

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

DRAFT

**TENTATIVE CLEANUP AND ABATEMENT ORDER NO. R9-2023-0102
AN ORDER DIRECTING CITIZENS DEVELOPMENT CORPORATION, SYMPHONY
ASSET POOL XXI LLC, LSM GOLF COURSE PARTNERS LLC, HOLLANDIA DAIRY
INC., WILGENBURG DAIRY, CITY OF SAN MARCOS, CITY OF ESCONDIDO,
VALLECITOS WATER DISTRICT, AND COUNTY OF SAN DIEGO TO CLEAN UP OR
ABATE EFFECTS OF WASTE DISCHARGED TO
LAKE SAN MARCOS AND SAN MARCOS CREEK, SAN DIEGO COUNTY**

Dischargers Information:

Citizens Development Corporation 1105 La Bonita Drive San Marcos, CA 92078	Contact: Pino Vitti pv@cdcsanmarcos.com
City of Escondido 201 North Broadway Escondido, CA 92025	Contact: Juan Magdaraog jmagdaraog@escondido.org
City of San Marcos 1 Civic Center Drive San Marcos, CA 92069	Contact: Reed Thornberry rthornberry@san-marcos.net
County of San Diego 5510 Overland Ave, Suite 410 San Diego, CA 92123	Contact: Neil Searing Neil.Searing@sdcounty.ca.gov
Hollandia Dairy Inc. 622 East Mission Road San Marcos, CA 92069	Contact: Patrick Schallberger pschallberger@hollandiadairy.com
LSM Golf Course Partners LLC 18029 Calle Ambiente, Suite 500 Rancho Santa Fe, CA 92091	Contact: Daniel Hayden dhayden@pemginc.com
Symphony Asset Pool XXI LLC 18029 Calle Ambiente, Suite 500 Rancho Santa Fe, CA 92091	Contact: Daniel Hayden dhayden@pemginc.com
Vallecitos Water District 201 Vallecitos De Oro San Marcos, CA 92069	Contact: James Gilpin james.gilpin@bbklaw.com

Wildcat Dairy LLC (formerly known as Wilgenburg Dairy) 24268 County Rd 21 Fort Morgan, CO 80701	Contact: Edward John Wilgenburg ewilgenburg@earthlink.net
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Site Information:

Name:	Upper San Marcos Creek Watershed, including Lake San Marcos
Address:	San Marcos, CA 92078 (San Diego County)

Site Description:

Lake San Marcos receives water from San Marcos Creek and the Upper San Marcos Creek Watershed. The lake is about 56 acres, and the watershed is about 42 square miles.
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Unauthorized Releases:

Lake San Marcos is characterized by eutrophic conditions due to an excess of nutrients discharged from sources within the Upper San Marcos Creek Watershed and internal nutrient recycling because the Lake San Marcos acts as a sediment trap. The Upper San Marcos Creek beneficial uses are impaired due to uncontrolled discharges of waste from sources within the Upper San Marcos Creek Watershed.

Effective Date

I, David W. Gibson, Executive Officer, do hereby certify this Order is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 8, 2023.

Order No. R9-2023-0102 is effective upon the date of signature.

Ordered by:

DAVID W. GIBSON

Date

TABLE OF CONTENTS

I.	FINDINGS	5
A.	Legal and Regulatory Authority	5
B.	Discharge of Waste within the Upper San Marcos Creek Watershed	5
C.	Dischargers	6
D.	Site Geographic Extent and History	8
E.	Potential Threat to Human Health	10
F.	Lake, Creek, and Watershed Condition	10
G.	Condition of Nuisance	11
H.	Beneficial Uses Impairment	12
I.	Remedial Investigation/Feasibility Study Report	13
J.	Basis for Cleanup and Abatement Order	14
K.	Basis for Technical and Monitoring Reports	14
L.	Cleanup Levels Pursuant to Resolution No. 92-49	14
M.	CWA 303(d) List of Water Quality Limited Segments	15
N.	Basin Plan	15
O.	Water Quality Standards: Basin Plan Beneficial Uses	16
P.	Water Quality Standards: Basin Plan Water Quality Objectives	17
Q.	California Environmental Quality Act (CEQA) Requirements	17
R.	Domestic Water Quality	18
S.	Cost Recovery	18
T.	Public Notice	18
II.	DIRECTIVES	19
A.	Data Gaps Assessment	19
B.	Feasibility Analysis	23
C.	Clean Up or Abate Discharged Waste	24
D.	Remedial Action Plans and Implementation	24
E.	Semiannual Progress Reports	26
F.	Exceedance Characterization Work Plan	27
G.	Exceedance Investigation and Characterization Report	28
H.	Compliance Dates	28
I.	Penalty of Perjury Statement	28
J.	Document Submittals	28
K.	Violation Reports	31

