CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER R5-2018-0033
FOR
SOUTHERN MINNESOTA BEET SUGAR COOPERATIVE,
SPRECKELS SUGAR COMPANY, INC. AND MEYERS FARMING, LLC
FORMER SPRECKELS MENDOTA FACILITY
FRESNO COUNTY

This Order is issued to Southern Minnesota Beet Sugar Cooperative (SMBSC), Spreckels Sugar Company, Inc. (SSCI) and Meyers Farming LLC (Meyers) (*collectively*, Dischargers) pursuant to Water Code section 13304, which authorizes the California Regional Water Quality Control Board, Central Valley Region ("Central Valley Water Board" or "Board") to issue a Cleanup and Abatement Order (Order), and Water Code section 13267, which authorizes the Central Valley Water Board to require preparation and submittal of technical and monitoring reports.

The California Regional Water Quality Control Board, Central Valley Region ("Central Valley Water Board" or "Board") finds that:

GENERAL BACKGROUND

1. SSCI and its various corporate parents (see Finding No. 4, below) previously operated a sugar beet processing facility (Facility) in Fresno County, near the City of Mendota. The subject Facility covers approximately 1,863 acres, and is comprised in part of Assessor Parcel Nos. ("APN") 013-030-17S, 019-061-79S and 019-070-61S. A location map is attached to this Order as "Attachment A," and is incorporated herein.

2. Throughout the operational lifetime of the Facility, beet sugar was extracted from a dilute molasses solution using activated Precipitated Calcium Carbonate (PCC), commonly known as "lime." This operation is commonly referred to as the "Steffen's Process." The Steffen's Process resulted in a nutrient-rich, high-saline residual solution (Steffen's Waste), which consisted of organic and inorganic constituents contributing to high levels of Total Dissolved Solids (TDS). Specifically, Steffen's Waste consisted of total organic contents of approximately 9,500 milligrams per liter (mg/L) and inorganic salts concentrations of approximately 11,500 mg/L. Up until 1991, Steffen's Waste was discharged into a series of shallow, unlined pools (Steffen's Ponds) covering approximately 128 acres at the Facility. These discharges have resulted in the degradation of soil and groundwater beneath the Facility.

3. In addition to the Steffen's Waste discharge, approximately two to four million gallons per day of Facility process wastewater were applied to approximately 130 acres of ponds (Factory Ponds), which are situated to the southwest of the Steffen's Ponds. Analytical data collected from 2006 to 2008 from nine Facility wastewater samples indicate an average TDS concentration of approximately 1,800 mg/L. Waste discharges to the Factory Ponds, Sedimentation Ponds and PCC Ponds effectively ended when the Facility ceased sugar beet processing operations in 2008. Soil sample results collected in 2012 indicate elevated nitrates in soils beneath the former Factory Ponds.

4. SSCI began operating the Facility in approximately 1962. Although SSCI initially operated as a subsidiary of AMSTAR Corporation (AMSTAR), now ASR Group International, Inc. (ASR), corporate ownership of SSCI was eventually sold to Spreckels Industries, Inc. (SII)

in 1987. In 1996, SII was purchased by or merged with the Holly Sugar Corporation (HSC), a subsidiary of the Imperial Holly Corporation (IHC). In 2001, IHC filed for bankruptcy protection. SSCI assets were subsequently acquired by SMBSC in 2005. SSCI and SMBSC subsequently ended all sugar beet processing activity in fall 2008, and all sugar beet packaging operations in spring 2009. As SSCI's corporate parent and/or successor-in-interest, SMBSC is equally liable as a "discharger" under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), Water Code section 13000 et seq. SSCI, as it is presently organized, was not a direct discharger of waste material at the Facility. The discharge was discontinued in 1991 by the SSCI's ownership as it existed at the time. The parent companies who subsequently purchased the property, Imperial Sugar in 1996 and SMBSC, who purchased the Facility in 2005, assumed liability for the contamination and continued to work toward closing the Steffen's Ponds. The current SSCI ownership have worked cooperatively with staff in developing this Order.

5. In 2004, Meyers began purchasing the parcels of which the Facility is comprised. When Meyers purchased the final parcel in 2015, it became the sole owner of the Facility. As explained in further detail below, Meyers is deemed liable as a "discharger" under the Porter-Cologne Act.

6. The Dischargers and the public received an opportunity to review a draft of this Order. This Order may be revised to name other responsible parties in the future should the Board identify additional responsible parties.

GEOGRAPHIC OVERVIEW

7. Current uses of the Facility include farmland, commercial space, open land, and groundwater banking. The northernmost 240 acres of the Facility are currently occupied by olive trees, while the southernmost 220 acres of the Facility are currently occupied by pistachio trees. The 960 acres east of San Mateo Avenue—i.e., the easternmost portion of the Facility—remains open and undeveloped.

8. The westernmost portion of the Facility is used as a privately-owned groundwater bank—i.e., the Meyers Family Farm Trust Groundwater Bank—which consists of four large recharge ponds (Meyers Bank Ponds). Three of the Meyers Bank Ponds are situated approximately 1,000 feet west of the former Steffen's Ponds; the fourth Meyers Bank Pond is situated immediately north of the former Steffen's Ponds. As needed, the banked groundwater is extracted from a series of "shallow zone" extraction wells (see Finding 10, below) and pumped back to the Mendota Pool, where it is exchanged through an existing agreement with the United States Bureau of Reclamation (Bureau of Reclamation).

9. Farmers Water District (FWD) borders the northern portion of the Facility and encompasses 2,222 acres (see Attachment B). FWD infrastructure includes 10 irrigation supply wells and approximately 4.75 miles of underground pipeline. The Fresno Slough reach of the Mendota Pool borders the western portion of the Facility and is approximately three-quarters of a mile west of the former Steffen's Ponds while the San Joaquin River reach of the Mendota Pool is located approximately two miles north of the former Steffen's Ponds.

10. The Mendota Pool Group (MPG) is an unincorporated association of farmers with groundwater production wells located near the Mendota Pool. Groundwater from MPG production wells is exchanged with the Bureau of Reclamation for surface waters in accordance with the Agreement for Mendota Pool Transfer Pumping Project for use as irrigation water by MPG members in the Westlands and the San Luis Water Districts located to the west of the Mendota Pool. The Central Valley Water Board was involved in the permitting process by the Bureau of Reclamation.

GROUNDWATER CONDITIONS

11. In the vicinity of the Facility, the upper aquifer has been subdivided into water-bearing zones, the "shallow zone" (above A-clay) and the "deep zone" (between A-clay and E-Clay or Corcoran Clay).

12. Groundwater monitoring, other than for supply wells, began at the Facility in 1982, and most of the monitoring wells were installed between 1984 and 1990. The current groundwater monitoring network for the Facility is comprised of 24 "shallow zone" monitoring wells (MW-1 through MW-6, MW-9, MW-13, MW-15, MW-17 through MW-21, and MW-23 through MW-32) and eight "deep zone" monitoring wells (MW-7, MW-8, MW-10, MW-11, MW-12, MW-14, MW-16 and MW-22). Monitoring is conducted on a semi-annual basis.

