this section discusses extensive continuous clay layers within the 180/400 Foot Aquifer Subbasin. However, there are existing wells and abandoned wells that are potentially acting as "conduits" for saline water to flow to the lower aquifers1. Airborne electromagnetic analysis conducted in the northern Salinas Valley Basin also showed that there are gaps in the 180/400-Foot Aquitard in the 180/400-Foot Aquifer Subbasin near the coast. Please add a discussion of potential conduits of vertical flow in the Subbasin. This comment was not provided during the December 6 Planning Committee Meeting.		Statement added that the clay layers are not continuous	Preliminary Comments_Chapter4_2019-3-26_EKI
4-17	4.4.2				3/26/19	EKI	180/400 Foot Aquifer Subbasin GSP should provide aquifer properties for each of the defined Principal Aquifers. The GSP should provide storativity, conductivity (per CCR §354.14 (b)(4)(B)), and transmissivity for each Principal Aquifer. We understand that Section 4.7 of the January 2019 update discussed aquifer parameters as a data gap. As agreed upon during the Planning Committee meeting, SVBGSA will obtain these aquifer property parameters from the Water Resources Agency to include in this section. This section could benefit from either a table or description on an aquifer and aquitard basis compiling all the relevant data (e.g. from field tests or models) and		Aquifer specific hydrogeologic properties are generally not available for the 180/400-Foot Aquifer Subbasin. This is identified as a data gap in the GSP. The GSP proposes up to six aquifer tests to fill this data gap.	Preliminary Comments_Chapter4_2019-3-26_EKI
4-18				4-6, 4-7, 4-8	3/26/19	EKI	The Deep Aquifers are unrepresented in cross-sections. Please provide a discussion if this is a data gap. This comment has been noted by and concurred to by SVBGSA during the Planning Committee Meeting. Section 4.7 of the January 2019 update has included information on the deep aquifer as a data gap.		Section 4.7 of the GSP states that the hydrostratigraphy, vertical and horizontal extents, and potential recharge areas of the Deep aquifers are poorly known and that these are an important data gap.	Preliminary Comments_Chapter4_2019-3-26_EKI

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
4-19	4.6.2				3/26/19	EKI	Please add the following text after the second paragraph on Page 33. This comment was not provided during the December 6 Planning Committee Meeting. "Groundwater with a total dissolved solid of 3,000 mg/L or less, is groundwater that is considered to be suitable, or potentially suitable, for beneficial uses in accordance with SWRCB Resolution No. 88-63 as adopted in its entirety in the Central Coast Regional Water Quality Control Board's Basin Plan. California Code of Regulations, Title 23, Section 659 – 669 lists the beneficial uses of surface water, which is also applicable to groundwater. Those beneficial uses include (1) domestic use, (2) irrigation use, (3) power use, (4) frost protection use, (5) municipal use, (6) mining use, (7) industrial use, (8) fish and wildlife preservation and enhancement use, (9) aquaculture use, (10) fish and wildlife protection and enhancement, (11) recreational use, (12) water quality use, and (13) stock watering use. In addition, Water Code Section 1242 states that the storing of water underground constitutes a beneficial use."		Text added as appropriate	Preliminary Comments_Chapter4_2019-3-26_EKI
4-20	4				3/26/19	EKI	See attached document		Reviewed the hydrostratigraphic summary. Incorporated as appropriate.	Draft Hydrostratigraphy Summary_MCWD_2019-01-17_EKI
4-21	4				12/6/18	Heather Lukacs	For the Salinas Valley Basin, we would specifically like you to start by considering at least the following contaminants for inclusion in the GSP and your monitoring network: 1. Nitrate 2. Arsenic 3. Hexavalent Chromium 4. Uranium 5. 123-TCP 6. DBCP 7. (also, chloride and TDS, as others have mentioned) See letter for details		Nitrate, arsenic, 123-TCP, and TDS are considered constituents of concern in the GSP. Hexavalent chromium is not included in the monitoring program because there is not currently an actionable limit. Should the State of California establish an MCL or SMCL for hexavalent chromium it will be added to the list of parameters monitored in the drinking water supply wells. Uranium and DBCP have not been found above actionable levels in supply wells.	HeatherLukacs_WaterQuality for Chapter 4_12.06.2018
4-22	4.3.2				12/21/18	Brian Frus	line 4, Error! Reference source not found should be deleted		Done.	GSP 180_400 Aquifer Comments Chs 4 Salinas Brian Frus 18 12 21
4-23	4.5				12/21/18	Brian Frus	line should read "35,000" acre-feet		Done.	GSP 180_400 Aquifer Comments Chs 4 Salinas Brian Frus 18 12 21
4-24	4.6.1				12/21/18	Brian Frus	Suggest this section state in layperson terms what is happening to the concentrations of the constituents discussed as one moves down the valley (or deeper into either the 180 or 400 aquifers)		Changes in general mineral chemistry with depth or location are not clear, and are not the focus of this GSP. More easily understandable language was added regarding the significance of the water quality information.	GSP 180_400 Aquifer Comments Chs 4 Salinas Brian Frus 18 12 21

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
5-1					2/7/19	Director Secondo	Would like to see in full each Hydrographs...all 2/7/19 comments saved	Yes, they will be added	Individual groundwater level hydrographs have been added after the hydrograph maps.	Comments-Feb 7 2019 Planning Committee
5-2				5-2	2/7/19	Director Granillo	The contour data do not extend all the way to the mountain ranges-there should be a note explaning the gaps, where/why exist.		An explanation has been added.	Comments-Feb 7 2019 Planning Committee
5-3				5-10	2/7/19	Director Granillo	It is difficult to see changes over time in the hydrorgraphs for the 180/400 aquifers.	Copies of the hydrographs will be added immediately following the maps.	Individual groundwater level hydrographs have been added after the hydrograph maps.	Comments-Feb 7 2019 Planning Committee
5-4					2/7/19	Public Comment/Mr Horacio with San Gerardo Community	How is water quality going to be monitored?	This will be detailed in the monitoring chapter.	Question answered	Comments-Feb 7 2019 Planning Committee
5-5					2/7/19	Public Comment/Mr Horacio with San Gerardo Community	When is the assessment going to start?	D Williams replied that's for the implementation once the plans are approved the 180/400 should be approved by December of this year	Question answered	Comments-Feb 7 2019 Planning Committee
5-6				5-26	2/7/19	Public Comment/Heather Lukas with Community Water Center	Why do the nitrates concentrations end in 2007?	D Williams indicated it was based on existing maps which were a series of maps that ended in 2007	Question answered	Comments-Feb 7 2019 Planning Committee
5-7					2/7/19	Public Comment/Heather Lukas with Community Water Center	Asked if the County data can be added as its been updated through fall of 2017. The data missing is the state data & county from private domestic wells. Does GSA consider private wells in terms of monioring water quality?	Les Girard replied only on new wells as part of the new process	These data will be identified in the monitoring chapter as a source for filling data gaps.	Comments-Feb 7 2019 Planning Committee
5-8					2/7/19	Public Comment/Patrick (Marina Coast Water)	How wil DWR handle the existing conditions to change the plans of the permiters on the overdraft?	D Williams said it will not change the Plan due to the existing conditions. The conditions are inherit in the Plans are conditions that can change in the future	Question answered	Comments-Feb 7 2019 Planning Committee
5-9					2/7/19	Public Comment/Tom Virsik	What does SMC stand for?	It stands for Sustainable Management Criteria	Question answered	Comments-Feb 7 2019 Planning Committee
5-10					2/7/19	Public Comment/Tom Virsik	Indicated he wrote a letter sent Feb 6, 2019 via email with details comments on the ISPs. Also commented on the lack of focus of fish flows, reservoir's and environmental aspects	D. Williams that these comments will be addressed in the SMC and fish flows will be addressed and other river rights not in detail only on requirement basis	The acronym is defined in its first usage.	Comments-Feb 7 2019 Planning Committee
5-11					2/7/19	Public Comment/Bill Lipe	Inquired about level of seawater intrusion	D Williams clarified that the current esitmate is approximately 14,000 acre-feet per year.	Question answered	Comments-Feb 7 2019 Planning Committee
5-12					2/7/19	Public Comment/Bill Lipe	Asked if the remainder is throughout the valley outside the 180/400?	D Williams advised there is a table in the ISP that lists the assumed overdrafts by subbasins based on groundwater levels. (The table refered to by D. Williams is Tablve 5-2 of the ISP)	Question answered	Comments-Feb 7 2019 Planning Committee
5-13	5.1.1				2/7/19	Chair McIntyre	Commented on the charts need little more explanation of what the contours mean	D. Williams replied it's a great suggestion to make this more readable	More explanation has been added in the text regarding the meaning of the contours and the contour interval	Comments-Feb 7 2019 Planning Committee
5-14	5.1.1				2/7/19	Director Secondo	Added that it could be less scientific	D Williams agreed this needs to be written less scientific and understandable	Not addressed in this draft. Final document edited to be more understandable.	Comments-Feb 7 2019 Planning Committee
5-15	5.1.2		17		2/7/19	Chair McIntyre	Addressed a typo on page 17: the 2007 should be 20017	D. Williams advised that it will be corrected if wrong	Corrected	Comments-Feb 7 2019 Planning Committee
5-16	5.1.3				2/7/19	Chair McIntyre	Asked if groundwater levels were recovered in 1983 & why they can't be recovered today?	D. Williams said there is no indication that water levels can be recovered to 1983 levels	Question answered	Comments-Feb 7 2019 Planning Committee
5-17	5.1.3				2/7/19	Director Brennan	Added it would be helpful to collaborate on the findings	D. Williams agreed	Question answered	Comments-Feb 7 2019 Planning Committee
5-18	5.1.4			5-13	2/7/19	Heather Lukacs	Asked what is represented on figure 5-13	D. Williams indicated these are graphs that are developed by the Water Resource Agency. Graphs that are to represent an average water level in a subbasin	Question answered	Comments-Feb 7 2019 Planning Committee
5-19	5.4				2/7/19	Heather Lukacs	What is represented on figure 5-10	D. Williams replied it's the cumulative total of water that has been lost from storage over time since the early 1940's	Question answered	Comments-Feb 7 2019 Planning Committee
5-20	5.6				2/7/19	Heather Lukacs	Regional Water Boards required ag water collection on farm domestic wells data is an additional source of groundwater quality data	D Williams replied that the current plan is to monitor groundwater quality it will be collected through the ILRP and Division of Drinking Water	These data will be identified in the monitoring chapter as a source for filling data gaps.	Comments-Feb 7 2019 Planning Committee
5-21	5.6				2/7/19	Mr. Horacio	Asked how much of the water quality are from the agency? Or, if the agency is only checking water levels and not the quality of the water	D. Williams indicated the water agency data in this chapter is water levels that will be used to develop a monitoring plan	Question answered	Comments-Feb 7 2019 Planning Committee
5-22	5.6.3				2/7/19	Director Brennan	How do you differ from seawater and chloride intrusion?	D. Williams pointed out they are related. It is a secondary MCL that needs to meet regulations with the GSA	Question answered	Comments-Feb 7 2019 Planning Committee

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
5-23	5.7				2/7/19	Tom Virsik	May be better to avoid the term 'underflow' due to legal implications	D. Williams advised he may have used the wrong term and meant to say 'subterranean stream' and will correct	Underflow has been replaced with suberranean stream.	Comments-Feb 7 2019 Planning Committee
5-24					2/21/19	Dallas Tubbs	Chevron purchases INSAR data from vendors	D Williams stated there is a significant data gap regarding subsidence that will require future surveys. Will need to assess the cost effectiveness	Comment Noted	2-21-19 Advisory Committee comments Chapter 5.doc
5-25					2/21/19	Bob Jaques	Noted decline in groundwater storage following both the Castroville Seawater Intrusion and Salinas Valley Water projects. He would like the text to comment regarding climactic impact or other factors that contribute to this decline.		Text added for clarification	2-21-19 Advisory Committee comments Chapter 5.doc
5-26	5.3				2/21/19	Bob Jaques	Section 5.3 should include the amount of useable groundwater as well as the groundwater storage loss and mentioned that water would not be included in the useable water data [comments saved]	D. Williams expressed concern that this information may mislead readers into believing that there is adequate water for use without considering implications such as further intrusion. D Williams stated that the water data would be addressed in Chapter 6 which will have a water budget with a sustainable yield number.	Question answered	2-21-19 Advisory Committee comments Chapter 5.doc
5-27	5.4				2/21/19	Bob Jaques	Follow up well head survey of the Seaside Basin showed that it was very economical		Comment Noted	2-21-19 Advisory Committee comments Chapter 5.doc
5-28	5.5				2/21/19	Bob Jaques	May have misunderstood Section 5.5 as he was under the impression that the 180/400 aquifer was recharged by the Salinas River, and the dam was to get water into the river beds	D. Williams stated that the intenet is to provide CSIP supplemental water in lieu of recharge. There is some percolation from the Salinas River but the impact is relatively small compared to the Forebay and Upper Valley	Question answered	2-21-19 Advisory Committee comments Chapter 5.doc
5-29					2/21/19	Howard Franklin	Made the distinction between interconnected water and recharge		Comment Noted	2-21-19 Advisory Committee comments Chapter 5.doc
5-30	5.5				2/21/19	Bob Jaques	Pointed out that one sentence states that groundwater greater than 20 feet below the surface may be interconnected and a following sentence states that groundwater greater than 20 feet below the surface is not interconnected to surface water.	D. Williams state that the contradictory sentence is in error	Contradictory sentences have been fixed	2-21-19 Advisory Committee comments Chapter 5.doc
5-31				5-7	2/21/19	Howard Franklin	Stated that figure 5-7 is the wrong map; it is a copy of the map on figure 5-6. For consideration regarding seawater intrusion and stopping the cone of depression, the WRA contours groundwater separately from seawater intrusion lines, which provide an interesting observation. The change in the cone of depression may be slowing down, but if continuing, would flatten out on the Eastside.		Map in Figure 5-7 was corrected	2-21-19 Advisory Committee comments Chapter 5.doc
5-32					2/21/19	EKI	EKI, on behalf of Marina Coast Water District, requested that the shallow aquifer be considered an aquifer and not removed, and they will submit a letter to that effect. Marina Coast Water is coordinating with Monterey		Comment noted	2-21-19 Advisory Committee comments Chapter 5.doc
5-33					2/21/19	Tom Adcock, G. Petersen, Nancy Isakson, Mr. Stefani	T. Adcock asked whether we would have to identify the aquifer or could simply take the coordination information. G. Petersen stated that the Agency would have to analyze the science. N. Isakson agreed with G. Petersen because there are differing opinions. Mr. Stefani stated that there is some data available from testing performed for two to three years		Question answered	2-21-19 Advisory Committee comments Chapter 5.doc
5-34					2/21/19	H Amezquito		D. Williams in response to H. Amezquito stated that the GSA has the responsibility of showing they are not harming groundwater quality, but is not responsible for mediation or cleanup. The Plan will identify existing water conditions to ensure it is not being made worse. Projects will have their own groundwater monitoring programs	Question answered	2-21-19 Advisory Committee comments Chapter 5.doc

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
5-35					4/4/19	Glenn Church	Comments received [GChurch_Public Comment Chapters 5]		The SVBGSA technical team acknowledges the impacts of seawater intrusion on the 180/400-Foot Aquifer Subbasin, and the need to address this issue during the GSP development and implementation. A data gap analysis for seawater intrusion monitoring is included in Chapter 7. Chapter 8 will address the seawater intrusion with appropriate sustainable management criteria, and Chapter 9 will offer potential solutions to halt seawater intrusion in this area through a combination of projects and management actions.	GChurch_Public Comment Chapters 5
5-36	5.5				4/11/19	The Nature Conservancy	We recommend that interconnections of surface water with groundwater in the Shallow Aquifer be evaluated in this section of the GSP, since the Shallow Aquifer is within the 180/400-Foot Aquifer Subbasin.		Comment noted. Maps of the shallow water bearing zone sediments are not available - analysis was done with the best available science, data and tools.	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-37	5.5				4/11/19	The Nature Conservancy	The 180-Foot Aquifer and the 400-Foot Aquifers are confined units, thus comparing groundwater levels of <20 feet below the ground surface with wells screened within a confined aquifer is an incorrect approach. This is because the potentiometric surface of a confined aquifer cannot reflect the position of the true water table. Comparing groundwater levels from the shallow (unconfined) aquifer (that exists above the Salinas Valley Aquitard) with the ground surface is a more appropriate approach for identifying ISW in the basin.		Comment noted. Maps of the shallow water bearing zone sediments are not available - analysis was done with the best available science, data and tools.	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-38	5.5				4/11/19	The Nature Conservancy	We would like to see groundwater conditions evaluated across the range of seasonal and interannual time frames		Comment noted. Long-term averages and seasonal changes will be developed with the groundwater model once it is available	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-39					4/11/19	The Nature Conservancy	Mapping ISW locations would be best done using contours of depth to groundwater measured from multiple points in time (different seasons and water year types) rather than only from Fall 2013. If data gaps exist in groundwater level contour data over time, these data gaps should be discussed in the GSP section 5.5.1 (Salinas Valley Basin ISP) and section 5.5 (180-400 Foot Aquifer GSP Draft) and reconciled in the Monitoring Network section, so that ISW maps can be improved in future GSPs		Comment noted. Once we have the model, we will be able to do these types of analysis more efficiently and accurately	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-40					4/12/19	The Nature Conservancy	The use of piezometric head from confined aquifers should be eliminated from these ISW mapping efforts, since they do not adequately reflect the position of the true water table (see last paragraph on p. 38 of Salinas Valley Basin ISP)		Comment noted. Maps of the shallow water bearing zone sediments are not available - analysis was done with the best available science, data and tools.	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-41					4/13/19	The Nature Conservancy	It is unclear on Figure 5-19 (Salinas Valley Basin ISP) and Figure 5-22 (180-400 Foot Aquifer GSP Draft), whether missing groundwater levels along certain reaches of the Salinas River are due to groundwater levels >20 feet bgs or due to data gaps in groundwater levels. Mapping the position of wells used for the interpolation of groundwater elevation data used to map groundwater level contours near surface water would help provide further clarification.		Maps were developed by MCWRA	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-42					4/14/19	The Nature Conservancy	Please elaborate on how depth to groundwater contours were developed		Maps were developed by MCWRA	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019
5-43					4/15/19	The Nature Conservancy	We recommend mapping the gaining and losing reaches onto Figure 5-19 (Salinas Valley Basin ISP) using the data from Figure 5-23 (Salinas Valley Basin ISP). If this is not possible due to insufficient data, then as with the first bullet above, we would like the data gaps to be addressed by the Monitoring Network.		Maps were developed by MCWRA - data gaps are addressed in Chapters 7 and 10.	TNC_180-400ftAquifer_Chapter5 submitted 04.11.2019

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response
6-0	6				6/6/2019	Director Brennan	It would be good to note that the Water Budget chapter will be updated when the model becomes available.		Text Added

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
7-0					4/18/19	Harold Wolgamott	Stated they report to the State monthly on shallow wells [comments received, saved]	D Williams would like to look at those reports	Chapter revised to include ILRP shallow wells once Ag. Order 4 is released	Chapter 7 Advisory Committee Comments 4-18-2019
7-1					4/18/19	Norman Groot	Inquired about duplication of water quality monitoring already required [comments received, saved]	D Williams stated that he would like to integrate this information and he would appreciate Mr Groot's assistance in filling in some of the data gaps	Question answered.	Chapter 7 Advisory Committee Comments 4-18-2019
7-2					4/18/19	Tom Ward	Had a question about well meter reading	D Williams replied to T Ward and stated well meter reading to confirm pumping data is an option. Added that he hasn't included meter reading because this option will come up in 1-2 months when discussing management actions	Question answered.	Chapter 7 Advisory Committee Comments 4-18-2019
7-3					4/18/19	Nancy Isakson	Thought they were required to provide data for the deep aquifer	D. Williams stated that Howard Franklin has confirmed there is a new ordinance that public reporting is required	Comment noted	Chapter 7 Advisory Committee Comments 4-18-2019
7-4					4/18/19	Nancy Isakson	Stated there were informative comments at the Planning Committee meeting regarding the different ways Ag growers measure for pumping. She would like information on the different methods and accuracy	D Williams stated that this would come up in 1-2 months; by law pumping has to be reported	Question answered.	Chapter 7 Advisory Committee Comments 4-18-2019
7-5					4/18/19	Tom Adcock	Stated that public water systems have a safety issue about publicly disclosing location of water facilities	D Williams will discuss the concern for privacy regarding precise locations with the Department of Water Resources (DWR)	The SVBGSA only discloses the location of wells that are already publicly available, such as MCWRA-owned wells and CASGEM wells.	Chapter 7 Advisory Committee Comments 4-18-2019
7-6					4/18/19	Brian Frus	Asked how critical is the data that the Water Resources Agency is currently collecting confidentially but may become public	D. Williams stated that he does not believe that any of the significant amount of data will be public unless explicitly authorized	Question answered.	Chapter 7 Advisory Committee Comments 4-18-2019
7-7					4/18/19	Howard Franklin	Stated that the data collection essentially has been constrained to seawater intrusion in the coastal area due to funding constraints. This year, they will not include the confidentiality clause in the request for data. Water quality has diminshed since 1941 but there is no measureable susidence.		Comment noted.	Chapter 7 Advisory Committee Comments 4-18-2019
7-8	7				4/18/19	Howard Franklin	Stated that estimating surface water depletion due to groundwater pumping may be difficult for highly managed rivers. Believes groundwater levels and storage is a good approach, but consideration should be given to the historical simulation being worked on.	D Williams stated that this does not mean that this would the primary approach to determining whether we are maintaining current storage	Comment noted	Chapter 7 Advisory Committee Comments 4-18-2019
7-9					4/18/19	May Nguyen	Stated the Environmental Justice Coalition developed a water quality mapping tool that they may have shared with D. Williams for integration with data for this plan. It is available online and will be rolled out the end of this month.	D Williams stated they have not received a response from Monterey County Health Dept for the requested data, and he noted Mr. Adcock's question as to whether well location should be publicized	Received County GW quility data, however it is not associated with specific well locations. This is a data gap now identified in Chapter 7 that will be addressed during implementation	Chapter 7 Advisory Committee Comments 4-18-2019
7-10					4/18/19	Jeff Johnson	Stated that Mr. Williams mentioned that the current assumption of the relationship between subsidence and depletion needs to be demonstrated. They would like a revision to eliminate the assumption until ample hydrographic and satellite data is available. He referred to the information on data providers that was previously provided to draw our own Salinas Valley graph	We have added the InSAR analysis to the SMC Chapter 8. The SMC chapter is where the analysis suggested by Mr. Johnson belongs.	Comment addressed.	Chapter 7 Advisory Committee Comments 4-18-2019
7-11	7.21				4/18/19	Jeff Johnson	Referenced 7.21 and stated that new CASGEM wells will likely be needed. The last paragraph suggests uncertainty about monitoring. They suggest this is an opportunity for the GSA to recommend that wells be added and that monitoring remain with the Water Resources Agency	D. Williams stated that multiple agencies can provide data to the State under CASGEM	Correction from DW response. All CASGEM wells used in GSP monitoring will be migrated to the GSA as part of the GSP submission process.	Chapter 7 Advisory Committee Comments 4-18-2019
7-12					4/18/19	James Bishop	Stated that the Regional Board is working with the Ag community on regional monitoring for water quality. It would be great for the Regional Board to work with the GSA to avoid duplicate monitoring networks		Comment noted	Chapter 7 Advisory Committee Comments 4-18-2019

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
7-13					4/18/19	Diane Kukol	[only response included in Advisory Committee Comments]	In response to Diane Kukol, D Williams estimated that the timing for working together on the Chapter would be near future. He supports the integration of monitoring, but the GSP must be submitted by January 2020. The monitoring system in the Plan may change within a year, which is not problematic. Coordination sooner than that would be great, but the SVBGSA schedule should not drive them	Question answered.	Chapter 7 Advisory Committee Comments 4-18-2019
7-14					4/18/19	Heather Lukacs	Stated that San Luis Obispo should be able to provide data in a quick time frame	D Williams stated they can differentiate between types of wells, but it was rough to differentiate at the time the data was downloaded for the draft chapters	Comment noted.	Chapter 7 Advisory Committee Comments 4-18-2019
7-15					4/18/19	Howard Franklin to Horacio Amezquita	Stated that water elevation monitoring information is on the Water Resources Agency's website		Comment noted	Chapter 7 Advisory Committee Comments 4-18-2019
7-16					4/18/19	Diane Kukol	[only response included in Advisory Committee Comments]	In response to Diane Kukol, D Williams stated they do not have better data than the Irrigated Lands Regulatory Program (ILRP) data. Current requirement is to look at the number of supply wells and see what is happening with them. Our job is to ensure our management does not make it worse. SGMA could be expanded in the future to include monitoring water quality, but that is not advisable during these first couple of years of the legislation	Comment noted	Chapter 7 Advisory Committee Comments 4-18-2019
7-17					4/18/19	Heather Lukacs	Stated that not much is known about shallow aquifers used for drinking water, and this should be considered a data gap. Private domestic wells should be incorporated into the monitoring networks, especially because they count as supply wells		Domestic wells that are regularly monitored as part of the ILRP will be included into the monitoring network for water quality once Ag. Order 4.0 is finalized. This is now explicitely stated in the GSP	Chapter 7 Advisory Committee Comments 4-18-2019
7-18	7				6/10/19	LandWatch	Recommend that GSA adopt an ordinance that requires 1) Independently calibrated and monitored flowmeters on agricultural pumps throughout the Salinas Valley Groundwater Basin; and 2) Annual pumping reports that are independently validated for accuracy. The ordinance should also include strict enforcement provisions that help assure full compliance. LandWatch's comments support these recommendations. We reject the proposed use of the existing monitoring program, as described in Chapter 7, to monitor annual groundwater pumping because it will generate inaccurate results and potentially lead to unfair cost allocations.		Comment noted. Expanding and updateing the well metering sytem is included as an implementation action in Chapter 10.	LandWatchComments_GSPChapter 7.pdf
7-19	7				6/10/19	LandWatch	Ordinance No. 3717 Has Not Been Enforced		Comment noted. Expanding and updateing the well metering sytem is included as an implementation action in Chapter 10.	LandWatchComments_GSPChapter 7.pdf
7-20	7				6/10/19	LandWatch	**Proposed Monitoring in Chapter 7 for Groundwater Agricultural Pumping.** Chapter 7 does not propose to require enforcement of the requirement for flowmeters.		Any additional enforcement mechanisms will be part of the expanded and updated well metering system included as an implementation action in Chapter 10	LandWatchComments_GSPChapter 7.pdf
7-21	7				6/10/19	LandWatch	Electricity Consumption Inaccurately Estimates Water Volumes Pumped		Comment noted	LandWatchComments_GSPChapter 7.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
7-22	7				6/10/19	LandWatch	There is uncertainty and a potentially serious data gap regarding groundwater pumping in the 180- and 400-foot aquifer subbasin. Chapter 7 ignores the following problems or potential problems with historic and future data collection: Failure to enforce the requirement to submit flowmeter-based pumping data and the use of less reliable means to estimate pumping • Apparent failure to require that flowmeter data be independently calibrated and reported by approved testing organizations on an annual basis • Failure of 5% of known wells to report at all • Potential uncertainty as to the number and location of other wells • Potential confusion if action plans are predicated on a water balance and hydrological model using inaccurate historic data while subsequent compliance benchmarks and fair share contributions are based on more accurate future water use data.		Comment noted. Expanding and updateing the well metering sytem is included as an implementation action in Chapter 10.	LandWatchComments_GSPChapter 7.pdf
7-23	7				6/10/19	LandWatch	To assure that pumping data are complete and verifiably accurate, Chapter 7 should be updated to address the following questions: 1. When will pumping data for the years 2016, 2017 and 2018 be made available? Will it be used to inform the Chapter 6 water balance data and the hydrologic model? 2. Has historic pumping data been systematically or materially misreported? If so, what action should be taken to correct the data and, if necessary, to re-assess the water balance data and hydrologic model? 3. How are current wells mapped? If they are not reliably mapped, how will unmapped wells be identified and pumping reported? 4. How will new wells be tracked? 5. How will the requirement to install flowmeters to and report pumping based on flowmeters be enforced? 6. How will flowmeters be tested and verified for accuracy? 7. How will the requirement for independent reporting of		1. Pumping for 2019 will be made available during the 2020 annual report. Puming for 2016 through 2018 are currently available from MCWRA. 2. We made no attempt to assess if historical pumpoing has been systematcally misreported. Any additional enforcement of pumping data will be discussed and implemented as part of the action items in chapter 10. 3. Current wells are mapped using data from MCWRA. Mapping all wells is an action item in chapter 10. 4. All new wells must be premitted by the County of Monterey, and will be tracked through the permitting system. 5. Any additional enforcement of pumping data will be discussed and implemented as part of the action items in chapter 10.	LandWatchComments_GSPChapter 7.pdf
7-24	7				6/10/19	LandWatch	Chapter 7 should acknowledge that SVBGSA does not need to rely on Ordinance 3717 and MCWRA's limited budget for enforcement. The SVBGSA has the independent statutory authority to mandate reporting and data collection methods and to use its fees to collect essential data.		Comment noted. Any additional enforcement of pumping data will be discussed and implemented as part of the action items in chapter 10.	LandWatchComments_GSPChapter 7.pdf
7-25	7	7.2	4		6/18/19	TNC	The wells listed in the table and proposed for monitoring do not include any wells completed in the Shallow Alluvial or Dune Sand Aquifers. As such, the proposed monitoring well network is inadequate to assess the potential effects of groundwater pumping and management on ISWs and GDEs. This fact should be acknowledged with a cross reference to Section 7.2.4 which describes the proposed work to remedy this situation.		The shallow aquifer and dune sands aquifers are not identified and principal aquifers, and therefore do not require monitoring networks. The chapter identifies two shallow wells that will be installed to verify stream/aquifer interaction assumptions.	TNC_180-400ftAquifer_Chapter7+8.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
7-26	7.7		23-24		6/18/19	TNC	Please revise this section to reflect what is known and published regarding potential surface-groundwater interactions in the subbasin and related groundwater level and budget trends, identify the existing data gaps, and provide recommendations for an adequate number of monitoring wells to assess surface-groundwater interaction and shallow groundwater level trends.		Limited information is available concerning surface water-groundwater interaction. Chapters 5, 7, 8, and 10 provide a review of the information available and propose to remedy this data gap with the use of the USGS integrated surface water/groundwater model and the installation of shallow groundwater monitoring wells during further investigations.	TNC_180-400ftAquifer_Chapter7+8.pdf
7-27	7.7		23-24		6/18/19	TNC	Please specify what other monitoring data and methods will be implemented to inform a determination whether significant and unreasonable impacts to GDEs are occurring, and explain how they will adequately meet the requirements of 23 CCR §354.34(c)(6) relative to GDEs and ISWs.		This information is provided in Chapters 5 and 8.	TNC_180-400ftAquifer_Chapter7+8.pdf
7-28	7A app		8		6/18/19	TNC	Please include monitoring protocols that meet the requirements of 23 CCR §354.34(c)(6) relative to GDEs and ISWs.		Monitoring protocols will be added in a later version of the GSP when data gaps for this monitoring network are filled and wells have been identified/installed.	TNC_180-400ftAquifer_Chapter7+8.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
8-152	8				11/4/2019	Rural Well Owner P Scholz	Add language that commits that by 2021 the GSA (or MCWRA) will do the studies that SHOULD HAVE BEEN DONE before the "sustainability" criteria was developed. There is absolutely no monitoring well data from the hill areas in the northern part of the 180/400 ft. aquifer. The monitoring wells are located on the flatland areas only. SVBGSA has NO IDEA what the condition of wells are in the hill areas where thousands of rural residents live. They do not know how many wells are already at risk in terms of groundwater level and how the proposed projects and continued high pumping rates could exacerbate those low levels.		The GSP was develope with best available data and tools. The GSP identifies data gaps for the 180-Foot and 400-Foot Aquifers in the northern hill areas of the 180/400-Foot Aquifer Subbasin. Those data gaps will be addressed during the implementation phase of the GSP, and the SVBGSA can adjust the SMCs according to additional data collected.	MOCOWS comment letter 11-3-19
8-153	8.6.2.2				11/4/2019	Rural Well Owner P Scholz	Revise 8.6.2.2 to say: Well depth and groundwater level information for domestic wells over a long-term period has not been provided by the Monterey County Water Resource Agency or other agency. The impact that the proposed groundwater level minimum threshold is likely to have on domestic wells located in the 180/400 ft. sub-basin is not known. Therefore, the reasonableness of the minimum threshold can not be determined.		Minimum thresholds for groundwater elevations are compared to the range of domestic well depths in the Subbasin using DWR's Online System for Well Completion Reports (OSWCR) database. This check was done to assure that the minimum thresholds maintain operability in a reasonable percentage of domestic wells. The proposed minimum thresholds for groundwater elevation do not necessarily protect all domestic wells because it is impractical to manage a groundwater basin in a manner that fully protects the shallowest wells. The average computed depth of domestic wells in the Subbasin is 316.6 feet for the domestic wells in the OSWCR database.	MOCOWS comment letter 11-3-19
8-154	8				11/4/2019	Rural Well Owner P Scholz	There needs to be a commitment that by 2022 private well owners and small water system managers will be notified if their well is located in an area where sea water encroachment is intruding based on increases in chloride and total dissolved solids occurring between 1995 through current time, whether the encroachment exceeds state standards or not		Comment noted. This is not a requirement under SGMA. MCWRA is the agency responsible for monitoring seawater intrusion.	MOCOWS comment letter 11-3-19
8-155	8				11/4/2019	Rural Well Owner P Scholz	There needs to be a commitment that by 2022 private well owners and small water system managers will be notified if their well is located in an area where ground levels have dropped below the minimum threshold or similar criteria that indicates potential risk of sanding or failing.		Comment noted. This is not a requirement under SGMA.	MOCOWS comment letter 11-3-19
8-156	8				11/4/2019	Rural Well Owner P Scholz	In the chapter regarding implementation, there needs to be a commitment that by 2022 private well owners and small water system managers will receive either in conjunction with #2 and #3 above, or independent of it, notification of funding and/or programs available for water testing, water impurity removal systems and funding for improvements to wells that are in jeopardy of well failure.		Comment noted.	MOCOWS comment letter 11-3-19

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
8-157	8				11/4/2019	Rural Well Owner P Scholz	In Chapter 8, Table 8.1, is unrealistic in the minimum threshold criteria for chronic lowering of groundwater levels. The level needs to be raised to the groundwater average level for the year 2007. This change is needed because the 2015 level is too close to the lowest gw level in 74 years of history records. Is it not reasonable to "Freeze" the minimum to the bottom that occurred during drought periods where well failures were know to occur. It is clear that severe over-drafting has been occurring for decades as evidenced by massive sea water intrusion. 2015 level is not a reasonable "floor" to prevent continued over-draft / sea water intrusion. The need for a higher minimum threshold is especially true considering the stated intent from GSA officials that measurable objectives do not need to met. They are just "goals".		Comment noted.	MOCOWS comment letter 11-3-19
8-158	8				11/4/2019	Rural Well Owner P Scholz	7). The proposed undesirable result for chronic lowering of groundwater levels in Table 8.1 of 15% exceedance for 2 consecutive years IS MUCH TOO GREAT OF AN EXCEEDANCE. This is especially true because the positive impacts of projects may not be known for decades.		Comment noted.	MOCOWS comment letter 11-3-19
8-159	8				11/4/2019	Rural Well Owner P Scholz	8). Reduction in Storage a). The sustainable yield figure of 112,000 AF/yr shown in Table 8.1 is absolutely not a realistic figure and needs to be drastically reduced. This figure is based on SVBGSA projections from an erroneous future model with unrealistic assumptions and inaccurately executed calculations. Until a realistic model is developed , the sustainable yield in Table 8.1 should be lowered from 112,000 AF/yr to 95,700 Af/yr which is historical sustainability as shown in Table 6-20 as 95,700 AF/yr. Attachment A shows some of the several errors in the Future model used by SVBGSA in calculating future sustainability to arrive at a figure of 112,000 AF/yr. The fact that the model was approved by the Department of Water Resources as a temporary model doesn't mean that is was executed properly or that GSA was required to use it b). The current measurable objective for pumping SHOULD BE SET TO THE HISTORICAL SUSTAINABLE YIELD of 95,700 AF/yr UNTIL IT IS DEMONSTRATED THAT PROGRESS IS BEING MADE TOWARDS ACHIEVING ALL 6 OF THE SUSTAINABILITY GOALS.		The GSP acknowledges uncertainties in the historical water budget. The historical water budget is based on best available data and tools. A more accurate historical water budget will be developed when the SVIHM is made available.	MOCOWS comment letter 11-3-19
8-160	8				11/4/2019	Rural Well Owner P Scholz	9). Sea Water Intrusion- Exceedances There should be NO EXCEEDANCES ALLOWED beyond the 2017 500 mg//L chloride boundary. NOT ON AVERAGE!!. Immediate pumping reductions need to occur immediately upon any intrusion beyond the 2017 line. The plan needs to clearly state that there will not be a "buffer" that allows further intrusion until projects are put into place. Future projects should be devoted to pushing the intrusion back to the measurable objective line.		Comment noted.	MOCOWS comment letter 11-3-19
8-161	8	8.1			11/4/2019	Rural Well Owner P Scholz	Revise Table 8.1 as shown in comment letter #3		Comment noted; SMCs are a decision of the SVBGSA Board.	MOCOWS comment letter 11-3-19