L. Provisions	31
M. Notifications	34
TABLES	35
ATTACHMENT A – FIGURES	A-1

List of Tables

Table 1: Maximum and Current Concentrations of Ammonia, Nutrients, and Dissolved Oxygen in Lake Water	35
Table 2: Maximum Concentrations of Nutrients in Lake Sediments	36
Table 3: Maximum and Current Concentrations of Ammonia and Nutrients in Creek Water	36
Table 4: Summary of Compliance Dates	37

List of Figures

Figure 1: Municipal Storm Sewer Systems in the Upper San Marcos Creek Watershed	A-1
Figure 2: Outfall Locations by Lake San Marcos	A-2
Figure 3: Site Location and Overview of Site Elements	A-3
Figure 4: Upper San Marcos Creek Watershed Composed of Twin Oaks and Richland Hydrologic Subareas	A-4
Figure 5: Areas Without Beneficial Uses in the Richland Hydrologic Subarea	A-5
Figure 6: Locations of Lake San Marcos Monitoring Stations A through E and Other Locations Sampled for the Remedial Investigation/Feasibility Analysis Report	A-6
Figure 7: Lake San Marcos Bathymetry (Water Depths), Locations of Nearby Golf Courses and Irrigation Intake Line, and Location of Dam	A-7

This Cleanup and Abatement Order No. R9-2023-0102 (Order) is issued to Citizens Development Corporation (CDC), the City of Escondido, the City of San Marcos, the County of San Diego, Hollandia Dairy Inc., LSM Golf Course Partners LLC, Symphony Asset Pool XXI LLC, Vallecitos Water District, and Wilgenburg Dairy based on provisions of Water Code sections 13267 and 13304, which authorize the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), to issue this Order and require the submittal of technical and monitoring reports.

I. FINDINGS

The San Diego Water Board finds that:

A. Legal and Regulatory Authority

This Order conforms to and implements (1) policies and requirements of the Porter-Cologne Water Quality Control Act (commencing with Water Code section 13000) including sections 13267 and 13304; (2) the federal Water Pollution Control Act (CWA); (3) applicable state and federal regulations; (4) all applicable provisions of statewide Water Quality Control Plans adopted by the State Water Resources Control Board (State Water Board) and the Water Quality Control Plan for the San Diego Basin (Basin Plan) adopted by the San Diego Water Board including beneficial uses, water quality objectives (WQOs), and implementation plans; (5) State Water Board policies and regulations, including Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California; Resolution No. 88-63, Sources of Drinking Water; Resolution No. 92-49, Policies and Procedures for Investigation, and Cleanup and Abatement of Discharges under Water Code Section 13304 (Resolution No. 92-49); California Code of Regulations (Cal. Code Regs.) title 23, chapter 16, article 11; Cal. Code Regs., title 23, section 3890 et seq.; and (6) relevant standards, criteria, and advisories adopted by other state and federal agencies.

B. Discharge of Waste within the Upper San Marcos Creek Watershed

1. Sources and Concentrations of Waste

- a. **Upper San Marcos Creek Watershed Sources.** Major sources of total phosphorus, nitrogen, and total suspended solid (TSS) in the Upper San Marcos Creek Watershed (Watershed) are from stormwater runoff and non-stormwater runoff (i.e., dry weather irrigation). Other waste (e.g., pesticides and selenium) also originates from the Watershed. These discharges reach San Marcos Creek (Creek) and Lake San Marcos (Lake) through private and municipal storm sewer system structures (e.g., storm drains, pipes, and ditches). Figure 1 shows the municipal separate storm sewer system (MS4) structures under the responsibility of the City of San Marcos, City of Escondido, and the County of San Diego. At the Lake shoreline, most of the stormwater outfalls belong to private entities. Figure 2 shows storm outfalls closest to the Lake.