13. In addition to monitoring wells, the Facility also currently has a line of eight "deep zone" production wells (i.e., PW-1 and PW-6 through PW-12; PW-1 and PW-8 have been sealed and closed) that stretch along its northernmost boundary (west to east) and border FWD. Based on a review of historical groundwater monitoring data collected from FWD wells downgradient of the Steffen's Plume, measurements of electrical conductivity (EC) have shown an increasing trend in wells R-1, R-3 and R-11 summarized as follows: R-1: 430 µmhos/cm (2001) to 1,030 µmhos/cm (2016); R-3: 560 µmhos/cm (1987) to 1,100 µmhos/cm (2016); R-11: 808 µmhos/cm (2000) to 1,420 µmhos/cm (2016). In general, EC has shown a steady increase in wells R-1 and R-3. The EC values in R-11 initially showed a decreasing trend between 2000 and 2002 but have steadily increased since that time.

14. In 2012, soil sampling and analysis revealed elevated nitrate and salt concentrations in the soils beneath the Steffen's Ponds, and elevated nitrate concentrations in soils beneath the Factory Ponds.

15. In February 2014, SSCI and SMBSC submitted a "Fate and Transport Report" from Ground Zero Analysis, Inc. (Ground Zero Report). The Ground Zero Report discussed groundwater conditions at the Facility, and recommended natural attenuation for groundwater. The Ground Zero Report went on to recommend that if mitigation were required, 160 gallons per minute should be pumped from two "shallow zone" and two "deep zone" monitoring wells. The Ground Zero Report also recommended that, during the irrigation season, the existing production wells be pumped at a minimum of 225 gallons per minute in order to mitigate offsite migration of groundwater with elevated salinity.

16. Groundwater pumping of shallow wells surrounding the Mendota Pool with discharge of the water to the Pool creates a groundwater depression, most evident during the irrigation season. This depression caused groundwater from the immediate vicinity to flow towards that depression from all directions. The propagation of the depression to the east towards the Facility is mitigated by recharge from Mendota Pool. The groundwater flow direction in the shallow zone underlying the western portion of the Facility is influenced by the operations of the Meyers Water Bank. During recharge operations, a groundwater mound is produced, thereby causing groundwater to flow radially outward. In other periods of time when recharge at the bank is not conducted, there is an easterly direction of flow in the western part of the Facility. Salinity concentrations at the Facility in the shallow zone are greatest to the east of the former Steffen's Ponds and lower to the west. This indicates the influence of the Meyer's Water Bank in the west and that higher concentrations in the central and eastern portions of the Facility originated from the Steffen's process discharge.

17. The migration of the Steffen's Plume from the shallow to deep zone and subsequent north and northeastward migration likely resulted from downward migration from the shallow zone to the deep zone where the A-Clay is not a limiting factor. The north and northeastward migration in the deep zone is a result of a predominant groundwater flow direction caused by on-site and off-site groundwater pumping.

18. Analyses of groundwater samples from on-site monitoring wells indicate that discharges of wastes from previous activities at the Facility have degraded groundwater. The TDS concentrations detected in monitoring wells are presented in **Table 1**, below.

Table 1—TDS Concentrations in Shallow Zone and Deep Zone Monitoring Wells (mg/L)

Zone	Well	Historic High	Oct. 1991, End of Steffen's Pond Discharge	Sept. 2008, End of Facility Ops.	Oct. 2015	Oct. 2015 divided by Historic High	Oct. 2015 divided by Oct. 1991	Oct. 2015 divided by Sept. 2008
Shallow Zone	MW-1	3,045	1,365	1,100	1,900	0.62	1.39	1.73
	MW-2	2,190	1,255	1,600	1,500	0.68	1.20	0.94
	MW-3	3,040	1,995	940	650	0.21	0.33	0.69
	MW-4	1,623	1,120	1,200	1,100	0.68	0.98	0.92
	MW-5	1,500	775	870	960	0.64	1.24	1.10
	MW-6	1,500	950	1,300	1,600	1.07	1.68	1.23
	MW-9	1,300	650	1,000	770	0.59	1.18	0.77
	MW-13	1,900	1,310	380	420	0.22	0.32	1.11
	MW-15	17,300	11,200	5,600	3,400	0.20	0.30	0.61
	MW-17	4,700	1,985	2,700	2,100	0.45	1.06	0.78
	MW-18	4,660	2,930	2,200	1,400	0.30	0.48	0.64
	MW-19	9,600	7,320	5,000	4,500	0.47	0.61	0.90
	MW-20	2,520	2,125	1,800	1,800	0.71	0.85	1.00
	MW-21	3,900	2,340	N/A	2,300	0.59	0.98	N/A
	MW-23	4,460	3,930	N/A	2,300	0.52	0.59	N/A

Table 1—TDS Concentrations in Shallow Zone and Deep Zone Monitoring Wells (mg/L)								
Zone	**Well**	**Historic High**	**Oct. 1991, End of Steffen's Pond Discharge**	**Sept. 2008, End of Facility Ops.**	**Oct. 2015**	**Oct. 2015 divided by Historic High**	**Oct. 2015 divided by Oct. 1991**	**Oct. 2015 divided by Sept. 2008**
	MW-24	2,900	1,280	1,400	2,100	0.72	1.64	1.50
	MW-25	8,100	1,635	2,300	2,200	0.27	1.35	0.96
	MW-26	10,800	8,400	4,000	1,400	0.13	0.17	0.35
	MW-27	7,020	2,560	3,700	1,200	0.17	0.47	0.32
	MW-28	1,500	N/A	1,200	1,500	1.00	N/A	1.25
	MW-29	1,760	N/A	1,300	1,100	0.63	N/A	0.85
	MW-30	900	N/A	590	640	0.71	N/A	1.08
	MW-31	650	N/A	590	610	0.94	N/A	1.03
	MW-32	600	N/A	210	290	0.48	N/A	1.38
	MF-1	1,400	1,400	740	730	0.52	N/A	0.99
	MF-2	1,400	1,400	510	900	0.64	N/A	1.76
	MF-3	1,700	1,700	570	1,100	0.65	N/A	1.93
	MF-4	1,600	1,600	1,200	640	0.40	N/A	0.53
	MF-5	1,800	1,800	680	560	0.31	N/A	0.82
	MF-6	1,400	1,400	1,300	630	0.45	N/A	0.48
	MF-7	2,600	2,600	480	540	0.21	N/A	1.13
	MF-8	3,100	3,100	1,700	1,800	0.58	N/A	1.06
	MF-9	2,100	2,100	1,200	1,500	0.71	N/A	1.25
	AVE.	3,472	2,901	1,592	1,398	0.53	0.88	1.00
Deep Zone	MW-7	5,000	3,860	4,000	3,800	0.76	0.98	0.95
	MW-8	1,100	485	1,000	920	0.84	1.90	0.92
	MW-10	900	1,000	880	1,200	1.33	1.20	1.36
	MW-11	1,400	1,000	1,400	1,300	0.93	1.30	0.93
	MW-12	3,540	2,540	2,100	1,300	0.37	0.51	0.62
	MW-14	1,190	860	640	690	0.58	0.80	1.08
	MW-16	6,800	4,360	3,300	3,000	0.44	0.69	0.91
	MW-22	2,780	2,540	1,700	2,100	0.76	0.83	1.24
	AVE.	2,839	2,081	1,878	1,789	0.75	1.03	1.00

19. Twelve supply wells have been installed on-site. Initial and highest total TDS concentrations for each well are presented in **Table 2**, below.