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
8-162	8				11/4/2019	Rural Well Owner P Scholz	11). Language needs to be added to the Chapter for Stakeholder Engagement and Public Outreach that more specifically identifies strategies that will be used to inform and engage the public. The existing language is very vague. In addition, not all of the outreach described in the Consensus Building document was carried out. The chapter needs to identify specific data bases that will be used to contact the public, such as the Environmental Health Bureau's small water system list, Monterey County Water Resource Agency's well owner list, and Monterey Resource Agency home owner association lists. The chapter needs to list identified social media that are known by local community organizations such as Prunedale Preservation Alliance, Monterey County Water Systems, Next Door, Prunedale Community Neighborhood Watch, and several others		Thank you for the suggestions for social media and organizations to include in the outreach plan. The CBI study was not a commitment on the part of the SVBGSA, but rather CBI's findings. The SVBGSA is working to improve outreach. Any individuals or organizations can sign up for updates on the listserve on its website.	MOCOWS comment letter 11-3-19
8-165	8	8-1			7/10/2019	Marla Anderson	Why is the minimum threshold in chapter 8 for long-term sustainability of groundwater storage based on the model's over-inflated 2070 precipitation projection instead of the more realistic historical sustainability projection of 95,700 af/yr? 112,000 af/yr is 17% higher than the historical sustainability yield of 95,7500 af/yr identified in Chapter 6, table 6-20. 112 af/yr based should not be considered the sustainable yield in chapter 8. Chapter 8 matrix needs to be changed to the yield to 95,700 af/yr.		The long-term sustainable yields are the sustainable yields after the basin has been brought into sustainability. It was derived from the SVIHM model, which takes into account climate change, among other factors.	Chapter 6. MOCOW Comments.pdf

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-1	9			7/10/19	Isakson	asked if slides will be posted on website	not at this time but once finished	Question answered
9-2	9			7/10/19	Isakson	all cost must be combined in one financing system? Or depending on the project how will the funding system will be done.	setting up a financing structure, the mechanism hasn't been set. G. Petersen added there will be a couple of mechanism. D. Williams also added that there is several tier's and one tier cost are regulatory fees other cost will be based on area of benefit.	Question answered
9-3	9			7/10/19	Secondo	fee collection, if it will be collected on the property tax or separate group?	Mr. Girard replied it depends on what you allow to be charged on the property tax along with the special assessments on property tax. D. Williams emphasized there are several options.	Question answered
9-4	9			7/10/19	Brennan	Water Charges Framework is based on pumping is it subject to the 218?	Mr. Girard replied no it's not since it's not a special benefit, it's the activity of pumping water, what it's been charged for.	Question answered
9-5	9			7/10/19	Brennan	asked how is the funds going to be collected?	D. Williams clarified the mechanism for collecting the Water Charges Framework the mechanism is yet to be decided. G. Petersen added there will be some projects that need a 218 vote.	Question answered
9-6	9			7/10/19	Secondo	Advised on the need to coordinate on the invasive species eradication since there has been issues taking out invasive species	D. Williams agreed	Question answered
9-7	9			7/10/19	Secondo	who will handle the funding for the CSIP Project?	G. Petersen indicated it will be researched first before its set after the modeling is done and negotiations.	Question answered
9-8	9			7/10/19	Brennan	suggested for the CSIP Projects to be organized as four projects under a major heading as CSIP Projects. And define SRDF (Salinas River Diversion Facility) D. Williams indicated all acronyms will be defined on the final report.		Text modified
9-9	9			7/10/19	Isakson	asked for the Expanded CSIP Area, what is the water source for the Expanded CSIP Area; water right would be needed	D. Williams indicated the water source for the Expanded CSIP Area is the Monterey 1 Water to some degree and river water. Trying to get away from the supplements water wells; agreed and advised that would be a legal matter	Question answered
9-10	9			7/10/19	Girard	clarified on the water rights associated with the water project. The Salinas Valley Water Project didn't grant to the agency any additional water rights, it changed the point of diversion to the SRDF. The original water rights were when the reservoirs and dams were constructed		Comment noted
9-11	9			7/10/19	Franklin	asked for clarification regarding pumping on the CSIP Area is covered in zone 2b ordinance . For CSIP to be successful you need the supplement wells during the dry periods when needed.	D. Williams indicated there is a zone that has limitations and there are growers that have the right to pump wells to supplement from CSIP.	Text clarifies that circumnstance for implementation is that a year round supply of water is avaialble to CSIP.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-12	9			7/10/19	Brennan	asked for clarification the CSIP Projects need to go forward before the Management Actions.	D. Williams clarified it does indicate under Management Actions this will be implemented after the CSIP project and will clarify on the report. G. Petersen added there is number of Management Actions that will happen simultaneously with project development. Clarify that there are some Projects and Management Actions that are related to the point that one needs to happen before the other. D. Williams advised there will be an Implementation Schedule on Chapter 10.	Question answered
9-13	9			7/10/19	Lukacs	how was the cost benefit analysis done for all projects; asked for visual of the cost per project	D. Williams indicated it's a rough draft per acre foot, based on the capitol cost will be, annual will be and a 25-year annexation. Looking into each project since some are expensive and others less expensive; will be added in a future chapter.	Question answered
9-14	9	22		7/10/19	Lukacs	how the projects were selected, process and presented to the stakeholders	It was decided after speaking with various Ag Groups and stakeholders.	Question answered
9-15	9			7/10/19	McIntyre	asked on the cost per acre foot, is it per acre feet of all the water in the basin; requested for a clearer description of the cost per acre foot	D. Williams indicated it's the cost per acre foot of delivered water to that project to the area of its benefit; description will be provided in the funding mechanism	Question answered
9-16	9			7/10/19	Isakson	will be helpful to have a better understating of the cost and be presented in a future the presentation	It will be added and presented in the funding structure; Girard added general operations can't be funded with the benefit assessment. Benefit assessment are defined special benefits and determined by an engineer. D. Williams indicated this is the reason we need the mechanism of these projects.	Question answered
9-17	9			7/10/19	Isakson	commented on the Seawater Extraction there is several reports on this and can be used for this project to expedite things	D. Williams agreed it was a good suggestion and will look into.	Comment noted
9-18	9			7/10/19	McIntyre	asked if this was presented to the 180/400 Group and what was the reaction	D. Williams indicated they were satisfied and received good feedback. D. Williams continued with 11043 Water Right is a wet water right with two existing diversion points one in Chualar and Soledad. It mainly benefits	Question answered
9-19	9			7/10/19	Brennan	asked if this conflicts with phase 2 of the Salinas Valley Water project and is the water right in relocation proceedings	L. Girard informed it's still active and it's at the State Water Board for renewal. D. Williams advised he doesn't believe it conflicts with phase 2	Question answered
9-20	9			7/10/19	Lukacs	asked what authority GSA has on the plans with the water rights and the Water Resource Agency.	L. Girard indicated it has the ability to come up with a plan with GSA Agency. Clarification on how to get access on the 11043 Water Right	Question answered
9-21	9			7/10/19	Brennan	commented water from the Carmel River doesn't look like a valuable project if this is a decision from CalAm Water, is the water right to the district.	D. Williams indicated they made an agreement with CalAm to run the water through their pumps. One vote against that	Project removed from Chapter 9

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-22	9			7/10/19	Secondo	asked if any word on the Jarrett Dam	D. Williams indicated he doesn't have much information on the Jarrett Dam. Potential on the Jared Dam.	Not included in Chapter 9
9-23	9			7/10/19	McIntyre	asked on Alternative Projects the Recharge winter Salinas River flow	It needs to be looked into since it has a diversion point	Question answered
9-24	9			7/10/19	Isakson	on two votes on Recharge winter water right from Carmel River and find out more on the water rights and permits		Project removed from Chapter 9
9-25	9			7/10/19	Franklin	commented on the 11043-water right caution during the wintertime the southern Gonzalez there is an environmental component and to please consider	D. Williams agreed; Isakson added the diversion season isn't winter it was the irrigation time	Comment noted
9-26	9			7/10/19	McIntyre	suggested to propose a two-year period ordinance and consider making a permanent ordinance		Section 9.3.6 modified to reflect extension of two-year oridnance.
9-27	9			7/10/19	Brennan	what's the status of the deep aquifer study	A. Franklin replied this agency funding, it's not a priority unless the funding structure changes; D. Williams indicated this will be a funding questions for the future and will make a recommendation if needed	Question answered
9-28	9			7/10/19	Brennan	added on the propose for landowners to retire their land or pumping allowances	D. Williams indicated it will be said a restriction will be placed for irrigated land. Director Brennan requested to rephrase Change convert land to be consistent with the general plan	Section 9.3.2 modified so that it is consistent with the County General Plan
9-29	9			7/10/19	McHatten	added on retirement land between Soledad and Gonzalez there is purposed annexation that is going forward with LAFCO that can be replaced urban residential that can affect the General Plan with the County	D. Williams indicated they will only be taking Ag sellers that are willing to give up their land but can live on the land.	Question answered
9-30	9			7/10/19	Brennan	asked for the language to be changed on the rural development plan of the Monterey County General Plan	D. Williams indicted will be done	Section 9.3.2 modified so that it is consistent with the County General Plan
9-31	9			7/10/19	McIntyre	pointed out a typing error on section 9.3.3.8 $50,0000 a year for two years should be $100,000	D. Williams indicated it will be corrected	Text modified (Section 9.3.5.8)
9-32	9			7/10/19	Brennan	in terms to comments on registered wells how will it be enforced? Can you transfer between sub-basins? Will it require flow meters? Are you directly pumping to the MWRA or GSA is it a duplication of reporting? What kind of comments are you expecting?	D. Williams said these are details that must be worked out	Question answered
9-33	9			7/10/19	McIntyre	pointed out with the recharge credits does it have return flow	D. Williams indicated no it doesn't have because of the allowances. Recharge credits have return flow.	Question answered
9-34	9			7/10/19	Secondo	do you encourage high water use	If you have a water right it can be done but it's not encouraged	Question answered
9-35	9			7/10/19	Secondo	regarding the ground been farmed before 2017, is that the cutoff date?	It's legal with a cutoff date saying you only have up to a certain date.	Question answered
9-36	9			7/10/19	Isakson	on developing GSA approval for credits or transferring should be added to the list and will there be a limitation on how much any one can pump? Based on the base allowance if you go over then a fee needs to be paid. Isn't the goal of GSA sustainability?	A water right isn't established. The idea of paying an additional fee if your pumping over the allowed amount those funds will be used for projects. The purpose of the higher cost tier so you can achieve sustainability	Question answered

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-37	9			7/10/19	Virsik	based on an adjudication. The proposal is heading that route. There is a huge emphasize on disclosure and how this look on GSA when setting allowance and have history or not and have been or not it can be irrelevant to your allowance's and have been publicly reporting and then after the fact you might have legal actions. Making it public might get the process faster it could be all the pumping in the sub basin numbers correct. Should pumping data be made public to move forward in the project. And on regulatory requirement on the 180-400 get rid of the overdraft and on the leap of faith on the client's perspective what this might look at this time, some kind of assurance that might cause less worry. Mr. Virsik will provide further information at a later time	D. Williams asked for him to provide and will consider	Question answered
9-38	9			7/17/19	Virsik/Orradres & Scheid	DRAFTS LACK MANDATORY REGULATORY CONTENT; the GSP for the 180/400 fails to quantify the overdraft to be mitigated to achieve sustainability (does not refer to Reg 354.44(b)(2) or 354.18; The word "overdraft" is used in text a single time in Chapter 6 but no number/figure/quantity in any table is so labeled. The 180/400 basin is designated by the DWR as in a critical condition of overdraft, of course.		Text added to section 9.6
9-39	9			7/17/19	Virsik/Orradres & Scheid	The current iteration of Chapter 9 also recites "overdraft" a handful of times -- section 9.7 is prominently labeled as a list of projects and actions for the "mitigation of overdraft" but one cannot find the quantity of overdraft to be mitigated, which renders of questionable value any projection of how much water is provided or mitigated by a given action or project. The current draft GSP for a basin in critical overdraft does not disclose the current quantity of overdraft. That lacuna will make the Plan non-compliant, no matter its other merits.		Text added to section 9.6. Section 9.7 deleted.
9-40	9			7/17/19	Virsik/Orradres & Scheid	Chapter 9 (including the oral presentations at the Planning Committee) is explicit that the priority projects may be insufficient to meet sustainability and one or more alternative projects are needed. The total amount of water just CSIP Projects 2, 3, 4, and 5 may develop appears to be 40,300 AF. By force of logic, one can guess the current overdraft in the 180/400 exceeds that 40,300 AFY figure. But the public should not need to guess or rely on back of cocktail napkin calculations. The total amount of overdraft to be mitigated to achieve sustainability must be explicitly identified for the GSP to meet minimum requirements.		Text added to section 9.6
9-41	9			7/17/19	Virsik/Orradres & Scheid	ACCEPTING THE "FRAMEWORK" IS NOT APPROVAL OF THE LATER DETAILS; partial or full acquiescence to the proposed "framework" may be perceived or taken as a willingness to accept the later "details." Well before any GSP chapter was drafted, they reminded the GSA that in 2003/04 they and certain others from the southern parts of the Valley obtained judgments based on hard-fought settlements in multiple validation actions. Those validation judgments limit the fiscal contribution of certain lands to efforts addressing the northern coastal overdraft and seawater intrusion issues. That the GSA was created after the date of the judgments does not immunize it from honoring the judgment terms. To put in somewhat practical terms, while the proposed slate of CSIP		Sentence added to Section 9.2 that, "The fee structures in each subbasin will be developed in accordance with all existing laws, judgements, and established water rights."
9-42	9			7/18/19	Gardner	would like to include information on backup projects that were not included in the GSP and why		The complete list of projects are in Appendix 9B. The list was reduced to what the SVBGSA believed are the most cost efficient and likely successful projects. If there is a public desire, we can add any projects in this Appendix to our list of preferred projects.
9-43	9			7/18/19	McCullough	would like to highlight management actions that will have Valley-wide benefit		Sentence added to Section 9.3.1

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-44	9			7/18/19	Lee	would like projects rated according to cost effectiveness	D. Williams responded that the cost per acre foot is estimated and there will be a map for each project that will show the water level rise	Question answered
9-45	9			7/18/19	Adcock	wondered why all winter flows are not being treated and stored	D. Williams stated the nondiurnal water would require enormous storage, and advance water purification is expensive. It is an alternative project for winter flows.	Question answered
9-46	9			7/18/19	Lee	would like information on how much more beneficial one project is over another	Does not have an answer currently, because it depends on how much water we can get at a lesser cost	Question answered
9-47	9			7/18/19	Lee	asked if it is less costly to run the treatment plant than injecting fresh water into aquifers.	stated he would look into the cost of a scalping plant where Salinas is expanding	Costs will be evaluated during plan implementation as project details are defined.
9-48	9			7/18/19	Frus	wondered about an investment risk analysis and which projects would show resilience in the face of extreme climate change; presented the possibility of analyzing feasibility considering a range when predicting climate change	D. Williamsesponded the analysis includes predictable climate change but not an excessive drought of proportions not yet seen	Question answered
9-49	9			7/18/19	Franklin	expressed concern that the cost of the extraction barrier is high for capital costs could make the problem worse.	D. Williams stated the cost of the extraction barrier is high for capital costs, roughly tens of millions of dollars; D. Williams included it because it is definitive, but there is some flexibility based on the success of other projects.	Question answered
9-50	9			7/18/19	Isakson	stated more information is needed about the implications of requesting changes to Permit 11043 or its possible revocation.		Comment noted
9-51	9			7/18/19	Lee	the scalping alternative would be drought proof and keep the hydrological cycle intact.		Comment noted
9-52	9			7/18/19	Adcock		In response to Tom Adcock, D. Williams stated that they need to review the water rights for the Alisal and Gabilan Creeks to determine if they are fully allocated.	A review of the water rights will be completed during the implementation phase of the GSP.
9-53	9			7/18/19	Lee	stated that the Gabilan range should be looked at for climate and ecological system changes because of the large potential to impact groundwater ecosystems	D. Williams stated that the diversion rights would be difficult to get so this would be put from a primary to alternative project	Question answered
9-54	9			7/18/19	Gardner	suggested looking at using tile drain water more effectively		Tile drain water will be evaluated during plan implementation as project details are defined.
9-55	9			7/18/19	Isakson	stated that some people would rather pay per acre instead of per acre foot	D. Williams stated that the cost is per acre foot because charging per acre would not result in controlling extraction	Comment noted
9-56	9			7/18/19	Tubbs		In response to Dallas Tubbs, D. Williams stated that a water marketplace is not the focus on the water charges framework but would be an outcome that would take a long time and require an impact	Question answered
9-57	9			7/18/19	Breen	asked for the nexus between the different fees. G. Petersen responded that the administration fee, pumping charge and Proposition 218 projects can be thought of in terms of tiers. Mr. Breen stated the GSP assumes there will be projects which means all users will have tier 2 or 3 charges or fees.	D. Williams stated that would only be accurate for sea water intrusion projects. All other projects balance inputs and outputs. D. Williams stated this is an innovative viable framework that will require negotiations and studies	Question answered

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-58	9			7/18/19	Isakson	stated that there have been comments from the Upper and Forebay Subbasins that they do not prefer fees based on extraction, and it is not clear that Chapter 9 is not cast in stone. G. Petersen stated that the GSP is adaptive for each sub-basin.		Comment noted
9-59	9			7/18/19	McCullough		In response to Mike McCullough, G. Petersen stated that the Board can reconsider how to fund administration fees if necessary. D. Williams stated that the water charges chapter is not discussing specifics yet but outlines a structure.	Question answered
9-60	9			7/18/19	McCullough	suggested including some clarifiers, e.g. this would be the fee if utilizing four out of five best management practices. If they are using efficiency as the driver, they should not be punished if being really efficient	D. Williams stated they would only be paying large fees if they are pumping outside of what we think is sustainable, and we have to decide what is sustainable. And these questions need to be answered for every sub-basin.	Question answered
9-61	9			7/18/19	Jacques		In response to Bob Jaques, D. Williams stated that the financial structure is to establish bonding capacity for projects	Question answered
9-62	9			7/18/19	Tubbs		In response to Dallas Tubbs, D. Williams stated that municipalities may be treated differently than outliers when setting base allowances, but that will be discussed in another forum.	Question answered
9-63				7/18/19	SVWC	How do we "re-operate"	D. Williams state that the reoperation plan had to come out of the HCP. D. Williams said the reservoirs should recharge the basin every year – the WRA didn't want every –D. Williams said he is committed to making it clear that releases every year is the objective	Question answered
9-64				7/18/19	SVWC	AS to the Arundo removal program – will landowners/growers be charged twice? D. Williams said landowners/growers will be charged only if program is expanded beyond what is being done today	D. Williams said landowners/growers will be charged only if program is expanded beyond what is being done today	Question answered
9-65				7/18/19	SVWC	MCWRA owns the assets for some of the projects, how will this be addressed?	G. Petersen stated that there are many such issues that he is currently negotiating with MCWRA	Question answered
9-66				7/18/19	SVWC	Coordination between agencies will be important to ensure there is no duplication of cost	D. Williams said fees will be structured to capture what is being paid for already	Question answered
9-67				7/18/19	SVWC	Doesn't it matter where reduced pumping occurs and who is responsible?	D. Williams said he wasn't going to address who is responsible, but reducing pumping will not solve seawater intrusion along – the problem of seawater intrusion must be actively addressed.	Question answered
9-68				7/18/19	SVWC	Are seawater intrusion barriers being considered and are they injection or pumping based?	Our primary choice is a pumping-based seawater intrusion barrier. Injection requires water we don't have.	Question answered
9-69				7/18/19	SVWC	Permit 11043's point of diversion is above the confluence of the Arroyo Seco – [it was stated that there is only one point of diversion and not a second one at chualar – this needs to be confirmed]	We will investigate the points of diversion	Question answered
9-70				7/18/19	SVWC	Why aren't the existing reservoirs on the project list?	D. Williams stated that only projects that directly benefit grounwater are on the list. We avoided projects that simply increase the available water supplies	Question answered

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-71				7/18/19	SVWC	What about a retro fit at Naci to increase the outflow capacity below 755 elev?	D. Williams admitted this was a good idea	Evaluation of a retrofit to Nacimiento will be completed during the implementation phase of the GSP.
9-72				7/18/19	SVWC	Are water charges based on gross pumping?	Generally yes, but there will be opportunities to refine water charges based on local conditions	Question answered
9-73				7/18/19	SVWC	Will CSIP be subsidized by everyone?	The overall sustainability program will be paid for by everybody, but individual projects will not be singled out.	Question answered
9-74				7/18/19	SVWC	Benefits are not the same in all sub-basins?	D. Williams stated that different areas will pay different amounts	Question answered
9-75				7/18/19	SVWC	How do the charges affect water rights? Are fees/taxes on water extractions a limiting factor on one's water rights?	The fees do not affect water rights	Question answered
9-76				7/18/19	SVWC	Are those operating costs or project costs?	Both! The idea is to eventually replace the administrative fee with a baseline tiered fee, with projects and O&M built on top of those.	Question answered
9-77				7/18/19	SVWC	Who will be 'watching' out for landowners/growers?		Comment noted
9-78				7/18/19	SVWC	Will structure fee be implemented with the 180/400 plan	No, this will be a multi-year negotiation.	Question answered
9-79				7/18/19	SVWC	Not everyone is in favor of an extraction fee basis	Baseline rates will be different in different areas. If there is no extraction fee, then there will be no limits on pumping. If there is a per acre fee, then there will have to be other caps on how much one can pump.	Question answered
9-80				7/18/19	SVWC	Will there be more influence on the MCWRA to fix the dams?	G. Petersen stated that the MCWRA is working on funding these projects now.	Question answered
9-81				7/18/19	SVWC	How do you factor recharge of extracted water in to the fee?	It could be factored in to the 1st tier charge, based on sub basin.	Question answered
9-82				7/18/19	SVWC	Who established baseline for pumping?	It is based on our assumed sustainable yield	Question answered
9-83				7/18/19	SVWC	Water Budget – how much is based on assumed reservoir releases/operation?	D. Williams pointed out this is an excellent quesiton that he cannot answer at this time. We will address it while we develop the Upper Valley and Forebay GSPs over the next two years	Question answered
9-84				7/18/19	SVWC	Extraction fees are they reasonable or unreasonable?	D. Williams believes they will be reasonable	Question answered
9-85				7/18/19	SVWC	Cost incurred by FB/UV landowners for maintaining their own wells, energy, etc., is different than CSIP where they get delivered water		Comment noted
9-86				7/18/19	SVWC	Need to consider contribution to basin from recharge		Comment noted
9-87				7/18/19	SVWC	Should pumping allowances account for different soil-climate conditions?	D. Williams said this was certainly possible	Question answered
9-88				7/18/19	SVWC	Basin/sub-basin limitations?	D. Williams said every subbasin will need a limit on how much can be pumped. But some subbasins may not have reached that limit yet.	Question answered
9-89	9				Christopher Bunn	1. De minimis users should be required to pay some sort of fee. While I realize they can't be charged according to usage, they shouldn't get a free pass as they are benefiting from the basin and all of our hard work and capital.		Comment noted

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-90	9				Christopher Bunn	2. The fallow land program should allow for a landowner to lease the land for fallowing, as opposed to simply put it in permanent deed restriction. The fallow lease could either be held by the GSA/county or secured by another landowner in order for that landowner to gain a certain portion of the fallowed land’s water credits. This open-ended approach to fallowing would allow such land to come back into production if the basin achieved balance and/or surplus.		Comment noted
9-91	9				Christopher Bunn	3. Reservoir re-operation (and increasing winter flows, etc) would have an adverse effect on river vegetation. This would have to be mitigated (see # 5).		The effect on river vegetation will be a factor incorporated into the design of this management action.
9-92	9				Christopher Bunn	4. Before completely restricting drilling and pumping in the deep aquifer, the GSA will first have to create a viable alternative (CSIP expansion does not seem to be a viable alternative yet, if it is merely to benefit the book-end months), as the county’s current regs prohibit new wells in the 400 west of Davis Road.		The extent to which alternatives are viable will be considered in the implementation phase of the GSP.
9-93	9				Christopher Bunn	5. The invasive species eradication project as it is written, limited to arundo, tamarisk and other negligible non-natives is too limited. Chapter 9 should amplify that eradication to species overgrowth in general in the river, as willows and several other species are what create the larger problem in the river in terms of sucking up water and blocking flow. The Salinas River Maintenance Program has permits in place that allow for that kind of maintenance, in addition to eradicating the arundo. A change from invasive to species overgrowth in general will more effectively reduce the amount of water taken by plants, in addition to allowing better flow in the river from the dams to the SRDF, radial collectors, and recharge points in between. The permits allow willows less than the 6 inches diameter at chest height to be taken without mitigation. Furthermore, if larger willows are taken (which is rarely necessary), the 2-1 replanting mitigation can be done along riverbanks and up on the levees, which many landowners are happy to do. This project, as currently written, is missing a tremendous opportunity for creating water and enabling better control of river flows, in addition to being a critical action that virtually all landowners, farmers and valley cities would be happy to see. Furthermore, if one of the projects is going to be reservoir re-operation for increased winter flows, the river will become even more choked; amplifying species eradication would mitigate this problem caused by the GSP.		Comment noted. Whether to include other species in invasive species eradication will be examined in the implementation phase.
9-94	9				Christopher Bunn	6. Chapter 9 should contain a blanket statement that all viable sewage should be pursued for capture and reclamation. Spreckels should be given priority in this regard. Also, a comfortable majority of the residents in the Toro area would be in favor of their sewage going to M1. This would not shut down CUS completely, as they would still need to capture the sewage and pipe it. The dollars involved here would be only focused on diverting it from their plant to the M1 plant, shutting down CUS’ spray fields (which are a food safety problem in themselves, let alone issue of being along the river and contaminating the water). Furthermore, as the Davis Rd bridge project is on the books, this is the time to influence that project and get a suitable pipe slung under the new bridge.		All potentially viable diversions from existing water reclamation plants will be considered in further planning efforts as part of GSP implementation.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-95	9				Christopher Bunn	7. All old, unused wells in the CSIP area and then over to the city and Davis Road need to be destroyed. This needs to be down at landowner cost, rather than expecting MCWRA to pay for it. Set a date when it needs to be done. Sooner than later.		This was not evaluated in the development of the GSP, but will be considered in further planning efforts and assessments.
9-96	9				Christopher Bunn	8. GSA needs to determine any and all pumping in the basin that is being exported out of the basin. If this is not done and policed, then the fee structures will not be honest and reflective of reality. Water export needs to stop.		The Monterey County Water Resources Agency Act, § 52.21 prohibits the export of groundwater from any part of the Salinas Valley Groundwater Basin, including the 180/400-Foot Aquifer Subbasin.
9-97	9				Christopher Bunn	9. The Salinas River Maintenance Program also includes a permit for sediment removal. This should be included in the project list as it would allow more efficient water movement in the river, either to get it to the SRDF, planned radial collectors, or to percolation points.		This will be discussed with MCWRA during the implementation phase of the GSP, as they manage surface water flows.
9-98	9				Christopher Bunn	10. Lastly, the Jerrett Reservoir should be included on the list. Increasing water storage will allow us to move increased amounts of water more efficiently down the river to percolation points, radial collectors and the SRDF. I haven't spoken with a single farmer/landowner who disagrees with this. If we're going to include Nacimento/San Antonio re-operation on the project list, a new reservoir would be governed by the same logic: controlling storage means controlling flow means controlling perc/extraction points.		This will be discussed with MCWRA during the implementation phase of the GSP, as they manage surface water flows.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-99	9			8/7/19	Thomas Virsik	Draft Chapter 10 (implementation) was discussed during the Planning Committee meeting on 1 August 2019. Based on language in that draft, I asked how the water charges framework would be applied in the 180/400 where the overall goal of the current GSP direction is to stop pumping and instead provide water from various projects or sources. The current CSIP area, for example, relies on, and is charged various levies by the MCWRA for water that is delivered via pipes. My query contributed to a discussion of the water charges framework by those present, including comments by GSA counsel Les Girard on the complications and intricacies of regulatory fees, SGMA statutory authority, Proposition 218, and other aspects of applying the proposed framework. The thrust of the discussion was that while a framework based on water extraction charges has certain merit, as a practical and legal matter, it may not be the only or most appropriate basis to finance projects under all circumstances. D. Williams suggested he would rewrite “that section” of presumably draft Chapter 10. The difficult decisions about financing and management will eventually come before the Board, but are not part of today’s agenda. Nevertheless, Chapter 9, which introduces and explains the water charges framework, states that it is the “fundamental structure for managing groundwater pumping and funding projects” and will be implemented in “all Salinas Valley subbasins in Monterey County.” § 9.2. The current draft fails to identify how the framework is geared to the 180/400, the focus of the GSP. The current Chapter 9 language may not be consistent with what one may expect in Chapter 10 about flexibility, the continuation of the current regulatory fee within or apart from the water charges framework, and how to charge extraction fees in areas (like the CSIP) that will not pump. It may be best to hold Chapter 9 until the language in Chapter 10 is finalized so that the two do not clash.		Clarification was added in 9.1 stating that this GSP is developed as part of an integrated sustainability plan between all six subbasins in the SVBGSA's jurisdiction. It also notes that the "specific design for implementing the water charges framework, management actions, and projects will provide individual landowners and public entities flexibility in how they manage water..."
9-100	9			8/1/19	Keith Van Der Maaten	Pumping Allowance (9.2.2) document implies that municipalities may not receive a sustainable pumping allowance and will need to pay more than agricultural users to pump their base amount. GSP needs to provide that MCWD's MCWRA groundwater allocations are the sustainable pumping allowances for Fort Ord Lands and Marina Area Lands pursuant to the annexation agreements (1993 Fort Ords Lands Annexation Agreement; MCWRA Backstop; 1996 Marina Area Lands Annexation Agreement; MCWRA's Obligation to Protect the Deep Aquifer for MCWD's Use.		Sustainable pumping allowances will be negotiated in the implementation period of the GSP.
9-101	9			8/1/19	Keith Van Der Maaten	Water Charges Framework - the sustainable pumping allowances cannot be tied to sustainable yield of the subbasin after all projects have been implemented because some projects will have more localized benefits and/or losses to certain subbasins versus others. We recommend SVBGSA consider using some estimate of the "natural safe yield" within each subbasin to determine the sustainable pumping allowance for each basin.		Sustainable pumping allowances will be negotiated in the implementation period of the GSP and stakeholders can discuss the structure and design of the framework at that point.
9-102	9			8/1/19	Keith Van Der Maaten	Management Actions, Projects, and Alternative Projects; Replenishment Water - it is recommended that the primary objectives of the actions/projects should be 1) provide replenishment water to North County in substitution for groundwater; 2) Repeal seawater intrusion - a mission that the MCWRA has had since the 1940s.		Comment noted

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-103	9			8/1/19	Keith Van Der Maaten	Following are first cut, suggested combinations of actions/projects for consideration: District Replenishment Water - Actions/Projects 1: MA2 - Reservoir Reoperation; PP1 - Invasive Species Eradication; PP2 - Optimize CSIP Operations; PP3 - Improve SRDF Diversion including installing Radial Collectors to increase ability to divert more water when water is available; PP5 - Expand Area Served by CSIP; PP6 - 11043 Diversion Facilities; PP5 - Expand Area Served by CSIP		Comment noted
9-104	9			8/1/19	Keith Van Der Maaten	Section 9.4.4.7 Preferred Project 6: 11043 Diversion Facilities incorrectly states that diversions under this permit can only occur at the two diversion locations identified in the original July 1949 Water Rights Application. The reservoir reoperation management action already stated the goal of operating the two reservoirs to allow both natural and surplus flows to better reach the SRDF diversion. Adding the SRDF as an additional point of diversion under permit 11043 would conform that the permit with the authorized points of redivision in MCWRA's other water rights licenses and permit comply with the biological opinion. The MCWRA has submitted a petition for an extension of time to put the water under the permit to beneficial use. A petition to add a new point of diversion could be added to that petition.		Comment noted
9-105	9			8/1/19	Keith Van Der Maaten	Indirect Replenishment Water - Actions/Projects 2: PP3 - Improve SRDF Diversion; PP6 - 11043 Diversion Facilities; PP5 - Expand Area Served by CSIP; AP2 - Winter Potable Reuse Water Injection; AP3 - Extract Winter Flows Using Radial Collector(s) and Inject into 180- and 400-Foot aquifers; AP5 - Use the Upper Portion of the 180/400-Foot Aquifer Subbasin for Seasonal Storage. These are complimentary projects; the synergy of these actions/projects is to use winter water for groundwater recharge and later extract that water for delivery in the summer. Any water to be injected must be treated. MCWD has performed a feasibility study on constructing a water treatment plant; that study will be made available to the SVBGSA.		Thank you, that will be helpful to have that information as projects and management actions are refined and considered..
9-106	9			8/1/19	Keith Van Der Maaten	Seawater Intrusion/Replenishment Water - Actions/Projects 3: PP8 - Sewater Intrusion Pumping Barrier; AP1 - Desalinate water from the Seawater Barrier Extraction Wells		Comment noted.
9-107	9			8/1/19	Keith Van Der Maaten	Regulatory - Actions/Projects 4: MA1 - Agricultural Land and Pumping Allowance Retirement; MA3 - Restrict Pumping in CSIP area; MA3 - Restrict pumping in CSIP area; MA4 - Support and strengthen MCWRA restrictions on additional wells in the deep aquifer. During the 25% driest water years, some agricultural pumping may be necessary. Formation of pump improvement districts or private community pumps for designated areas within CSIP could be considered for use during the driest water years.		Comment noted

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-108	9			8/1/19	Keith Van Der Maaten	Combined Seawater Intrusion Pumping Barrier (PP8) with Desalinate Water from the Seawater Barrier Extraction Wells (with or without reinjection) AAP1) Project: The extracted water or a portion thereof could be conveyed to a new or existing desalination faciltiy where it can be treated for potable and/or agricultural use. The water extracted from these wells will be brackish due to historical seawater intrusion, therefore, the extraction will serve to remove the brackish water and allow replacement for fresh water from other sources, most likely a combination of desalinated water, excess surface water from the Salinas River, and/or the purified recycled water. The project will stop and reverse sewater intrusion, helping to remediate and restore the 180/400-foot aquifer subbasin. The project would treat water extracted from the seawater intrusion barrier an allow for its reinjection in the 180-ft aquifer and 400-ft aquifer		Comment noted
9-109	9			8/1/19	Keith Van Der Maaten	Injection barriers are the most common method employed to halt seawater intrusion. Injection barriers have been used in Southern California basins to control saltwater intrusion for over 30 years. They are the most common, technically demonstrated method employed to stop seawater intrusion around the world. But they add another layer of costs and infrastructure. A pure extraction barrier project with no reinjection of treated water, with similar groundwater hydrology to North County, may not exist. Alameda County Water District's Newark Desalination Facility could be studied to determine if it can possibly be used as a model for the Pumping Barrier. ACWD's Desalination Facility is part of ACWD's Aquifer Reclamation Program which began in 1974 with the goal of reclaiming those portions of the Niles Cone Groundwater Basin affected by saltwater intrusion from San Francisco Bay in the early 20th century. The District pumps brackish water from the groundwater basin so that freshwater from other parts of the basin can move in to take its place. A key component of this project has been the addition of replenishment water to the basin, which brought mean water levels above sea level prior to the initiation of extraction. Since 2003, brackish water which was once allowed to flow back into San Francisco Bay is now diverted to the Desalination Facility so that it can be put to beneficial use in the Tri-City area.		Comment noted