- b. **Lake Sources.** During summer, the major cause of increased phosphorus concentrations in Lake water is “biogeochemical cycling” from Lake sediments. Specific chemical conditions in Lake water and sediments provoke internal nutrient recycling. Other waste (e.g., pesticides and selenium) accumulate in Lake sediments and biota and/or boat activity may release constituents of concern to Lake water because they disturb sediments.

Tables 1, 2, and 3 below, show the maximum and current concentrations of waste in Lake water, Lake sediments, and Creek water, respectively. The maximum waste concentrations and minimum dissolved oxygen levels reported in Tables 1 and 2 were recorded at monitoring stations A and B found in the deepest part of the Lake (Figures 6 and 7).

2. **Constituents of Concern.** The following are constituents of concern in Creek and Lake waters and sediments: ammonia as nitrogen, arsenic, cadmium, chromium, copper, lead, nickel, zinc, nitrate, nitrogen, pesticides¹, phosphorus, polycyclic aromatic hydrocarbons (PAHs), selenium, and TSS. The discharge of these constituents of concern to waters of the state constitutes a discharge of waste as defined in Water Code section 13050 subdivision (d).²

C. Dischargers

CDC, LSM Golf Course Partners LLC, Symphony Asset Pool XXI LLC, City of San Marcos, County of San Diego, City of Escondido, Vallecitos Water District, Hollandia Dairy, and Wilgenburg Dairy (collectively, Dischargers) discharged waste, are discharging waste, or threaten to discharge waste. These discharges are a violation of the Water Code and have resulted in pollution and contamination of the waters of the state and constitute a public nuisance.

1. **Citizens Development Corporation.** CDC bought the Lake property³ in the 1960s and developed residential areas and golf courses near the Lake. CDC is the landowner and is responsible for the accumulation of waste in Lake water and sediments (State Water Board Order No. WQ 86-2 [Zoecon Corp.]). CDC is also responsible for operations of the St. Mark Golf Course (SMGC) and Executive Golf Course (EGC) groundwater wells, and groundwater

¹ Bifenthrin, cypermethrin, organochlorine pesticide byproducts (e.g., dichlorodiphenyldichloroethylene as a degradation product of dichlorodiphenyltrichloroethane (DDT)), permethrin, and pyrethroid.

² This Order requires the dischargers to clean up and abate the effects of ammonia as nitrogen, total nitrogen, total phosphorus, TSS, and other nutrients causing eutrophic conditions at the Lake (e.g., nitrate and orthophosphate) in the Lake and Creek. Remedial actions implemented pursuant to this Order may address other wastes as well. If the other wastes are not addressed by the remedial actions, the San Diego Water Board may take other appropriate regulatory action to address the other wastes in the Creek and Lake, including amending the Order to address the other wastes.

³ Assessor Parcel Numbers: 2212400100, 2215004300, 2215004400, 2220310700, 2220310800, 2220305600, 2220304400, 2220303000.

discharges from the wells to the Lake. CDC submitted data to the San Diego Water Board that shows concentrations of total nitrogen and total phosphorus in groundwater exceed WQOs for the Lake. Total iron, total manganese, and total selenium concentrations also exceed Basin Plan WQOs for these constituents.