Table 2—TDS Concentrations in On-Site Supply Wells (mg/L)							
Well	**Initial Conc.**	**Well Installed**	**Last Test**	**High Conc. Date Tested**	**High Conc.**	**Last Conc.**	**Last Conc. divided by High Conc.**

Table 2—TDS Concentrations in On-Site Supply Wells (mg/L)							
Well	**Initial**	**Well**	**Last Test**	**High**	**High**	**Last Conc.**	**Last**
PW-1	235	Mar-62	Mar-03	Apr-87	1,975	1700 Closed & sealed	0.86
PW-2	121	Oct-63	Mar-88	Mar-88	1,605	1605 Closed & sealed	1.00
PW-3	138	Oct-63	Mar-88	Nov-81	617	415 Closed & sealed	0.67
PW-4	382	Oct-63	May-02	Sep-94	1,600	1300 Closed & sealed	0.81
PW-5	134	Oct-63	Apr-88	Oct-81	4,433	257 Closed & sealed	0.06
PW-6	310	Apr-83	May-16	Oct-12	1,600	640	0.40
PW-7	270	May-83	Oct-15	Sep-08	1,200	870	0.73
PW-8	265	Sep-84	May-02	Oct-98	2,300	1500 Closed & sealed	0.65
PW-9	670	Nov-84	May-16	May-11	2,400	1,500	0.63
PW-10	390	Dec-88	May-16	Oct-12	840	770	0.92
PW-11	96	Oct-01	Oct-16	Oct-16	510	510	1.00
PW-12	320	Mar-04	Oct-16	Oct-15	900	510	0.57
Avg.	278				1665	965	0.69

20. Monitoring data from groundwater monitoring wells indicate that the wastes discharged at the facility have impacted underlying groundwater. Concentrations of TDS, chloride, and sulfate for water samples collected in October 2015 from monitoring wells for the "shallow zone" of the upper unconfined aquifer are presented in Table 3, below.

Table 3—October 2015 TDS, Chloride and Sulfate Concentrations (mg/L) in "Shallow Zone" Monitoring Wells			
Well	**TDS**	**Chloride**	**Sulfate**
MW-1	1,900	270	420
MW-2	1,500	250	7
MW-3	650	99	86
MW-4	1,100	240	150

Table 3—October 2015 TDS, Chloride and Sulfate Concentrations (mg/L) in "Shallow Zone" Monitoring Wells			
Well	**TDS**	**Chloride**	**Sulfate**
MW-5	960	210	130
MW-6	1,600	440	180
MW-9	770	130	190
MW-13	420	100	79
MW-15	3,400	400	1,000
MW-17	2,100	450	260
MW-18	1,400	260	130
MW-19	4,500	730	850
MW-20	1,800	330	240
MW-21	2,300	330	160
MW-23	2,300	360	140
MW-24	2,100	490	120
MW-25	2,200	440	170
MW-26	1,400	210	180
MW-27	1,200	250	160
MW-28	1,500	240	470
MW-29	1,100	170	410
MW-30	640	39	240
MW-31	610	59	210
MW-32	290	19	98

21. Concentrations of TDS, chloride and sulfate for water samples collected in October 2015 from monitoring wells and supply wells for the "deep zone" of the upper unconfined aquifer are summarized in Table 4, below.

Table 4—October 2015 TDS, Chloride and Sulfate Concentrations (mg/L) in "Deep Zone" Monitoring Wells			
Well	TDS	Chloride	Sulfate
MW-7	3,800	1,000	<1
MW-8	920	210	12
MW-10	1,200	280	9
MW-11	1,300	300	5
MW-12	1,300	260	16
MW-14	690	120	97

Table 4—October 2015 TDS, Chloride and Sulfate Concentrations (mg/L) in "Deep Zone" Monitoring Wells			
Well	TDS	Chloride	Sulfate
MW-16	3,000	530	130
MW-22	2,100	430	13
PW-6	750	140	68
PW-7	870	160	54
PW-9	1,500	320	87
PW-10	800	180	72
PW-11	450	50	97
PW-12	900	150	120

22. Because monitoring wells were installed at the site approximately 20 years after facility operations began, pre-facility operation groundwater data is unavailable. Upgradient groundwater (west of Mendota Pool) has high salinity originating from natural causes and irrigation practices and does not reflect background conditions for the Spreckels site.

23. In their 2 December 2009 report, Revised Comments on the Steffen's Ponds Closure Plan, Luhdorff & Scalmanini Consulting Engineers (Luhdorff & Scalmanini) estimated background groundwater quality for the Facility. Luhdorff & Scalmanini used historical and contemporaneous data from onsite and offsite wells not yet affected by the plume originating from the former Steffen's Ponds. Upper Tolerance limits were calculated for the western, central, and eastern portions of the site in both the shallow and deeper groundwater zones. The Central Valley Water Board concurs with Luhdorff & Scalmanini's background groundwater quality estimates, which are set forth in Table 5, below.

Table 5—Upper Tolerance Bounds for Background TDS Concentrations (mg/L)			
Zone	Location	Sample Size	Upper Tolerance Bound
Shallow	Western Area	51	1,170
	Central Area	55	740
	Eastern Area	70	362
Deep	Western Area	35	1,100
	Central Area	93	453
	Eastern Area	26	380

24. A calculation of background groundwater quality was also made by consulting engineer John Minney. Mr. Minney's calculation includes data from west of the Mendota Pool, as well as data from wells as much as three miles away from the Facility. Much of this data originates from groundwater regimes distinctly different than that of the Facility, which are not reflective of groundwater conditions beneath the Facility. Accordingly, the Central

Valley Water Board does not consider Mr. Minney's background estimates to be correct for the site.

LEGAL FRAMEWORK

25. The Central Valley Water Board's Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised July 2016 (Basin Plan), designates beneficial uses of the waters of the State and establishes water quality objectives (WQOs) to protect those areas. The Facility overlies groundwater within the Delta-Mendota Basin Hydrologic Unit, Detailed Analysis Unit (DAU) No. 235. Present and potential future beneficial uses of this groundwater include Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Supply (IND), Industrial Process Supply (PRO), Non-Contact Water Recreation (REC-2) and Wildlife Habitat (WILD).

26. The Basin Plan contains numeric and narrative WQOs to protect beneficial uses of groundwater. For MUN-designated groundwater, the Basin Plan incorporates by reference certain drinking water maximum contaminant levels (MCLs), as promulgated in title 22, chapter 15 of the California Code of Regulations (Title 22). The relevant Title 22 MCLs are 500 mg/L, with an upper limit of 1,000 mg/L, for TDS; 250 mg/L, with an upper limit of 500 mg/L, for chloride; and 250 mg/L, with an upper limit of 500 mg/L, for sulfate. However, if natural background values exceed WQOs, the background values are used as numerical limits in lieu of the otherwise-applicable Title 22 MCLs. In this case, the concentrations of the waste constituents listed above that are currently found in groundwater, or are likely to be found in groundwater after migration from soils, significantly exceed the applicable WQOs.

27. The Basin Plan also contains narrative WQOs that apply to groundwater for tastes and odors and for toxicity. The taste and odor WQO requires in part that, groundwater not contain substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes and odors to municipal and domestic water supplies. The toxicity WQO requires, in part, that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans.

28. "Pollution" is defined by Water Code section 13050, subdivision (l)(1) as "an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either … [¶] (A) The waters for beneficial uses[,] [or] [¶] (B) Facilities which serve these beneficial uses."

29. Consistent with the State Water Resources Control Board's (State Water Board's) longstanding interpretation of "discharge" under the Porter-Cologne Act (see, e.g., Zoecon Corp., State Water Board Order WQ 86-2), the passive migration of waste from soils to groundwater constitutes a continuing "discharge" to the waters of the State.