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-110	9			8/1/19	Keith Van Der Maaten	There is a lot of uncertainty relating to costs, who pays, where are the optimum locations for the extraction wells, and whether an injection barrier would also be needed as envisioned in AP1. It is suggested that the combined project be broken up into possibly 4 phases with each phase consisting of 4 to 6 extraction wells and a modular brackish water desalination plant with the 1st Phase starting at the northern end of the 180/400-Foot Aquifer Subbasin. A study would be performed during 2020 and 2021 to determine the specific depths, locations, spacing and rates of extraction of the brackish water extraction wells to make the project most effective, and to assess, among other things, (1) the effectiveness of these wells to halt salt-water intrusion, (2) evaluate other potential subbasin impacts, and (3) the best location for the brackish water desalination plant. A majority of the project area has been the subject of intense hydrogeological study within the last decade and most recently the focus of a high-quality Airborne Electromagnetic (AEM) survey (data-collection effort) that has generated valuable information about subsurface conditions over a significant section of the coastline and inland areas and is available for use in project design and implementation. MCWD conducted its first AEM overflight in May 2017 (AEM 1.0) and its second in April 2019 (AEM 2.0). Both AEM studies covered the North County area and should be used to focus well locations and well design that would target the main pathways of seawater intrusion into and within the multi-aquifer system of the 180/400 Foot Aquifer Subbasin. The use of this technology has grown to be an effective tool in California as shown by other AEM studies that have been conducted in Tulare County, Eastern Kern County, and Butte and Glenn Counties. (see letter for remainder of comment)		Comment noted
9-111	9			8/1/19	Keith Van Der Maaten	Potential Project Benefits: The potential project benefits could be considerable, including: (1) stop and reverse seawater intrusion within the 180/400 Foot Aquifer Subbasin and Monterey Subbasin; (2) provide supplemental drinking water to Castroville; (3) provide supplemental drinking water to the City of Salinas to decrease the known pumping depressions within the Eastside Subbasin and to help restore seaward gradients and groundwater flow within the 180 Foot Aquifer and 400 Foot Aquifer; (4) provide supplemental drinking water to Marina, Fort Ord and the Monterey Peninsula, and potentially groundwater recharge within the Seaside Subbasin; (5) provide desalinated water for an injection barrier located landward of the extraction barrier and inland of the seawater intrusion front to increase the benefit of the extraction barrier and halt the further inland movement of seawater; and (6) avoid pumping and building new infrastructure within Environmentally Sensitive Habitat Areas (ESHA).		Comment noted
9-112	9			8/1/19	Keith Van Der Maaten	Project Elements: Location of Brackish Water Extraction Wells: PP8 proposes a Pumping Barrier of approximately 8.5 miles in length between Castroville and Marina. Assuming that the project will be phased, it is recommended that the Phase 1 extraction wells be located west of Castroville for the protection of the area that suffers both seawater intrusion and the counter flow of groundwater east to the East Side pumping depressions.		Comment noted. Location of extraction wells will be considered in the project design during the implementation phase of the GSP.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-113	9			8/1/19	Keith Van Der Maaten	Location of Brackish Water Desalination Plant: The location of the desalination plant will need to be determined by an optimization study using various factors, including identified Project Benefits and their prioritization. For example, a plant located north of the Salinas River would be located (1) nearer to Castroville, (2) nearer to the City of Salinas and the East Side pumping depressions, and (3) within the North County agricultural area. However, it would be further away from the Monterey Peninsula. In contrast, a plant located south of the Salinas River would be located nearer to the Monterey Peninsula but further away from, Castroville, City of Salinas, and the North County agricultural area. AP1 lists the following possible desalination plants: Monterey Peninsula Water Supply Project (MPWSP) (6.4 mgd/7,100 AFY); Deep Water Desalination Plant (22 mgd/ 25,000 AFY); and People Water Supply Project (12 mgd/ 13,400 AFY).		Comment noted. Location of desalination plant will be considered in the project design during the implementation phase of the GSP.
9-114	9			8/1/19	Keith Van Der Maaten	Desalination Capacity of Brackish Water Plant: The desalination capacity of the brackish water plant will initially depend upon the pumping capacity of the extraction wells and how the plant's product water will be allocated among Project Benefits c(2) through (5) or any other uses. It is common for these types of facilities to be constructed for future expansion in a modular design that will allow for incremental growth as additional feedwater is made available. The design capacities of the pipelines bringing brackish water in and of the pipelines carrying product water out will need to take into consideration future expansion for the ultimate project buildout.		Comment noted
9-115	9			8/1/19	Keith Van Der Maaten	Groundwater Rights Issues: Because the 180/400-Foot Aquifer Subbasin has been designated as a Critically Overdrafted Subbasin, the necessary groundwater rights that would support the project will need to be assessed. Returning water to the Salinas Valley Groundwater Basin to comply with the Monterey County Water Resources Agency Act's export prohibition does not confer a groundwater right, only compliance with the Agency Act.		Comment noted. Project will take into account water rights and MCWRA's export prohibition.
9-116	9			8/1/19	Keith Van Der Maaten	Restriction on Additional Wells in the Deep Aquifer (Priority Management Action 4) MCWD supports implementation of Priority Management Action 4: Support and Strengthen MCWRA Restrictions on Additional Wells in the Deep Aquifer. As presented in our comments for Chapter 8, groundwater elevations in the Deep Aquifer are below sea level and declining, suggesting that extraction from this aquifer exceeds the sustainable yield of this aquifer zone. This issue is very important to MCWD because in the 1996 Annexation Agreement, MCWRA agreed to protect the Deep Aquifer for MCWD's use, but MCWRA did not take any protective action until the recent adoption of Ordinance 5302. Section 5.3, Management of 900-foot aquifer, of the 1996 Annexation Agreement provides, "The Parties agree that the '900-foot' aquifer should be managed to provide safe, sustained use of the water resource, and to preserve to MCWD the continued availability of water from the '900-foot' aquifer." Section 5.9 further stated that the annexation fees paid by MCWD "shall also be used for management protection of the '900-foot aquifer.'" MCWD will work with MCWRA pursuant to the 1996 Annexation Agreement on MCWRA's Deep Aquifer study.		Comment noted

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-117	9			8/1/19	Keith Van Der Maaten	Winter Potable Reuse Water Injection (Alternative Project 2) For Alternative Project 2: Winter Potable Reuse Water Injection, the document should include an option (or separate alternative) for year-round potable reuse water injection by MCWD, as described in its Grant Application, provided to SVBGSA on 20 June 2019. MCWD has rights to recycled water on a year-round basis. Per discussions during the meeting on 11 July 2019, MCWD provided the following language for inclusion in the GSP: "MCWD is currently conducting a feasibility study on injection of purified recycled water into the Monterey Subbasin. The project proposes to use purified recycled water available to MCWD from the AWPF, some of which is available year-round per the district's agreement with M1W, for indirect potable reuse and prevention of further seawater intrusion. This project is consistent with and can readily be implemented in conjunction with the winter potable reuse project identified herein."		Injection of purified recycled water into the Monterey Subbasin will be considered when the Subbasin GSP for the Monterey Subbasin is completed, working together with MCWD.
9-118	9			8/1/19	Keith Van Der Maaten	Extract Winter Flows using Radial Collectors and Inject into 180- and 400-Foot Aquifers (Alternative Project 3) Alternative Project 3 is the winter extension of Preferred Project 3, Improve SRDF Diversion. While under Alternative Project 3, the new radial collector system would only operate from November through March, the system would be operated from April through October under Preferred Project 3. There may be even steelhead benefits to also operating the system during April through October in conjunction with the SRDF. Section 9.4.5.3 correctly observes that a significant volume of water may be available for diversion or extraction from the Salinas River during the winter. However, securing and clarifying water rights is not a constraint on this proposed project. As discussed above, MCWRA's Amended Water Rights License 7543, Amended License 12624, and Amended Permit 21089 already designate the SRDF Diversion as an authorized point of rediversion. Those licenses and permits were amended to comply with the NMFS' Biological Opinion. Therefore, water stored and released under those water rights is already authorized to be diverted at the SRDF. The Reservoir Reoperation Management Action already has the stated goal of operating the two reservoirs so as to "Allow both natural and surplus flows to better reach the SRDF diversion." Adding the SRDF as an additional point of diversion under Permit 11043 pursuant to a change petition under Water Code Sections 1701.2, et		Suggested language added.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-119	9			8/8/19	Virsik	As asked in the planning committee meeting on 8/1: how will the water charges framework be applied in the 180/400 where the overall goal of the current GSP direction is to stop pumping and instead provide water from various projects or sources. The current CSIP area, for example, relies on, and is charged various levies by the MCWRA for water that is delivered via pipes. My query contributed to a discussion of the water charges framework by those present, including comments by GSA counsel Les Girard on the complications and intricacies of regulatory fees, SGMA statutory authority, Proposition 218, and other aspects of applying the proposed framework. The thrust of the discussion was that while a framework based on water extraction charges has certain merit, as a practical and legal matter, it may not be the only or most appropriate basis to finance projects under all circumstances. D. Williams suggested he would rewrite “that section” of presumably draft Chapter 10. The difficult decisions about financing and management will eventually come before the Board, but are not part of today’s agenda. Nevertheless, Chapter 9, which introduces and explains the water charges framework, states that it is the “fundamental structure for managing groundwater pumping and funding projects” and will be implemented in “all Salinas Valley subbasins in Monterey County.” § 9.2. The current draft fails to identify how the framework is geared to the 180/400, the focus of the GSP. The current Chapter 9 language may not be consistent with what one may expect in Chapter 10 about flexibility, the continuation of the current regulatory fee within or apart from the water charges framework, and how to charge extraction fees in areas (like the CSIP) that will not pump. It may be best to hold Chapter 9 until the language in Chapter 10 is finalized so that the two do not clash.		Comment noted. The details of the Water Charges Framework for each subbasin will be developed during the implementation period of the 180/400-Foot Aquifer Subbasin GSP.
9-120	9.2.2	4		8/2/19	Woodrow	re: "pro-rata share of their subbasin's sustainable yield" - Would a share be determined for landowners in CSIP? They would still receive benefit from future projects but are not directly pumping groundwater.		Text clarified to note that landowners in CSIP will receive separate allowances, as projects are intended to reduce their pumping.
9-121	9.3.5	16		8/2/19	Woodrow	This management action has the potential to duplicate or conflict with parts of Agency Ordinance No. 3790, which regulates wells within Zone 2B. Any ordinance that the SVBGSA enacts in this area should include an exemption for pumping of CSIP supplemental wells, otherwise, one of the three water sources for CSIP could be compromised. There is language in the Agency’s 2017 Recommendations report that addresses such an exemption (section 1.4.2). Consider optimizing and expanding CSIP rather than restricting pumping in that area.		Comment noted. Implementation details will be developed in coordination with MCWRA so that there is not duplication nor conflict with MCWRA ordinances. This instance could be handled by making CSIP supplementary wells exempt from this ordinance restriction.
9-122	9.3.6	18		8/2/19	Woodrow	Ordinance 5302 is a County ordinance, not MCWRA ordinance. Ordinance 5302 applies to the entirety of the Deep Aquifers, not just the Deep Aquifers within the Area of Impact. From the ordinance: “The Deep Aquifers new well prohibition applies in the portions of the 180/400-Foot Aquifer Subbasin and the Monterey Subbasin within the Area of Impact; in the portions of those Subbasins outside the Area of Impact, it is the intent and purpose of this ordinance to require testing to ensure no extraction of water from the Deep Aquifers.”		Text revised accordingly.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-123	9.3.6	18		8/2/19	Woodrow	re: "This study is anticipated to be completed by MCWRA over the next three years" - MCWRA proposed this study in the 2017 Recommendations report and made a presentation to the Board of Supervisors/Board of Directors, but no funding has been identified to support a study of the Deep Aquifers.		Comment noted.
9-124	9.3.6.3	19		8/2/19	Woodrow	re: "study of Deep Aquifer" -Such a study is not underway and funds have not been identified to support this study.		Text revised to note that it will be completed when funding becomes
9-125	9.4.4.3	32		8/2/19	Franklin	Supplemental wells are responsible for most pumping in CSIP zone for the reason specified here. Private wells in the CSIP area standby wells and are allowed to be pumped for specified circumstances.		Comment noted.
9-126	9.4.4.3	34		8/2/19	Franklin	Additional storage will also reduce the need to drill additional CSIP supplemental wells. Existing wells will be stressed less and last longer. Storage could also be used when SRDF or SVRP is unavailable, reducing the number of wells needed to meet demand on an emergency basis or peak demand period.		Comment noted.
9-127	9.4.4.3	34		8/2/19	Franklin	There are no wells classified as "Non-CSIP Supplemental" wells. What you are refering to are "standby" wells. As noted previously, " standby wells are private wells in the CSIP area that are allowed to be pupmped for specific reasons. Eliminating the use of of standby wells within CSIP would reduce pumping in zone 2b. Theis current demend which is being met by standby wells could be met thouugh optimizing effecencies in CSIP operation to better utilize diverted and/or treated water.		These have been changed to 'standy wells'.
9-128	9.4.4.4	41		8/2/19	Franklin	Some components of the existing SVRP must be shut down during low-demand wet weather months for annual maintenance. Any plan to operate SVRP during this period must consider the impact to opertions of winter maintance.		Comment noted.
9-129	9.4.4.8	57		8/2/19	Franklin	re: 3,000 hp: This is a very (very - huge) large pump moter. Is this a correct number?		This number has been updated to 350 hp.
9-130	9.4.4.10	66		8/2/19	Franklin	It is incorect that 27,900 acre-feet is a maximum annual SRDF diversion under Permit 21089. 27,900 acre-feet is the additional volume of storage found after the orinianl volume approved in License 7543 uas updated in the early 1990's with more accurate topographic data; an increase from 350,000 acre-feet to 377,900 acre-feet at Nacimiento Reservoir. Permit 21089 is a change in place of use of waters released from Nacimiento Reservoir, the maximum amount releassed annually not to exceed 180,000 acre-feet		Comment noted.
9-131	9			9/10/19	Salinas Valley Water Coalition	This GSP should not set forth any basin-wide commitments since the other subbasins within the Salinas Valley Groundwater Basin (“SVGB”) have not benefited from any thorough analysis. Additional details are found in the letter.		This GSP does not set forth any basin-wide commitments. Rather, this GSP includes a list of potential management actions, projects, and charges framework that will be negotiated, taking into consideration the effects on all subbasins.
9-132	9			9/10/19	Salinas Valley Water Coalition	Water charges framework should require voter approval for funding of projects consistent with Proposition 218. Additional details are found in the letter.		If Proposition 218 funding is used, you are correct in stating that it would require voter approval; however, other financing strategies will also be considered.
9-133	9			9/10/19	Salinas Valley Water Coalition	All of the Priority Management Actions in Chapter 9 can be supported by the Coalition for further consideration and analysis to address seawater intrusion and overdraft in the 180/400 Subbasin. That said, these Priority Management Actions should be evaluated for their appropriateness for the other Subbasins of the SVGB only at the time the respective GSPs are prepared for these Subbasins. Additional details are found in the letter.		All management actions and projects that potentially affect other subbasins will be evaluated with respect to subbasin impacts in the subbasin GSPs.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-134	9			9/10/19	Salinas Valley Water Coalition	The Coalition strongly supports further consideration and analysis of Priority Management Action 3, Reservoir Reoperation. This Management Action should be evaluated not only for valley-wide benefits but also for environmental (fishery flow) benefits. Additional details are found in the letter.		Assessment for environmental benefits was added explicitly.
9-135	9			9/10/19	Salinas Valley Water Coalition	The Coalition supports further evaluation and analysis of the following Priority Projects in Chapter 9 in order to address seawater intrusion and overdraft in the 180/400 Subbasin: invasive species eradication; optimize Castroville Seawater Intrusion Project ("CSIP") operations; maximize existing Salinas River Diversion Facility ("SRDF") diversion; modify Monterey One Water recycled water plant; and expand area served by CSIP. Additional details are found in the letter.		Comment noted.
9-136	9			9/10/19	Salinas Valley Water Coalition	The Coalition supports further evaluation and analysis of the following Priority and Alternative Projects in Chapter 9 for consideration and potential implementation to address sustainability issues, if any, in the Subbasins other than the 180/400 Subbasin: winter releases (coupled with reservoir infrastructure upgrade) and 11043 Diversion Facilities Phase 1 and Phase II. Additional details are found in the letter.		Comment noted. Further evaluation and analysis of these projects on other subbasins during the development of their subbasin GSPs.
9-137	9			9/10/19	Salinas Valley Water Coalition	Any "new water" the Salinas Valley Water Project ("SVWP") generates as part of any related projects such as "optimize CSIP operations" and "maximize existing SRDF diversion" must be shown to be over that amount already produced by the previously approved SVWP and must not be double counted. The SVWP is currently funded by special assessments which must be taken into consideration when determining a Prop 218 vote for its expansion or optimization. Additional details are found in the letter.		Comment noted.
9-138	9			9/10/19	Salinas Valley Water Coalition	Nitrate issues are already addressed through other governmental processes, and those processes should be referenced to avoid duplicative efforts. Additional details are found in the letter.		Nitrate issues are no longer discussed in Ch
9-139	9			9/9/2019	LandWatch	The SVGBSA cannot rely on voluntary reductions to ensure sustainability because it does not have the information needed to set water prices that would limit water demand to the available supply. The SVGBGSA should initially limit pumping to sustainable yield plus transitional allowance until new water supplies are firmly in place. When new water supplies are produced, the SVGBGSA should then limit pumping to sustainable yield plus those new water supplies. Additional explanatory text is included in the letter.		Comment noted. This will be taken into consideration when developing and negotiating the details of the water charges framework.
9-140	9			9/9/2019	LandWatch	Transitional Allowances should be ramped down as quickly as feasible because there is no substantial evidence that a longer period is consistent with attaining sustainability by 2040. Additional explanatory text is included in the letter.		Comment noted.
9-141	9			9/9/2019	LandWatch	The Transitional pumping surcharge should be based on the best estimate of future supplemental fees. Supplementary allowances and supplementary fees should not be implemented until new water is developed, priced, and allocated. Additional explanatory text is included in the letter.		Comment noted.
9-142	9			9/9/2019	LandWatch	The Plan should not assume the Monterey County Water Resources Agency (MCWRA) will complete a Deep Aquifer study; MCWRA has no funding or authorization. Instead, SVGBGSA should fund and undertake the study because development of this information is part of SVGBGSA's mandate under SGMA.		Comment noted.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-143	9			9/9/2019	LandWatch	Chapter 9 fails to provide the mandatory quantification of the mitigation of overdraft: it fails to quantify the benefits of Management Actions, assigns all of the Basin-wide Project benefits to the 180/400- Foot Aquifer Subbasin, double counts some benefits, and contains an arithmetic error. Additional explanatory text is included in the letter.		Chapter 9 provides figures that estimate the location and amount of overdraft mitigation. In addition, Section 9.6 discusses mitigation of overdraft by projects and management actions.
9-144	9			9/9/2019	LandWatch	De minimis wells on fallowed land should be limited to those needed to support the residential use that is currently permitted by right in order not to interfere with general plan land use designations. Additional explanatory text is included in the letter.		Comment noted.
9-145	9			9/9/2019	LandWatch	Agricultural Best Management Practices (BMP) provisions are redundant. Additional explanatory text is included in the letter.		This has been deleted to avoid redundancy
9-146	9.2			9/16/2019	MCWD	RE: "The fee structures in each subbasin will be developed in accordance with all existing laws, judgements, and established water rights." We understand that SVBGSA will further revise this sentence to include existing water management agreements as part of the basis for developing fee structure and pumping allowances (discussion during the 7/10/19 meeting and MCWD's comment letter for Chapter 9 dated 8/1/19). We understand that SVBGSA has received the comment letter but have yet to incorporate those comments into Chapter 9. Additionally, it appears that this sentence and the associated paragraph discuss the fee structure as well as the sustainable pumping allowance. Therefore, the sentence should be revised to begin with "The fee structures and pumping allowance in each subbasin…"		Water management agreements' and 'pumping allowances' was added to this sentence.
9-147	App 9-C			9/16/2019	MCWD	Appendix 9-C mentions that the estimated pumping rates of the barrier project is calculated based on an analytical solution published by Javandel and Tsang (1987). This analytical solution assumes a constant background gradient. However, it is highly unlikely that a constant background gradient will be maintained over the project lifetime, because once sea water intrusion is stopped water levels inland of the barrier will begin to decline as seawater stops recharging the basin. As recognized in the GSP, numerical modeling is needed to assess rates of groundwater extraction that will be required to halt saltwater intrusion. The SVIHM will likely not have the resolution or adequate calibration in proposed project area and cannot be used to model density driven flow. Therefore, the GSP should acknowledge that alternative models will likely be required to evaluate the proposed pumping barrier project.		Comment noted.
9-148	App 9-C			9/16/2019	MCWD	Appendix 9-C estimates that the pumping barrier will have a total extraction volume of 30,000 AFY; 22,500 AFY of which would be extracted from the 180/400 Foot Aquifer Subbasin. Per discussion, it is understood that the remaining 7,500 AFY would be extracted from the Monterey Subbasin.		Comment noted.
9-149	9.6			9/16/2019	MCWD	As stated in Chapter 6, "[t]he priority projects include more than ample supplies to mitigate existing overdraft, as presented in Table 9-5." As agreed during the meeting, SVBGSA should add a discussion that Section 9.6 is included per requirements of GSP Regulations (and cite relevant sections) and that mitigating the overdraft as estimated does not meet all of the basin's sustainable management criteria. Specifically, without a hydraulic barrier, seawater intrusion will continue to occur if groundwater extraction within the basin occurs at the identified sustainable yield. As SVBGSA stated in Chapter 6, "simply reducing pumping to within the sustainable yield is not proof of sustainably, which must be demonstrated via Sustainable Management Criteria (SMC)."		Comment noted.

Number	Chapter	Page	Figure	Date	Commenter	Comment	DW response	Response
9-150	9.6			9/16/2019	MCWD	Given the technical uncertainties of the proposed seawater intrusion pumping barrier project and the potential project cost that may not be approved by groundwater basin users, the GSP should provide an estimate of the sustainable yield of the 180/400 Foot Aquifer Subbasin (or the larger Salinas Valley Basin) without the pumping barrier project. This estimate is required under SGMA, which defines "Sustainable Yield" as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result." We understand that due to modeling limitations and data gaps, SVBGSA is reluctant to provide an estimate the "sustainable yield" of the basin when sustainable management criteria for seawater intrusion are considered. However, analytical methods, similar to those used to estimate extraction rate of the pumping barrier project, could be utilized to provide a preliminary estimate of the Sustainable Yield of the basin if the extraction barrier is not installed. For example, previous studies conducted on this topic by Geoscience (2013), Protective Elevations to Control Sea Water Intrusion in the Salinas Valley, estimated that approximately 60,000 AFY would be needed for the Salinas Valley Water Project to recharge the Salinas Valley Basin sufficiently to stop seawater intrusion. Alternatively, the GSP could compare and discuss the volume of water needed for an injection barrier, as presented in Appendix 9-C.		Comment noted.

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
10-1	10	8/1/19	Adcock	asked if the State Water Resource Control Board has an understanding there will be basins where there is GSA's and a separate water resource agency, and will it be accepted	indicated its relatively unique as having two agencies with overlapping authorities and understand that if there are activities in a basin, yes it will be accepted to reach sustainability.	Question answered	8-1-2019 Planning Committee Comments
10-2	10	8/1/19	Brennan	asked how is the Deep Aquifer study going be done financially	indicated as of today there is no agreement for GSA to take it over and is not committing the GSA to work on this	Question answered	8-1-2019 Planning Committee Comments
10-3	10	8/1/19	Public Comment	Howard Franklin added the agency is not currently funded to complete the deep aquifer study, and asked Mr. Williams if he has a monitoring program in the deep aquifer and planning to expand it.	All the data currently being collected from the Deep Aquifer will be used in future asssessment of the Deep Aquifer conditions. There is no plan to expand the monitoring program until we assess what data are already availalbe.	Question answered	8-1-2019 Planning Committee Comments
10-4	10	8/1/19	McIntyre	Chair McIntyre asked if there is a proposal. Mr. Franklin indicated not until the funding is identified. Once finalized then a proposal will be developed.	Mr. Williams pointed out the tools are in place and have an approachable plan. All GSPs will end up with a flexible plan knowing they are difficult to implement but need to be negotiated.	Question answered	8-1-2019 Planning Committee Comments
10-5	10	8/1/19	McIntyre	asked in terms of implementing groundwater monitoring system what is the timeline	indicated his guess will be in two or three year	Question answered	8-1-2019 Planning Committee Comments
10-6	10	8/1/19	Brennan	indicated a number of issues have been identified that need to be addressed one is USGS Historical Model that doesn't fall under a data gap definition. The big issue is the double counting issue and it isn't addressed as a data gap.	Clarified the issue of double counting by pointing out that historical pumping was estimated from the Water Resource Agency records of what is self-reported. The amount of diversions of the river were based on the State records. There are growers that report the same amount of water use to both groups. In our historical budget there is some amount of water that is therefore double counted as both groundwater pumping and river diversion. This double counting does not show up in the future water budget which is derived from the groundwater model. When the historical groundwater model is made available, it will avoid the double counting problem	Question answered	8-1-2019 Planning Committee Comments
10-7	10	8/1/19	Brennan	asked what's the implication of having the historical model	clarified the Historical Model and the USGS Model will not have the double counting. Based on the best data and tools	Question answered	8-1-2019 Planning Committee Comments
10-8	10	8/1/19	McIntyre	added for clarification regarding the data that was used from the county and state needs to be stated in Chapter 6; Need edits in chapter 6 that clarifies the source of double counting and it will be irrelavent once the Historical Model is in place.		Text added to Chapter 6	8-1-2019 Planning Committee Comments
10-9	10	8/1/19	Public Comment	Heather Lukacs agreed that the double counting does need to be more clarified on Chapter 6. With basic links or refences that were used for that data.		Comment noted	8-1-2019 Planning Committee Comments
10-10	10	8/1/19	Public Comment	Howard Franklin: two questions one on the model and one on the cost. It should be noted some stakeholders are already paying a portion of the cost to the agency. Moving forward integrating this data collection program, monitoring program with the agency programs will be key that the stakeholders are not paying twice for the same thing. The model, currently the agency has provided the USGS data to update has provided the USGS will be the historical model of spring 2020, the agency has made a commitment that the USGS will be updated yearly.		Comment noted	8-1-2019 Planning Committee Comments
10-11	10	8/1/19	Brennan	asked the fee collected in water charges framework will also be used in the projects	indicated yes, details need to be worked with the Board and Legal counsel. His preference, first tier is money that is used in operational charges the projects are funded by higher tiers. Higher charges raise more money per acre foot. Pumping that is outside the sustainable yield that goes to the projects	Question answered	8-1-2019 Planning Committee Comments
10-12	10	8/1/19	Brennan	in terms of the cost that will be refined, to address the duplicated counting data. Clarify that cost will not be duplicated.		Sentences added to Section 10.8 clarifying that no duplicate fees will be assessed	8-1-2019 Planning Committee Comments
10-13	10	8/1/19	Adcock/Peterson	Adcock asked is January 31, 2022 the deadline for the refining projects and agreeing on funding details; asked if the State will be holding the date. Mr. Petersen added once the plan is updated the date might change until 2025.	indicated it should be January 2023; indicated if more time would be needed the State will likely allow as long as the SVBGSA is showing substantial progress.	Question answered	8-1-2019 Planning Committee Comments
10-14	10	8/1/19	Virsik	Chapter 10 of the 180-400 CSIP modification projects, shouldn't there be more specific of those projects, those cost for implementation. Chapter 6 says this is what needs to be done. Potentially money numbers more specific the amount of water changes how will it affect. For that subset it should be more define. For the State to see how the process will work. On the water charges framework is the first tier, how does the first-tier work for CSIP?	Indicated that the first tier costs will need to account for fees already paid into CSIP	Question answered	8-1-2019 Planning Committee Comments
10-15	10	8/1/19	Girard	commented CSIP is an agency project. A decision will be made if GSA will take ownership of any expansion of CSIP. Or if it's going to be a project of the agency to expand CSIP. If they keep ownership of that expansion project how they finance will be CSIP issue not GSA's. CSIP may choose to finance it based on benefit assessment. GSA doesn't own the means of production. He added there is several options of financing.		Comment noted	8-1-2019 Planning Committee Comments

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
10-16	10	8/1/19	McIntyre	added facilitated process will accomplish funding	indicated that is correct the facilitated process will show how all is incorporated, with a timeframe of three-years.	Question answered	8-1-2019 Planning Committee Comments
10-17	10	8/1/19	Brennan	asked Mr. Girard if the water charges framework will require protest votes and if other funding mechanisms will be needed.	Mr. Girard indicated that is correct due to regulatory fees.	Question answered	8-1-2019 Planning Committee Comments
10-18	10	8/1/19	McIntyre	added this needs to be as flexible as possible due to all the pro and cons. Mr. Girard added who pays for an expansion of CSIP is to be determined in the future.	agreed with Chair McIntyre indicated we do have options and look for funding mechanisms and emphasize funding options	Comment noted	8-1-2019 Planning Committee Comments
10-19	10	8/1/19	Brennan	added water charges framework is a big selling point of the funding	indicated it is appealing with the practical aspect, however flexibility is needed for funding purposes	Question answered	8-1-2019 Planning Committee Comments
10-20	10	8/1/19	Brennan	asked the water charges framework can be funded with an extraction fee or some other kind of fee. Is that where the option is	Yes, the option is to fund with an extraction fee, a flat fee, a land-based fee, or some other type of fee	Question answered	8-1-2019 Planning Committee Comments
10-21	10	8/1/19	Peterson	answered water charges framework isn't been excluded. The water charges framework remains an option along with other more traditional funding options, including protest votes or 218's. It might not work in all sub-basins it is important to understand that Chapter 9 will have the projects. The biggest cost and funding needed is on the 180-400.		Comment noted	8-1-2019 Planning Committee Comments
10-22	10	8/1/19	Brennan	indicated the discussion needs to be expanded to clarify, because at this point this is the only option	Offerend to look at test and recognize other options for funding open	Text revised	8-1-2019 Planning Committee Comments
10-23	10	8/1/19	Girard	added GSA has the ability to require pumpers to pay for a measuring device on the well. GSA doesn't have to pay for it the owners will. Using water charges gives you data. In his opinion, two things do you do that for the purpose of data or to raise revenue Greenfield or combination of both. Recognizing the revenue you raise has to be committed to the program for funding. There is a number of limitations and GSA Board needs to understand there is a variety of ways to make revenue before making a plan to raise revenue. Menu of options for raising revenue.		Comment noted	8-1-2019 Planning Committee Comments
10-24	10	8/1/19	McHatten/Girard/ Adcock	McHatten requested clarification on the 218 process what does it look like and what does the process include. Will it include Gonzales, Soledad and King City, since there isn't enough people or benefit assessment district? Is it 66% of people? the Board of Directors need to know all the options in implementing a fees, assessments or tax.	Mr. Girard indicated a 218 is majority protest for a vote for a property related fee, the 2/3 has to do with a tax fee. Director Adcock added in a plan once decided the State would understand. Mr. Girard said yes,	Question answered	8-1-2019 Planning Committee Comments
10-25	10	8/1/19	Public Comment	Heather Lukacs commented, the biggest issue for her because projects are so uncertain. A measure of allowable pumping for or sustainable yield that doesn't assume new projects that is needed to know for the whole Valley. Chair McIntyre indicted that would be different for each sub-basin. She indicated then for each sub-basin for the public to see the numbers and avoid political issues. Her concern is seawater intrusion. Chair McIntyre indicated that was provided already.	indicated the only thing he doesn't have is if pumping would be cut off completely on the 180-400 would it reverse the seawater intrusion, will it push it back and what will it look like. He also added, seawater intrusion you end up with two time periods getting to sustainability and maintain it. Getting there is difficult you need to raise water levels, sustaining it isn't so difficult since you just need to maintain it there.	Question answered	8-1-2019 Planning Committee Comments
10-26	10	8/1/19	Brennan	asked the 7% percent reduction on the 180-400 that doesn't include sweater intrusion	indicated no, The 7% cut only balances the water budget. He added he will ask DWR to clarify what is the definition of the sustainable yield number. There is a strict reading of the regulations saying the sustainable yield doesn't get any sweater intrusion.	Waiting for response from DWR	8-1-2019 Planning Committee Comments
10-27	10	8/1/19	Brennan	Are we looking into interim to sustainability or maintain sustainability? It becomes a complicated problem due to no guidance from DWR.	indicated to Heather Lukacs point there is a question of what sorts of cutbacks might be necessary if there weren't no projects, what might our future in 20 years would look like.	Question answered	8-1-2019 Planning Committee Comments
10-28	10	8/1/19	Lukacs/Peterson	Heather Lukacs also added in terms to interim GSA is committed to holding the seawater intrusion line and will not include it through pumping but through projects. The projects won't be implemented in several years and it's a disconnect. Mr. Petersen added it's important to remember we have 20 years to get to sustainability because it acknowledges how much effort it will require to get there		Comment noted	8-1-2019 Planning Committee Comments
10-29	10	8/1/19	Public Comment	Walter commented doesn't see in the plan the development of Deep Aquifer study. Aseked if SVBGSA plans to take over or develop it. What will happen to the 180-400 in the interim period?	indicated GSA is supporting the extension of the emergency ordinance until there is a better understating of the deeper aquifer. At the same time, it's understood the farmers can't be cut off of a water source	Question answered	8-1-2019 Planning Committee Comments
10-30	10	8/1/19	Public Comment	Walter added there is no 180 foot wells in the area and no replacement opportunities. Walter asked how it is going to be handled in the interim period.	D. Williams recognized the interim period is a problem	Comment noted	8-1-2019 Planning Committee Comments
10-31	10	8/1/19	Peterson	added it's needed categorize the sub-basin as soon as possible to have the data to make a good decision		Comment noted	8-1-2019 Planning Committee Comments
10-32	10	8/1/19	Public Comment	Patrick asked will you be categorizing a replace well not a deeper well	G. Petersen indicated the only deep well allowed is if you have a well that is in the 400 and it goes bad and decide to replace it there is an agreement that if you take it out of commission and replace it in accordance with the requirement. Drinking portable water is acceptable as well. Franklin indicated the agency will use the best data available to determine if the well will be in the deep aquifer and verify based on the logs	Question answered	8-1-2019 Planning Committee Comments