30. Cleanup and Abatement Orders are issued pursuant to Water Code section 13304, subdivision (a), which provides in pertinent part as follows:

> A person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or

> who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall, upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts. A cleanup and abatement order issued by the state board or a regional board may require the provision of, or payment for, uninterrupted replacement water service, which may include wellhead treatment, to each affected public water supplier or private well owner. Upon failure of a person to comply with the cleanup or abatement order, the Attorney General, at the request of the board, shall petition the superior court for that county for the issuance of an injunction requiring the person to comply with the order. In the suit, the court shall have jurisdiction to grant a prohibitory or mandatory injunction, either preliminary or permanent, as the facts may warrant.

31. Subdivision (c)(1) of Water Code section 13304 further provides that

> If the waste is cleaned up or the effects of the waste are abated, or, in the case of threatened pollution or nuisance, other necessary remedial action is taken by a governmental agency, the person or persons who discharged the waste, discharges the waste, or threatened to cause or permit the discharge of the waste within the meaning of subdivision (a), are liable to that governmental agency to the extent of the reasonable costs actually incurred in cleaning up the waste, abating the effects of the waste, supervising cleanup or abatement activities, or taking other remedial action. The amount of the costs is recoverable in a civil action by, and paid to, the governmental agency and the state board to the extent of the latter's contribution to the cleanup costs from the State Water Pollution Cleanup and Abatement Account or other available funds.

32. Technical Reporting Orders are authorized under Water Code section 13267, subdivision (b)(1), which provides that:

> In conducting an investigation … the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

33. On 18 June 1992, the State Water Board adopted Resolution 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304 (Resolution 92-49). As amended, Resolution 92-49 sets forth the policies and procedures to be used in the investigation and cleanup of a polluted site, and requires that cleanup levels be consistent with the State Water Board's Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (Anti-Degradation Policy).

34. Resolution 92-49 and the Basin Plan establish cleanup levels to be achieved. Resolution 92-49 requires the waste to be cleaned up in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored. Any alternative cleanup level to background must: (1) be consistent with the maximum benefit to the people of the State; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Basin Plan and applicable Water Quality Control Plans and Policies of the State Water Board. Resolution 92-49 also directs that investigation proceed in a progressive sequence. To the extent practical, Resolution 92-49 directs the Central Valley Water Board to require and review for adequacy written work plans for each element and phase, and the written reports that describe the results of each phase of the investigation and cleanup.

35. Chapter IV of the Basin Plan contains a policy for the Investigation and Cleanup of Contaminated Sites, which generally outlines a process that includes site investigation, source removal or containment, information requirements for the consideration of establishing cleanup levels, and a basis for establishing soil and groundwater cleanup levels.

36. California Code of Regulations, title 23, sections 3890–95 require that the dischargers submit analytical data electronically via the internet, using electronically deliverable formats (EDF) designated by the State Water Board that are both non-proprietary and available as public domain. All EDF data must be submitted over the Internet to the State Water Board Geographic Environmental Information Management System database (Geotracker). In addition, subdivision (b) of section 3895 permits the Central Valley Water Board to require submittal in alternative forms, provided the benefit or need bears a reasonable relationship to any increased burden of production.

DISCHARGERS' LIABILITY FOR CLEANUP AND ABATEMENT

37. The Facility has historically been regulated under Waste Discharge Requirements (WDRs) Resolution No. 61-147, adopted 14 December 1961. The 1961 WDRs provide in pertinent part that "[w]aste discharge shall not cause a pollution of useable ground or surface waters."

38. The prior discharges of waste to the Steffen's Ponds and Factory Ponds (see Finding Nos. 2-3), as well as the present passive migration of such waste into the groundwater of the State has created (or likely will create) a condition of pollution. In other words, the discharges have "cause[d] a pollution of useable ground … waters …" underneath the

Facility in violation of the 1961 WDRs. Accordingly, the 1961 WDRs do not preclude cleanup and abatement liability under Water Code section 13304.

39. Each of the Dischargers are subject to order under Water Code section 13304 because the Dischargers have discharged or deposited waste and/or caused or permitted waste to be discharged or deposited where it has discharged, or likely discharged to waters of the State and has created, or likely will create, a condition of pollution. The meaning of the term "discharge", as interpreted by the State Water Board in precedential orders, including State Water Board Order WQ 86-2 (*In the Matter of the Petition of Zoecon Corporation*), includes the passive migration of waste from soils to groundwater. The discharge, as stated in Finding No. 38, has resulted, or will likely result, in a condition of pollution. The condition of pollution is a priority violation and the issuance of a cleanup or abatement order pursuant to Water Code section 13304 is appropriate and consistent with policies of the Central Valley Water Board.

40. According to Meyers, SMBSC has agreed to bear the costs of cleanup and remediation at the Facility. Notwithstanding this purported agreement, Meyers remains liable as a "discharger" under the Porter-Cologne Act based on its current ownership and/or control of the Facility. However, to the extent that cleanup and remediation activities are undertaken and completed by SMBSC, such activities will be deemed to have been carried out on Meyers' behalf.

JUSTIFICATION FOR TECHNICAL REPORTS

41. The burden of preparing the reports required by this Order bears a direct relationship for the need for the reports and the benefits to be obtained from the reports. The technical reports required by this Order are necessary to assure compliance with the Water Code, the applicable Basin Plan, Resolution 92-49, Title 27, and this Order, which require the prompt identification and abatement of waste sources and the investigation and cleanup of affected areas to protect the beneficial uses of waters of the State, to protect against nuisance, and to protect human health and the environment. In accordance with Water Code section 13267(b), the Findings in this Order provide the Dischargers with a written explanation with regard to the need for remedial action and reports and identify the evidence that supports the requirement to implement cleanup and abatement activities and submit reports. The Dischargers named in this Order own and/or operated the Facility from which waste has been discharged, is discharging, or is suspected of discharging, and thus is appropriately responsible for providing the reports required by this Order.

CONSEQUENCES OF NONCOMPLIANCE

42. Should the Dischargers fail to take any of the cleanup actions specified in this Order, the Central Valley Water Board may impose administrative civil liability pursuant to Water Code section 13350, which states, in relevant part as follows:

> (a) Any person who (1) violates any cease and desist order or cleanup and abatement order hereafter issued, reissued, or amended by a regional board … shall be liable civilly, and remedies may be proposed, in accordance with subdivision (d) or (e).

***

(e) The state board or a regional board may impose civil liability administratively pursuant to Article 2.5 (commencing with Section 13323) of Chapter 5 either on a daily basis or on a per gallon basis, but not both.

(1) The civil liability on a daily basis may not exceed five thousand dollars ($5,000) for each day the violation occurs.

(A) When there is a discharge, and a cleanup and abatement order is issued, except as provided in subdivision (f), the civil liability shall not be less than five hundred dollars ($500) for each day in which the discharge occurs and for each day the cleanup and abatement order is violated.

(B) When there is no discharge, but an order issued by the regional board is violated, except as provided in subdivision (f), the civil liability shall not be less than one hundred dollars ($100) for each day in which the violation occurs.

(2) The civil liability on a per gallon basis may not exceed ten dollars ($10) for each gallon of waste discharged.

43. Should the Dischargers fail to submit any of the technical or monitoring reports required by this Order, the Central Valley Water Board may impose administrative civil liability pursuant to Water Code section 13268, which provides in relevant part as follows:

(a)(1) Any person failing or refusing to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267 . . . or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in accordance with subdivision (b).

***

(b)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (a) in an amount which shall not exceed one thousand dollars ($1,000) for each day in which the violation occurs.

***

(c) Any person discharging hazardous waste, as defined in Section 25117 of the Health and Safety Code, who knowingly fails or refuses to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267, or who knowingly falsifies any information provided in those technical or monitoring program reports, is guilty of a misdemeanor, may be civilly liable in

accordance with subdivision (d), and is subject to criminal penalties pursuant to subdivision (e).

(d)(1) Civil liability may be administratively imposed by a regional board in accordance with Article 2.5 (commencing with Section 13323) of Chapter 5 for a violation of subdivision (c) in an amount which shall not exceed five thousand dollars ($5,000) for each day in which the violation occurs.

EXEMPTION FROM CALIFORNIA ENVIRONMENTAL QUALITY ACT

44. The issuance of this Order is exempt from the requirements of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.), as an enforcement action taken by a regulatory agency (see Cal. Code Regs., tit. 14, § 15321, subd. (a)(2)), and as an action by a regulatory agency for the protection of the environment (see *id*., § 15308).

REQUIRED ACTIONS

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13304 and 13267, SMBSC, SSCI and Meyers (Dischargers) shall, as soon as reasonably possible without risk to health and safety: investigate the discharge of waste; cleanup the discharged waste and abate all effects of the discharge, including any impacts to soil and groundwater quality, in conformity with Resolution 92-49 and the Basin Plan (see Ch. IV); and complete each of the following tasks according to the specified schedule.

1. By **6 August 2018** (120 days after issuance), submit an **INVESTIGATION WORK PLAN** for Central Valley Water Board staff concurrence, and a **TIME SCHEDULE** for approval by the Executive Officer (or their designee).

    a. The **Investigation Work Plan** shall:

        i. Propose a systematic and logical sequence of tasks to delineate the lateral and vertical extent of groundwater degraded by constituents of concern originating from the Facility operations;

        ii. Contain all of the information outlined in **Attachment C**, the contents of which are incorporated as part of this Order; and

        iii. Be amended or supplemented to the satisfaction of Central Valley Water Board staff, particularly with regard to whether the proposed tasks will be capable of sufficiently delineating the extent of groundwater degradation.

    b. The **Time Schedule** shall:

        i. Be submitted concurrently with the Investigation Work Plan;

        ii. Propose a final date for submission of a **Site Assessment Report**, discussed in further detail below;

iii. Provide dates for completion of each and every task specified in the Investigation Work Plan; and

iv. Be revised as directed by Executive Officer.

c. Executive Officer approval of Time Schedule will be partly conditioned on staff concurrence regarding the Investigation Work Plan.

d. Upon Executive Officer approval, all tasks and deadlines set forth in the Time Schedule shall be incorporated (and enforceable) as part of this Order.

2. Within **90 days** of Time Schedule approval (see above), begin implementation of tasks identified in the Investigation Work Plan.

3. On the **date specified** in the approved Time Schedule, submit a **SITE ASSESSMENT REPORT** for acceptance by Central Valley Water Board staff.

a. The Site Assessment Report shall contain all information and findings outlined in **Attachment D**, the contents of which are incorporated as part of this Order.

b. If further investigation is warranted, the Site Assessment Report shall also make such recommendations, and include supplemental work plan for additional investigation.

c. If the Site Assessment Report is not accepted by Central Valley Water Board staff, it shall be revised or supplemented in accordance with staff direction.

4. Within **180 days** of Site Assessment Report acceptance, submit a **FEASIBILITY STUDY AND REMEDIAL OPTIONS EVALUATION** for concurrence by Central Valley Water Board staff.

a. The Feasibility Study and Remedial Options Evaluation shall contain all information outlined in **Attachment E**, the contents of which are incorporated as part of this Order.

b. The Dischargers shall attempt to clean up each constituent to background concentrations, or to the lowest level that is technically and economically achievable and which complies with all applicable water quality objectives of the Basin Plan.

c. Each of the three or more groundwater remediation alternatives analyzed in the report shall:

i. Meet the range of cleanup levels specified in the Basin Plan and in Resolution 92-49; and

ii. Be capable of remediation according to groundwater modeling (or a technically acceptable alternative).

5. Within **120 days** of staff concurrence with the *Feasibility Study and Remedial Options Evaluation*, submit a **CLEANUP PLAN** for Executive Officer approval.

    a. The Cleanup Plan shall:

        i. Describe the preferred groundwater remediation alternative(s) or alternatives with sufficient design and detail to construct and operate the cleanup, and includes a time schedule to conduct the cleanup activities; and

        ii. Contain all information outlined in **Attachment F**, the contents of which are incorporated as part of this Order.

    b. Upon final approval by the Executive Officer, the time schedule set forth in the Cleanup Plan shall be incorporated (and enforceable) as part of this Order.

6. Within **120 days** of *Cleanup Plan* approval, commence cleanup or installation of approved remedial systems.

7. Within **180 days** of *Cleanup Plan* approval, submit a **CLEANUP STATUS REPORT** that:

    a. Describes the status and results of the cleanup work.

    b. Clearly show whether the installation of any cleanup system is complete, and if not, give a schedule for installation of the remaining remedial systems.

8. Semi-annually after remediation system operations commence, submit **REMEDIATION PROGRESS REPORTS** to Central Valley Water Board staff.

    a. If remedial systems are optimized to improve overall efficiency, operating time or waste removal rates (see General Requirement No. 3.c), Remediation Progress Reports shall include a discussion as to whether any such optimizations were effective.

    b. If groundwater monitoring indicates the waste in groundwater has migrated beyond laterally or vertically defined limits during the half year, the Remediation Progress Report semi-annual monitoring reports must include a work plan and schedule, with work to begin within thirty days of Central Valley Water Board staff approval, to define the new plume limits.

9. If it is determined that the Steffen's Plume has impacted the beneficial uses of water, the Discharger can be further required upon notification by the Assistant Executive Officer to provide a replacement water supply or treat the water to allow continued use.

GENERAL REQUIREMENTS

1. **Reports Submitted to Central Valley Water Board**

a. All reports shall be (i) prepared by a registered professional engineer or geologist, or another individual working under their direction, and (ii) signed and stamped by the preparing or supervising professional.

b. Each report must be accompanied by a cover letter, signed by the submitting Discharger or their authorized representative, certifying, under penalty of perjury, that:

i. If applicable, that the representative is authorized by the submitting Discharger to speak on its behalf;

ii. After examining the report, he or she is familiar with its contents; and

iii. The attached report is, to the extent of their knowledge, true, complete, and accurate.

c. Each report shall be accompanied by a signed statement from the submitting Discharger or their representative indicating:

i. Whether the submitting Discharger agrees with any of the report's recommendations and proposals; and

ii. Whether the submitting Discharger approves implementation of the report's proposals.

2. **On-Site Work, Testing and Sampling**

a. Dischargers shall notify Central Valley Water Board staff at least 72 hours prior to commencing field work under the Cleanup Plan.

b. Dischargers shall not undertake any work without first obtaining:

i. Concurrence of Central Valley Water Board staff in the proposed work; and

ii. All State and local permits and access agreements necessary to fulfill the requirements of this Order.

b. Dischargers shall notify Central Valley Water Board staff at least three business days prior to conducting on-site work, testing or sampling if the subject activity:

i. Relates to environmental remediation and investigation; and

ii. Is not limited to routine monitoring, maintenance and inspection.