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
10-33	10	8/1/19	Peterson	Petersen commented the $1,200,000 a year is for the entire Valley. And this GSP is for the 180-400? Is it needed to say this much comes from this fee and this from this fee? Mr. Girard replied yes, if portion of the fee that only benefits the 180-400. Providing it can be identified for other benefits the sub-basins, forebay or upper valley	D. Williams indicated to look at the table and see if this is supporting the 180-400 or is it a valley wide implementation	Tables modified to differentiate between Valley-Wide and Subbasin costs	8-1-2019 Planning Committee Comments
10-34	10	8/1/19	Brennan	asked this implementation fee does not include developing the other GSP yet the $1,200,000 million a year is collected to the GSA.	D. Williams clarified yes it goes to GSA not to develop the GSP. G. Petersen indicated because of matching funds our grants require 50% matching funds. All cost that goes to operating the GSA are used as the matching funds on the grant to cover our 50%. DW encouraged the Committee and public to look over the list and provide suggestions. He stated this is the implementation cost not the project cost.	Cost tables now divided into Subbasin and Valley-Wide costs	8-1-2019 Planning Committee Comments
10-35	10	8/1/19	Public Comment	Tom Virsik on the cost fees as Director Brennan pointed out the regulatory fee of $1,200,000. His impression was for regulatory fee for those who are not in 180-400 and will get you to the others end in the GSP's. If the message is, we need more money to finish the GSP's you will have fight. Regarding the Chapter and presentation policy issues. There are two one is weather the Board should be focused on the minimum of what DWR wants under any circumstances or should it be focused on something other than that. In particular in the interim period one of the best management practices, documents from DWR that explains the regulatory content and shows examples on a metric this is a way the plans can be implemented. The Board policy decision is if they will go with it and that's with seawater intrusion particular.		The cost tables do not include the costs of developing additional GSPs	8-1-2019 Planning Committee Comments
10-36	10	8/1/19	Public Comment	the agency will move forward with revising GEMS ordinance with data collection addressing the boundaries under the GSA	D. Williams asked Mr. Franklin to write /email him directly with details of this information to make the appropriate changes	Question answered	8-1-2019 Planning Committee Comments
10-37	10	8/1/19	Public Comment	Mr. Franklin continued with the groundwater level seen it was based under CASGEM is a small subset of the agency in the monitoring program. To participate in the CASGEM you need full disclosure and redacted information.	D. Williams indicated he wasn't sure if that was needed for SGMA but would look into it.	Requirements for SGMA are similar to CASGEM requirements	8-1-2019 Planning Committee Comments
10-38	10	8/1/19	Public Comment	Heather Lukacs asked for clarification under communication and outreach related to the monitoring in a well how is the GSA tracking the groundwater levels or how the public can obtain that information	D. Williams indicted with transparency of the data that is been used and obtained it will be released in the next Board meeting next week	Data portal is now active	8-1-2019 Planning Committee Comments
10-39	10	8/1/19	Peterson	added this is a continued effort to obtain as much as information as legally as possible to provide to the public		Comment noted	8-1-2019 Planning Committee Comments
10-40	10	8/15/19	Groot / Ward	expressed concerns about meeting the three-year water charges framework.		Comment noted	08-15-19 AC minutes
10-41	10	8/15/19	Girard	Girard responded that generally, absent an allegation of illegality, the Agency would not be prohibited from going forward with the Plan unless the plaintiff received a preliminary injunction	D. Williams believes the legislation includes a tolling provision in the event of litigation.	Question answered	08-15-19 AC minutes
10-42	10	8/15/19	Girard	Girard stated that the DWR's ability to declare our Basin probationary would be tolled by litigation preventing filing of the Plan.		Comment noted	08-15-19 AC minutes
10-43	10	8/15/19	Johnson	stated that Chevon would like an outline for an appropriate well test for the upper Valley so that they may provide the Agency with the information they need. He referenced Section 10.4.4, Water Quality Monitoring Network and asked whether the GSA would expand the scope of water systems in the fee structure.	D. Williams stated the negotiations would begin with seeking financial contributions for all non de minimis systems and could include non-community water systems.	Outline has been provided to Chevron	08-15-19 AC minutes
10-44	10	8/15/19	Wolgamott	expressed surprise at the increase in the fee from $1.2 million to $2.1 million	D. WIlliams stated that a fee structure for operational costs is needed going forward, including new commitments that were not contemplated in the $1.2 million such as the USGS model and expanding monitoring systems and gets the projects going. There will be costs on top of that.	Question answered	08-15-19 AC minutes
10-45	10	8/15/19	Peterson	stated that some of these costs may be covered by grants. The cost framework is being approved as required, not the fees	D. Williams stated the Plan estimates what it would cost to implement the Plan, and we did not know what the costs were until the Plan was developed. By approving the Plan, we are saying we are committed to finding the funding	Question answered	08-15-19 AC minutes
10-46	10	8/15/19	Adcock		In response to Tom Adcock, D. Williams stated that the additional costs may not be spread throughout the Basin; valley-wide project costs would be spread throughout the Basin	Question answered	08-15-19 AC minutes
10-47	10	8/15/19	Virsik	Tom Virsik stated that flexibility would not be found in the water charges framework. Mr. Williams' comments are good but not written into the Plan. He questioned how the charges framework concept can work in the most critical area where pumping needs to stop. His memory is the $1.2 million administrative fee was to include preparation for other parts of the Basin. It lays the foundation for litigation by people who believe they would pay twice.		People will not pay twice. Either pumpers pay for the water they pump, or they pay for the water they import.	08-15-19 AC minutes
10-48	10	8/15/19	Franklin	stated it is apparent that more education is needed on how water is used in the 180/400 sub-basin and options for water demands and developing fees		Comment noted	08-15-19 AC minutes
10-49	10	8/15/19	Lukacs	asked how the Agency could work with environmental health and agencies that collect water quality data on obtaining information when new data is available to inform groundwater decisions	SVBGSA decision was to set the number of groundwater quality monitoring wells and only change the monitoring network every 5 years	Question answered	08-15-19 AC minutes

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
10-50	10	8/15/19	Tynan		In response to Eric Tynan, D. Williams stated that seawater intrusion will be impacted by our approach to the deep aquifer and the approach taken to promote the interim ordinance that allows replacement wells in the deep aquifer until we understand how much pumping it can support. G. Petersen confirmed that he is having discussions with other GSAs. Mr. Johnson agreed it would be valuable to compare critical data gaps.	Question answered	08-15-19 AC minutes
10-51	10	8/15/19	Amezquita	Horacio Amezquita asked what the GSA will do if systems' nitrates continue going up due to overdraft.	D. Williams responded that the GSA will look at overdrafting, but is not taking on the role of providing drinking quality water to everyone in the Valley. Quality has a sustainability aspect, but there are other programs to address this issue.	Question answered	08-15-19 AC minutes
10-52	10	9/11/19	Virsik	First, the cost estimate of implementation over the next five years rose over $500,000 between the two drafts, with some $300,000 of the increase in the "refine water charges framework. Additional explanatory information for the comment is included in the letter.		Comment noted.	Chapter 10 and 11, Virsik.pdf
10-53	10	9/11/19	Virsik	A cursory review of Chapter 9's recommendations show that, by design, numerous of the management actions and projects benefit the 180/400, thus the cost of "refining" those actions and projects should also be allocated to that sub basin, rather than shared (in a yet unknown ratio) among all. Additional explanatory information for the comment is included in the letter.		Comment noted.	Chapter 10 and 11, Virsik.pdf
10-54	10.3	9/16/19	EKI Environment & Water	The following additional data gaps and analyses should be identified Chapter 10: Seawater intrusion cross-sections (Chapter 5 comments dated 18 April 2019) - Per GSP Regulations Section 354.16 (c), a GSP should provide "seawater intrusion conditions in the basin, including maps and cross sections of the seawater intrusion front for each principal aquifer". The GSP should commit to development of such cross-sections, once data gaps have been filled. These data are needed to inform placement of seawater intrusion barrier wells. Groundwater extraction within individual aquifers (Chapter 6 comments dated 2 July 2019) - We suggest that SVBGSA collect information needed to identify groundwater extraction from each principal aquifer, to allow the development of a water budget for each aquifer. As discussed and agreed upon during the 7/2/19 meeting, this data gap may be extremely difficult to fill and water level data/gradients in each aquifer may serve as a proxy for evaluating the effectiveness of projects and management actions to address saltwater intrusion within each of these zones. However, given the uncertainties associated with groundwater recharge and groundwater levels within the Deep Aquifer (consistent with data gaps identified in Section 10.3), quantification of all groundwater extraction from the Deep Aquifer, should be clearly identified as a Data Gap that will be filled as under the GSP.		The seawater intrusion cross-section is included as Figure 5-25. Some of the data gaps in the Deep Aquifers will likely be filled in response to Monterey County Urgency Ordinance 5302. The SVBGSA will support MCWRA's efforts to fill the Deep Aquifer data gaps.	MCWD letter to SVBGSA Chapter 9-10 comments 2019-09-16
10-55	10.3	9/16/19	EKI Environment & Water	We further recommend that the GSP identify actions that will be implemented to allow: Development of Sustainable Management Criteria for the deep aquifer; and Development of Sustainable Management Criteria that consider project implementation. For example, alternative groundwater elevation Sustainable Management Criteria will be required near the coast if a pumping barrier is constructed.		SMC were developed for all principal aquifers that have sufficient data. Where insufficient data exists, SMCs will be developed when data gaps are filled, such as for the Deep Aquifers. The SMCs are developed based on current conditions and the projects and management actions are intended to address them. DWR does not require SMCs for after project implementation, but those could be considered during GSP updates.	MCWD letter to SVBGSA Chapter 9-10 comments 2019-09-16
10-56	10.6-10.7	9/16/19	EKI Environment & Water	The GSP should acknowledge that alternative models will likely be required to evaluate certain projects, such as the pumping barrier or injection wells, because the SVIHM does not have the resolution or adequate calibration in proposed project areas and cannot model density driven flow. Further, The GSP states that SVIHM model will be available for use within one year. Per discussion during the meeting, we understand that within one year, the SVIHM model will be released for public use by USGS. Additionally, we understand that the model will be made publicly available consistent with GSP Regulations Section 352.4 (f)(3), "[g]roundwater and surface water models developed in support of a Plan after the effective date of these regulations shall consist of public domain open-source software."		A note that alternative models may be used to complement the SVIHM was added.	MCWD letter to SVBGSA Chapter 9-10 comments 2019-09-16
10-57		9/16/19	EKI Environment & Water	MCWD is considering applying for Proposition 68 Grant (SGM Grant Round 3) for Monterey Subbasin. We understand that SVBGSA is also planning to apply for this grant for other basins under its jurisdiction. As agreed, both parties will coordinate and support each other in grant funding processes.		Comment noted.	MCWD letter to SVBGSA Chapter 9-10 comments 2019-09-16

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
10-58	10	10/7/19	LandWatch	1. The proposed implementation fails to recognize the urgency required for action to address the critically overdrafted 180/400 Foot Aquifer Subbasin. (The issue is further discussed in the letter.)		Refinement of the projects and actions will occur simultaneously with refinement of the funding mechanism that supports the projects and actions. This will take time to complete and will be undertaken immediately following submission of the GSP. For the projects and management actions that are dependent on not only the 180/400, but other subbasins, refinement will occur as the other GSPs are being developed and implementation will begin as soon as possible. Individual SMCs will be met simultaneously.	LandWatchComments_GSPChapter10.pdf
22190	10	10/7/19	LandWatch	The SVGBGSA should impose pumping restrictions pending start-up of new water projects in order to restore and maintain the protective groundwater elevations needed to attain the adopted minimum threshold for seawater intrusion.		Comment noted.	LandWatchComments_GSPChapter10.pdf
10-60	10	10/7/19	LandWatch	2. Chapter 10 does not disclose realistic project start-up projections. (The issue is further discussed in the letter.)		Thank you for your comment noting that implementation should not begin before all subbasin plans are complete. This is why Chapter 10 notes that project refinement and negotiation will occur from 2020-2023 and project implementation will begin in 2023.	LandWatchComments_GSPChapter10.pdf
10-61	10	10/7/19	LandWatch	3. Unlike projects, pumping restrictions are feasible in the very near term. (The issue is further discussed in the letter.)		The SVBGSA will evaluate pumping restrictions once the Salinas Valley Integrated Hydrologic Model becomes available. It is duplicative of efforts and not cost-effective to do so before it is available.	LandWatchComments_GSPChapter10.pdf
10-62	10	10/7/19	LandWatch	4. Unlike projects, pumping restrictions do not require extensive additional data acquisition. (The issue is further discussed in the letter.)		Having access to the SVIHM will enable comparison between pumping restrictions and other projects and management actions, and therefore will be evaluated when the SVIHM is available.	LandWatchComments_GSPChapter10.pdf

Number	Chapter	Date	Commenter	Comment	DW response	Response	Commenter doc name
11-1	10	9/11/19	Virsik	The head/footers of Appendix 11E identifying it as a no-longer accurate early draft that should be understood as a legacy staff document, not authorized by Board action. Additional explanatory information for the comment is included in the letter.		Appendix 11E has been updated.	Chapter 10 and 11, Virsik.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-1	All				10/31/2019	Virsik	Grammatical edits - see letter		Relevant edits were added.	Virsik_GSPComment31Oct2019
W-2	All				11/14/19	Virsik	Clarify subbasins under SVBGSA (see letter for specific details)		This has been double checked and any consistencies corrected.	Virsik_GSPComment14Nov2019
W-3	All				11/14/19	Virsik	The Basin or Sub-basin Counts are Misleading and Confusing (see letter for specific details)		Thank you for the specific examples. The relevant ones have been fixed.	Virsik_GSPComment14Nov2019
W-4	All				11/14/19	Virsik	The GSP is Premised on a Demonstrably False Binary Distinction Between the 180/400 and "Valley-wide" (see letter for specific details)		This GSP covers the 180/400-Foot Aquifer Subbasin, which is a subbasin of the Salinas Valley Basin. In accordance with the approach approved by the SVBGSA Board of Directors, all subbasins in the Salinas Valley will be managed in an integrated fashion. Therefore, it is important to include actions that primarily benefit the 180/400 and those that are part of a Valley-wide sustainability effort. SGMA does not require full details for projects outside of the GSP subbasin, but it is important to highlight other projects in the Valley and those that require a Valley-wide effort.	Virsik_GSPComment14Nov2019
W-5	All				11/14/19	Virsik	Certain Important Tables are Facially Confusing/Impenetrable		The arithmetic has been double checked and does add up.	Virsik_GSPComment14Nov2019
W-6	All				11/14/19	Virsik	The Water Budgets Tacitly Admit They Do Not Comply with SGMA Standards		The water budgets are based on best available data and tools, and therefore comply with SGMA standards. As noted throughout the GSP process, the GSP acknowledges the water budgets have some uncertainty which will be reduced as additional data and tools become available.	Virsik_GSPComment14Nov2019
W-7	All				11/14/19	Virsik	The Water Budgets Analyses Have Inexplicably Changed From the Prior Iteration		The changes were made in response to the chapter's public review process. Discussing the numbers and calculations used is part of the iterative process and shows that the GSP preparation is responsive.	Virsik_GSPComment14Nov2019
W-8	All				11/14/19	Virsik	GSP Ignores the Tool of a Management Area; letter highlights that CSIP could be a management area		You are correct - the GSA is not obligated to create a management area for CSIP and thus far they have not decided to designate it as such; however, the option remains if they so choose.	Virsik_GSPComment14Nov2019

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-9	9.3.5.8				10/8/2019	Adin Holdings	The "mandatory pumping reduction program" should be explained and the activities covered by the mentioned budget should be listed.		As explained in Section 9.3.5, mandatory pumping reductions in the CSIP area are implemented only after a group of projects that provide alternative sources of water to the CSIP area are completed. The budget item in Section 9.3.5.8 will be used to conduct a study and deliberations on how to design and implement the program.	AH commentary on Ch 9 10.8.2019.pdf
W-10	9.4				10/8/2019	Adin Holdings	The time-line of projects currently being pursued by other agencies and their integration with the preferred projects should be clearly explained in this GSP.		The existing efforts by other agencies are explained under each specific project.	AH commentary on Ch 9 10.8.2019.pdf
W-11	9.4.1				10/8/2019	Adin Holdings	What about water conservation: Is looking for substituting types of plants/products that evapotranspirate at high rate or consume much water with more effective ones totally out of question? A close issue to this is water savings by controlling "exporting water" so called also "virtual water" through export of agricultural products that contain large percentage of water.		The GSA cannot instruct private entities what types of plants to grow. Rather, private entities may choose to switch crops based on the availability or cost of water supplies.	AH commentary on Ch 9 10.8.2019.pdf
W-12	9.4.1.1				10/8/2019	Adin Holdings	The offset depends on the water source. Reclaimed wastewater and desalinated seawater (remineralized) could be used to offset use of groundwater. Using river water and rainwater harvesting to offset use of groundwater requires careful water balance calculations considering potential natural recharge by these waters.		Agreed. Careful water balance calculations will be conducted prior to implementation.	AH commentary on Ch 9 10.8.2019.pdf
W-13	9.4.1.2				10/8/2019	Adin Holdings	In view of the continuously increasing demand for food, land availability and cost is expected to increase.		Costs will be taken into consideration and programs will be adjusted over time, taking into account factors such as the change in price of land.	AH commentary on Ch 9 10.8.2019.pdf
W-14	9.4.1.2				10/8/2019	Adin Holdings	Dual-purpose wells should also be considered for underground storage or for aquifers where the water table rises enough seasonally or due to unpredictable climate changes. "Dual-purpose well" is a well intended both for injection and recovery.		Construction of existing wells will be examined prior to construction of new injection wells to see whether existing wells could be turned into dual-purpose wells.	AH commentary on Ch 9 10.8.2019.pdf
W-15	9.4.1.3				10/8/2019	Adin Holdings	A highly effective method for reducing water loss by evaporation, already widely implemented in Salinas Valley, is transformation of traditionally used irrigation methods such as flood or furrow irrigation to irrigation with low-rate applicators, e.g. sprinkler or drip irrigation systems. Other BMPs in agriculture should be explored.		Agricultural BMPs are included in 9.3.3	AH commentary on Ch 9 10.8.2019.pdf
W-16	9.4.1.4				10/8/2019	Adin Holdings	Dual-purpose wells may also be worth consideration here (see comment above). Energy demand and cost are particularly critical in this kind of project, and should be presented. Injection - The possible water resources should be listed. Extraction - Seawater might have no use other than discharge to the sea.		Energy demand and cost will be taken into consideration. The water resources depend on the exact location of the wells, which will be assessed in the project design phase.	AH commentary on Ch 9 10.8.2019.pdf
W-17	9.4.2.2				10/8/2019	Adin Holdings	It is not enough to present only the merits. The shortcomings of each proposed project should be equally presented. A detailed comparison of the alternatives should be presented.		The consideration and comparison of projects and alternatives will include both benefits and shortcomings.	AH commentary on Ch 9 10.8.2019.pdf
W-18	9.4.3				10/8/2019	Adin Holdings	A true holistic approach demands presenting the integrated GSP at basin level.		Agreed. That is why the SVBGSA will continue to revise and add to the Integrated Sustainability Plan as the GSPs for other subbasins are developed.	AH commentary on Ch 9 10.8.2019.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-19	9.4.3				10/8/2019	Adin Holdings	The methodology of assessment should be presented in detail.		The complete list of projects are in Appendix 9B. The list was reduced to what the SVBGSA believed are the most cost efficient and likely successful projects. If there is a public desire, we can add any projects in this Appendix to our list of preferred projects.	AH commentary on Ch 9 10.8.2019.pdf
W-20	9.4.4.1				10/8/2019	Adin Holdings	The full list of projects and the list of preferred projects should be revisited occasionally as more information is gathered. Reassessment with new information may change projects' preferences.		The projects will be revisited as more information is gathered, more detailed assessments done, and the other subbasin plans completed.	AH commentary on Ch 9 10.8.2019.pdf
W-21	9.4.4.2				10/8/2019	Adin Holdings	Which chemical treatment? How will it affect groundwater and runoff to Salinas river? Using chemicals for invasive species eradication is not a sustainable solution and should be reconsidered or minimized, requiring careful environmental impact assessment. This may take a while. What will be done in the cleared areas? Could cleared areas be used as recharge basins or storage reservoirs? Could agriculture be a future use?		EPA- and RWQCB-approved aquatic formulations for use near open water is used for herbicide spraying (glyphosphate or imazapyr). There are no effects from this approved method - application is done when no surface water is present in/near treatment areas. Using chemicals should require careful environmental impact assessment. In cleared areas, natural recruitment of native forbs and shrubs are allowed to come back into treatment areas. Cleared areas can be used for recharge, but they are primarily in the active flood channel and not on agricultural areas or out of the active channel so storage would be limited. Cleared areas provide benefit primarily by reducing roughness in the channel. Agriculture cannot be a future use because arundo populations are limited to the active flood channel and farm levee banks and typcially would not be allowed to be converted to agricultural use according to laws.	AH commentary on Ch 9 10.8.2019.pdf
W-22	9.4.4.2				10/8/2019	Adin Holdings	For Invasive Species Eradication, a direct measure of success could be river flow before and after cleared areas and groundwater elevation measurements in the large cleared areas.		Comment noted.	AH commentary on Ch 9 10.8.2019.pdf
W-23	9.4.4.3				10/8/2019	Adin Holdings	For Optimize CSIP Operations, leakage is not mentioned. Leak detection and repair should be included and priced. Increasing pressure will increase leakage and require more leakage detection and repair. Requirements for the ongoing monitoring of the system should include leak detection. Advanced technologies for this are readily available.		Comment noted. We will consider CSIP maintnance when looking at CSIP optimization and improvements.	AH commentary on Ch 9 10.8.2019.pdf
W-24	9.4.4.4				10/8/2019	Adin Holdings	Is there a plan for using these effluents for injection to the aquifer in the hydraulic barrier project?		If injection is chosen as the preferred the hydraulic barrier, the least expensive source of water wil be chosen. Effluent will be considered as one source of injection water.	AH commentary on Ch 9 10.8.2019.pdf
W-25	9.4.4.4				10/8/2019	Adin Holdings	An effort should be made to treat and reuse all wastewater during all seasons.		Comment noted	AH commentary on Ch 9 10.8.2019.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-26	9.4.4.4				10/8/2019	Adin Holdings	1. The final title 22 Engineering Report April 2019 (Revised) of Pure Water Monterey states (p.28) that the recycled water supply for agriculture here "is subject to (1) Water Recycling Requirements issued to MRWPCA (Order 94-82) and (2) Recycled Water Used Requirements (Order No. 95-52) issued to MCWRA by the Central Coast Regional Water Quality Control Board." What is the status of meeting those requirements? 2. The recycled water is purified to the standard of drinking water quality with technologies that altogether produce excellent water for that purpose. Irrigation for most products would not need such a high level of purification, which might end up with higher costs of water for the farmers than necessary. If not done already, other alternatives for that portion of the recycled water intended for irrigation can be considered. (see letter for remainder of comment)		If recycled water is used for any project, the level of treatment will be appropriate for the intended use.	AH commentary on Ch 9 10.8.2019.pdf
W-27	9.4.4.4 - 9.4.4.6				10/8/2019	Adin Holdings	These projects are highly interdependent and should be planned and managed as one project.		Agreed. The plan is to develop all projects and actions as a single program.	AH commentary on Ch 9 10.8.2019.pdf
W-28	9.4.4.7				10/8/2019	Adin Holdings	This option of using extracted water seems promising and sustainable, yet depends on the sustainability of the barrier project as a whole.		Comment noted	AH commentary on Ch 9 10.8.2019.pdf
W-29	9.4.4.7				10/8/2019	Adin Holdings	Could there be a situation where a good rainy season will drive the seawater intrusion front back enough that pumping of sweet water could be of interest? If and where such a case exists, dualpurpose wells could perhaps be of value.		To date, we have not seent high rainfall years reverse seawater intrusion	AH commentary on Ch 9 10.8.2019.pdf
W-30	9.4.4.7				10/8/2019	Adin Holdings	By that time several other projects are planned to be completed. What will be the need then? A consolidated planning on a timeline of the water balance is missing.		Projects will only be initiated as needed. SVBGSA will adopt an adaptive management approach to see how each project is working, and to assess whether additional projects are necessary.	AH commentary on Ch 9 10.8.2019.pdf
W-31	9.4.4.7				10/8/2019	Adin Holdings	Missing: Impact on groundwater - Either extraction or injection will affect groundwater. This project is the only one with no Estimated Groundwater Level Benefit graphs.		These graphs will be developed when appropriate tools are developed.	AH commentary on Ch 9 10.8.2019.pdf
W-32	9.4.4.8				10/8/2019	Adin Holdings	Could dual-pumping serve here (Preferred Project 7)?		This is a river diversion project, and dual-purpose wells are likely not appropriate.	AH commentary on Ch 9 10.8.2019.pdf
W-33	9.4.4.9				10/8/2019	Adin Holdings	This option seems promising and sustainable.		Comment noted.	AH commentary on Ch 9 10.8.2019.pdf
W-34	9.4.5.1				10/8/2019	Adin Holdings	The desal plants (Alternative Project 1) are close to the coast so there should be no specific problem of disposing the brine.		Comment noted.	AH commentary on Ch 9 10.8.2019.pdf
W-35	9.5				10/8/2019	Adin Holdings	Why are these not part of the GSP? The benefit of these projects could be similar to and higher than the programs included in the GSP. Is there more than one GSP?		The benefits from these activities are difficult to rely on or quantify. The SVBGSA supports these activities, but cannot rely on them to achieve sustainability.	AH commentary on Ch 9 10.8.2019.pdf
W-36	9.5.1				10/8/2019	Adin Holdings	Important: Why not plan and calculate the benefit of agricultural BMPs and compare them to the projects above mentioned, perhaps they will be found more economic and more sustainable than some of them? Inputs from agro-technology experts may be needed for assessing the potential.		Comment noted	AH commentary on Ch 9 10.8.2019.pdf
W-37	App 9C				10/8/2019	Adin Holdings	The GSP should present complete information on the process of assessing the projects and on the process of selecting the preferred and alternative projects.		The complete list of projects are in Appendix 9B. The list was reduced to what the SVBGSA believed are the most cost efficient and likely successful projects. If there is a public desire, we can add any projects in this Appendix to our list of preferred projects.	AH commentary on Ch 9 10.8.2019.pdf
W-38	App 9C				10/8/2019	Adin Holdings	The GSP should include an estimation of energy demand and cost for extraction and for injection. Destination and cost of extracted water should be presented, particularly alternatives of using the extracted water. In case of injection, alternative water resources should be presented with their costs and compared.		Energy demand and cost will be taken into consideration. The water resources depend on the exact location of the wells, which will be assessed in the project design phase.	AH commentary on Ch 9 10.8.2019.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-39	App 9C				10/8/2019	Adin Holdings	Not clear: "in the absence of any of the other future projects included in the GSP." What does this mean?		Injection or recharge projects may reduce or eliminate the need for the seawater intrusion barrier	AH commentary on Ch 9 10.8.2019.pdf
W-40					11/13/2019	LandWatch	The GSP fails to adopt a conservative estimate of sustainable yield until resolution of data gaps and calibration of the groundwater model. 1. The groundwater model is not calibrated. 2. The minimum threshold for reduction in storage is improperly based on uncalibrated model projection of 2070 sustainable yield and improperly uses the least conservative estimate of sustainable yield.		The GSP is based on best available data at the time of development. It will be updated when the SVIHM is released, at which point the future water budget will be calibrated with the historical water budget.	LandWatchCommentsEntireGSP_FINAL.pdf
W-41					11/13/2019	LandWatch	The minimum thresholds for groundwater levels and storage reduction are inconsistent with SGMA regulations because they fail to avoid the undesirable results for the seawater intrusion sustainability indicator. The minimum threshold for groundwater levels, set at one foot above lowest historical groundwater levels, will not support the minimum threshold for seawater intrusion, set at existing line of seawater intrusion advance, because those groundwater levels will not halt seawater intrusion. The minimum threshold for reduction in storage, set at the future long‐term sustainable yield, will not support the minimum threshold for seawater intrusion, because halting seawater intrusion requires replacement of depleted groundwater storage by temporarily reducing extractions to below the sustainable yield.		The sustainability indicators will be met simultaneously, but they are independent, such that the minimum thresholds for groundwater levels and storage reduction are not responsible for avoiding seawater intrusion. Further, the long-term sustainable yield is the sustainable yield AFTER all undesirable results have been addressed, including seawater intrusion.	LandWatchCommentsEntireGSP_FINAL.pdf
W-42					11/13/2019	LandWatch	The GSP proposes inconsistent programs and management actions to attain the minimum threshold for seawater intrusion, and these remedies would not be timely.		SGMA specifies that GSAs have 20 years to come to sustainability. The projects and management actions are realistic within that timeframe.	LandWatchCommentsEntireGSP_FINAL.pdf
W-43					11/13/2019	LandWatch	The Plan fails to include immediate pumping reductions, which are required in order to attain the identified minimum threshold for seawater intrusion.		Immediate pumping reductions are not required by SGMA, but rather are only one possible management option. The GSP includes other projects and management actions to meet the minimum threshold for seawater intrusion, such as the seawater intrusion barrier and the water charges framework.	LandWatchCommentsEntireGSP_FINAL.pdf
W-44					11/13/2019	LandWatch	The Plan fails to mitigate overdraft: the water charges framework cannot reliably mitigate overdraft because pumping reductions remain voluntary and because price sensitivity and demand elasticity are unknown. SGMA requires that a GSP identify projects or management actions, including demand reduction or other methods, that would be sufficient to mitigate overdraft. Contrary to the Plan's claim, the water charges framework would not reduce demand or increase supply sufficiently to mitigate overdraft because it relies on voluntary pumping reductions and permits pumping in excess of sustainable pumping allocations. Mitigation of overdraft requires mandated pumping restrictions that limit total pumping to current sustainable yield plus newly produced water. The Plan fails to provide the mandatory quantification of the mitigation of overdraft: it fails to quantify the benefits of management actions, it assigns all of the Basin-wide Project benefits to the 180/400- Foot Aquifer Subbasin, it double counts some benefits, and it contains an arithmetic error.		SGMA does not specify HOW GSAs mitigate overdraft - they leave that decision to the GSAs. Using a voluntary, market-based approach must take into consideration price sensitivity and demand elasticity and often involve adjustments over time, but there are myriad examples of market mechanisms meeting and exceeding environmental targets (which is the sustainable yield in this case). This is the approach the Board has elected to take. The Board may change that at a future date, or they may combine it with mandatory pumping reductions if they so choose. The GSP outlines the plan to achieve sustainability, but allows for flexibility in implementation to adjust as needed to meet sustainability.	LandWatchCommentsEntireGSP_FINAL.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-45					11/13/2019	LandWatch	The implementation plan improperly delays substantive action for two years in order to accommodate the implementation schedule for the GSP for the rest of the Basin, which is not critically overdrafted.		The implementation period set forth by DWR is 20 years. The Salians Valley subbasins are hydraulically connected, and it is important that the GSA take a coordinated approach to sustainability. Development details of the projects and management actions will occur simultaneously as the other subbasin GSPs are being developed.	LandWatchCommentsEntireGSP_FINAL.pdf
W-46					11/13/2019	LandWatch	The Plan fails to identify project startup dates		Notional timelines are proposed with the understanding that exact start-up dates depend on a number of factors such as project refinement, environmental permitting, etc.	LandWatchCommentsEntireGSP_FINAL.pdf
W-47					11/13/2019	LandWatch	The Plan fails to impose pumping restrictions pending startup of new water projects. Interim pumping restrictions are needed in order to restore and maintain the protective groundwater elevations to attain the minimum threshold for seawater intrusion.		The GSP proposes other ways to meet minimum thresholds that are more likely to be agreed upon by the Board.	LandWatchCommentsEntireGSP_FINAL.pdf
W-48					11/13/2019	LandWatch	The GSP's multiple, inconsistent, incomplete, and deferred approaches to meeting the seawater intrusion minimum threshold – eventual temporary pumping reductions, a long-delayed $100+ million pumping barrier, or some eventual "agreed approach" from the Working Group – renders the GSP uncertain and inadequate as a plan.		The GSP describes several projects and management actions. Implementation of all of them may not be necessary, but further analysis and discussion is needed for the Board to decide which to implement, which will occur in the implementation period.	LandWatchCommentsEntireGSP_FINAL.pdf
W-49					11/13/2019	LandWatch	Chpater 6: Assumptions regarding efficacy of future projects and management actions to address seawater intrusion in the projected future sustainable yield should be spelled out.		The impact of each project and management action on the seawater intrusion SMC will be refined as the projects are refined.	LandWatchCommentsEntireGSP_FINAL.pdf
W-50					11/13/2019	LandWatch	Double counting of water withdrawals should be resolved.		The GSP acknowledges the potential double counting of extractions, and identifies this as an uncertainty in the water budget. Because of the many uncertainties in the historical water budget, it was deterimined that attempting to identify all double counting was not cost effective. The cost effective approach is to refine the water budget with the SVIHM when it becomes availalbe. The SVIHM does not double count surface water diversions and groundwater pumpiong. This is the approach specifically identified in the GSP.	LandWatchCommentsEntireGSP_FINAL.pdf
W-51					11/13/2019	LandWatch	Sustainable yield determinations should incorporate climate change�caused variability in precipitation.		The future sustainable yield does incoroporate reasonable climate change, in accordance with the climate change factors provided by DWR.	LandWatchCommentsEntireGSP_FINAL.pdf
W-52					11/13/2019	LandWatch	Chapter 7 should require that pumping be monitored by flowmeters.		Section 10.1.5 states that, "The SVBGSA will work with MCWRA to expand the existing well metering system currently in place to collect additional groundwater pumping information."	LandWatchCommentsEntireGSP_FINAL.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-53	9				11/25/2019	Farm Bureau	We fully support the intent of Preferred Project #1 and desire this to be the highest priority project for the 180/ 400 sub-basin (as well as the Forebay and Upper Valley sub-basins). Eradicating the exotic Arundo donax vegetation from the Salinas River Channel has multiple benefits for both landowners, the environment, and the groundwater basin. Table 9-5 lists 6,000 acre-feet of savings due to Arundo donax removal, but there is a reference of 20,000 acre-feet also; is that amount of the entire water savings for the full basin for just theArundo donax vegetation type? While we fully respect and support the program that the Resource Conservation District of Monterey County and the success achieved in removing Arundo donax, there is more to be done than just replicating this as Preferred Project #1. We urge that the draft be modified to include other vegetative species that are in overgrowth mode. ..Reducing all vegetation in the river channel would improve water conveyance and lead to increased water flows for recharge as well other possible projects, such as the diversion points for the Permit #11043 that could supply water to the Eastside trough. (see letter for full comment).		A range of water savings is included due to the range of potential benefits from existing data sources. The existing Arundo Removal Program will be nearing a 4-year review in 2020 and will be required to submit a report to permitting agencies regarding the program status. This will include an assessment of exiting vegetation management areas and arundo and tamarisk removal in the river channel. This information can be used to update strategies related to vegetation management in the river.	GSP Comment Letter-MCFB 112519.pdf
	9.4.3.6				11/25/2019	Farm Bureau	The estimated yield for this project is 11,600 AF/yr; yet, "the yield for this project is the same yield that is identified in Priority Project #2 and a portion of the yield identified in Priority Project #3. Is this statement intending that the same water.		Clarifying text has been added.	GSP Comment Letter-MCFB 112519.pdf
W-55	9.4.3.7				11/25/2019	Farm Bureau	Much more needs to be known about this particular project before it can be considered more fully. Although seawater intrusion extraction wells may very well yield 30,000 acre-feet per year, this water is essentially useless until it can be desalinated. That seems to indicate that extracted water would need to be dispose of, possibly into the ocean? After determining if this project is environmentally (and politically) feasible, the cost-benefit analysis may not be justified. If the project yield is 30,000 acre-feet, why is there a statement in the notes below Table 9-5 that shows only 22,000 acre-feet? Shouldn't the projected cost benefits of this project then be based on the 11,000 acre-feet of net yield?		The cost and benefit of the seawater intrusion pumping barrier will be refined during GSP implementation. The yield/benefit of the project is now consistent throughout the document. The yield is included soley for cost comparison to other projects. The seawater instrusion barrier does not contribute to mitigation of overdraft, but rather provides benefits in other ways, so it was removed from Table 9-5.	GSP Comment Letter-MCFB 112519.pdf
W-56	9.4.3.10				11/25/2019	Farm Bureau	We question if winter flow injection makes sense in the context of possible land fallowed and available for dedicated recharge basins. The costs of removing the ground from active production could be offset by passive recharge that has little in ongoing operational and maintenance costs, and very little (comparatively) of capital investment costs. This may be an alternative opportunity for land use should there be voluntary fallowing of land in the sub-basin area.		Surface recharge in the northern end of the 180/400 foot aquifer will likely not percolate into the deeper, productive aquifers. However, if a location is found where surface recharge does percolate to deeper aquifers, this option will be considered.	GSP Comment Letter-MCFB 112519.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-57	9.2				11/25/2019	Farm Bureau	As described, the water charges framework is a proposal and will still need approval from the SVBGSA Board of Directors (requiring 3 of 4 agricultural directors supporting the program). We question that if this type of funding program is to incentivize the reduction of groundwater pumping, the program will eventually defund itself due to declining water use revenue. This has happened to other utilities and is a distinct possibility in the Salinas Valley also as future farming practices may find more efficient means of delivering and using groundwater. We also note that significant analysis will be required to determine the correct rate levels of the proposed framework; fluctuations in crops and land values, availability of any new project water, and intensive cropping patterns may make the process of determining the rate structure nearly impossible. Will the water charges framework be adopted in all sub-basins? What happens to the budget if one or more sub-basins is not needing to adopt this method of funding?		Comments noted. These concerns will be discussed and addressed when the details of the water charges framework are developed during GSP implementation.	GSP Comment Letter-MCFB 112519.pdf
W-58	9.2.1				11/25/2019	Farm Bureau	We point out that the draft language indicates that well registration does not obviously equate to metering, but only that some wells may have meters. There is needed clarity on what well registration and metering requirements intend, how they transect, and how this will be enforced.		Clarifying text has been added.	
W-59	9.2.4				11/25/2019	Farm Bureau	We find that this section may need some enhancements with more details. This is effectively a water trading market mechanism and critical to how pumping allowances will be managed ultimately. If SVBGSA intends to manage this on a case-by-case basis, there will need to be guidelines for how this will be managed and who will make any determinations for transfers; the mechanics of this can get quite complicated and should be fully understood before any transfers are considered. What will be the platform for managing these transfers? Will farmers need to manage these trades amongst themselves? What distance will be allowed as a maximum for a transfer (only within each sub-basin)? In past community discussions there was little support for this type of program; is that why there are no details or the consultants have not recommended a platform or program? We suggest that the fallowing of land needs to be a fully-defined Management Action or Preferred Project. Will SVBGSA purchase water and retire land for a single year or more? There is no direct statement on what will happen if growers decide to change to different crops that may require higher water use, such as vineyard to vegetables. Just as followed land can be recycled into production, can irrigated land that was formerly producing low water use crops convert to a higher water use crop? Will there then be a penalty applied to that farm or land? This could then cross a line into managing land use and dictating which crops can be produced, or even restrict the ability of a farm to change when market conditions alter the economics of any given crop.		These concerns will be discussed and addressed when the details of the water charges framework are developed during GSP implementation. SVBGSA may consider promoting land fallowing to a fully defined Management Action during the next draft of the GSP, planned for 2022. There is no plan to manage which crops can be produced other than establishing pumping charges through the Water Charges Framework.	