3. **Remediation, Treatment and Control Systems**

a. Except for brief maintenance or repair-related shutdowns, all remedial, treatment and control systems shall be **operated continually**.

b. If installed or operated as a means of treatment and control in compliance with the terms of this Order, all facilities, systems and equipment shall be **properly operated and maintained** at all times.

c. Remedial, treatment and control systems shall be **optimized as needed** to improve efficiency, operating time and waste removal rates; and any such optimizations shall be discussed in quarterly progress reports. (See Required Action No. 8.a, above.)

d. If a **planned shutdown** of any remedial, treatment or control system is expected to last more than three days, Central Valley Water Board staff shall be notified prior to the shutdown.

e. If an **unplanned shutdown** of any remedial, treatment or control system last longer than three days, Central Valley Water Board staff shall be notified of:

i. The estimated time needed to restart the offline system; and

ii. All steps being taken to restart the offline system.

4. **Continued Remediation and Monitoring**

a. The Dischargers shall maintain a number of monitoring wells sufficient to completely define and encompass all waste plumes.

b. If groundwater monitoring data indicates the waste in groundwater has migrated beyond laterally or vertically defined limits during the quarter of monitoring activity, then the quarterly monitoring reports must include a work plan and schedule, with work to begin within thirty days of Central Valley Water Board staff approval, to define the new plume limits.

c. All remediation and monitoring activity shall be continued until:

i. The Executive Officer determines that the discharge has been sufficiently assessed and/or remediated in compliance with this Order; and

ii. This Order has been amended or rescinded in writing.

5. **Requests for Extension**

a. If, for any reason, the Dischargers are unable to perform any activity or submit any report in compliance with the schedule set above (or any work schedule incorporated herein), the Dischargers may request an extension from the Executive Officer.

b. To be considered by the Executive Officer, an extension request must:

i. Be made in writing;

ii. Set forth a definite period of extension (no indefinite extensions); and

iii. Include justification for the delay.

c. Any extension request shall be submitted as soon as the situation is recognized and no later than the compliance date. Untimely requests may be disregarded.

d. All requests not approved by the Executive Officer in writing with reference to this Order, within 30 days of the original deadline, are denied.

e. An extension may be granted by revision of this Order, or by a letter from the Executive Officer.

6. **Reimbursement of Oversight Costs**

a. The Dischargers shall reimburse the Central Valley Water Board for all reasonable costs incurred in connection with oversight of the investigation and remediation of the Site, as provided in Water Code section 13304, subdivision (c)(1).

b. Failure to reimburse the Central Valley Water Board's reasonable oversight costs shall be considered a violation of this Order.

If, in the opinion of the Executive Officer, the Dischargers fail to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $5,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268 and 13350. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 April 2018.

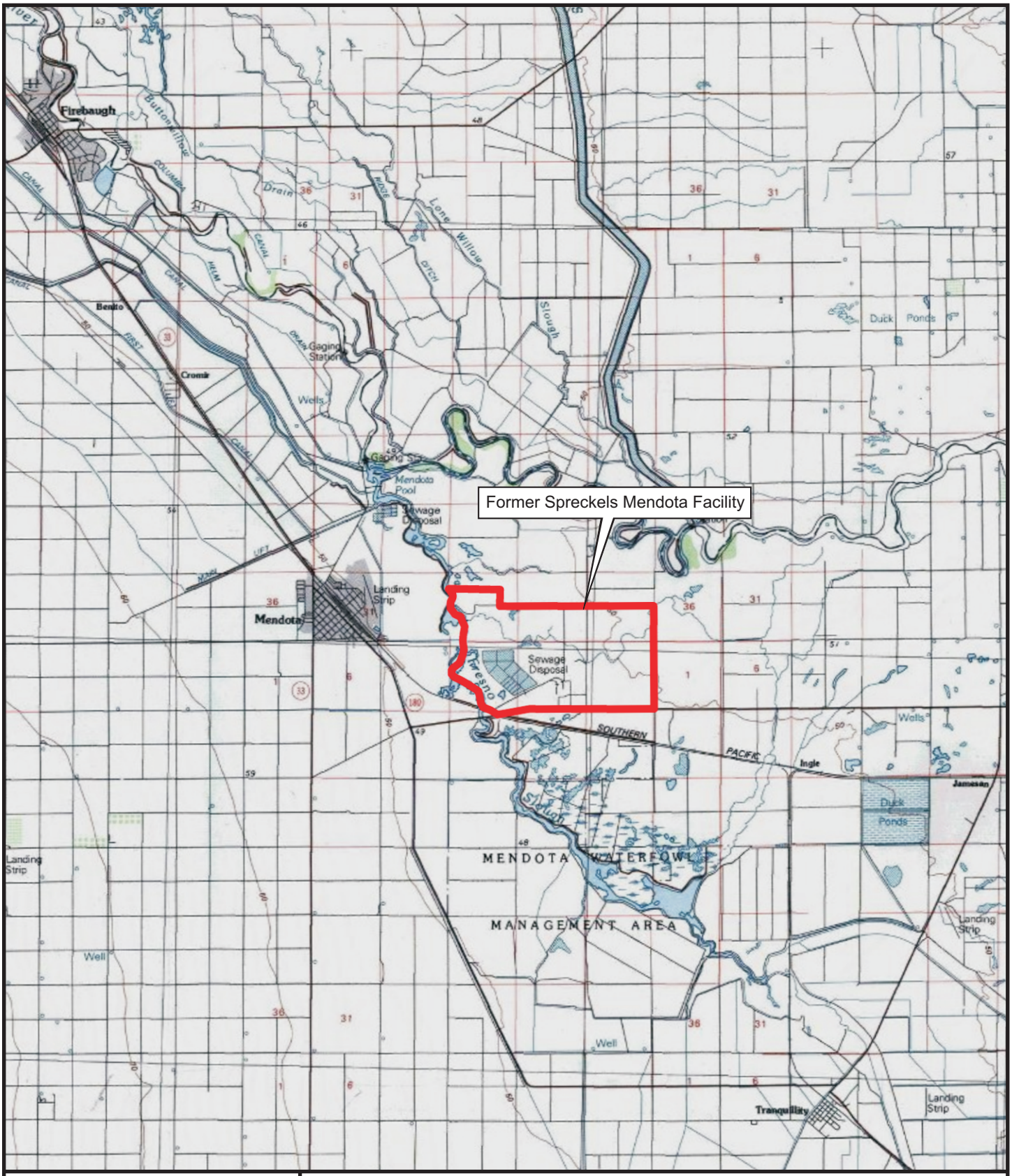
Original signed by

_____

PAMELA C. CREEDON, Executive Officer

4/6/2018

(Date)



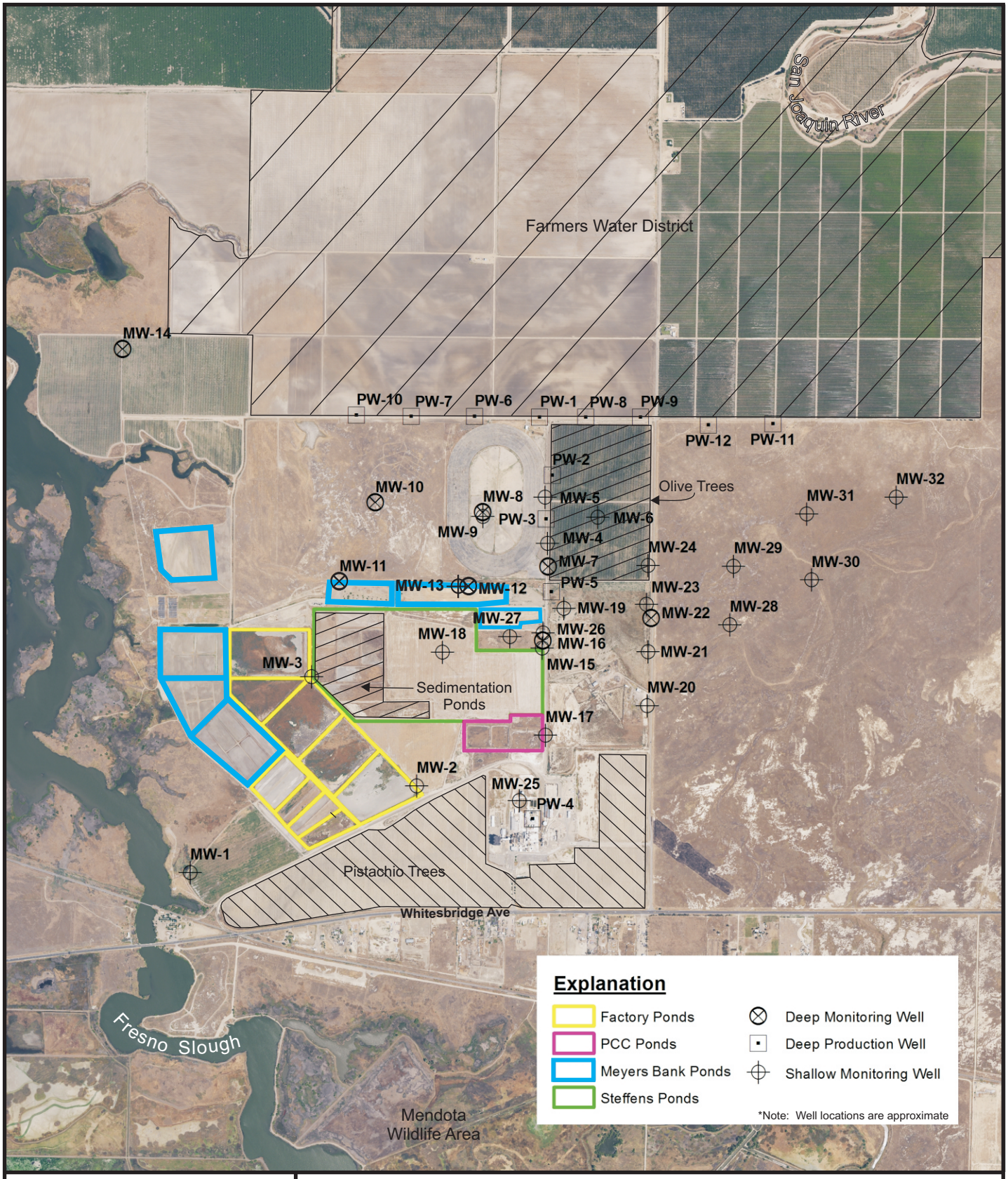
Map Source:
ArcGIS Online Premium Services
USA Topo Maps, National Geographic Society

SCALE IN MILES
0 1 2

LOCATION MAP

ORDER NO. R5-2018-0033
CLEANUP AND ABATEMENT ORDER
FOR
SPRECKELS SUGAR COMPANY INC, SOUTHERN MINNESOTA BEET SUGAR COOPERATIVE, AND MYERS FARMING LLC
FORMER SPRECKELS MENDOTA FACILITY
FRESNO COUNTY

ATTACHMENT A



Map Source:
USDA, NAIP Aerial Photograph, 2014
Sections 33, 34, and 35, T13S, R15E, MDB&M
Sections 2, 3, and 4, T14S, R15E, MDB&M

SCALE IN FEET
0 1,000 2,000

SITE MAP

ORDER NO. R5-2018-0033
CLEANUP AND ABATEMENT ORDER
FOR
SPRECKELS SUGAR COMPANY INC, SOUTHERN MINNESOTA BEET SUGAR COOPERATIVE, AND MYERS FARMING LLC
FORMER SPRECKELS MENDOTA FACILITY
FRESNO COUNTY

ATTACHMENT B

ATTACHMENT C

ITEMS TO BE INCLUDED IN A SITE ASSESSMENT WORK PLAN

The outline below is a minimum requirement for items to be included and discussed in the text of all site assessment work plans submitted to the Board. All work plans must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

I. **BACKGROUND**

A. *Site History*

State all operations conducted at the site.
Identify present and historic chemical usage and handling procedures.
List all chemical spills and their disposition.
Identify all past and present above ground and underground tank locations.
Identify tank capacities and other specifications as necessary.
Identify tank contents, past and present.
Submit all records of tests or repairs on fuel lines and tanks.
Identify locations of maintenance shops, chemicals used in the shops, method of chemical storage and disposal.
Identify past and present land uses and future as applicable.

B. *Topographic map of site vicinity showing:*

All natural and man-made drainage features including ditches and surface impoundments, and the drainages destination;
Utilities, especially storm drain system;
Location of existing monitoring wells, including those installed by other parties;
Locations of above ground and underground storage tanks, septic tanks, leach lines, other waste-handling facilities, and/or spill site;
Location of a major body of water relative to the site;
Location of any nearby private, municipal, or irrigation wells; and
Other major physical and man-made features.

C. *Geology/Hydrogeology*

Include proposal for logging of boreholes and characterizing site geology, and identifying unconfined or confined aquifers and contaminant flowpaths.

II. **PREVIOUS SITE ASSESSMENTS**

Provide a detailed description of any previous site assessment conducted to determine if there is any soil or ground water contamination. Include analytical results of all soil and water samples analyzed, and water level and floating product measurements.

III. **FIELD INVESTIGATION**

A. *General*
- Monitoring well or other assessment activity locations and rationale
- Survey details
- Equipment decontamination procedures
- Health and safety plan

B. *Drilling Details*
- Describe drilling and logging methods

C. *Monitoring Well Design*
- Casing diameter
- Borehole diameter
- Depth of surface seal
- Well construction materials
- Diagram of well construction
- Type of well cap
- Size of perforations and rationale
- Grain size of sand pack and rationale
- Thickness and position of bentonite seal and sand pack
- Depth of well, length and position of perforated interval

D. *Well Development*
- Method of development to be used
- Method of determining when development is complete
- Method of development water disposal

E. *Soil Sampling*
- Cuttings disposal method
- Analyses to be run and methods
- Sample collection and preservation method
- Intervals at which soil samples are to be collected
- Number of soil samples to be analyzed and rationale
- Location of soil samples and rationale
- QA/QC procedures

F. *Well Sampling*
- Minimum time after development before sampling (48 hours)
- Well purging method and amount of purge water
- Sample collection and preservation method
- QA/QC procedures

G. *Water Level Measurement*

Elevation reference point at each monitoring well shall be within 0.01 foot. Ground surface elevation at each monitoring well shall be within 0.1 foot. Method and time of water level measurement shall be specified.

IV. **QA/QC PROCEDURES**

Specify number of field blanks and duplicates.

V. **TIME SCHEDULE FOR PROPOSED WORK**

The work plan shall include a time schedule for implementation of work.