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-60	9.3.2				11/25/2019	Farm Bureau	We support the right of landowners to do as they please with their lands in terms of wanting to continue farming, temporarily fallow or permanently retire agricultural lands under SGMA on a voluntary basis. However, we find this section lacking in detail and therefore may not garner the attention from landowners that may be interested. The assumption is that a combination of reduced pumping and Preferred Projects are likely needed; however, there is no statement on how this goal will be achieved with reduced extractions alone. The cost analysis is also incorrect and needs revision. In a basin that has seawater intrusion and facing a long list of expensive projects, we believe this warrants a more proactive and thoughtful approach. SVBGSA and its consultants should conduct a geospatial analysis to assess the best areas to potentially retire land through careful study of the economic value of the land and water, and then proactively contact the specific landowners to gauge interest in voluntarily participating. There is no mention that funding could be sourced from grant programs for water quality, habitat, and conservation easements for a voluntary land retirement program. All sources of financial support should be fully explored and exhausted prior to SVBGSA expending funds on land fallowing or retirement.		Comment noted. SVBGSA agrees that a voluntary land retirement program is the correct approach. The financial incentive for land retirement will be refined during GSP implementation.	
W-61	9.6				11/25/2019	Farm Bureau	We find there is a lack of transparency in understanding the overall goal; the total acre-feet of savings through projects needed to bring the sub-basin into balance should be clearly stated here. What is the current demand? What is the sustainable yield? What is the overdraft amount? What is the target goal that includes a buffer for seawater intrusion mitigation? There is also a lack of understanding of what the cumulative impact of multiple projects would be, if more than one or all are put into place; would there be enough water to manage multiple projects? For example, the three projects listed for the Castroville Seawater Intrusion Project (CSIP) have overlapping water savings, yet these three projects are listed independent of each other.		The current demand, overdraft, and sustainable yield are included in Chapter 6. The cumulative impact of multiple projects will be addressed after the projects are refined during GSP implementation and the SVIHM becomes available for project benefit analysis.	

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-62	9.3				11/25/2019	Farm Bureau	Our members are sensitive to total costs of implementing SGMA over the next 20 years. Between the First and Second drafts of Chapter 9 (between July 18 and August 8, 2019), two new Management Actions (MAs) have been added and the cost for existing MAs have expanded in number of years and cost per year, and total cost. We calculate that annual costs for these Management Actions have increased total costs by $1,000,000 or more. On the "Public Comment" document, there is no apparent public comment on these MA changes; most of the comments were around the Water Charges Framework and Projects. A table listing the MAs with anticipated costs would be a good addition to this chapter of the document. We request more specific information on the following: -Why did MA #1 change from a 4% 30-year amortization to a 6% 25-year amortization? • How many years is MA #2 expected to take? There is only a notation of "on going." • Why has the cost per year increased for MA #4? • SVBGSA will provide oversight for many of the MAs; will these be overseen by SVBGSA staff or the consultants? • Why are there missing MAs on the Table 10-1? • Should 180/400 operational costs specific to MAs be in table 10-1?		Costs have been updated according to feedback provided on subsequent drafts regarding more realistic projected costs of implementation.	
W-63		10-1, 10-2			11/25/2019	Farm Bureau	There appear to be some mathematical errors on these two tables. Table 10-1 lists planning level costs that total to $1,399,000 yet the table reflects a total of $1,784,000, a difference of $385,000. Table 10-2 lists planning level cots of $2,922,000 yet the table reflects a total of $9,423,000, a difference of $6,501,000. If either of these tables reflects planning level costs that are for multiple years, it is not clearly noted; thus, there is a distortion of the projected planning level costs for the first five years of implementation.		Tables have been double checked and corrected.	GSP Comment Letter-MCFB 112519.pdf
W-64		9.4.3.6			11/25/2019	Farm Bureau	The estimated yield for this project is 11,600 AF/yr; yet, "the yield for this project is the same yield that is identified in Priority Project #2 and a portion of the yield identified in Priority Project #3. Is this statement intending that the same water can be saved twice, or is this just a simple double reference to water that can be saved? Clarification is needed to determine the exact savings for this project and the related three projects listed for the CSIP upgrades and expansion.		No, it is not intended that the same water can be saved twice, but the CSIP projects are related. This statement was intended to avoid double counting of project yields, however, text has been added to clarify further.	GSP Comment Letter-MCFB 112519.pdf
W-65	3				11/21/2019	Dept of Fish and Wildlife	The Department recommends changing the map on page 3-14 to include privately conserved lands to Moro Cojo Ecological Reserve. The Department also recommends the GSP include a section within 3.3 Jurisdictional Areas that defines the privately conserved lands within its boundary, including Elkhorn Slough Foundation lands.		The labeling of the the Department's Moro Cojo Ecological Reserve matches the data provided by DWR. We would appreciate further information on any errors that we can remedy. Figure 3-3 is intended to identify Federal and State jurisdictional areas, not private foundation lands. This map shows other government agencies that may have groundwater jurisdiction: the map is not intended to identify all conserved lands.	Dept of Fish and Wildlife SVBGSA GSP Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-66					11/21/2019	Dept of Fish and Wildlife	i.The Department recommends that the GSP model results that identify the estimated quantity and timing of streamflow depletions in the Subbasin. The Department also recommends that the GSP include clear documentation on model development, as numerical modeling is an apt but complex tool for identifying surface water-groundwater connectivity. ii.The Department recommends including the shallow water-bearing sediments above the Salinas Valley Aquifer as a principal aquifer in the GSP to encourage diligent monitoring and management of a resource of great significance to environmental beneficial uses and users in the Subbasin. iv.The Department requests clarification on how surficial recharge can be both severely restricted by the Salinas Valley Aquitard and comprise such a significant portion of the Water Budget inflow when shallow groundwater above the aquitard is not included in the GSP's Water Budget analysis. v.The Department requests including expanded ISW studies and monitoring in the Subchapter 4. 7 Data Gaps.		i. The SVBGSA will use the SVIHM to estimate the quantity and timing of streamflow depletions in the Subbasin when the model becomes available. ii. In accordance with the description in DWR Bulletin 118, the shallow sediments are not identified as a principal aquifer. iii. We have added clarifying language to the text. iv. Text has been added discussing uncertainty regarding the fate of percolation from the river. v. The data gaps address the key issues needed to substantiate the sustainable management criteria for interconnected surface waters.	Dept of Fish and Wildlife SVBGSA GSP Comments
W-67	4				11/21/2019	Dept of Fish and Wildlife	The Department recommends developing a specific plan and timeline for GOE identification that includes methods used to vet the current set of potential GD Es shown in Figure 4-10. If the GSP will include a depth-to-groundwater analysis for GOE verification, in addition to field reconnaissance, the Department advjses development of a hydrologically robust baseline that relies on multiple, climatically representative years of groundwater elevation and that accounts for the inter-seasonal and inter-annual variability of GOE water demand. The Department also suggests careful consideration of potential GDEs near interconnected surface water bodies, as they may depend on sustained groundwater elevations that stabilize the gradient or rate of loss of surface water, rather than directly on the water table itself.		We have identified potential GDEs using the approach detailed by TNC. Currently, there is no plan to further analyze GDEs. However, this subject will likely be addressed again during GSP implementation, and we look forward to working with TNC when we revisit this subject.	Dept of Fish and Wildlife SVBGSA GSP Comments
W-68					11/21/2019	Dept of Fish and Wildlife	ii. The Department recognizes that NCCAG (Klausmeyer et al. 2018) provided by California Department of Water Resources (CDWR) is a good starting reference for GDEs however, the Department recommends that the GSP consider additional resources for evaluating GOE locations, including but not limited to the California Department of Fish and Wildlife (CDFW) Vegetation Classification and Mapping Program (VegCAMP) (CDFW 2019A); the CDFW California Natural Diversity Database (CNDDB) (20198); the California Native Plant Society (CNPS) Manual of California Vegetation (CNPS 2019A); the . CNPS California Protected Areas Database (CNPS 20198); the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (2018); the USFWS online mapping tool for listed species critical habitat (2019); the U.S. Forest Service CAL VEG ecological grouping classification and assessment system (2019); and other publications by Klausmeyer et al. (2019), Rohde et al. (2018), The Nature Conservancy (TNC) (2014), and Witham et al. (2014).		We have identified potential GDEs using the approach detailed by TNC. Currently, there is no plan to further analyze GDEs. However, this subject will likely be addressed again during GSP implementation, and we look forward to working with TNC when we revisit this subject.	Dept of Fish and Wildlife SVBGSA GSP Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-69					11/21/2019	Dept of Fish and Wildlife	The Department recommends that the GSP provide a more robust representation of water quality data for the constituents identified within the plan and provide data (i.e. graphical or tabular) illustrating trends over time. Additionally, the Department recommends that the GSP provide the most current available water quality information for the constituent presented within the plan to further substantiate sustainability for this indicator.		Additional groundwater quality analysis is not warranted under SGMA. The GSP is not intended to address all groundwater quality conditions in the Subbasin; rather it sets a baseline to asses whether future actions taken by the SVBGSA may impact groundwater quality.	Dept of Fish and Wildlife SVBGSA GSP Comments
W-70					11/21/2019	Dept of Fish and Wildlife	The Department recommends that the GSP specify management actions to mitigate potential undesirable results to ISW and GDEs during dry years when groundwater pumping increases. Suggestions include pumping restrictions for areas that may impact surface water flow when streamflow depletion minimum thresholds are reached in dry and critical water years.		The GSP is a long-term management plan, and is not intended to manage to short-term weather fluctuations.	Dept of Fish and Wildlife SVBGSA GSP Comments
W-71					11/21/2019	Dept of Fish and Wildlife	See OTHER COMMENTS beginning on page 9 , Implementation of Project Actions Related to SGMA		Comment noted. These details will be taken into consideration in the planning and implementation of projects and management actions.	Dept of Fish and Wildlife SVBGSA GSP Comments
W-72					11/24/2019	James Sang	I disagree with the proposed groundwater sustainability project unless it can add a managed aquifer recharge project! My objection is that majority of the proposed projects take water and don't add water. The injections wells need a source of water to work. CSIP requires recycled water and water from the Salinas River to work. The Arundo project sounds iffy. Plants only transpire 10 percent of the atmosphere water vapor, which is a small amount of water effecting the ground moisture. I would like the project to include my proposed swale and pond idea to see if we can recharge the ground water and the aquifer and wells. I believe that this is a project that will be accepted by the property owner because this would directly effect the well owner. The project can be monitered easily to find the results and the well owner can use the surface pond water to irrigate.		Managed Aquifer Recharge IS included within the list of projects. It wasn't initially called that specifically, so a paragraph has been added to clarify.	SVBGSA PROJECT James Sang.pdf
W-73	App 11E				11/25/2019	TNC	Appendix 11E states (Responses to Comments 7-26, 8-124, 8-132): “The shallow aquifer is not considered a principal aquifer.” The GSP states (p. 4-17) that some domestic wells draw water from the shallow aquifer, and that groundwater in these sediments is hydraulically connected to the Salinas River. TNC disagrees with the statement that the shallow aquifer is not a principal aquifer; it is indeed a principal aquifer that needs Sustainable Management Criteria established to prevent adverse impacts to GDEs and surface water beneficial users. Additionally, SGMA defines principal aquifers as “aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems” [23 CCR § 351 (aa)].		Comment noted. In accordance with DWR Bulletin 11, The GSP does not identify the shallow sediments as a principal aquifer.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-74	App 11E				11/25/2019	TNC	Appendix 11E states (Responses to Comments 8-131, 8-133, 8-134): "The GSP does not protect species; it assesses whether the depletion of surface water due to pumping is significant or unreasonable." However, the Water Code § 10723.2 states: "The groundwater sustainability agency shall consider the interests of all (emphasis added) beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to [..] (e) Environmental users of groundwater; and (f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies. Identifying beneficial users of surface water, which include environmental users, is a critical step in defining "significant and unreasonable adverse impacts". Without this it is impossible to know what is being impacted. In the GSP, please propose Sustainable Management Criteria that assure protection of GDEs and instream environmental beneficial users.		As stated in section 8.6.2.3, groundwater elevations are set above historical and current depletion rates, and therefore the impact to surface water bodies, including GDEs, will be less than historical impacts. Thererfore, our impact on GDEs is neither significant nor unreasonable.	TNC comments - Salinas 180-400ft.pdf
W-75					11/25/2019	TNC	TNC considers the 180/400-Foot Aquifer Subbasin Draft GSP to be inadequate under SGMA since key environmental beneficial uses and users are not adequately identified and considered. In particular, ISWs and GDEs are not adequately identified and evaluated for ecological importance or adequately considered in the basin's sustainable management criteria. Please present a thorough analysis of the identification and evaluation of ISWs and GDEs in subsequent drafts of the GSP. Once GDEs are identified, they must be considered when defining undesirable results and evaluated for further monitoring needs.		We have identified potential GDEs using the approach detailed by TNC. Currently, there is no plan to further analyze GDEs. However, this subject will likely be addressed again during GSP implementation, and we look forward to working with TNC when we revisit this subject.	TNC comments - Salinas 180-400ft.pdf
W-76	11				11/25/2019	TNC	The Joint Exercise of Powers Agreement (Appendix 11D) lists the Board of Directors that includes a Director representing environmental users and interests. This is the only mention of environmental users in Chapter 11. No details are given as to the types and locations of environmental uses and habitats supported, or the designated beneficial environmental uses of surface waters that may be affected by groundwater extraction in the Subbasin.		More information on environmental users and interests has been added to Chapter 11.	TNC comments - Salinas 180-400ft.pdf
W-77	3.1		3-39 - 3-50		11/25/2019	TNC	This section discusses the city (Salinas, Gonzales, and Marina) and county (Monterey) general plans covering areas within the Subbasin. Please include a discussion of how implementation of the GSP may affect and be coordinated with General Plan policies and procedures regarding the protection of wetlands, aquatic resources and other GDEs and ISWs.		Section 3.10.7 discusses plan implementaion effects on existing land uses	TNC comments - Salinas 180-400ft.pdf
W-78					11/25/2019	TNC	This section should identify Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the Subbasin and if they are associated with critical, GDE or ISW habitats. Please identify all relevant HCPs and NCCPs within the Subbasin and address how GSP implementation will coordinate with the goals of these HCPs or NCCPs.		The Salinas River HCP is addressed in Chapter 8. No NCCPs have been developed to our knowledge.	TNC comments - Salinas 180-400ft.pdf
W-79					11/25/2019	TNC	Please refer to the Critical Species Lookbook4 to review and discuss the potential groundwater reliance of critical species in the basin. Please include a discussion regarding the management of critical habitat for these aquatic species and its relationship to the GSP.		Comment noted. This is not relevant to the general plans discussion.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-80	3.3		3-13 - 3-15		11/25/2019	TNC	The GSP describes several wildlife refuges, reserves, and conservation areas under Federal and State Jurisdiction, however there is no discussion of any in-stream flow requirements or other protections in place for species in these critical areas. Please include a discussion regarding the management of critical habitat for aquatic species and its relationship to the GSP, including discussion of any in-stream flow requirements.		The Salinas River HCP is addressed in Chapter 8. This is the only known flow requirement for aquatic species.	TNC comments - Salinas 180-400ft.pdf
W-81	3.10.5		Mar-47		11/25/2019	TNC	The GSP includes a brief discussion of well permitting policies governed by Monterey County. Please include a discussion of how future well permitting will be coordinated with the GSP to assure achievement of the Plan's sustainability goals.		There is no plan to modify the well permitting system	TNC comments - Salinas 180-400ft.pdf
W-82					11/25/2019	TNC	The State Third Appellate District recently found that counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF v. SWRCB and Siskiyou County, No. C083239). Compliance of well permitting programs with this requirement should be stated in the GSP.		A paragraph on the case was added to Chapter 3. Monterey County is responsible for well permitting in the Salinas Valley.	TNC comments - Salinas 180-400ft.pdf
W-83	4.3.2				11/25/2019	TNC	[Comment 4-14: GSP text changed but theme of original comment still holds; response does not adequately address the comment.] The SVBGSA has adopted the base of the aquifer defined by the USGS (Durbin et al., 1978). However, as noted on page 9 in DWR's Hydrogeologic Conceptual Model BMP5 "the definable bottom of thebasin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data, as part of the best available data available to the GSA, should also be included in the determination of the basin bottom. This will prevent extractors with wells deeper than the basin boundary from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary.		This GSP has adopted the USGS definition of the bottom of the aquifer for consistency.	TNC comments - Salinas 180-400ft.pdf
W-84	4.4				11/25/2019	TNC	Regional basin-wide geologic cross sections are provided in Figures 4-6 through 4-8 (p. 4-14 to 4-16). These cross-sections do not include a graphical representation of the manner in which the shallow aquifer may interact with ISWs or GDEs that would allow the reader to understand this topic. Please include example near-surface cross section details that depict the conceptual understanding of shallow groundwater and stream interactions at different locations.		Per SGMA regulations, these cross sections illustrate the current understanding of the regional, principal aquifers. Near-surface cross sections are not required by SGMA, and it is unclear that adequate data exists to construct realistic near-surface cross sections.	TNC comments - Salinas 180-400ft.pdf
W-85	4.4.1		4-17		11/25/2019	TNC	TNC disagrees with the statement that the shallow aquifer is not a principal aquifer; it is indeed a principal aquifer that needs Sustainable Management Criteria established to prevent adverse impacts to GDEs and surface water beneficial users.		Comment noted	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-86	5.6.1		5-54		11/25/2019	TNC	While groundwater in the 180- and 400-foot Aquifers is generally not considered to be hydraulically connected to the Salinas River or its tributaries, the Shallow Aquifer (which resides above the Salinas Valley Aquitard) likely does. To address this, interconnections of surface water with groundwater in the Shallow Aquifer should be evaluated in this section of the GSP, since the Shallow Aquifer is within the 180/400-Foot Aquifer Subbasin. Where data gaps exist, cite them here or refer to a subsequent section of the GSP. Cite cross-sections that relay the conceptual understanding of the shallow aquifer interaction with surface water. Groundwater in the shallow aquifer is also likely to be supporting groundwater dependent ecosystems and interacting with the Salinas River in this part of the basin. Basins with a stacked series of aquifers may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, that can support springs, surface water, and groundwater dependent ecosystems. This is because the goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits, and while groundwater pumping may not be currently occurring in a shallow aquifer, it could be in the future.		Because the shallow sediments are not a principal aquifer, they are not evaluated in this GSP. The sustainable management criteria state that there will not be any increased depletion of surface water from the Salinas River due to pumping from the 180 for 400-Foot aquifers.	TNC comments - Salinas 180-400ft.pdf
W-87					11/25/2019	TNC	Mapping ISW locations would be best done using contours of depth to groundwater measured from multiple points in time (different seasons and water year types) rather than only from Fall 2013. Groundwater conditions evaluated across the range of seasonal and interannual time frames provides a more representative view of ISWs.		Comment noted. Our ability to identify areas of interconnected surface water will be improved when the SVIHM becomes available.	TNC comments - Salinas 180-400ft.pdf
W-88					11/25/2019	TNC	The groundwater levels shown on Figure 5-35 are irrelevant to the discussion of ISWs since they do not map the shallow water table. The use of piezometric head from confined aquifers should be eliminated from these ISW mapping efforts, since they do not adequately reflect the position of the true water table (see last paragraph on p. 38 of Salinas Valley Basin ISP).		These are maps of groundwater levels in the principal aquifers.	TNC comments - Salinas 180-400ft.pdf
W-89					11/25/2019	TNC	It is unclear on Figure 5-35 whether missing groundwater levels along certain reaches of the Salinas River are due to groundwater levels >20 feet bgs or due to data gaps in groundwater levels. Mapping the position of wells used for the interpolation of groundwater elevation data used to map groundwater level contours near surface water would help provide further clarification.		The groundwater level maps were adopted from MCWRA, who does not provide well locations for their maps. In accordance with SGMA regulations, future groundwater elevation maps will provide well locations.	TNC comments - Salinas 180-400ft.pdf
W-90	5			5-35	11/25/2019	TNC	Please elaborate on how depth to groundwater contours were developed for Figure 5-19 of the Salinas Valley Basin ISP and on Figure 5-35 of the GSP.		Groundwater contours were adopted directly from maps previously developed by MCWRA. These previously developed maps were considered the best available data for historical groundwater level contours.	TNC comments - Salinas 180-400ft.pdf
W-91					11/25/2019	TNC	We recommend mapping the gaining and losing reaches onto Figure 5-19 (Salinas Valley Basin ISP) using the data from Figure 5-23 (Salinas Valley Basin ISP).		Comment noted. We will review this in the ISP.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-92	5.6				11/25/2019	TNC	Please present or refer to a depth to groundwater map in this section. Refer to our comments on Section 5.6 Interconnected Surface Water above. Please ensure that only wells screened in the shallow unconfined aquifer are used to develop the depth to groundwater maps. Using "depth to groundwater" measurements from confined aquifers is mapping piezometric head of the confined aquifer and not detecting groundwater conditions in the unconfined aquifer that is supporting the ecosystem. The GSP refers to data gaps in water levels in the shallow unconfined aquifer. If there are insufficient groundwater level data in the shallow aquifer, then the GDE polygons in these areas should be included as GDEs in the GSP until data gaps are reconciled in the monitoring network.		Figure 5-35 is a depth to groundwater map. As noted in Appendix 4A, the conservative approach to identifying potential GDEs used in this GSP, "clearly has the potential to overestimate the number of GDEs in the Subbasin."	TNC comments - Salinas 180-400ft.pdf
W-93					11/25/2019	TNC	Please clarify how the light blue shaded area shown in Figure 4A-3 (depth to water < 30 ft south of Chualar) is used for the GDE analysis. The figure implies an incorrect interpretation of the GDE Guidance		The methodology is described in Appendix 4A. Only areas south of Chular or near the coast have groundwater elevations within 30 feet of ground surface.	TNC comments - Salinas 180-400ft.pdf
W-94					11/25/2019	TNC	Please use care when considering rooting depths of vegetation. Please list the species in each GDE, and whether the GDE was eliminated or retained based on the 30-foot standard, and provide evidence for the decision.		Comment noted.	TNC comments - Salinas 180-400ft.pdf
W-95					11/25/2019	TNC	While depth to groundwater levels within 30 feet are generally accepted as being a proxy for confirming that polygons in the NC dataset are connected to groundwater, it is highly advised that seasonal and interannual groundwater fluctuations in the groundwater regime are taken into consideration. Utilizing groundwater data from one point in time (e.g., Fall 2013) can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Based on a study we recently submitted to Frontiers in Environmental Science Journal, we've observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Seasonal fluctuations in the regional water table can support perched groundwater near an intermittent river that seasonally runs dry due to large seasonal fluctuations in the regional water table. While perched groundwater itself cannot directly be managed due to its position in the vadose zone, the water table position within the regional aquifer (via pumping rate restrictions, restricted pumping at certain depths, restricted pumping around GDEs, well density rules) and its interactions with surface water (e.g., timing and duration) can be managed to prevent adverse impacts to ecosystems due to changes in groundwater quality and quantity under SGMA. We highly recommend using depth to groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. (see letter for more details)		Our ability to identify areas of interconnected surface water will be improved when the SVIHM becomes available.	TNC comments - Salinas 180-400ft.pdf
W-96					11/25/2019	TNC	Decisions to remove, keep, or add polygons from the NC dataset into a basin GDE map should be based on best available science in a manner that promotes transparency and accountability with stakeholders. Any polygons that are removed, added, or kept should be inventoried in the submitted shapefile to DWR, and mapped in the plan. We recommend revising Figure 4-10 to reflect this change.		Interim maps are included in Appendix 4A. Figure 4-10 is intended to only show the final set of potential GDEs.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-97					11/25/2019	TNC	Please include a description of the types of species (protected status, native versus non-native), habitat, and environmental beneficial uses (see Worksheet 2, p.74 of GDE Guidance Document) and assign an ecological value to the GDEs.		This will be undertaken should the GSA opt to undertake additional GDE analysis.	TNC comments - Salinas 180-400ft.pdf
W-98					11/25/2019	TNC	Are any of the wells from the MCWRA program (described in Section 5.1.1 of the Salinas Valley Basin ISP) close enough (<1 km) to GDEs and screened in the shallow portions of the aquifer to characterize historical and current groundwater conditions for each GDE? If data gaps exist, they should be discussed in Chapter 5.		This has been identified as a data gap that will be addressed during implementation.	TNC comments - Salinas 180-400ft.pdf
W-99					11/25/2019	TNC	The GDE Pulse web application developed by The Nature Conservancy provides easy access to 35 years of satellite data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within the 180-400 Foot Aquifer area (Figure 1). Over the past 10 years (2009-2018), NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture which are correlated to declines in groundwater levels (e.g., as indicated by wells GZWA21202, CHEA21208).		Comment noted	TNC comments - Salinas 180-400ft.pdf
W-100					11/25/2019	TNC	In a future draft of the document, please provide more details on how the needs of environmental beneficial users (GDE and ISW ecosystems) will be balanced with other water users in the basin.		In accordance with the SGMA regulations, the GSP currently describes the assessment of whether surface water depletions are significant and unreasonable.	TNC comments - Salinas 180-400ft.pdf
W-101					11/25/2019	TNC	Please provide or crossreference this information, including reference to publicly available information regarding GDEs that was researched and how environmental stakeholders were engaged.		All cited material will be uploaded to the SGMA Portal when the GSP is uploaded. Environmental stakeholder engagement is addressed in Chapter 11.	TNC comments - Salinas 180-400ft.pdf
W-102					11/25/2019	TNC	The shallow aquifer is indeed a principal aquifer that needs SMC established to prevent adverse impacts to surface water beneficial users. SGMA defines principal aquifers as "aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [23 CCR § 351 (aa)]. In addition, more nested/clustered wells are needed in the 180-400 Foot Aquifer area to determine vertical groundwater gradients and whether pumping in the deeper aquifers are causing groundwater levels to lower in the shallow aquifer and deplete surface water.		Comment noted. In accordance with DWR Bulletin 11, The GSP does not identify the shallow sediments as a principal aquifer.	TNC comments - Salinas 180-400ft.pdf
W-103					11/25/2019	TNC	As previously mentioned in our April 11 letter regarding Chapter 5 of the Draft GSP, the shallow aquifer in the 180/400 Foot Aquifer and Monterey Subbasins are likely to be supporting GDEs and interconnecting with the Salinas River. Thus, pumping in deeper aquifers can still cause adverse impacts to environmental beneficial users reliant on shallow groundwater. Even if pumping is not occurring in shallow groundwater aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, especially those that support springs, surface water and GDEs for current and future uses.		The sustainable management criteria state that there will not be any increased depletion of surface water from the Salinas River due to pumping from the 180 for 400-Foot aquifers.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-104					11/25/2019	TNC	Several published references indicate that the 180-Foot aquifer is in direct hydraulic communication with the overlying Dune Sand Aquifer or Shallow Alluvial Aquifer where the Salinas Valley Aquitard is thin or absent.7 These same references indicate aquitards within the 180/400 Foot aquifer system are known to be locally discontinuous. In addition, the fact that the Salinas is a losing stream and that 67,000 acre feet are recharged from the stream to the groundwater basin in an average year strongly suggests that the shallow aquifer is hydraulically connected to the underlying pumped aquifer systems.		The GSP notes that the Salinas Valley Aquitard is thin or absent in places. However the depth to groundwater map shown on Figure 5-35 shows that groundwater elevations in the 180-Foot aquifer are high enough to be hydraulically connected to the Salinas River in only limited areas.	TNC comments - Salinas 180-400ft.pdf
W-105	8.10.2				11/25/2019	TNC	Please include a discussion of how baseline conditions, current trends and potential adverse impacts to GDEs were considered in the definition of significant and unreasonable conditions and establishment of Minimum Thresholds and Measurable Objectives. A discussion of applicable state, federal and local standards, policies and guidelines applicable to the GDE species and habitats identified should also be provided. The section should explain how, in light of the nature and condition of the GDEs, these Sustainable Management Criteria will prevent undesirable results related to damage to GDE resources. Any data gaps and the means to address them should be identified.		Chapter 8 includes a discussion of how minimum thresholds effect ecological users for each of the six sustainability indicators.	TNC comments - Salinas 180-400ft.pdf
W-106					11/25/2019	TNC	Please expand the listing of beneficial uses and users to address GDEs and ecosystems that are located adjacent to the river and its tributaries. The discussion of ecological land uses and users should include GDEs and ecosystems adjacent to the river and its tributaries, and their dependence on interactions with ISW and groundwater.		The GSP addresses GDEs as required by regulation. The Board of Directors was informed during open session that they have the ability to expand the definition of significant and unreasonable groundwater elevations to address GDEs	TNC comments - Salinas 180-400ft.pdf
W-107					11/25/2019	TNC	We recommend the streamflow requirements set by the NMFS should be explicitly stated or referenced in the GSP. In addition, any other state, federal or local standards, requirements and guidelines pertaining to the GDE habitats and species identified in the NC dataset or the list of species included in Attachment C should also be discussed or referenced.		As discussed in Section 8.11.1, The U.S. Army Corps of Engineers has re-initiated consultation with the National Marine Fisheries Service on the Biological Opinion. No flow requirements are presently in place, even though MCWRA continues to operate in accordance witht he 2007 biological opinion as a safe harbor practice. The GSP is not required to meet flow requirements, it is only required to assess whether depletions due to pumping are significant and unreasonable. Therefore, there is no need to list flow requirements in this document. The Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River (MCWRA, 2005) will be included in the list of references uploaded to DWR during GSP submission.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-108					11/25/2019	TNC	Model estimates should be monitored more closely than every five years in order to detect potentially significant effects in a time frame that allows for rapid response and alleviation of ecosystem decline. Please discuss how the minimum threshold will be measured in a way that assures protection of GDEs and instream environmental beneficial users.		The GSP will be addressed regularly in accordance with SGMA regulations. The modeling approach to assessing depletions due to pumping is the approach proposed in the DWR BMP for monitoring.	TNC comments - Salinas 180-400ft.pdf
W-109					11/25/2019	TNC	It is noteworthy that the table does not include a single well completed in the Shallow Alluvial or Dune Sand Aquifer. Please identify the lack of shallow aquifer monitoring wells as a data gap, and cross reference your plans discussed in Chapter 7 to install a sufficient number of shallow monitoring wells to assess potential undesirable results to GDEs.		No wells are included for the shallow sediments because they do not constitute a principal aquifer. However, shallow wells along the Salinas River that will help estimate river depletions are identified as a data gap, and will be installed during implementation.	TNC comments - Salinas 180-400ft.pdf
W-110	8.6.2.3 and 8.7.2.2				11/25/2019	TNC	Please revise these sections to include a discussion regarding the effects of potential groundwater level declines on GDEs and limitations of groundwater level monitoring alone to assess potential undesirable results to GDEs.		In accordance with SGMA regulations, chapter 8 includes a discussion of how minimum thresholds effect ecological users for each of the six sustainability indicators.	TNC comments - Salinas 180-400ft.pdf
W-111	8.6.2.5 and 8.7.2.4				11/25/2019	TNC	Please include a discussion explaining how GDEs, ISWs and recreational uses may benefit or be protected by implementation of the proposed Minimum Thresholds and Measurable Objectives.		In accordance with SGMA regulations, chapter 8 includes a discussion of how minimum thresholds effect ecological users for each of the six sustainability indicators.	TNC comments - Salinas 180-400ft.pdf
W-112	8.6.4.3		8-26		11/25/2019	TNC	This section should be revised to use these data as a basis for addressing how the proposed compliance strategy will address significant and undesirable decline of GDEs at the spatial scale already observed in the GDE Pulse data.		The undesirable result includes the additional clause that no one well will exceed it's minimum threshold for more than two consecutive years to avoid ongoing, localized water level declines.	TNC comments - Salinas 180-400ft.pdf
W-113	7	7-2	7-4		11/25/2019	TNC	This fact should be acknowledged with a cross reference to Section 7.2.4 which describes the proposed actions to remedy this situation.		Section 7.2.4 only addresses the groundwater level monitoring plan for principal aquifers, and therefore is not relevant as a cross reference for the shallow sediments. Shallow wells along the Salinas River that will help estimate river depletions are identified as a data gap for the surface water depletion SMC.	TNC comments - Salinas 180-400ft.pdf
W-114	7.7		7-29		11/25/2019	TNC	Please revise this section to (1) reflect what is known and published regarding potential surface-groundwater interactions in the subbasin and related groundwater level and budget trends, (2) identify the existing data gaps, and (3) provide recommendations for an adequate number of monitoring wells to assess surface-groundwater interaction and shallow groundwater level trends.		Text has been added to discuss the uncertainty regarding the fate of surface water depletions.	TNC comments - Salinas 180-400ft.pdf
W-115					11/25/2019	TNC	Please specify what other monitoring data and methods will be implemented to inform a determination whether significant and unreasonable impacts to GDEs are occurring, and explain how they will adequately meet the requirements of 23 CCR §354.34(c)(6) relative to GDEs and ISWs.		The groundwater model will be used to assess whether future surface water depletions exceed current rates, and therefore become unreasonable.	TNC comments - Salinas 180-400ft.pdf
W-116					11/25/2019	TNC	In Appendix 7B, please include monitoring protocols that meet the requirements of 23 CCR §354.34(c)(6) relative to GDEs and ISWs.		Because there is no specific GDE monitoring other than estimating surface water depletion rates, no monitoring protocols are required.	TNC comments - Salinas 180-400ft.pdf
W-117	9.1		9-1		11/25/2019	TNC	Please include environmental benefits and multiple benefits as criteria for assessing project priorities.		The SVBGSA will attempt to address multiple benefits as the list of projects are refined.	TNC comments - Salinas 180-400ft.pdf
W-118	9.3		9-9 to 9-21		11/25/2019	TNC	Please consider adding Management Actions which include education and outreach for protection of GDEs and ISWs as well as specific management of these ecosystems and the species they provide for.		Text has been added to the existing education and outreach management action.	TNC comments - Salinas 180-400ft.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-119	9.4				11/25/2019	TNC	Section 9.4.1 lists “Direct Recharge through recharge basins or wells” as one of the four major types of projects that can be developed to supplement the 180/400-Foot Aquifer Subbasin’s groundwater supplies or limit seawater intrusion. However, only one of this project type is presented, as an Alternative Project. The description of Measurable Objectives for Alternate Project 2 (Recharge Local Runoff from Eastside Range) only identifies benefits to groundwater elevation, groundwater storage, land subsidence, and groundwater quality. Because maintenance or recovery of groundwater levels or construction of recharge facilities may have potential environmental benefits, it would be advantageous to demonstrate multiple benefits from a funding and prioritization perspective. For Alternate Project 2, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.		The comment is inaccurate: priority projects 7, 8 and 9 are all direct recharge projects. Alternate project 2 is included only for Valley-wide completeness, but does not directly impact the 180/400-Foot Aquifer Subbasin. This project will be discussed in more detail in the Eastside Subbasin GSP.	TNC comments - Salinas 180-400ft.pdf
W-120	9.4				11/25/2019	TNC	If ISWs and GDEs will not be adequately protected by the projects listed, please include and describe additional management actions and projects targeted for protecting ISWs and GDEs.		Existing projects and actions, including priority and alternate projects and actions, are sufficient to avoid all undesirable results.	TNC comments - Salinas 180-400ft.pdf
W-121					11/25/2019	TNC	Please consider identifying if there is habitat value incorporated into the design and how the recharge basins will be managed to benefit environmental users. Grant and funding considerations for SGMA-related work may be given to multi-benefit projects that can address water quantity as well as provide environmental benefits. Therefore, please include environmental benefits and multiple benefits as criteria for assessing project priorities.		The SVBGSA will attempt to address multiple benefits as the list of projects are refined. The clear example is project #1 - invasive species removal.	TNC comments - Salinas 180-400ft.pdf
W-122	3.4.1				11/25/2019	Chevron	It is stated in the GSP, that the 180/400-Foot Aquifer Sub-basin has three water source types: groundwater, surface water, and recycled water. However, there is inconsistent use of terminology: both "recycled" and "reclaimed" water appear to be used interchangeably in the document. Chevron recommends the consistent use of the term reclaimed as opposed to recycled. While the terms are synonyms, reclaimed better describes the conversion of wastewater into water that can be reused for other purposes.		All mentions of reclaimed water have been changed to recycled water for consistency.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-123					11/25/2019	Chevron	Chevron recommends that the SVBGSA include a fourth category, that being "desalinated water". This will include the desalinated new water that is expected to be produced by the California American Water (Cal-Am) Monterey Peninsula Water Supply Project. It will also allow for the inclusion of water sources created via reverse osmosis or equivalent processes.		This will be considered in the future, but at this point is not included because there currently are not any sources of desalinated water in the Subbasin.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-124	3.9				11/25/2019	Chevron	Chevron recommends that the California American Water (Cal-Am) Monterey Peninsula Water Supply Project also be included in this section. While not reclaimed water, the Cal-Am desalination project will represent a new source of water that will be used for urban uses in the Monterey Peninsula, which will offset water demand from the other water sources within the Sub-basin.		There is uncerainty regarding whether this project will move forward, so this was not included at this point.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-125	6				11/25/2019	Chevron	The "future" water budget is based on output from a groundwater model still under developed by the USGS. Chevron notes that the Salinas Valley Integrated Hydrologic Model (SVIHM) has not been made available for public review. Chevron formally requests that a copy of the model and its relevant input parameters be provided for review. Without external review, the water budget lacks foundation for broad stakeholder acceptance and becomes a matter of faith.		USGS will release the SVIHM review in 2020, at which point stakeholders can review it.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-126	6				11/25/2019	Chevron	Although this GSP is for the 180/400-Foot Aquifer Sub-basin, the SVIHM is dependent on flow parameters for the entirety of the Salinas Valley Basin. Chevron notes that the amount of monitoring well data at the southern boundary of the Salinas Valley - Upper Aquifer Sub-basin is sparse (between Monterey and San Luis Obispo counties). This could be a consequential source of error in the USGS model.		Comment noted. The USGS is working on reducing error within the model.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-127	6.2.2				11/25/2019	Chevron	Chevron notes that the Groundwater budget inflows does not include desalinated water and recommends that it be added to the "Inflows" budget. This will account for new source of desalinated water expected from projects like the California American Water (Cal-Am) Monterey Peninsula Water Supply Project		Comment noted.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-128	6.11				11/25/2019	Chevron	In answer to a Chevron question posed at a meeting of the Advisory Committee, it was learned that the USGS model has not been history matched using actual data from prior years. Replicating historical data seems an obvious first step in validating the efficacy of the model. Accordingly, what is the technical foundation for the expressed confidence in the SVIHM Model?		The water budgets will be updated when USGS releases the SVIHM in 2020. It was the best available data while the future water budget was under development.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-129		7-5			11/25/2019	Chevron	Table 7-5 contains placeholders for data not yet populated. Will data for desalination projects be include in the data field labeled "Recharge"? If not, Chevron recommends that an additional column be added to capture desalination projects.		Comment noted. This data is to be populated in the future, after GSP submittal.	180_400-Foot_Aquifer_Subbasin_GSP_Chevron_Comments.pdf
W-130					11/25/2019	The Otter Project	The Plan is a plan to create a plan at a later date. The SGMA was passed by the California legislature in 2014 and GSAs have had five years to form and create plans for priority watersheds. The Draft GSA is incomplete. Over and over again the Draft Plan uses “Details to be Developed Later.” This is unacceptable at this late date. Instead of using best available data and modeling, the Draft GSP proposes to wait for a USGS model that has been promised for -- literally -- years. Instead of making a good effort to create a plan around the two existing models that call for reduction of extraction of 22 and 45 percent (in addition, see comment two below), the SVBGSA proposes to wait for a model that they hope will be more generous. As noted, the Central Coast is the region most reliant on groundwater, critically over-drafted, and as noted by numerous studies of nitrate contamination,3 perhaps one of the most contaminated in the state. Waiting is not an option.		Comment noted. The GSP establishes a clear definition of sustainability in the SMC chapter; and presents the tools SVBGSA will use to achieve sustainability in the Projects and Actions Chapter. While many details on the projects and actions have yet to be finalized, this is not a plan to create a plan.	TOP GSP comments.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-131					11/25/2019	The Otter Project	The amount of “Usable Storage” is over-estimated by 21 to 32 percent. As stated in section 5.3, the definition of usable storage is: “[T]he annual average increase or decrease in groundwater that can be safely used for municipal, industrial, or agricultural purposes.” But the same paragraph goes on to state: “Change in usable groundwater storage is the sum of change in storage due to groundwater level changes and the change in storage due to seawater intrusion.” “Usable” does not mean, just for agriculture. Just as saltwater is not available for agricultural use, nitrate contaminated groundwater is not available for municipal use. As outlined in the executive summary, three different studies have shown the lower Salinas basin groundwater to be heavily contaminated with nitrates. Agricultural fields require the application of literally hundreds of pounds of chemicals per acre.4 The impact of not considering nitrate laden groundwater is to allow pumping far above the seven-percent reduction mentioned is the Draft GSP. This pumped groundwater will then percolate through the chemical laden soils and further contaminate groundwater. The actions or inactions of the SVBGSA will directly impact water quality; by allowing excessive pumping water quality will be degraded, an action considered an “undesirable result” not allowed under the SGMA. This SVBGSA action or inaction could also violate the California Nonpoint Source Pollution Policy recently successfully litigated in the trial and appellate courts by Monterey Coastkeeper.		Usable is interpreted to mean usable by at least one group of groundwater users. Therefore, groundwater with elevated nitrates is still considered usable groundwater.	TOP GSP comments.pdf
W-132					11/25/2019	The Otter Project	Comment Three: Nitrate laden groundwater plumes are ignored in the Draft GSA. The Draft GSA states at 7.5: “ There are no known significant contaminant plumes in the GSP area, therefore the monitoring network is monitoring non-point source pollution and naturally occurring water quality impacts.” This statement contradicts studies performed by the Monterey County Water Resources Agency, a partner agency for implementation of the GSP. Graphically, nitrate plumes in the 180/400 aquifers are demonstrated in the following illustration extracted from a MCWRA report (see document for figure). Increases in nitrate concentration are results of contamination plumes. Monitoring of plumes will most likely require a greater density of monitoring site.		The statement about significant contaminant plumes refers to remediation sites associated with point source contamination. The GSP acknowledges that there are elevated nitrates broadly distributed throughout the Subbasin, and a map of the elevated nitrates is included in the GSP.	TOP GSP comments.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
					11/25/2019	The Otter Project	Comment Four: The cost of priority projects is greatly underestimated. Not all projects were evaluated, but review of the highest priority project, Invasive Species Eradication, revealed a gross under-estimation of the costs of the project. One must wonder if all project costs are under-estimated. The concept is to remove the invasive reed Arundo donax and benefit from the resulting evapotranspiration water savings. Without question, removing Arundo is desirable and would have environmental benefits. However it is extremely expensive as evidenced by the very high cost of the 2014 removal of 75 acres; approximately 1500 acres remain. Referring to the removal project the Draft GSP states: “Implementation costs for these projects are typically capital intensive with only minor long-term maintenance costs. Thus, the water supply benefit/cost ratio can increase significantly over the long term.” The concept that removal of 1500 acres of Arundo is financially feasible is a fallacy and the idea that the long term maintenance cost will be minor is equally flawed. As has been experience during the initial roll-out of the project, not all landowners are cooperative and Arundo will re-infest areas very quickly. Continuous removal will be required. The benefits may be exaggerated as well: removal of Arundo do not result in bare dirt, the Arundo is replaced by other plants that could use a very significant amount of water, just as the Arundo did.		Comment noted. Costs and associated benefits will be refined as the projects are refined during GSP implementaiton.	TOP GSP comments.pdf
W-134					11/25/2019	The Otter Project	The Tiering Structure of the pumping allowances will be ineffective – for many years – in reducing over-extraction of groundwater. The Draft GSP states that sustainable pumping allowances will be developed over the first three years. We believe this first step is structured to take far longer. We believe determination of the allowances will take longer because of the structure of the board, and/or allowances will be overgenerous in pro-rata allocation and underpriced (limiting management actions) because of the structure of the board. Once the sustainable pumping allowances are determined, the tiering structure is designed to not meet the goal of sustainable balance within 20 years. As stated on page 9-5, the Tier Two transitional pumping allowance will be phased out over 10 to 15 years. The result of three years of sustainable allowance planning and a 10 to 15-year transition means that it takes 13 to 18 years to even start to come to balance. Also as stated on page 9-5, “Maximum annual (calendar year) pumping between 2012 and 2017 will be used to determine transitional pumping allowances.” In other words, the Draft GSP requires absolutely no reduction in pumping from the over-extraction-status-quo for the first 13 to 18 years and then “overnight” growers will be required to meet their sustainable pumping allowance. We believe, the tiering structing leads to growers simply planning to pay supplemental charges instead of reducing pumping. Again, we must state that because of the board voting structure, the growers control the fees.		The tiered water charges framework is designed to encourage, but not demand, pumping reductions that meet the 20-year sustainability goal. Any groundwater pumper will have the option of paying supplemental charges instead of reducing pumping. The funds from these supplemental charges will be used to implment additional projects and retain teh Subbaisn's groundwater balance.	TOP GSP comments.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-135					11/25/2019	The Otter Project	The ability to “Carry over” (9.2.3) or”Transfer” (9.2.4) saved water defeats the entire purpose of the Draft GSP and in addition, carry over water is simply “paper water” that will likely no longer exist in the basin. Water moves. Pumping less that the allocation is a very good thing, but that water allowance can not be carried over into a future year as that water has moved downslope and may no longer be in the watershed.		The SVBGSA has the option to either implement the carryover options or not. Carryover can be reduced annually to account for water that leaves the Subbaisn.	TOP GSP comments.pdf
W-136					11/25/2019	Rincon Farms	How are water rights, specifically appropriated water rights being considered in the plan for the 180/400 Sub-Basin? Especially when it comes to allocation and pumping. What are the details or ideas on specifics for well extraction limits? Can previously held water rights be mandated with limits? Legal ramifications will need to be considered. Specifically in Gonzales, please consider the jurisdiction of the former Gonzales Irrigation Company- there are special preliminary water rights in this region from this case. These pre-1914 water rights could take precedent over other rights on other parcels in Monterey County. In drought instances ifthere is a shortage of water, holders of these rights may have first call on river water even if it is not taken directly from the river. (See letter to Clarence "Toots" Vosti and map enclosed). Supporting the invasive species issue in the Salinas River should not just stop at Arundo donax- a more thorough examination and analysis of the species in the river should conclude other finds that with their removal can also gain additional water to help with replenishing our aquifer. Other ways to help penetration and replenishment would be additional clearing of our river channels.		Water rights will be considered and analyzed as projects and management actions are further refined and designed in the implementation phase of the GSP.	Public Comment_Rincon Farms.pdf
W-137					11/25/2019	Rincon Farms	How will this plan handle well drilling rights or replacement wells? In cases of financial hardships, there should not be a penalty or cease of water rights and/or access. Be aware of Ag Order 4.0 on its jurisdiction of groundwater. Part of the new regulations, specifically in Table 5, is crossing into SGMA territory by requiring irrigated riparian habitats/buffers. Most of the irrigated water in the Salinas Valley is groundwater. It is in the best interest of landowners, farmers and SVBGSA to monitor this cross over of regulatory agencies. And a final note, please consider or make sure to be aware of the SVPOLA- Salinas Valley Property Owners for Lawful Assessments v. County of Monterey (Monterey County Superior Court Case No. M66890). From this court case there may need to be reconsideration of the responsibility for salt water intrusion for those represented land parcels whose owners won the ruling of this case. Most of these parcels are in the southern portion of the Pressure Area, which does not fall under the same category or jurisdiction of other parcels in the Pressure Area.		Well drilling rights and replacement wells will be considered in the implementation phase of the GSP. Implementation of the GSP will work together with Ag Order 4.0 and other areas of potential regulatory overlap.	Public Comment_Rincon Farms.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-138	5			5-23, 5-24	11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	Based on the seawater intrusion maps developed by the MCWRA, there is significant uncertainty regarding the extent of seawater intrusion in the northern and southern portions of the impacted area for both the 180-Foot and 400-Foot Aquifers.2 These uncertainties are not reflected in the draft GSP's presentation of MCWRA's historical seawater intrusion boundaries (Figure 5-23 and 5-24), or in the draft GSP's adoption of these boundaries as the basis for its seawater intrusion MTs. Therefore, it is not known how far seawater has actually intruded in the areas of Castroville and north of Castroville (DACs) and it is not known to what degree the proposed seawater intrusion MTs are protective of beneficial users in these areas. This uncertainty is not clearly and transparently reflected in the draft GSP, which is of particular significance as these data are used as the basis for MTs.		The GSP includes an action to develop a seawater intrusion working group to address the uncertainty in the extent and location of seawater intrusion.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-139	7	7-2			11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP includes hydrographs for numerous wells in the 180-Foot and 400-Foot Aquifers, but, as the draft GSP acknowledges, does not include any such data for the Deep Aquifer, which represents a significant data gap. Well 13S02E19Q003M,3 listed in Table 7-2 of the draft GSP, is part of the California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring network and water level data are available. The draft GSP should at least consider and include data from this well. While limited data are available for this well, as shown in the hydrograph below, water levels at this well show a declining trend over the available period (2014 – 2019). In order to develop a better understanding of the subbasin, the interaction between aquifers, and the conditions of the Deep Aquifer, the Salinas Valley Basin Groundwater Sustainability Agency (SVGSA) should work to fill this data gap and at a minimum, should include the limited available data in the draft GSP.		The hydrograph has been added as existing data for the deep aquifer.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-140	8-6				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The review of water quality data in the groundwater conditions section of the draft GSP (Section 5.5) is very limited and focused almost entirely on nitrate. The draft GSP identifies numerous constituents that have been detected in groundwater above drinking water standards, but, with the exception of nitrate, does not present this data spatially or even in tabular format. Even though the draft GSP sets water MTs for these constituents (Table 8-6 through 8-9), the supporting data are not presented, and no analyses of spatial or temporal water quality trends are presented. This does not present a clear and transparent assessment of current water quality conditions in the subbasin with respect to drinking water beneficial use (23 CCR § 354.16(d)). It is therefore recommended that the GSP include specific discussions supported by maps and charts, of the spatial and temporal water quality trends for constituents that have exceeded drinking water standards.		The GSP is based on best available data. No existing maps are available for the mapped extent of most constituents of concern.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-141	4.4.1				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP identifies three principal aquifers, i.e., the 180-Foot Aquifer, the 400-Foot Aquifer, and the Deep Aquifers, and notes that the subbasin's "aquitards and aquifers have long been recognized, and are the distinguishing features of this subbasin" (Section 4.4.1). However, despite this, the draft GSP lumps all three aquifers together in its evaluation of the water budget, and does not appear to account for lag time and flows between aquifers, or the effects of differential pumping rates and changes in pumping rates between aquifers. Given this, it is not clear that the projected water budget, as developed in the draft GSP, is sufficiently robust and representative of subbasin conditions for purposes of fully assessing sustainable yield.		The water budget is developed for the entire Subbasin in accordance with SGMA regulation 354.18(a)	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-142	6	6-31			11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The projected sustainable yield values presented in Table 6-31 of the draft GSP reflect a roughly 7% reduction in groundwater pumping, but still reflect an annual change in storage deficit of approximately 4,700 acre-feet per year (AFY). It is not clear how the sustainable yield of a subbasin already severely impacted by seawater intrusion can include continued decline in storage, particularly when the proposed inland groundwater flow gradients under the water level sustainable management criteria (SMCs) will allow for continued seawater intrusion into the subbasin. This sustainable yield value also does not take into account of the effects of a hydraulic barrier, which the draft GSP highlights as necessary to achieve the seawater intrusion SMCs. 5 Thus, the sustainable yield values presented in Section 6.10.5 do not appear to be reflective of the sustainability conditions outlined elsewhere in the draft GSP. It is important that the sustainable yield values take into consideration all factors that will lead to long-term sustainability of the subbasin, especially given that these values form the basis for the Water Charges Framework described in Section 9.2.		Text has been added to explain that the sustainable yield is a long term management number, not the amount of pumping needed to stop current seawater intrusion. The sustainable yield assumes seawater intrusion has been halted. In other words, the future sustainable yield is the sustainable yield once actions have been taken to reach measureable objectives and avoid undesirable results. Prior to the future sustainable yield there will need to be actions taken to come to sustainability.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-143	8				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	In its discussion of the relationship between the water level MTs to other sustainability indicators, Section 8.6.2.3 of the draft GSP indicates that "A significant and unreasonable condition for seawater intrusion is seawater intrusion in excess of the extent delineated by MCWRA in 2017. Lower groundwater elevations, particularly in the 180- and 400-Foot Aquifers, could cause seawater to advance inland. The groundwater elevation minimum thresholds are set at or above existing groundwater elevations. Therefore, the groundwater elevation minimum thresholds will not exacerbate, and may help control, seawater intrusion." However, as shown in Figure 8-2 and 8-3 of the draft GSP, the proposed water level MTs are set at 0 feet above mean sea level (ft MSL) along the coastline, and decrease farther east for both the 180- and 400-Foot Aquifers. Figure 8-2 and 8-3 are excerpted below and shown alongside the August 2017 groundwater level contours (Figure 5-3 and 5-5 from the draft GSP). As illustrated here, while the groundwater flow gradient would be less steep, the direction is consistent with the conditions that have resulted in seawater intrusion. Given that the inland water level MTs are below sea level an easterly groundwater flow gradient will remain and seawater intrusion will continue. While the rate of seawater intrusion would likely be slower than observed historically, even if the water level MTs were met today, seawater intrusion will still continue within the subbasin, threatening the drinking water supplies for DACs and other vulnerable populations...(see letter for remainder of comment).		The minimum thresholds are set independently for each sustianability indicator. All six undesirable results must be avoided simultaneously, therefore there is no need to predicate the groundwater elevation undesireable result on the seawater intrusion undesirable result. Furthermore, groundwater elevations will be different if seawater intrusion is manager through an extraction barrier, or if it is managed through significant managed recharge.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-144	8	8-2			11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	Charts 2a and 2b below reflect the proposed SMCs (per Table 8-3 of the draft GSP) for the 180-Foot and 400-Foot Aquifer water level representative monitoring wells (RMWs) located in and near the areas of seawater intrusion (wells identified on excerpted Figures 8-2 and 8-3 above). If the measurable objectives (MOs) are met, this represents a relatively small decline in water levels from current conditions in most wells, and in some wells an increase in water levels. However, the MTs in most cases represent a substantial decline in water levels from current conditions, to levels well below sea level. Given that current conditions are resulting in significant seawater intrusion conditions, it is unclear from the draft GSP how such declines in water levels will result in sustainability for the beneficial uses and users of the subbasin, and how seawater intrusion will be limited to 2017 limits (i.e., the seawater intrusion MTs).		The measurable objectives are set independently for each sustianability indicator. All six undesirable results must be avoided simultaneously, therefore there is no need to predicate the groundwater elevation undesireable result on the seawater intrusion undesirable result.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-145					11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP definition for degraded water quality identifies constituents of concern (COCs) as those that have an established level of concern or affect crop production and have been found in the subbasin above those levels of concern (Section 8.9.2). Further, the list of monitored COCs is dependent on the water quality constituent that each type of well is monitored for independent of the Sustainable Groundwater Management Act (SGMA). As illustrated in Tables 8-6 through 8-9 of the draft GSP, many COCs have been detected in municipal supply wells that have not been detected in domestic or small system wells, because these wells are not routinely tested for as many constituents as municipal supply wells. Given this selective sampling and establishment of MTs for water quality constituents, the draft GSP does not present a monitoring network that is sufficient to monitor for impacts to beneficial users who rely on domestic wells and small water systems for drinking water (pursuant to 23 CCR § 354.34(b)(2)) and the draft GSP does not fully evaluate how these selective MTs will affect the interests of these beneficial users (pursuant to 23 CCR §354.28(b)(4)).		The monitoring system includes both large municipal and small water systems.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-146					11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	DACs and public water systems in the subbasin, and the seawater intrusion MO and MTs. There are no water level RMWs located in the northernmost portion of the subbasin, in an area with a high concentration of domestic well users. Thus, the water level monitoring network is inadequate to properly monitor for these sensitive beneficial users, as required under 23 CCR §354.34 (b)(2).		Figures 7-4 and 7-5 identify areas with data gaps. These data gaps will be filled by measuring either existing wells or installing new wells.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-147	3				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	Figures 3A and 3B show the estimated water decline from current conditions that would occur at each RMW if water levels reach the MTs for the 180-Foot and 400-Foot Aquifers, respectively. As shown in Figure 3B, the MTs for two RMWs (14S/02E-03F03 and 14S/02E-12B03) located along the 2017 seawater intrusion line/seawater intrusion MT are more than 20 feet below current groundwater conditions. The GSP should explain how continued water level declines in areas already or imminently impacted by seawater intrusion will result in sustainable conditions for beneficial users.		The minimum thresholds are set independently for each sustainability indicator. All six undesirable results must be avoided simultaneously, therefore there is no need to predicate the groundwater elevation undesirable result on the seawater intrusion undesirable result.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-148	8				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP does not clearly identify what wells will specifically be used as water quality RMWs, but rather lists MTs by general type of well (i.e., Municipal Supply Wells, Small Systems Supply Wells, Irrigated Lands Regulatory Program (ILRP) Domestic Wells, and Agricultural Use in ILRP Wells) in Tables 8-6 through 8-9, and states that the MOs are the same as the MTs (Section 8.9.3).6 However, under 23 CCR §354.34(h), the GSP must include "The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used." Thus, the GSP must clearly identify on both maps and in tabular form each of the wells to be used as RMWs for water quality. Without this information, the public cannot review and assess the adequacy of the proposed GSP to monitor impacts to beneficial users of groundwater, in particular those reliant on domestic wells for drinking water purposes.		The groundwater quality monitoring wells are shown in Figure 7-9 and 7-10. Well data are listed in Appendix 7E	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-149	7				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	Table 7-2 of the draft GSP tabulates the locations and well depths of existing CASGEM wells and Table 7-4 of the draft GSP tabulates the locations and well depths of seawater intrusion RMWs. However, the well locations and well depths are different between these two tables for a given well (based on the State Well Number [SWN]).7 Therefore, it is unclear what well information is accurate, and as a result the draft GSP does not fulfill the requirement of 23 CCR § 354.34(h).		All well tables are being double checked.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-150	9				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP identifies an estimated groundwater storage deficit of up to 9,600 AFY under 2030 conditions and up to 10,300 AFY under 2070 conditions (Table 6-29), which represents roughly 8.5% of agricultural pumping and 6% of total pumping in the basin (Table 6-30). In order to arrest and roll back seawater intrusion to 2017 levels, significant projects and management actions will need to be implemented. The draft GSP identifies several potential options but does not select one clear path forward. The options include a hydraulic barrier, which "can be operated as a recharge barrier, wherein water is injected into the wells and the resulting water level mound creates the hydraulic barrier. Or the barrier can be operated as an extraction barrier, wherein the wells are pumped and the resulting water level trough creates the hydraulic barrier" (Section 9.4.1.4). The draft GSP identifies a seawater intrusion pumping barrier and estimates that operation will require withdrawing up to 30,000 AFY of groundwater, which would then be conveyed to discharge into the Pacific Ocean or to a new or existing desalination plant (Section 9.4.3.7). The draft GSP also states that an "optional barrier using injection instead of extraction was also considered" and that this option would require injection of approximately 46,000 AFY of water to create a protective mounding effect. While it is clear that one of these options is necessary to achieve the seawater intrusion MTs, the draft GSP does not consider and fully articulate impacts of these options on the projected water budget or sustainable yield. Implementation of either an extraction or a recharge barrier will, by definition, change the localized groundwater flow gradients. An extraction barrier will result in localized seaward flow gradients, and some portion (likely significant) of the estimated 30,000 AFY extracted will be of freshwater from the subbasin. (see letter for remainder of comments)		The projects and management actions identified in Chapter 9 will be implemented as part of an overall program. Each project or management action has both benefits and some impact on the Subbasin water budget. The final selected set of projects and management actions will meet all six sustainability indicators and balance the Subbasin water budget..	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-151	9				11/25/2019	Clary, Dolan, Arthur, Lukacs, Matsumoto, Ortiz-Partida	The draft GSP contemplates "Agricultural Land and Pumping Allowance Retirement [sic]" as a management action (Section 9.3.2), but does not actually quantify the scale or expected benefit of such a management action.... the future overdraft conditions including implementation of the pumping barrier represents approximately 40% of agricultural pumping. The draft GSP also identifies several potential recharge projects to augment the groundwater supply, but these projects, along with the pumping barrier, require construction of infrastructure and will take years to implement even under the best circumstances. In order to achieve the seawater intrusion MTs and to avoid further degradation of the subbasin, more immediate action is necessary. Thus, the draft GSP should: 1) more transparently lay out and quantify the deficit that needs to be addressed by projects and management actions; 2) provide a clear plan for implementing pumping restrictions and agricultural land retirement with specific targets; 3) clearly articulate how much pumping will need to be reduced in the subbasin; and 4) quantify and present the degree of continued seawater that will occur before the projects and management actions are implemented.		The projects and management will be refined during GSP implementation, and will clearly articulate how the projects individually, and as a program, achieve sustainability.	Salinas Valley - 180_400 Ft Aqufer GSP FULL Analysis V2 Ag Innovations.pdf
W-152					11/25/2019	RCDMC	GSP in section 9.3.3 "Priority Management Action 2: Outreach and Education for Agricultural BMPs" starting on page 9-12. According to personal communication with local UC Cooperative Extension Farm Advisors (Drs. M. Cahn and R. Smith), they have observed potential agricultural water use efficiency increases of 10% on average among the farmers they have surveyed and/or with whom they have conducted water use efficiency trials while factoring in necessary leaching fractions and maintaining comparable yields. We actively engage in local producer and irrigator trainings for water use efficiency. However, beyond simply providing outreach and education, we need to invest in critical tools for guiding more efficient irrigation management decisions. Placement of additional weather stations throughout the valley that better reflect the variable microclimates that farmers experience moving west to east and north to south is a relatively low-cost project with substantial potential benefit. Such stations can be installed relatively cheaply (around $10k each) and connected to the CA Dept of Water Resources' California Irrigation Management Information System (CIMIS) for easy online access and incorporation of weather and reference evapotranspiration data for informing day-to-day water management on area farms. Support for more stations in the Salinas Valley could be a low-expense relative to impact project for the GSP.		Comment noted. Text has been added to management action 2.	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-153					11/25/2019	RCDMC	The RCD's official name is the 'Resource Conservation District of Monterey County (RCDMC)' rather than the 'Monterey County Resource Conservation District (MCRCD).'		Text has been fixed	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf
W-154					11/25/2019	RCDMC	There are two programs currently underway on the river: the RCD's Arundo Control Program, and the Salinas River Stream Maintenance Program (SMP). While we work very closely and compatibly, and in-fact do have substantial interconnectivity between the two programs, they are, in fact, distinct, with separate lead agencies and separate environmental permits. The RCD is CEQA lead and holds all permits for the Arundo Control Program, and Monterey County Water Resources Agency is the CEQA lead and holds the primary permits for the SMP. It is a bit confounding that the RCD is the CDFW permittee on behalf of the SMP, and that arundo control is a valuable mitigation option for SMP participants. That's a blessing of a history of positive collaboration between two mutually-beneficial programs developed somewhat in parallel in the first half of this decade. The majority of arundo control work on the river is being conducted under the RCD's program.		Text has been modified to discuss the Arundo Control Program	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf
W-155					11/25/2019	RCDMC	It's important to acknowledge the pivotal role that the Monterey County Agricultural Commissioner's Office has played in the genesis, development and continuity of the RCD's Arundo Control Program. They provided the initial funding and encouragement to initiate the program in 2009 and remain a critical partner to the RCD in this endeavor. As such, they are also an important partner for the GSA.		Comment noted	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf
W-156					11/25/2019	RCDMC	On page 9-27, reference is made to the wide range of estimated potential water savings to be garnered from arundo eradication. We have communicated to GSA consultants that there is research needed to better understand the actual water conservation benefits on the Salinas River and that we have pursued research partnerships with Cal State University Monterey Bay (CSUMB) and UC Santa Barbara for this purpose, both at very different scales. CSUMB is currently funded through one of our Wildlife Conservation Board grants to use satellite imagery and data to estimate differences in evapotranspiration rates on Salinas River lands with and without arundo. UCSB is measuring water use on individual plants, a method that would provide the highest level of accuracy for understanding water consumption on-site, but for which we have not yet been able to develop or fund a collaboration. We would encourage GSA consideration of inclusion of research funding to better understand the actual water conservation benefits of arundo control along with seeking funding for the arundo control and maintenance work itself.		Text has been added to acknowledge ongoing studies	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-157					11/25/2019	RCDMC	On this same topic, figures 9-2 and 9-3 on pages 9-28 and 9-29, respectively, show modeled groundwater elevation benefits from arundo eradication within the 180/400-Foot aquifer subbasin, but it is not clear what base numbers (4 ac-ft/ac/year or 20 ac-ft/ac/year?) were used for informing the model, and the units for the groundwater level benefit gradations (feet?) are not identified.		All groundwater elevations are in feet. The benefits in the GSP are provided as a range, depending on the assumed base number.	RCDMC Salinas Basin GSP Comments 2019-11-25.pdf
W-158					11/25/2019	California Water Service	We recommend the following to be considered and defined in the Water Charges Framework: 1. Recognition of a groundwater user's share of a basin's native safe yield and the benefits and/or effects of previous efforts undertaken by the user to augment basin supplies (e.g., investment in water supplies and conservation); 2. The ability to incorporate and preserve the projects and water management efforts that are implemented by individual agencies that result in additional supplies to the basin; 3. A mechanism by which a projects' yield can be reasonably allocated to those who have contributed to the project, either via the tiered rate structure or through direct investment; 4. Flexibility for groundwater users that are located in multiple Salinas Valley subbasins and are willing to invest in projects. Specifically, given the integrated nature of the Salinas Valley subbasins, groundwater users should receive credit for projects and water management efforts across subbasins where there are demonstrable benefits (i.e. each subbasin's issues do not need to be entirely addressed through projects in that subbasin).		The letter has been read and the comments in the letter have been reviewed and considered. These will be taken into consideration during the GSP implementation phase, as the Water Charges Framework is refined and implemented.	California Water Service 180-400 GSP Comments.pdf
W-159					11/25/2019	ALCO	Because the California Legislature has already declared, in California Water Code § 1063, that the highest use of water is for that 15f domestic purposes, which is the type of water that Alco and all other municipal water providers provide, Alco believes that municipal water providers must be allowed a Tier 1 sustainable allowance, which should be based on historical groundwater pumped by municipal water providers. Courts, including the California Supreme Court and Federal Courts, have upheld California Water Code § 106' s declaration that the highest use of water is domestic use and that this is binding upon all California agencies. Please refer to the cited cases, below: Provision of this section declaring that use of water for domestic purposes is the highest use to which water can be devoted is binding on every California agency, City of Beaumont v. Beaumont Irrigation District (1965) 46 Cal.Rptr. 465, 63 Cal.2d 291, 405 P.2d 377. And, Provisions of this section declaring general state policy that use of water for domestic purposes is the highest and best use and in § 106. 5 that rights of municipalities are to be protected to extent necessary for existing and future uses, do not merely regulate administrative action which state engineer might take on applications to appropriate surplus water, but they constitute part of substantive law of California delineating rights of users of water. Rank v. Krug, S.D.Cal.1956. 142 F.Supp. 1.		Comment noted. The water charges framework will not alter water rights and is not envisaged to ban or place limitations on groundwater pumping, and as such will not restrict municipal pumping directly. Whether it establishes Tier 1 sustianable pumping allowances for municipal water providers will be considered during the design of the framework.	Alco's Comments on SVBGSA GSP for 180-400 ft Aquifer.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-160					11/25/2019	ALCO	As Alco has previously stated, when the SVBGSA is establishing water allowances and water charges framework for municipal water providers, it must take into consideration the obligations of California Water Code § 106.3, the requirements of the CPUC (in the case of water utilities like Alco that are regulated by that agency) and SWRCB on municipal water providers. Alco believes that the Tier 1 sustainable water allowance for municipal water providers should be based on the providers' historical pumping information. Also, the municipal water providers should be able to carry over any excess pumping allowances into future years. Municipal water providers should be able to obtain all pumping credits and/or Tier 1 and Tier 2 pumping allowances for irrigated and fallow lands to which the municipal water provider provides water service in excess of the amounts that are pumped on these lands, if any.		Comment noted. This will be taken into consideration during the development of the water charges framework	Alco's Comments on SVBGSA GSP for 180-400 ft Aquifer.pdf
W-161					11/25/2019	ALCO	Alco believes that there should be a mechanism for the transfer of pumping credits and/or Tier 1 and Tier 2 pumping allowances for 1) lands or any portion thereof that are converted from agricultural use (or fallow lands) to development to which the municipal water provider provides service and 2) agricultural lands (or fallow lands) to which the municipal water provider provides water service in excess amounts of the amounts that are pumped on these lands, if any.		Comment noted. This will be taken into consideration during the development of the water charges framework.	Alco's Comments on SVBGSA GSP for 180-400 ft Aquifer.pdf
W-162					11/25/2019	ALCO	The benefit of allowing parties to directly fund such projects is that the SVBGSA will not have to expend the time, monies and efforts to implement a tax and/or go through the Proposition 218 process. Additionally, the tax burden and/or fees to landowners and residents of the Salinas Valley Basin will subsequently be reduced.		Comment noted. This will be taken into consideration during the development of the water charges framework and financing options for projects.	Alco's Comments on SVBGSA GSP for 180-400 ft Aquifer.pdf
W-163					11/25/2019	Community Water Center	This letter contained a number of comments on the GSP and its relation to drinking water sources of the vulnerable, and often underrepresented, groundwater users. Its key points include: the GSP should include immediate actions to take effect in 2020 while projects are being developed; the SVBGSA should immediately develop a robust drinking water well program present or mitigate impacts; include a map of DACs; the GSP should revise the basin setting and water budget to better articulate and quantify the needs of drinking water users within the GSA; provide the locations and depths of all public water systems, state and local small water systems, and private domestic wells in the subbasin using hte best available information; and revise SMC to be protective of drinking water users.		The letter has been read and the comments in the letter have been reviewed and considered. Due to the large number of comments received immediately before GSP adoption, not all comments from this letter are addressed individually in this matrix. Comments that were not able to be individually addressed in this matrix will be addressed as the GSP is implemented and refined. In response to the main points: more detailed analysis and design of projects and management actions is needed before implementation, and this will begin immediately following GSP submittal and simultaneous to the development of other subbasin GSPs; SGMA does not require improving water quality, and it needs to be a choice of the Board to do so, however, there is insufficient time to consider it before GSP submittal; SMC levels and who they protect is a determination of the Board, which can change the levels in the future as needed.	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-164	7				11/25/2019	Community Water Center	Update language on Chapter 7 to reflect the data gaps mentioned in Chapter 8. Specifically, that state and local small water systems and domestic wells will be part of the monitoring network. (CWC p. 21)		The text has been updated	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-165	App 7E				11/25/2019	Community Water Center	Clarify through the text or a footnote that well construction information will be added at a later date to the table of state and local small water systems, similar to what is currently Appendix 7E.		Text now reads: Small public water systems wells, regulated by Monterey County Department of Public Health, include a total of 136 wells in the current network. The limitation of this dataset is that the well location coordinates and construction information are currently missing; this is a data gap. SVBGSA work with the County to fill this data gap and additional wells from this network with sufficient data will be added to the public water supply wells network for water quality monitoring. These wells will be added to Appendix 7E when this data gap is filled.	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-166		8-6			11/25/2019	Community Water Center	Also for Table 8-6, we noted that the water quality monitoring network in for public water systems should include the same number of wells for each contaminant. The reason for data gaps for individual systems (e.g. some systems are missing data for some contaminants) is likely due to the monitoring schedules as all public water systems have the same requirements. (CWC page 25)		This has been checked.	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-167					11/25/2019	Community Water Center	Clarify definitions of drinking water systems. We outlined and recommend the 3 commonly used system types used by all drinking water regulators (CWC p. 8 and throughout).		The definitions of drinking water systems have been clarified	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-168	3			3-6	11/25/2019	Community Water Center	Update Figure 3-6 to include Moss Landing and clarify the definition of "municipal areas." In the future, this map can also include GW Dependent domestic wells, SSWS, and LSWS. (CWC p. 11)		Figure 3-6 was made based on a DWR data set on water districts, which does not include Moss Landing. The figure was updated to clarify the data Figure 3-6 is based on.	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-169	11				11/25/2019	Community Water Center	Include map of all DACs. Ideally this would be included in Chapter 3, but might be more appropriate in Chapter 11. (CWC p. 3)		A map of DACs was added to Chapter 11.	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf
W-170					11/25/2019	Community Water Center	The CWC letter includes many recommendations regarding DACs and drinking water. We suggest adding an appendix on DACs and their relationship to groundwater quality.		An informational appendix on DACs has been added	180_400 Foot Aquifer Subbasin GSP Comment Letter with Attachments 11.25.19 Final from CWC and San Jerardo.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-171					11/25/2019	Arroyo Seco GSA	The draft 180/400 Foot Aquifer Subbasin GSP repeatedly oversteps its appropriate geographic scope, which should be limited to the 180/400 Foot Aquifer Subbasin. It is written as if it were the "Valley-Wide Plan." The SVBGSA may develop a Valley-wide plan, but it is not appropriate for a single basin plan. Valley-wide planning has not yet even commenced, much less reached a point that results can be published. There has been neglible coordiantion between SVBGSA and ASGSA regarding data, methods and groundwater conditions outside the 180/400 Foot Subbasin, and there has been no discussion of sustainability criteria or management actions. If interbasin agreements had been developed as part of the 180/400 Aquifer GSP process, it would be appropriate to discuss those in this GSP. However, no agreements have been reached. It is premature to discuss valley-wide problems and solutions in this document. Its geographic scope should be the 180/400 Foot Aquifer Subbasin....The technical chapters (1 through 8) are nearly silent with respect to the Forebay and Upper Valley Subbasins, but Chapter 9 suddenly sweeps them into a valley-wide plan for solving problems in the 180/400 Foot Subbasin.		Comment noted. Based on conversations with DWR, the SVBGSA Board decided to develop a GSP for each subbasin under its jurisdiction with an Integrated Sustainability Plan to coordinate them. The ASGSA is not in the 180/400-Foot Aquifer Subbasin, so is not discussed in this GSP. The SVBGSA is working with the ASGSA to develop a coordination agreement for the Forebay Subbasin. It is not premature to discuss valley-wide solutions in this GSP because the subbasins of the Salinas Valley are hydrologically connected; however, it notes that valley-wide components, such as the projects and management actions will be revised as the GSPs for the other subbasins are developed.	SVBGSA_GSP_comment_ltr_11252019.doc
					11/25/2019	Arroyo Seco GSA	Almost all of the activities and all of the benefits of the management actions and projects described in the draft GSP are local to the 180/400 Foot Subbasin. Therefore, the GSP should describe implementation of those activities within the 180/400 Foot Subbasin. ...Instead of passively accepting the SVBGSA-proposed actions that could potentially benefit the ASGSA area, ASGSA would prefer to implement similar actions on its own. (see letter for more comments).		Comment noted. SVBGSA will work with the ASGSA on proposed projects and management actions that affect the City of Greenfield.	SVBGSA_GSP_comment_ltr_11252019.doc
W-173					11/25/2019	MGSA	SVBGSA Must Evaluate and Incorporate the Best Available Science Regarding the Coastal Portion of the Subbasin into the Draft GSP		The SVBGSA agrees that there are differences in opinion regarding the extent of seawater intrusion. To remedy this, the GSP requires a Seawater Intrusion Working Group be formed early during GSP implementation.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-174					11/25/2019	MGSA	The Draft GSP Must Designate, Evaluate, and Manage the Dune Sand Aquifer as a Principal Aquifer		In accordance with the geologic descriptions in Bulletin 118, the shallow sediments are not designated as principal aquifers. The three principal aquifers in the Subbasin are the 180-Foot Aquifer, 400-Foot Aquifer, and Deep Aquifers.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-175					11/25/2019	MGSA	The Draft GSP Must Recognize, Monitor, and take Management Actions for Groundwater Dependent Ecosystems as a Beneficial Water Use.		The GSP adopted TNC's approach to identifying potential GDEs in the Subbasin. Discussions of impacts on GDEs were held during Advisory Committee meetings and Board of Directors meetings. These criteria may be modified in future versions of the GSP.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-176					11/25/2019	MGSA	The Draft GSP Should Recognize and Consider State and Federal Protections for Habitats and Species in and near the MGSA Area.		This comment does not directly address requirements of SGMA.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-177					11/25/2019	MGSA	SVBGSA Must Expand the GSP's Proposed Monitoring Network		The GSP includes an assessment of data gaps, including monitoring locations, that will be filled during implementation. The MCWRA Coastal Monitoring program may fill many of the identified data gaps.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-178	2		2-4		11/25/2019	MGSA	Subbasin Governance: This section states that SVBGSA developed the GSP for the 180/400-Foot Aquifer Subbasin with input and assistance from MCWD GSA; however, the GSP should also recognize the MGSA and document its efforts to coordinate with SVBGSA. (see letter for more details)		A formal agreement exists between SVBGSA and MCWD that promotes input from MCWD. MGSA is not a party to this agreement.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-179	2.3.2		2-8		11/25/2019	MGSA	Coordination Agreements: This section describes coordination agreements and is confusing and incomplete as currently worded. We recommend the following edits (see letter for more details).		No coordination agreement exists, and therefore is not cited in the GSP.	MGSA Comment Letter on the SVBGSA 180_400 Aquifer GSP.pdf
W-180		9-5			11/25/2019	MCWD	The total in Table 9-5 is incorrect and should sum up to positive 40,800 AFY.		This has been corrected.	MCWD09582120191125152330; and MCWD Comment Letters to 180-400 GSP Draft Chapters
W-181	3.3.1				11/25/2019	MCWD	Most of the former Fort Ord property has been transferred for civilian use and no long under federal jurisdiction as of 2019, including the airport. This area should be removed from Figure 3-3 and the above statement should be revised (see letter for text).		These changes have been made.	MCWD09582120191125152330; and MCWD Comment Letters to 180-400 GSP Draft Chapters
W-182	6.10.5				11/25/2019	MCWD	Please provide a definition of "well interflow" and clarify why it was subtracted from total pumping.		This has been added.	MCWD09582120191125152330; and MCWD Comment Letters to 180-400 GSP Draft Chapters
W-183	8.6.2.3				11/25/2019	MCWD	It is not accurate to state that groundwater elevation minimum thresholds, which are set below mean sea level and will maintain landward gradients "will not exacerbate and may help control seawater instrusion." The seawater intrusion front will continue to migrate inland if water levels remain below sea level and inland gradients persist. Section 8.6.2.3 should be modified (see letter for suggested wording).		The section has been revised according to the suggested wording.	MCWD09582120191125152330; and MCWD Comment Letters to 180-400 GSP Draft Chapters
W-184	8.6.2.4				11/25/2019	MCWD	We understand that the SVBGSA intends to coordinate SMC development as the managing GSA for each of the adjacent subbasin. However, it is premature to state that the minimum threshold of the 180/400-Foot Aquifer Subbasin has taken sustainable management of adjacent basins into full consideration, as those subbasins are still in their early phases of GSP development. Therefore, the following caveat should be included, and the following would replace the entire paragraph (see letter for suggested wording).		The suggested wording has been incorporated.	MCWD09582120191125152330; and MCWD Comment Letters to 180-400 GSP Draft Chapters