ATTACHMENT D

ITEMS TO BE INCLUDED IN A SITE ASSESSMENT REPORT

The outline below is a minimum requirement for items to be included and discussed in the text of all site assessment reports submitted to the Board. Other supporting data to be included in the report, either within the text of the report or in appendices, are italicized at the end of each section. All reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

I. INTRODUCTION

Summary of past investigations
Purpose of the recent investigation
Scope of the recent investigation
Time period in which the recent investigation was carried out

II. SUMMARY

Number of wells drilled
Results of soil and water analyses
Ground water flow direction and gradient
Possible source determination

III. FIELD INVESTIGATION

Well Construction

- Number and depth of wells drilled
- Date(s) wells drilled
- Description of drilling and construction
- Approximate locations relative to facility site(s)

Supporting Data:
A well construction diagram for each well should be included in the report which shows the following details:

- Total depth drilled
- Depth of open hole (same as total depth drilled if no caving occurs)
- Footage of hole collapsed
- Length of slotted casing installed
- Depth of bottom of casing
- Depth to top of sand pack
- Thickness of sand pack
- Depth to top of bentonite seal
- Thickness of bentonite seal
- Thickness of concrete grout
- Boring diameter
- Casing diameter

Casing material
Size of perforations
Number of bags of sand
Well elevation at top of casing
Depth to ground water
Date of water level measurement
Monitoring well number
Date drilled
Location

Well Development
Date(s) of development of each well
Method of development
Volume of water purged from well
How well development completion was determined
Method of effluent disposal

Supporting Data:
Field notes from well development should be included in report.

Water Sampling
Date(s) of sampling
How well was purged
How many well volumes purged
Levels of temperature, EC, and pH at stabilization
Sample collection, handling, and preservation methods
Sample identification
Analytical methods used

Soil Sampling
Date(s) of sampling
Sample collection, handling, and preservation method
Sample identification
Analytical methods used

IV. FINDINGS OF THE INVESTIGATION

Lithology
Types of sediments encountered
Presence, location, and lateral continuity of any significant sand, silt, or clay layers
Any visual signs of contamination

Supporting Data:
Well logs geologic cross-sections should be included in the report.

Analytical Results of Soil and Ground Water Sampling
Analytical results of each monitoring well should be summarized

Supporting Data:
Laboratory analytical sheets
Chain-of-custody forms

Water Levels

Static water levels measured when well drilled
Date(s) of water level measurements
Water levels determined prior to sampling

Supporting Data:

Dates of water level measurement, depths to ground water, and ground water elevations should be tabulated and included in the report.

Ground Water Gradient and Flow Direction

Ground water gradient and flow direction determined by the investigation should be discussed and compared to the regional gradient and flow direction.

Supporting Data:

A ground water contour map, drawn to scale, should be provided which shows each well, its ground water elevation, and lines of equal ground water elevation. Ground water gradient and flow direction should be shown on the map. The calculation of the gradient should be included.

V. RESULTS OF QA/QC

QA/QC procedures
QC sample identification
Field blank analyses
Comparison of duplicate sample results

VI. CONCLUSIONS AND RECOMMENDATIONS

Evaluate any contamination found;
Compare to background levels and appropriate screening levels;
Identify any suspected source of contamination;
Recommend any further investigative needs based on data gaps; interim remedial measures; public participation;

ATTACHMENT E

ITEMS TO BE INCLUDED IN A
FEASIBILITY STUDY/REMEDIAL OPTIONS EVALUATION REPORT

The outline below is a minimum requirement for items to be included and discussed in the text of all feasibility studies/remedial option evaluation reports submitted to the Board. Reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the state of California.

I. Purpose of Feasibility Study/Remedial Options Evaluation

II. Background

A. Description of Facility
B. Site History
   1. Years of Operation
   2. Chemical Use
   3. Chemical Releases (Potential and Documented)
C. Geology
   1. Regional
   2. Local, soil type, lithology, lateral extent of lithologic units
D. Hydrogeology
   1. Aquifers, Aquitards, Perched Aquifers
   2. Groundwater flow rates, directions, recharge, discharge
   3. Groundwater Use
   4. Effect of extraction and injection wells on groundwater flow
E. Surface Water
   1. Losing or gaining streams, ponds etc.
   2. Hydraulic connection with aquifers
F. Local Land Use
G. Previous Investigation and Remedial Actions

III. Nature and Extent of Contamination

A. Contaminants in Soils
   1. Types and Concentrations
   2. Lateral and Vertical Extent

B. Pollutants in Groundwater
   1. Types and Concentrations
   2. Lateral and Vertical Extent (including Perched Zones)

IV. Contaminant Fate and Transport

A. Contaminant Properties
   1. Mobility
   2. Toxicity
   3. Half-life
   4. Chemical and biological degradation
B. Contaminant Transport based on Soil and Aquifer Properties

V. Remedial Action Objectives

VI. Description of Remedial Action Alternatives – at a minimum, 3 alternatives must be considered

A. Alternative that meets background levels
B. Alternative that meets water quality objectives
C. Alternative that meets levels between background and water quality objectives

VII. Evaluation of Remedial Action Alternatives

A. Overall Protectiveness of Human Health and the Environment
B. Compliance with Laws and Regulations
C. Long Term Effectiveness and Permanence
D. Reduction of Toxicity, Mobility, and Volume
E. Short Term Effectiveness
F. Implementability
G. Cost
H. State and Community Acceptance

VIII. Potential Impacts of Remedial Actions

IX. Estimated Project Schedule for Each Alternative

X. Preferred Alternative

ATTACHMENT F
ITEMS TO BE INCLUDED IN A CLEANUP PLAN

The outline below is a minimum requirement for items to be included and discussed in the text of all cleanup plans submitted to the Regional Board. All reports must be signed and stamped by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California. Other pertinent information specific to each individual investigation also should be included.

I. INTRODUCTION

A. Site Assessment and characteristics
Site Background
Site description and location
Site history
Historic and current operations conducted at the site correlated to site contamination
Existing and planned use of the site
Present and historic chemical usage and handling procedures
Site geology and hydrogeology
Condition of surface and/or subsurface soil
All previous investigations with reference to relevant documents

B. Nature and Extent of Soil and Groundwater Contamination
1. Constituents and concentrations, including background concentrations
2. Lateral and vertical extent
3. Site maps to show above, including locations of any groundwater monitoring wells relative to soil and groundwater contamination

II. SUMMARY OF SELECTED REMEDIATION ALTERNATIVE

Discussion of selected remedial alternative
Discussion of implementation of remedial alternative
Summary of field activities
Summary of bench-scale testing
Summary of aquifer testing
Remedial investigation results
Summary of remedial goals
Compliance with Federal and State regulations, if applicable

III. TREATMENT SYSTEM DESIGN AND IMPLEMENTATION

Conceptual Model/Remedial Design
Overview
Equipment selection and operation
System schematics (layout, instrumentation, and controls)
Treatment processes
Construction activities and utility requirements
Operation, maintenance and performance monitoring

Start-up sampling and performance monitoring
Sampling and analysis plan to demonstrate system effectiveness, performance optimization, and long-term operation with respect to achieving cleanup goals
Potential for off-site migration
Emission and discharge controls
Handling and disposal procedures
Quality assurance/quality control plan

IV. CLOSURE AND POST-CLOSURE MONITORING

Cleanup Strategy
Field sampling plan for closure and post-closure monitoring
Long-term operation and maintenance of remedial action measures, if any are needed

V. TIME SCHEDULE FOR IMPLEMENTATION AND REPORTING