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-185					11/14/2019	Robin Lee	It is my opinion that the ground water level of sustainable yield has been set at an unsustainable level. The level for sustainable yield should be set at the average depth of domestic wells. For projects, a scalping plant should be used for the east side of Salinas. This plant would be closer to connecting the much disrupted hydrologic cycle on the east side, making the scalping plant both an economical and efficient project. Looking at and correcting the ordinances that prevent the recommendations stated in the GSP from being implemented, should be listed as an administrative project in GSP.		The sustainable yield is determined by the water budget. The SMC for chronic lowering of groundwater levels is a decision of the Board, which can change the level in the future if it so decides. More details are needed on a scalping plant. Relevant ordinances will be reviewed as needed during the implementation phase, together with MCWRA or the corresponding agency.	Lee_comments on draft GSP 11 14 19
W-186					11/25/2019	MCWRA	The GSP refers frequently to the "Eastside" subbasin. Bulletin 118 uses a two-word naming of this subbasin: East Side.		Incorrect, Bulletin 118 uses a one-word naming of this subbasin.	SVBGSA_MCWRA Cover Letter.pdf
W-187					11/25/2019	MCWRA	The GSP refers to the "Deep", "deep aquifer", "Deep Aquifer", and "Deep Aquifers". Suggest that this be standardized to 'Deep Aquifers' for consistency with MCWRA nomenclature.		All these references have been changed to 'Deep Aquifers' to standardize with MCWRA nomenclature.	SVBGSA_MCWRA Comments.pdf
W-188	ES-1		1		11/25/2019	MCWRA	Suggest changing The Salinas Groundwater Valley to the Salinas Valley Groundwater Basin		Fixed	SVBGSA_MCWRA Comments
W-189	ES-1		3		11/25/2019	MCWRA	Spreckles should be changed to Spreckels		Fixed	SVBGSA_MCWRA Comments
W-190	ES-1		3		11/25/2019	MCWRA	Paragraph two states that "The primary water use sector is agriculture, which uses 85% of the water in the Subbasin." Data from the 2015 Groundwater Extraction Summary report published by MCWRA in April 2017 indicates that 88% of groundwater extractions in the 180/400-Foot Aquifer Subbasin were attributed to agriculture.		Changed; The numbers were derived from that report and a MCWRA 2015 report. The 85% is derived from averaging the use from 2010 to 2015. 88% is if only the year 2015 is used; however, since agricultural water use increased in 2015, it is more accurate to use the average over several years.	SVBGSA_MCWRA Comments
W-191	ES-1		4		11/25/2019	MCWRA	paragraph 3 states " ... the 180-Foot Aquifers and the 400-Foot Aquifer are relatively transmissive aquifers with very good well yields." The phrase "very good" is open to wide interpretation. Perhaps a couple of examples, or a range of well yields for the subbasin, could be used instead. Also, it is critical that the treatment of the Shallow Aquifer is consistent throughout. As it is not a principal aquifer, it should not be included in water budgets. Important gaps in the Salinas Valley Aquitard have been reported (e.g., Kennedy Jinks' 2004 report; "Hydrostratgraphic Analysis of the Northern Salinas Valley") that create important connectivity between the Shallow Aquifer and the 180-Foot Aquifer that must be also be addressed. Additionally, the MCWRA does not agree with the statement, " ... the 400-Foot Aquifer is a single permeable bed approximately 200 feet thick. This disagreement in the characterization of the 400-Foot Aquifer is illustrated in analysis from Kennedy Jinks, 2004 and cross sections from Section 4 of this report. And, it will be important that the statement; "Recharge to the productive zones of the Subbasin is very limited due to the low permeability of the Salinas Valley Aquitard, meaning it is unlikely that any significant surficial recharge in the Subbasin would reach the productive 180-Foot and 400-Foot Aquifers" is consistent with this reports and future water budgets.		Very good was updated to "high." The level of detail is higher level than examples in the Executive Summary. The water budget is for the entire groundwater system, including the shallow sediments and principal aquifers. The Executive Summary was revised to better match the text, including adding "400-Foot Aquifer, a single permeable bed approximately 200 feet thick near Salinas, but variable throughout the Subbasin."	SVBGSA_MCWRA Comments
W-192	ES-1		4		11/25/2019	MCWRA	Consider adding some discussion of induced vertical recharge to the Deep Aquifers from overlying aquifers. Also, consider including the Deep Aquifers in the list of "productive" aquifers of the Subbasin.		This is more detail than we have in the Executive summary and do not want to mislead readers; however, it is detailed in the GSP.	SVBGSA_MCWRA Comments
W-193	ES-1		6		11/25/2019	MCWRA	Are domestic purposes included in the list of applications used to determine change in groundwater storage? Only municipal, industrial, and agricultural purposes are listed.		Different parts of the GSP Regulations refer to different sets of uses...changed to domestic, ind, agr	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-194	ES-1		6		11/25/2019	MCWRA	Are domestic purposes included in the list of applications used to determine change in groundwater storage? Only municipal, industrial, and agricultural purposes are listed.		Different parts of the GSP Regulations refer to different sets of uses...changed to domestic, ind, agr	SVBGSA_MCWRA Comments
W-195	ES-5		8		11/25/2019	MCWRA	"High groundwater levels in 1983 suggest groundwater levels previously had the capacity to recover to earlier levels in response to recharge events, but decline since then provides no indication that they can recover to pre-1983 levels." The MCWRA believes this statement to be incorrect and/or too simplistic. See detailed comments to Section 5.1.3 page 15.		This has been clarified.	SVBGSA_MCWRA Comments
W-196	ES-5		8		11/25/2019	MCWRA	Acronym for the Salinas Valley Integrated Hydrologic Model in paragraph two should be SVIHM.		This has been corrected.	SVBGSA_MCWRA Comments
W-197	ES-5		9		11/25/2019	MCWRA	Percolation of streamflow plus percolation of precipitation and excess irrigation frequently provides over 100,000 afy of inflow to groundwater, which doesn't correspond to earlier statements about stream connectivity and recharge to the aquifers. Please state what is included in the water budgets and reconcile that with the description of the conceptual model.		Done. The water budgets are for the entire groundwater system, including the shallow sediments and principal aquifers.	SVBGSA_MCWRA Comments
W-198	ES-5		10		11/25/2019	MCWRA	The section on Projected Water Budgets refers to the "projected SVIHM". Does this mean the provisional, "operational" version of the SVIHM? Consider differentiating between the historical SVIHM and operational SVIHM for clarity, as both versions of the model are being used for projects within Monterey County. The statement; ''The average changes in storage due to groundwater level fluctuations during the historical and current periods are approximately 400 AF/yr. and 600 AF/yr., respectively", does not indicate whether this is a positive or negative change in storage. The statement; "The difference between the storage calculated based on groundwater budgets and storage estimated based on groundwater levels shows the uncertainty of the budgets" is one measure of uncertainty within the budgets, but it should not be inferred to capture the full extent of uncertainty within the budget.		It is unclear what is meant by 'operational' version... It has been clarified that 400 and 600 AF/yr are negative changes in storage.	SVBGSA_MCWRA Comments
W-199	ES-5	1			11/25/2019	MCWRA	Only comparing the calculated difference between the budget and estimated storage changes to the outflow seems to underestimate the "error". This is not a true measurement of error, although it is referred to that way in the text.		Error changed to uncertainty.	SVBGSA_MCWRA Comments
W-200	ES-5	2			11/25/2019	MCWRA	Under the "Groundwater Storage" heading, Groundwater Level Change is positive and Seawater Intrusion is negative, giving a total that is positive. The Change in Storage based on the budget components is negative. These should be reconciled.		This has been fixed.	SVBGSA_MCWRA Comments
W-201	ES-5		12		11/25/2019	MCWRA	GSP states that " ... pumping will need to be reduced by about 7% to meet the sustainable yield." What years(s) are the basis for determining the 7% reduction? That is, a 7% reduction compared to what? Does this consider how much of the action (stream leakage, groundwater ET, and lateral fluxes) is taking place in the Shallow Aquifer, which is not used for water supply? Water that is cycled above the production aquifers should probably not be considered in the calculation of sustainable yield.		The water budget includes all water in the groundwater system, including both in the shallow sediments and principal aquifers. 7% is from the future pumping that the SVIHM projects, and that has been clarified in the ES.	SVBGSA_MCWRA Comments
W-202	ES-6		13		11/25/2019	MCWRA	Consider using groundwater level data from the monitoring wells that have been, and others that are expected to be, installed as part of the Monterey Peninsula Water Supply Project in addition to CASGEM wells.		Good suggestion. Wells that have already been installed will be reviewed during the activity of filling data gaps, and other wells can be added as they become available	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-203	ES-7	3			11/25/2019	MCWRA	The aspirational goal (Measurable Objective) for groundwater levels is 2003, but the Minimum Threshold for seawater intrusion is the 2017 extent of intrusion. What is not addressed in this GSP is; was seawater intrusion actively progressing in 2003? If so (it was), the Measurable Objective for groundwater level should reconcile what is hoped to achieve for seawater intrusion? Also, it would be clearer if the Sustainable Management Criteria stated that pumping is to be limited to the long-term future sustainable yield. As it stands, this could be read as suggesting that the reduction in groundwater storage could be 112,000 afy.		Pumping added to description of measurable objective for storage. Changing the measurable objective is something that must go through the Board. The minimum thresholds are set independently for each sustainability indicator. All six undesirable results must be avoided simultaneously, therefore there is no need to predicate the groundwater elevation undesirable result on the seawater intrusion undesirable result. Furthermore, groundwater elevations will be different if seawater intrusion is manager through an extraction barrier, or if it is managed through significant managed recharge.	SVBGSA_MCWRA Comments
W-204	ES-8		17		11/25/2019	MCWRA	One of the management actions refers to "MCWRA restrictions on additional wells in the Deep Aquifers." The existing limitation on new wells in the Deep Aquifers is the result of a County ordinance (Ord. No. 5302) and is not a restriction set in place by MCWRA.		Done	SVBGSA_MCWRA Comments
W-205	ES-8		18		11/25/2019	MCWRA	Section on Mitigation of Overdraft lists "optimizing CIP". Assume this should this be corrected to "CSIP"		Done	SVBGSA_MCWRA Comments
W-206	2.1		2-6		11/25/2019	MCWRA	The name of the "Salinas Valley Groundwater Sustainability Agency" is missing the word "Basin".		Added	SVBGSA_MCWRA Comments
W-207	3.6.1.3		3-25		11/25/2019	MCWRA	"These pumping depressions occur in the 180-Foot and 400-Foot Aquifers between the City of Salinas and the coast. 11 Figure 5-3 and 5-5 show the deepest water levels in both aquifers being approximately along the western edge of the City of Salinas, whereas the text implies that they would be found further west. Although it is understood that this GSP is only for the 180/400-Foot Aquifer subbasin, it seems like the water level monitoring should be contextualized by stating that the far deeper groundwater troughs are located further east, in the East Side. Or, remove this sentence entirely.		The sentence has been deleted	SVBGSA_MCWRA Comments
W-208	3.6.1.4		3-25		11/25/2019	MCWRA	Most CASGEM wells are monitored monthly, except for a few that are monitored twice per year.		Clarifying language was added.	SVBGSA_MCWRA Comments
W-209	3.8				11/25/2019	MCWRA	Consider including Monterey County Water Resources Agency Ordinance No. 3709 which prohibits groundwater extractions and the drilling of new groundwater extraction facilities in certain portions of the 180-Foot Aquifer after January 1, 1995.		This ordinance has been added to the chapter	SVBGSA_MCWRA Comments
W-210	3.8.9		3-39		11/25/2019	MCWRA	This section mentions the Habitat Conservation Plan under development by MCWRA. Was consideration given to any potential impacts to operational flexibility from regulatory documents that are currently in place?		This section lists impacts to operational flexibility from three other in-place regulations.	SVBGSA_MCWRA Comments
W-211	4		4-49		11/25/2019	MCWRA	"Previous studies of groundwater flow across this boundary indicate that there is restricted hydraulic connectivity between the subbasins. 11 While groundwater flow might be "restricted" it may be significant. The HBA calculated something like 8,000 afy of exchange (from Pressure to East Side).		comment noted	SVBGSA_MCWRA Comments
W-212	4		4-13		11/25/2019	MCWRA	Groundwater in the 180/400 Foot Aquifer Sub basin is increasingly being produced from the Purisima and Santa Margarita Formations that comprise the Deep Aquifers. Also, statement; "These three cross sections are adapted from the Final report, hydrostratigraphic analysis of the Northern Salinas Valley (Kennedy-Jenks, 2004). " I believe that Figure 4-6 is adapted from Brown and Caldwell (2015).		The correct citation has been added to the text.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-213	4		4-18		11/25/2019	MCWRA	Statement; "Near Salinas, the 400-Foot Aquifer is a single permeable bed approximately 200 feet thick; but in other areas the aquifer is split into multiple permeable zones by clay layers (DWR, 1973)." This is an important qualification statement that should be used in the Executive Summary for clarification.		This qualification has been added to the executive summary	SVBGSA_MCWRA Comments
W-214	4		4-21		11/25/2019	MCWRA	Statement; "ft is unlikely that any significant surficial recharge in the 180/400-Foot Aquifer Subbasin reaches the productive 180-Foot Aquifer or the 400-Foot Aquifer." "Significant" should be defined. For example, in Section 6 (Water Budgets) net deep percolation to groundwater of precipitation and irrigation is about 20,000 afy, equivalent to lateral inflows from adjoining subbasins and about 20% of the total inflow to the subbasin. If just considering recharge of precipitation, that amounts to 8,500 afy in the historical water budget, about 10% of the total inflow.		The 20,000 AF/yr. cited in this comment does not necessarily reach the productive aquifers. These numbers can be refined when the SVIHM becomes available.	SVBGSA_MCWRA Comments
W-215	4.6.1		4-28		11/25/2019	MCWRA	The caption of the figure and content of the figure do not match		These now match	SVBGSA_MCWRA Comments
W-216	5.1.1		5-2		11/25/2019	MCWRA	Section 5.1.1, page 5-2 - Data collected from privately-owned CASGEM wells is not available prior to 2015 when permission for data sharing was granted by the well owner.		It is our understanding that this comment has been superseded based on MCWRA's revised policies.	SVBGSA_MCWRA Comments
W-217	5.1.3		5-15		11/25/2019	MCWRA	Statement; "The high groundwater levels observed in 1983 suggest that groundwater levels previously had the capacity to recover to earlier levels in response to significant recharge events." This implies that recharge can affect water levels in the 180/400 over a period of several years. There was a statement earlier (Section 4.4.3) that local recharge is "very limited" but that seems inconsistent with the text here. Unless we're to believe that it only takes a few years for groundwater to flow in laterally from adjoining subbasins that don't have aquitards, or that this results from a decrease of pumping during wet years (very little decrease in agricultural pumping is observed in wet periods).		This sentence has been removed from the text	SVBGSA_MCWRA Comments
W-218	5.1.3		5-17		11/25/2019	MCWRA	Statement; "Groundwater levels have declined since 1983 with no indication that they will recover to pre-1983 levels." The data does not necessarily support this conclusion. There hasn't been an extended wet period like that seen in the late 1970's/early 1980's, therefor to conclude that it would not occur again is unsupported. The last period where 2 consecutive years of +1 standard deviation on rainfall occurred was 1982-1983.		This sentence has been removed from the text.	SVBGSA_MCWRA Comments
W-219	5			5-10 thru 5-18	11/25/2019	MCWRA	It is difficult to read the figures due to text/image quality. Placement of vertical axis at 110' artificially dampens changes. Maximum range in data is approximately 85'.		All figures have a similar range on the vertical axis so that hydrographs can be compared to each other. The 110-foot range is chosen to easily accommodate the hydrograph with the greatest range.	SVBGSA_MCWRA Comments
W-220	5.1.4		5-29		11/25/2019	MCWRA	Limited data were available that could be presented, due to confidentiality agreements. More data will be available in the future.		Limited data were available that could be presented, due to confidentiality agreements. More data will be available in the future.	SVBGSA_MCWRA Comments
W-221	5.2.1		5-31		11/25/2019	MCWRA	The 500 mg/L chloride concentration is also significant in that it represents a level that is approximately 10 times greater than native background chloride levels in the groundwater of the 180/400 Foot Aquifer.		This has been added to the text.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-222	5.2.2		5-34		11/25/2019	MCWRA	Statement; "Figure 5-23 shows that the extent of seawater intrusion in the 180-Foot Aquifer has nearly reached a local cone of depression, as represented by the small circular water level contour with a -20 foot ms/ label. This partially explains why the rate of seawater intrusion has slowed in recent years: the seawater intrusion is reaching a local low point and is not being drawn further inland." The closed -20 foot msl contour does not represent a local cone of depression, it represents a local high in water level. The closed contour is between the - 20 and -30 feet msl contours, which means that anything outside of the closed contour is below - 20 feet msl. Therefore, the area inside the closed contour must be above -20 feet msl. This statement is incorrect.		This statement has been removed.	SVBGSA_MCWRA Comments
W-223	5			5-25	11/25/2019	MCWRA	Consider stating the year associated with the seawater intrusion data on the figure.		The date has been added.	SVBGSA_MCWRA Comments
W-224	5.2.3		5-37		11/25/2019	MCWRA	Some of the increase in area of seawater intrusion in the 400-Foot Aquifer between 2013 and 2015 was also due to additional data points that made contouring possible, particularly in the Marina area.		comment noted	SVBGSA_MCWRA Comments
W-225	5.2.3		5-37		11/25/2019	MCWRA	Thin/discontinuous aquitards and improperly constructed / improperly abandoned wells may also contribute to the vertical migration of seawater intruded groundwater.		Text added	SVBGSA_MCWRA Comments
W-226	5.3.2		5-37		11/25/2019	MCWRA	Seawater intrusion likely occurs preferentially along pathways determined in part by geology so the rate of advancement of the seawater intrusion "front" can be highly variable.		Comment noted	SVBGSA_MCWRA Comments
W-227	5		5-40		11/25/2019	MCWRA	Suggest changing "Deeper Aquifers" to "Deep Aquifers".		Text has been modified.	SVBGSA_MCWRA Comments
W-228	5		5-40		11/25/2019	MCWRA	Restrictions on new wells in the Deep Aquifers was also driven by previous modeling which suggests that increased pumping in the Deep Aquifers will lead to increased vertical flow from the overlying aquifers (WRIME, 2003).		Comment noted. This is captured in the statement, "...due to concern over this risk [of seawater intrusion into the deep aquifers]..."	SVBGSA_MCWRA Comments
W-229	5		5-40		11/25/2019	MCWRA	Statement; "The volume of seawater flowing into the subbasin every year does not strictly correspond to the acreages overlying the seawater-intruded area that is shown in Figure 5-27 and Figure 5-28. As the seawater intrusion front approaches pumping depressions, the front will slow down and stop at the lowest point in the pumping depression. The seawater intrusion front will then appear to stop; and no more acreage will be added every year. However, seawater will continue to flow in from the ocean towards the pumping depression." There are several reasons that the volume of SWI will never correspond to the acreage intruded. For example, the area behind the mapped SWI front has variable concentrations of chloride (an acre-foot of seawater, with about 22,000 mg/L chloride, could translate to about 44 acre-feet of intruded groundwater at 500 mg/L). Also, the aquifer thickness is quite variable in the subbasin. Regarding the appearance of the SWI front to "slow or stop at pumping depressions", it is not the opinion of the MCWRA that this mechanism is a driver of the rate of SWI in the subbasin. The presented understanding of how the seawater intrusion front reacts at a pumping depression is not relevant in this situation. And in fact, a gradient toward the pumping depression will not necessarily prevent intrusion from continuing.		comment noted	SVBGSA_MCWRA Comments
W-230	5.3.1		5-40		11/25/2019	MCWRA	MCWRA estimates of annual change in groundwater elevation are made on a Subarea (MCWRA management zones) basis rather than for Bulletin 118 subbasins.		Comment noted. This is shown on Figure 5-20.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-231	5.3.2		5-41		11/25/2019	MCWRA	The 2015 State of the Basin report from Brown and Caldwell was prepared for Monterey County, not MCWRA		The text has been changed	SVBGSA_MCWRA Comments
W-232	5.3.2		5-43		11/25/2019	MCWRA	It would make more sense to divide into periods based on significant change in the management of the groundwater basin (i.e., up to the beginning of operation of Nacimiento Reservoir in 1957, San Antonio Reservoir in 1967; then introduction of the CSIP in 1998 and the SVWP in 2010). This would be an approach that is defensible as it is based on known fundamental shifts in groundwater management.		These periods are already shown on Figure 5-25. We will consider revising the time periods for analyzing changes in groundwater storage in future iterations of the GSP.	SVBGSA_MCWRA Comments
W-233	5.3.2		5-43		11/25/2019	MCWRA	The variation in storage from 1947 to 1998 has seen large increases in storage during wet periods, along with a cumulative positive storage change from 1949 to 1998. During the period from 1947 to 1998, there were 28 years of negative storage change and 24 years of positive storage change; while technically that indicates that "most" years had decreasing storage, it's very close to an equal number of negative and positive years. Consider revising the statement indicating a trend of steadily-decreasing groundwater storage in most years.		The text has been slightly modified.	SVBGSA_MCWRA Comments
W-234	5			5-29	11/25/2019	MCWRA	Suggest clarifying if the figure depicts data from the 180/400 Foot Aquifer Subbasin or MCWRA's "Pressure Subarea".		Notation added	SVBGSA_MCWRA Comments
W-235	6.3.1		6-7		11/25/2019	MCWRA	Statement; "The BCM-reported average annual precipitation in the 180/400-Foot Aquifer Subbasin is 114,100 AF for the historical water budget period and 106,600 AF for the current water-budget period. As shown in Table 6-1, the runoff for the historical and current periods was 1,100 and 1,700 AF/yr., respectively; equivalent to approximately 1 to 2% of precipitation." It is unclear from the text whether this analysis is limited to runoff generated within the 180/400-Foot Aquifer subbasin, or includes tributary inflow from the hills to the west (not otherwise quantified).		The text states that the calculation is "in the Subbasin"	SVBGSA_MCWRA Comments
W-236	6.3.1	6-1 and 6-2			11/25/2019	MCWRA	It is confusing that runoff would be higher during the Current period compared to the Historical period, when precipitation is lower? In contrast, flow in the Salinas River during the Current period was substantially lower than during the Historical period (Table 6-2).		Comment noted. The difference is small. It is unclear why this difference exists. It may be due to antecedent conditions in the BCM model.	SVBGSA_MCWRA Comments
W-237	6.3.2		6-7		11/25/2019	MCWRA	Statement; "As reported by MCWRA, the Salinas River depletion during September 2017 between Soledad and Gonzales, near the Subbasin boundary, was 134 cubic feet per second (cfs). The Salinas River depletion between Gonzales and the Chualar gauge was 79 cfs. Therefore, approximately 63% of the Salinas River depletion between Soledad and the Chualar gauge occurred in the Forebay Subbasin, above Gonzales; and 37% of the Salinas River depletion occurred in 180/400-Foot Aquifer Subbasin, below Gonzales." This stream depletion is based on a single day's measurement which may not be representative. If this analysis conclusion is used there should be a discussion of the limitations of applying a single data point to annual stream loss calculations.		This does constitute best available data. A comment to this effect has been added to the text.	SVBGSA_MCWRA Comments
W-238	6.5.3		6-15		11/25/2019	MCWRA	The "Pressure Management Area" is more commonly referred to as the "Pressure Subarea". Also, when discussing CSIP deliveries, it is worth noting that SRDF diversions did not begin until 2010.		All instances of Pressure Management Area have been changed to Pressure Subarea	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-239	6.5.4	6-11	6-17		11/25/2019	MCWRA	Statement; "Based on groundwater flow directions and hydraulic gradients at the Subbasin boundaries, subsurface inflow to the 180/400-Foot Aquifer Subbasin from the Forebay Subbasin has been estimated as approximately 17,000 AF/yr. (Montgomery Watson, 1997; MCWRA, 2006; Brown and Caldwell, 2015}." The Brown and Caldwell reference is incorrect in this context. This reference should also be removed from Table 6-11. The correct reference would be Montgomery Watson, 1998.		The citation has been changed	SVBGSA_MCWRA Comments
W-240	6		6-29	6-5	11/25/2019	MCWRA	Either the vertical scale or data shown on the graph for agricultural and urban pumping seem incorrect. For example, in 1998, total (agricultural and urban) pumping reported by MCWRA was 104,916 AF. The data in Figure 6-5 seems to suggest that total pumping was less than 100,000 AF for that year.		Pumping has been modified to roughly compensate for the difference between the MCWRA Pressure Area and the 180/400-Foot Aquifer area.	SVBGSA_MCWRA Comments
W-241	6.6.2		6-19		11/25/2019	MCWRA	Was any consideration given to capturing variation in ET by crop type? Perhaps data reported through ranch maps could be used as a coarse approximation to group crops and provide a more refined ET value for the basin. Also, the stated ET for Arundo donax of 16 AF/year/acre should be referenced. Regarding riparian ET included with the groundwater, it is the opinion of the MCWRA that riparian ET has a more significant impact on surface water flows		This refinement will be done when the SVIHM becomes available.	SVBGSA_MCWRA Comments
W-242	6.6.2		6-19		11/25/2019	MCWRA	The estimate of riparian ET for the subbasin (12,000 AFY) differs from the calculated value of 4,277 AFY determined by the Agency in a 1997 exercise. Changes to reservoir operations and channel maintenance practices have changed since 1997, surely influencing the extent of some phreatophytes, however, does SVBGSA believe that there has there been enough of a change in coverage to account for a nearly three-fold increase in riparian ET?		These ET estimates were the best available from people currently working along the riparian corridor. However, the text notes that the ET rate is highly variable.	SVBGSA_MCWRA Comments
W-243	6.6.3	6-15	6-19		11/25/2019	MCWRA	"The combined outflow to these two subbasins has been estimated at approximately 8,000 AF/yr. (Brown and Caldwell, 2015)." The correct reference here and in Table 6-15 is Montgomery Watson, 1998.		The citation has been changed	SVBGSA_MCWRA Comments
W-244	6.8.1	6-17			11/25/2019	MCWRA	This section should include a discussion of why there is a substantial difference (5% for historical, 15% for current) between the surface water inflows and outflows for an average year. There is no substantial storage change in the surface water system. (Section 6.9 discusses the differences in terms of uncertainty, and that section should be summarized or referenced here.)		These numbers are a result of the calculations based on best available data. Some data collected during the current period are questionable.	SVBGSA_MCWRA Comments
W-245	6.8.3		6-30		11/25/2019	MCWRA	"A review of water supply sources in the 180/400-Foot Aquifer Subbasin shows that surface water supplies, as measured by the San Antonio and Nacimiento Reservoir releases to the Salinas River, allow for a stable supply in wet and normal years." Direct diversions of reservoir releases provide a very small portion of the water supply for the 180/400-Foot Aquifer sub basin, and only since 2010. The Maximum diversion capacity of the SRDF is approximately an order of magnitude lower than total pumping in this subbasin. This statement should be revised.		This statement is about reliability, not volume. The statement has been modified to emphasize this.	SVBGSA_MCWRA Comments
W-246	6.8.5		6-32		11/25/2019	MCWRA	"Based on the water budget components, the sustainable yield of the Subbasin is 97,200 AF/yr., which represents a 10% reduction in total pumping relative to the average annual historical pumping rate." Using the average annual storage change of - 39,700 afy derived from Table 6-19, the sustainable yield would be 68,400 afy, representing a pumping decrease of 37%.		Because of the high uncertainty in the historical water budget components, the water budget is based on a calculated change in storage using water levels and seawater intrusion, not the difference between inflows and outflows.	SVBGSA_MCWRA Comments
W-247	6.9				11/25/2019	MCWRA	The difference between groundwater inflow and outflow for the historical budget is referred to twice, with different totals: 39,700 AF and 39,900 AF.		The text is now consistent.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-248	6.10.5				11/25/2019	MCWRA	Statement; "For example, the total pumping used to calculate the historical sustainable yield is 86,500 AFY, while the pumping used to estimate the projected sustainable yields varies between 115,300 and 120,600 AFY." Total pumping from Table 6-21 is 108,100 afy, not 86,500 afy. Review value given in Table 6-31.		The text is now consistent.	SVBGSA_MCWRA Comments
W-249	7.2.2		7-3		11/25/2019	MCWRA	The CASGEM network consists entirely of wells that are either owned by MCWRA or were monitored by MCWRA prior to the initiation of the CASGEM program, rather than "primarily" as stated.		The word "primarily" has been deleted	SVBGSA_MCWRA Comments
W-250	7.3.2		7-17		11/25/2019	MCWRA	"During implementation ... the SVBGSA will verify well completion information and location." Does SVBGSA intend to collect location data for all wells during the effort to acquire an accurate accounting of wells in the subbasin? MCWRA has done some preliminary work on the availability of GPS location data for wells and may be able to assist with defining data gaps in this area.		An accurate accounting of wells is one of the implementation actions. We look forward to working cooperatively with the MCWRA in this activity.	SVBGSA_MCWRA Comments
W-251	7.3.2		7-17		11/25/2019	MCWRA	"A potential data gap is the accuracy and reliability of reporting pumping rates." Is this referring to data reported to MCWRA through GEMS? If so, a clarification of what is meant by "pumping rates" would be helpful. Data reported through GEMS is done so annually and includes monthly totals of water usage but not a 'gallons per minute' type of pumping rate for each well.		The word "rates" has been deleted	SVBGSA_MCWRA Comments
W-252	7.7		7-29		11/25/2019	MCWRA	Statement; "As described in Section 5.5, there is little to no connection between the 180-Foot, 400-Foot, or Deep Aquifer and surface water in the 180/400-Foot Aquifer Subbasin. However, the Salinas River is potentially in connection with groundwater in the shallow water-bearing sediments that do not constitute a principal aquifer. The shallow sediments are not used for any significant extraction, and have very little monitoring data. Therefore, the level of interconnection is unclear." According to the water budget, stream percolation accounts for 50,000 afy of the 90,000 afy of annual inflow to the subbasin, more than half the total. This indicates either that the water budget includes the Shallow Aquifer sediments, or that the River is better connected to the 180-Foot Aquifer than is indicated by the text. As stated earlier in the GSP, there are recognized gaps in the Salinas Valley Aquitard.		The water budget includes the shallow sediments.	SVBGSA_MCWRA Comments
W-253	8	8-1	8-6		11/25/2019	MCWRA	The Undesirable Result for Sustainability Indicator "Reduction in Groundwater Storage" refers to a "long-term average". Suggest defining how the period of time for "long-term" will be determined.		Comment noted. No definition of long-term exists.	SVBGSA_MCWRA Comments
W-254	8	8-1	8-6		11/25/2019	MCWRA	Sustainability Indicator "Seawater Intrusion" has interim milestones that suggest measurements will be made relative to some starting point, e.g. "one third of the way". Suggest clarifying the starting point, as the seawater intrusion front consists of irregularly-shaped contours or, in the case of the 400-Foot Aquifer, multiple non-contiguous contours.		The first interim milestone is current conditions, the implied starting point.	SVBGSA_MCWRA Comments
W-255	8.6.2.1		8-17		11/25/2019	MCWRA	Fall groundwater level contour maps are developed from data collected from October through December.		The text has been clarified	SVBGSA_MCWRA Comments
W-256	8.6.2.1		8-34		11/25/2019	MCWRA	MCWRA seawater intrusion contours are developed using data from privately-owned wells and dedicated monitoring wells, not only "dedicated monitoring wells near the coast" as stated in paragraph 3.		The text has been clarified.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-257	8		8-36	8-7	11/25/2019	MCWRA	Suggest showing the 2017 contours as depicted by MCWRA as part of the overall front illustrated on the figure.		The objective must be a single isocontour. therefore, the 2017 contours were combined into a single isocontour.	SVBGSA_MCWRA Comments
W-258	8.11		8-61		11/25/2019	MCWRA	The Salinas River is a losing river, independent of the year type or season.		The text has been clarified.	SVBGSA_MCWRA Comments
W-259	9.3				11/25/2019	MCWRA	Through its extensive experience and knowledge of facilities operation, MCWRA can provide valuable insights to aid the SVBGSA in the implementation of Management Actions. MCWRA looks forward to a cooperative approach in the assessment and implementation of Management Actions.		SVBGSA looks forward to working cooperatively with MCWRA during GSP implementation.	SVBGSA_MCWRA Comments
W-260	9.3.2				11/25/2019	MCWRA	The SVBGSA should evaluate the impact of Prime Agricultural Land designation or Agricultural Preservation Zones prior to the development of policies or ordinances related to agricultural land retirement.		This will be considered during the implementation phase.	SVBGSA_MCWRA Comments
W-261	9.3.4				11/25/2019	MCWRA	The MCWRA Board of Directors adopted a Reservoir Operations Policy in February of 2018 after a robust stakeholder process. As stated on page 2 of the policy, "As a multi-use facility, Nacimiento Dam and Reservoir is operated with consideration to many factors including dam safety, flood protection, groundwater recharge, operation of the SRDF, water supply, fish migration, fish habitat requirements, agriculture, and recreation. This Operation Policy defines parameters and describes guidelines and requirements the Agency will follow to operate the Dam and meet the challenges of balancing the sometimes competing interests involved in operating this multi-use facility." The MCWRA is undertaking a Habitat Conservation Plan (HCP) to update the operations of the reservoirs. The HCP will be developed through an extensive stakeholder process and robust scientific analysis that evaluate a wide range of environmental and operational considerations. The MCWRA anticipates the SVBGSA will play a significant role in the development of a Habitat Conservation Plan for future reservoir operations.		SVBGSA looks forward to participating in MCWRA's HCP development process.	SVBGSA_MCWRA Comments
W-262	9.3.5		9-16		11/25/2019	MCWRA	This management action has the potential to duplicate or conflict with parts of MCWRA Ordinance No. 3790.		SVBGSA will work with MCWRA to ensure management actions do not conflict with MCWRA ordinances.	SVBGSA_MCWRA Comments
W-263	9.3.6		9-18		11/25/2019	MCWRA	Ordinance No. 5302 is a Monterey County ordinance. Restrictions on wells in the Deep Aquifers are not MCWRA's restrictions.		This has been corrected.	SVBGSA_MCWRA Comments
W-264	9.4.3.1				11/25/2019	MCWRA	MCWRA will actively participate in the pre-design phase of all projects related to existing MCWRA infrastructure.		SVBGSA looks forward to working with MCWRA on the pre-design and implementation of projects.	SVBGSA_MCWRA Comments
W-265	9.4.3.2				11/25/2019	MCWRA	The RCD of Monterey County spearheads an arundo eradication project that is not considered mitigation for impacts. It is a comprehensive program that has systematically addressed this invasive species from the upstream to the downstream sections of the Salinas River. The long-term benefits of invasive species eradication will decrease as native vegetation grows in its place. The Salinas River Stream Maintenance Program allows for consistent vegetation treatment to increase flow capacity of the river and will reduce evapotranspiration for the longer term. Additional river flows as considered in Section 9.3.4 will make vegetation management actions even more critical since vegetation will thrive under those conditions.		Comment noted.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-266	9.4.3.2.2				11/25/2019	MCWRA	Statement; "Model results suggest that this project reduces seawater intrusion by approximately 890 AF/yr. on average." First mention of a groundwater model, not referenced in Appendix 9C.		This is the NSV model is discussed in Appendix 9C.	SVBGSA_MCWRA Comments
W-267	9.4.3.3				11/25/2019	MCWRA	The CSIP system has integrated recycled water, well water and river diversion supply through the sharing of infrastructure. As it is currently configured, the recycled water and river diversion water share a storage pond near the treatment facilities. The wells are located out in the irrigation system and therefore serve as a critical link to distributing water when there are peak demands. Substituting more recycled water or river water does not always reduce well use as the previous two compete to fill the storage pond. Irrigation demands are dependent on many other factors such as crop type, stage of growth, and climate conditions. Shifting the irrigation demand to when the water is available may not meet the objectives of optimal plant growth and productivity. Water storage could be from recycled water since		Comment noted. This will be taken into consideration during the implementation phase.	SVBGSA_MCWRA Comments
W-268	9.4.3.3		9-31		11/25/2019	MCWRA	Supplemental wells are responsible for most pumping in the CSIP zone for the reason specified here. Private wells in the CSIP area are standby wells and can be pumped for specified circumstances.		Comment noted.	SVBGSA_MCWRA Comments
W-269	9.4.3.4				11/25/2019	MCWRA	MCWRA is a sister agency to MIW and the agencies work collaboratively on operating and maintaining the tertiary treatment facility (SVRP). Modifications to produce tertiary treated recycled water when demands are low is needed at the SVRP site. All wastewater is treated to the secondary level without any modifications necessary. Groundwater pumping is currently necessary for meeting demand as well as addressing pressure issues in the system. These modifications would need to be coupled with the hydraulic modeling and other system improvements described in the previous section to be most effective at reducing groundwater pumping. This project is not currently funded nor have the CSIP customers approved an increased charge. New funding estimates are $7-10 million and additional funding resources should be identified to implement this project.		The GSP includes an estimated capital cost for the M1W Winter Modification project of $1,493,000, estimated by Raftelis Financial Consultants (2018). This comment does not include sufficient information to revise this estimate at this time, but the SVBGSA will discuss the project and cost with MCWRA during the implementation phase.	SVBGSA_MCWRA Comments
W-270	9.4.1.3		9-72		11/25/2019	MCWRA	Statement; "The desalination alternative project is one of five alternative projects that may provide additional water to the Subbasin. The project will only be implemented after all five alternative projects have been refined. The most cost-effective project of the five will be selected to supply additional water to the Subbasin." There are only four Alternative Projects listed in 9.4.4.		Text revised to say four.	SVBGSA_MCWRA Comments
W-271	9.4.3.5				11/25/2019	MCWRA	Other possible approaches to CSIP expansion should be considered moving forward. A thorough analysis of distribution system upgrades and some reliance of existing wells must be considered. Storage of recycled water may not be able to meet peak demands and SRDF water is not available every year. Areas for expansion should consider more factors than seawater intrusion. Expansion may decrease the need for the SVRP modifications described previously.		Thank you for the information. This will be included as projects are refined during the implementation phase of the GSP.	SVBGSA_MCWRA Comments
W-272	9.4.3.6				11/25/2019	MCWRA	Scheduling irrigation deliveries to reduce peak demands and re-operating the SVRP storage pond could help increase SRDF efficiency. Additional analysis to understand how the water would be used in the system is necessary. In years when SRDF diversions are not available, an alternate back up supply, such as groundwater, will be needed. As the system is currently configured, when SVRP usage increases SRDF reduces and vice versa as they are sharing facilities that limit the amount of water that can be delivered. Capital expenditures may be necessary to accomplish the increased use of SRDF water.		Thank you for the information. This will be included as projects are refined during the implementation phase of the GSP.	SVBGSA_MCWRA Comments

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-273	9.4.3.7		9-50		11/25/2019	MCWRA	GSP States that "Supplemental water to replace the extracted water would come from one of a number of other sources" but does not elaborate on what those other sources might be.		Sources of supplemental water will be evaluated during the implementation phase of the GSP as projects are refined.	SVBGSA_MCWRA Comments
W-274	9.4.3.7		9-51		11/25/2019	MCWRA	GSP includes assumptions about the pumping rates of wells in the 180- and 400-Foot Aquifer but does not explain the origin of these assumptions, subsequently making it difficult to evaluate the validity of the assumptions and the project as a whole.		Comment noted. Section 4.4.2 gives a range of pumping rates for the principal aqiufers.	SVBGSA_MCWRA Comments
W-275	9.4.3.9				11/25/2019	MCWRA	Preferred Project 8 (11043 Diversion Facilities Phase II: Soledad) should include coordination with MCWRA and consultation on construction and operation of a diversion facility.		Text added: The SVBGSA will coordinate and consult with MCWRA on planning, construction, and operation of this project.	SVBGSA_MCWRA Comments
W-276	9.4.3.9.2		9-60		11/25/2019	MCWRA	Consider including water quality as a relevant measurable objective for this project.		Water quality is not a primary expected benefit of this project; however, could be added during the planning phase.	SVBGSA_MCWRA Comments
W-277	9.4.3.10				11/25/2019	MCWRA	The SRDF is a point of re-diversion from Nacimiento and San Antonio Reservoir's two water right licenses and permit. Permit 21089 is a right to store and use water from the Nacimiento River. Changes to all three would be necessary to change the time of year water could be rediverted, along with the addition of an additional storage component. These changes are currently in conflict with the amou nt of water available to redivert at the SRDF from April 1st to October 31st, when demands are at their peak. The reservoirs have a limit on the amount of water that can be stored on an annual basis; and the water right licenses and permits have restrictions as to how much is withdrawn from storage annually. Additionally, treatment of river water should must comply with all state and federal regulations for injection into the groundwater aquifers.		Thank you for the additional information. The SVBGSA will work with MCWRA in the planning stages of this project.	SVBGSA_MCWRA Comments
W-278	10.3		10-8		11/25/2019	MCWRA	Statement; 'To develop better estimates of aquifer properties, the SVBGSA will identify up to three wells in the 180-Foot Aquifer and up to three wells in the 400-Foot aquifer for aquifer testing. Each well test will last a minimum of 8 hours, and will be followed by a 4-hour monitored recovery period. Wells for testing will be identified using the following criteria." It is the opinion of the MCWRA that three data points and the minimum test period in each aquifer will do little to refine the hydrogeologic properties of this subbasin. At a minimum, the MCWRA would recommend six to eight additional data points in the Deep Aquifers with an additional four to six data points in each of the 180-Foot and 400-Foot Aquifers. Pumping for the tests should last for a minimum of 12 hours, with a six to eight-hour recovery period in order to derive aquifer properties beyond the immediate vicinity of each well (data point).		Comment noted. The number of wells or duration of test was not changed at this point, as it would increase the budget ; however, SVBGSA will revisit these details when the testing program is initiated.	SVBGSA_MCWRA Comments
W-279	10.4				11/25/2019	MCWRA	Numbering errors in subsections		Numbering is fixed	SVBGSA_MCWRA Comments
W-280	10.1.9		10-8		11/25/2019	MCWRA	Two Shallow wells adjacent to the Salinas River are inadequate to characterize level of interconnection.		Comment noted. MCWRA can raise this with stakeholders in future SVBGSA meetings.	SVBGSA_MCWRA Comments
W-281					11/25/2019	SVWC	Many of the references to the other Sub-Basins within the text of the 180/400 GSP should be deleted as they are confusing as to whether they apply other subbasins and/or how they would apply. This GSP is specific to the 180/400 Aquifer Subbasin and it should be clear to the reader that the various thresholds, standards, projects and/or management actions work to provide the needed and required sustainability to the 180/400 Aquifer Subbasin.		The GSP needs to be clear as to how this GSP relates to other subbasins. Text has been revised to try to clarify these relationships and avoid confusion.	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-282					11/25/2019	SVWC	Data gaps and lack of data: Section ES-5, Historical and Current Water Budgets states the historical and current water budgets are based on “best available data and tools”, but goes on to state that “no groundwater model is available that produces an accurate historical and current water budget.” That is, there are significant data gaps due to the unavailability of a groundwater model. We understand that it is anticipated that the water budgets will be updated to reflect the SVIHM output when it is released. The water budgets are key to this critically overdrafted subbasin. It is difficult to fully know what management actions and projects are needed to bring this subbasin into sustainability without having accurate historical and current water budgets. This is an important element of the entire GSP. Because of the lack of accurate data and tools, it is important to look at what management actions and projects should be implemented in the near-term (immediately) and the short-term (within 6 months to one year) and the long-term in order to bring the 180/400 subbasin into sustainability as soon as possible while preparing to meet long-term sustainability. This section also states that the “relatively high percentage error emphasizes the need to adopt the modeled historical groundwater budget when the historical SVIHM becomes available.” It is because of this statement, in part, that it is difficult to understand the extent of the existing seawater intrusion problem in the 180/400 subbasin and the level of management actions and/or projects needed to meet sustainability, and whether the ones presented in the GSP will provide it. Table 1 on page 10 demonstrates the level of uncertainty of using the ‘best available data and tools’, and only further confuses the matter and the reader.		Comment noted. Lack of a groundwater model does not prohibit the determination of water budgets from other available data and tools, so it is not a data gap. However, the water budget wil be updated when the SVIHM is available.	SVWC comments on 180 400 GSP 112519 final.pdf
W-283					11/25/2019	SVWC	Water Charges Framework: The water charges framework discussion should be geared only for the 180/400 GSP. While this type of framework may work for the other subbasins, this plan is ONLY for the 180/400 subbasin and what management actions and projects need to be implemented to meet the required sustainability for this critically overdrafted subbasin. Any contemplated water charges for implementing management actions and/or projects to address the seawater intrusion issue in this subbasin, should not be applied to the other subbasin unless and until it is shown how, and if, the other subbasins contribute to the seawater intrusion of the 180/400 subbasin and how they will benefit from the implementation of the management actions and/or projects. o Please know that the Salinas Valley Water Coalition supports all lands within the entire SVGBGSA paying fees to meet the overall administrative costs. However, they do not support blanket implementation of pumping charges to offset costs of implementing management actions and/or projects within the 180/400 subbasin; the costs for implementing these actions and projects should be paid for by those who would benefit from them – i.e. those within the 180/400 subbasin.		Comment noted. The SVBGSA decided to include the water charges framework, projects, and management actions for the entire SVBGSA area because they are hydraulically connected and affect each other. Comment noted regarding what SVWC supports.	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-284					11/25/2019	SVWC	Management Actions: This section identifies six management actions that “are most reliable, implementable, cost-effective, and acceptable to stakeholder.” The GSP then goes on to state “the first three would benefit the entire Salinas Valley; the last three are specific to the 180/400 Aquifer Subbasin.” “Agricultural land and pumping allowance retirement”. The SVWC does not believe that the Salinas Valley, other than the 180/400 Aquifer Subbasin will benefit from such pumping allowances and/or agricultural land retirement. Science and ‘accurate’ data has shown that areas outside of the 180/400 Aquifer do not contribute to seawater intrusion in the 180/400 and/or will the Salinas Valley, other than the 180/400, benefit from stopping seawater intrusion – except and to the extent of being a good neighbor and wanting to see this problem in the northern end of the Salinas Valley solved. Science and data have shown that this problem can only be solved by those within the 180/400 Aquifer Subbasin. See letter for specific comments.		SVWC preferences are noted. These comments will be taken into consideration during the implementation phase when projects and management actions are further developed.	SVWC comments on 180 400 GSP 112519 final.pdf
W-285					11/25/2019	SVWC	Without offering a tracked changes version for each document, it is difficult for the public to sift through all text, figures and tables to determine what has been changed. Although the SVB GSA website is a repository for all documents, not all previous versions of Chapters are easily accessible to the public. On the GSP Valley Wide page, only Chapter 7 (released 5/16/19), Chapter 5 ((released 3/14/19) and Chapter 4 ((released 1/10/19) are available.1 The 180/400 page lists a simple one page “Update No. 1” description of a few high level changes. 2 Instead, one has to look through old meeting agendas and packets to find previous versions of documents. Unfortunately, many of these documents, although included as part of a dated agenda, do not have a date and the bottom of the document.		While meeting materials are transparent and located with the corresponding meeting agendas, the SVBGSA only makes the chapters public by putting them on the main pages after Board approval.	SVWC comments on 180 400 GSP 112519 final.pdf
W-286	9.2				11/25/2019	SVWC	As mentioned above, the water charges framework should be considered for implementation only within the 180/400 Aquifer Subbasin. It should not be assumed to apply and be appropriate for the entire Salinas Valley. The GSP should also include other types of funding mechanisms to fund the implementation of management actions and projects for this GSP – but again, it should only consider such funding mechanisms as needed for the 180/400 Aquifer Subbasin, and not the entire Salinas Valley. Each subbasin should be allowed to consider other funding mechanisms as need to support implementation of their individual GSP. See letter for specific comments related to the text		Comment noted	SVWC comments on 180 400 GSP 112519 final.pdf
W-287	9.2.7				11/25/2019	SVWC	As we have stated above, this section should add: “Which financing method will fund GSA functions and projects for the 180/400 sub basin” o The option for multiple funding sources is clearly stated earlier, but at this point the document is making it sound as if WCF is already finalized and that it will be applied throughout all subbasins in the Salinas Valley—when it should only be applied within the 180/400 Aquifer Subbasin for this GSP and then may be considered within the other subbasins as their GSP’s are developed and implemented. o Page 9-2: “Depending on the outcome of the negotiations, long-term GSP implementation may be funded by the water charges framework, other financing method as permitted by SGMA and other state law, or a combination thereof.”		The water charges framework has not been finalized. As stated in the text, there will be numerous stakeholder discussions to design and agree upon it.	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-288	9.2.7				11/25/2019	SVWC	The GSP states, "What is an equitable balance between the Tier 1 Sustainable Pumping Charge collected in the 180/400-Foot Aquifer Subbasin and the Tier 1 Sustainable Pumping Charge collected in other subbasins?" o However, this seems to conflict with what is stated on Page 9-2: "Therefore, actual costs seen by growers are proportional to individual needs project water." o This statement assumes that other subbasins will have Tiered WCF similar to the 180/400, as we have stated, this may not be the case. The 180/400 Aquifer Subbasin GSP should clearly state that the water charges framework will be applied to the 180/400 Aquifer Subbasin GSP and "may' be considered for implementation in other subbasins as their GSP's are developed.		The GSP outlines a notional idea of what the water charges framework could look like; however, as stated in the text, there are many details to be discussed and agreed upon, such as this question.	SVWC comments on 180 400 GSP 112519 final.pdf
W-289	9.3.2				11/25/2019	SVWC	The assumption of Chapter 9 is that a combination of reduced pumping and projects are likely needed, however, doesn't state how we may be able to achieve our goal with reduced pumping alone. The 180/400 Aquifer Subbasin GSP should state what other action(s) would be needed if projects are not supported and approved – this would be comparable to including a 'no project' alternative.		An analysis of how to achieve the sustainability goal with reduced pumping alone has not been done at this point, but the SVBGSA may do so during the implementation and GSP update period.	SVWC comments on 180 400 GSP 112519 final.pdf
W-290	9				11/25/2019	SVWC	SGMA requires projects and management actions to have quantified benefits. Management Action #1 is the only Management Action that has potential water savings, therefore it should either state those savings or be moved to the Projects section in the Final Draft. It should consider, and be limited to, opportunities for such savings within the 180/400 Aquifer. The "Project" would be for SVB GSA staff or consultants to conduct a geospatial analysis to assess the best areas to potentially purchase lands for retirement, study the economic value of the land and water		Projects are defined as activities that support groundwater sustainability that require infrastructure, so Management Action #1 would not qualify. The amount of water savings is unknown at this time. The SVBGSA includes the suggested assessment as part of the overall management action.	SVWC comments on 180 400 GSP 112519 final.pdf
W-291	9				11/25/2019	SVWC	In order provide a full understanding as to what it would be mean to the 180/400 Aquifer if NO projects were approved and implemented, at the minimum, the Permanent Retirement estimated cost calculations (9.3.2.8) needs to be refined		While water savings will continue, to obtain a comparable number, 25 years was used. More detailed refinement of the cost of implementation and benefits will be calculated during the implementation period.	SVWC comments on 180 400 GSP 112519 final.pdf
W-292	9				11/25/2019	SVWC	Relevant Measurable Objectives - Why isn't Water Quality Objective mentioned in any of these sections? • The GSP should state that it is the intent to collaborate with other agencies, entities, including the Regional Water Quality Control Board to promote water quality objectives.		The Retional Water Quality Control Board is one of the stakeholders. The GSP does not list all stakeholders individually.	SVWC comments on 180 400 GSP 112519 final.pdf
W-293	9				11/25/2019	SVWC	"The project cost will be covered through delivery charges to existing CSIP customers. Because a funding mechanism for this project has already been identified, these costs will not be incorporated into the Water Charges Framework." • Seems that this would apply to PP2 and PP5 as well. Shouldn't optimizing CSIP be paid by those who would benefit, and expanding CSIP be paid by those who benefit? Would all growers in the 180/400 pay into PP2 and PP5 or just those that receive water from CSIP? • Page 9-2: "Therefore, actual costs seen by growers are proportional to individual needs project water."		Which projects are included in the water charges framework will be part of future discussions.	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-294	9.4.3.6.6				11/25/2019	SVWC	" The estimated projected yield for the project is 11,600 AF/year. "The yield for this project is the same yield that is identified in Priority Project #2 and a portion of the yield identified in Priority Project #3." • What does this statement mean, does it mean it is the same water saved (it cannot be double-counted)? • If this is the case, why is the project yield AF related to CSIP projects listed separately in Table 9-5 if the water saved is the same? • The 3 CSIP-related projects need to be clarified for the public, growers and land owners to understand o How are they interrelated? o How many acre-feet exactly result from the separate projects of 2,3 and 5? o What is the intention of separating projects vs. combining all into one if they have overlapping water savings? o Could these projects be listed as one project to be implemented in phases?		The text has been clarified and now reads "The yield for this project will facilitate achieving the yield that is identified in Priority Project 2 and a portion of the yield identified in Priority Project 4." The 11,600 was removed from Table 9-4. The questions will be considered as the projects are refined.	SVWC comments on 180 400 GSP 112519 final.pdf
W-295	9.4.3.7				11/25/2019	SVWC	Does the cost estimate include environmental review under CEQA? PG&E costs? Where will brackish water go? There are many unanswered questions that require significant analysis before a decision can be made as to whether this project can work. It might be helpful to also compare this project to a desal plant.		CEQA is not included in estimated project costs, but is included in the budget because it is part of the design and permitting phase (whereas the water charges framework or other funding mechanism would fund construction).	SVWC comments on 180 400 GSP 112519 final.pdf
W-296	9.4.3.7				11/25/2019	SVWC	Does the cost estimate include desalination so it can be used? If not, it is not a "yield" of water for the basin to use. Although the seawater intrusion wells may pump this amount per year, none of this water will be useful for irrigation or domestic purposes. Therefore a reader cannot easily make an "apples to apples" comparison from this to other Preferred Projects, such as PP2,3,4,5. Even PP1, Invasive Species removal, which is of a different category, still has the supposed end result that less water is taken up by evapotranspiration and therefore more water will be left in the river or groundwater basin that could be available to recharge. To the contrary, PP6 takes brackish water out of the basin and discharges it into the ocean, so where is the water savings?		The estimation of yield for the seawater intrusion barrier is only included for the purpose of comparing its cost to other projects (and that has been clarified in the text). The benefit it provides is not directly comparable to other projects.	SVWC comments on 180 400 GSP 112519 final.pdf
W-297	9.4.3.7				11/25/2019	SVWC	Whether environmentally and politically possible, the cost-benefit analysis of this proposed project does not seem to be correct. Specifically: o If the project yield is 30,000 AFY, why is it stated that it extracts 22,000 AFY in the notes below Table 9-5? o If project yield and costs calculation use the denominator 30,000 AFY, why is it listed as a value of only -11,000 AFY in table 9-5? If this is the actual value to the basin, shouldn't the cost be divided by 11,000 AF? o If the value is negative 11,000 AFY (and other projects are positive) how exactly does this add up to helping mitigate overdraft? Again, it is hard to compare apples to oranges.		The seawater intrusion barrier yield has been removed from Table 9-5 since it does not directly mitigate overdraft.	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-298	9.4.3.7				11/25/2019	SVWC	Why is PP6 the same cost as PP9, when capital costs are $50 million higher and annual O&M is $6Million higher/year? (Again, the 30,000 AF "yield" of PP6 does not increase water in the aquifer – it takes it out, therefore you cannot divide by yield in PP6 similarly to PP9). o PP6 Seawater Intrusion Pumping Barrier: "Capital cost for the Seawater Intrusion Pumping Barrier project is estimated at $102,389,000. This includes 44,000 LF of 8-inch to 36-inch pipe and rehabilitation of the existing M1W outfall. Annual O&M costs are anticipated to be approximately $9,800,000. The total projected yield for the Seawater Intrusion Pumping Barrier is 30,000 AF/yr. The cost of water for this project is estimated at $590/AF." o PP9 SRDF Winter Flow Injection: "The majority of the costs are for the construction of the injection wells. Capital costs are assumed to be $51,191,000 for construction of an injection well field consisting of 16 wells as well as construction of a 4-mile conveyance pipeline between the SRDF site and the injection well system. Annual O&M costs are estimated at $3,624,000 for the operation of the injection well field. Total annualized cost is $7,629,000. Based on a project yield of 12,900 AF/yr., the unit cost of water is $590/AF/yr."		The costs in the text are correct. The capital costs are annualized and the O&M costs are then added to the annualized capital costs.	SVWC comments on 180 400 GSP 112519 final.pdf
W-299	9.4.3.10				11/25/2019	SVWC	This project proposes injection wells, have groundwater recharge basins been considered? This would include a water savings from taking ground out of production (3 af/acre) and no major ongoing O&M/capital costs. • Why is there 4 miles of pipeline? Could you contact landowners closer to facilities, purchase land, permanently fallow ground closer to region to be served and reduce fee. Compare the cost/mile pipe vs. land costs.		Because the 180 and 400 foot aquifers are somewhat confied, surface recharge is inefficient at recharging these aquifers. The deatils of implementation we'll work out during the design phase.	SVWC comments on 180 400 GSP 112519 final.pdf
W-300	9.6				11/25/2019	SVWC	What is the current demand in the 180/400 Aquifer Subbasin? What is the sustainable yield for Subbasin? What is the overdraft of the Subbasin? - According to 5.3.4 Total Change in Groundwater Storage, the basin is over drafted by 11,700 AFY. - According to 9.6 Mitigation of Overdraft, the historical subbasin overdraft estimated in Chapter 6 is 12,600 AF/yr. - If we have to add on to the overdraft as a "buffer" to stop seawater intrusion, what is the target goal? 20,000 AFY?		Text has been added to clarify that mitigation of overdraft is based on the long-term future overdraft, and is not sufficient for reaching sustainability.	SVWC comments on 180 400 GSP 112519 final.pdf
W-301	9.6				11/25/2019	SVWC	What is the cumulative impact of multiple projects? If all projects were put in place, or a certain combination of projects in place, would there be enough water for it?		Table 9-5 demonstrates that there are ample projects to mitigate overdraft	SVWC comments on 180 400 GSP 112519 final.pdf
W-302	9.6				11/25/2019	SVWC	Table 9-5 – total in table is -58,201, but this appears to be incorrect, if added the total is 40,800 AF		Table 9-5 has been modified	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-303	10				11/25/2019	SVWC	Our members are sensitive to total costs to implement SGMA, especially for Management Actions that may be lumped into the shared Valley Wide budget. Between the First and Second drafts of Chapter 9 (between July 18 and August 8, 2019, as described in Process section above), the two Management Actions (MAs) have been added and the cost for existing MAs have increased in both years, cost per year and total cost. In total we have calculated that annual costs for these MAs have gone up +$255,000 and assuming MA #2 education lasts 5 years, total costs increase by $1,000,000. On the "Public Comment" document, there is no apparent public comment on these MA changes, most of the comments were around the Water Charges Framework and Projects.6 Since the release of the August draft and the October draft, there doesn't seem to be substantial changes despite the extensive comments received.		Discussions and comments received. Only formal comments and meetings were included in the spreadsheet. Only technical edits and more realistic cost estimates were made to projects and management actions, not substantive changes that require more thorough analysis, which will be done as the projects are refined during the implementation period.	SVWC comments on 180 400 GSP 112519 final.pdf
W-304	10				11/25/2019	SVWC	Why did MA 1 change from a 4% 30 year mortgage to a 6% 25-year mortgage? • How many years is MA #2 expected to take? • Why has the number of years gone up for MA #3, 4, 5? • Why has the cost per year gone up for MA #4? • MA6 creating a Seawater Intrusion Working Group (SIWG) was recently added, and while this may be a good idea, it is the most expensive Management Action. It also isn't clear as to the level of inclusion of stakeholders – they need to be included in any working group. o Why is there $250,000 on Tale 10-1 for "Seawater Intrusion Working Group" and an additional $200,000 on Table 10-2 for "Coordinate SIWG? If total budget is $250,000+$200,000, why aren't these costs stated in Chapter 9? o Table 10-2: We have $1.2 million for Operational Costs, why is SWIG listed as a separate line item whereas other Management Actions are assumed to be included under Operational Costs? • It states that the SVB GSA is only providing "oversight" for many of the Management Actions and even some Projects. Will these be overseen by other agencies? If so, would SVBGSA have any authority over these actions and projects? o If it is just to primarily stay informed and attend meetings, why is the cost to GSA so high (especially MA 3,4,5)? o Has SVB-GSA Board of Directors approved expansion to its staffing? o If not, will salaries of two existing staff be significantly increasing?		The cost assumptions for MA1 were changed to be consistent with the cost assumptions for all other projects Management Action 2: Outreach and Education is ongoing with no set end date The timeframes and costs for management actions were set based on our best estimate of when these actions could reasonable be implemented and the estimated effort. The costs for seawater intrusion working group include coordination, meeting, and negotiation costs (Coordinate SIWG), as well as costs for technical analyses of existing data (Seawater Intrusion Working Group). SVBGSA plans to work cooperatively with other agencies and NGOs to effectively and efficiently implement the management actions and projects. SVBGSA currently does not plan to duplicate work done by others. While not agreed to yet, it is possible that SVBGSA will share authority on shared projects.	SVWC comments on 180 400 GSP 112519 final.pdf
W-305	10	10-1 and 10-2			11/25/2019	SVWC	Are all Management Actions assumed to be included under Table 10-2 Operational Costs ($1.2M)? o We have $1.2 million for Operational Costs, why is SWIG listed as a separate line item if other Management Actions are assumed to be included under Operational Costs?		As stated in the text: "Costs for implementing projects and actions are in addition to the agreed-upon funding to sustain the operational costs of the GSA, and the funding needed for monitoring and reporting. "	SVWC comments on 180 400 GSP 112519 final.pdf

Number	Chapter	Table	Page	Figure	Date	Commenter	Comment	DW response	Response	Commenter doc name
W-306	10	10-1 and 10-2			11/25/2019	SVWC	All 180/400 planning, operational costs and specific actions should be put under table 10-1, not 10-2. This is important because the basin is different both scientifically and in the eyes of the State Water Board. It is considered a high priority basin and therefore has different regulatory time schedule for the implementation of 180/400 projects. Because saltwater intrusion issue it faces is more challenging than other sub-basins, the potential need for complex and multiple projects will also drive up the costs for compliance for this sub-basin. For example, o Why is SIWG ($200,000) listed on “Valley-wide” planning cost Table 10-2 when seawater intrusion isn’t a valley-wide issue? o Why is Refine Projects and Actions ($460,000) on table 10-2 if other basins may have no need for projects, or the projects they may partake in (such as PP#1 Invasive Species Removal) already exist? o While the cost/benefit analysis of projects for the 180/400 may have some interaction with other basins such as the Forebay, to put a generic placeholders on table 10-2 and claim that they are “Whole Valley” line items is erroneous.		Table 10-1 lists costs that are specific to the 180/400-Foot Aquifer Subbasin; Table 10-2 are costs that could reasonably viewed as Valley-wide. These are estimated costs, but are open to revision when the funding mechanisms are finalized. The Seawater intrusion were accidently duplicated. The seawater intrusion working group costs have been removed from the Valley-wide costs.	SVWC comments on 180 400 GSP 112519 final.pdf
W-307	10	10-1 and 10-2			11/25/2019	SVWC	There appears to be an addition error in Table 10-2 as the ‘Total’ of $9,422,600.00 is not correct – but rather it should be $2,921,800.00 according to our addition. This is a significant error as it distorts the overall total costs of the projects, and then distorts the average annual cost and hence, the potential costs to be paid by landowners. Table 10-1 also appears to be added incorrectly, calling into question the integrity of the document.		In both Tables 10-1 and 10-2 costs are marked as 'lump sum' or 'annual' costs. Annual costs are included in the total budget for 5 years. Numbers have been double checked and are correct.	SVWC comments on 180 400 GSP 112519 final.pdf