2. **LSM Golf Course Partners LLC and Symphony Asset Pool XXI LLC.** LSM Golf Course Partners LLC owns the SMGC and Assessor Parcel No. 2212400300, which is the part of the Creek that enters the Lake south of the Discovery Street bridge. Symphony Asset Pool XXI LLC owns the EGC. LSM Golf Course Partners LLC and Symphony Asset Pool XXI LLC also own the SMGC and EGC wells, respectively. LSM Golf Course Partners LLC and Symphony Asset Pool XXI LLC use herbicides and fertilizers on the golf courses that can run off the property with non-stormwater or stormwater discharges into the Lake and Creek. Further, the highest concentrations of total phosphorus, TSS, and ammonia from Lake area storm drains are located near Parcel No. 2212400300, the SMGC, and the EGC.
3. **City of San Marcos, City of Escondido, and County of San Diego.** The City of San Marcos, the City of Escondido, and the County of San Diego are owners and operators of MS4s in the Watershed. These entities are regulated by San Diego Water Board Order No. R9-2013-0001, as amended, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region* (Regional Phase I MS4 Permit) As enrollees of the Regional Phase I MS4 Permit, these entities (i) own and/or operate MS4s that are sources of nutrients and TSS to the Creek and Lake throughout the year; (ii) own and/or operate MS4s that include the receiving waters within their jurisdiction; (iii) have jurisdiction over the areas where monitoring stations for compliance with Regional Phase I MS4 Permit and this Order are to be located; (iv) have land use authority over agricultural operations within their jurisdiction; and (v) may convey agricultural discharges to the Creek and Lake via their MS4s. The highest concentrations of nitrate, total nitrogen, and TSS in Lake area storm drains are detected in samples collected from major outfalls under the jurisdiction of the City of San Marcos and the County of San Diego.⁴ Further, the highest concentrations of ammonia as nitrogen and total phosphorus are detected in Creek water samples near the City of Escondido.⁵ The Creek contributes up to 95 percent of the total annual nutrient and TSS loads to the Lake.⁶ Existing Watershed runoff management efforts, such as street

⁴ See Section 4.1.1.6 of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

⁵ See Sections 4.1.1.1 and 4.1.1.4 of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

⁶ Ibid.

sweeping and stormwater best management practices (BMPs) within the Watershed performed by City of San Marcos, City of Escondido, and County of San Diego, are not sufficient to prevent Lake eutrophication, exceedances of WQOs for the Lake and Creek, and impairment of Lake and Creek beneficial uses.

4. **Vallecitos Water District.** Vallecitos Water District manages a sanitary sewer system within the Watershed. Sanitary sewer overflows from the Vallecitos Water District date back to 1987⁷ and have discharged waste to the Lake, Creek, and parts of the Watershed.
5. **Hollandia Dairy.** Hollandia Dairy Inc. (Hollandia) owned and operated the Hollandia Dairy in San Marcos⁸ from 1950 to 2003. Operations at Hollandia lacked adequate wastewater storage and disposal facilities, which resulted in the discharge of dairy waste (e.g., manure high in nutrients and ammonia)⁹ to the Creek.¹⁰
6. **Wildcat Dairy LLC (formerly known as Wilgenburg Dairy¹¹).** From 1958 to 1987, Jacob and Edward Wilgenburg managed and owned Wilgenburg Dairy in San Marcos.¹² They maintained approximately 500 cows on 20 acres and discharged dairy waste via a pipe to the Creek¹³ because they did not have an adequate wastewater storage and disposal facility.

The San Diego Water Board will consider whether additional dischargers caused or permitted the discharge of waste at the Site and whether additional dischargers should be added to this Order. The Board may amend this Order or issue a separate order or orders in the future as more information becomes available. The Board is issuing this Order to avoid further delay of Site remediation.

D. Site Geographic Extent and History

The term “Site” in this Order is defined as waters and sediments of the Watershed, Lake, and Creek impacted by nutrients and other constituents,

⁷ See Appendix AA of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

⁸ Hollandia Dairy is located at 622 East Mission Road, San Marcos, CA.

⁹ Daniel B. Stephens & Associates, Inc. February 2017. Response to RWQCB Comments dated January 3, 2017, Remedial Investigation/Feasibility Study Report dated 9/30/16, see response to comment 6.

¹⁰ See Section 7 and Appendices X, Y, and Z of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

¹¹ In 2005, the Wilgenburg Dairy was converted into the Wildcat Dairy, LLC, in Colorado.

¹² Wilgenburg Dairy was formerly operated at 600 Rancheros Drive, between California Highway 78 and San Marcos Creek, in San Marcos, CA.

¹³ See Section 7 and Appendix W of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

resulting in exceedances of WQOs for the Creek and Lake and impairment of beneficial uses.

1. **Lake San Marcos.** The Lake is an impoundment formed by a dam completed in 1951 across the Creek. The Lake surface area is currently about 56 acres. The Creek flows into the Lake at its north end (Figure 2). The Lake is in the north-central part of San Diego County. The headwaters of the Creek are in the City of Escondido. Water in the Creek travels through the Cities of Escondido and San Marcos before arriving at the Lake. The Creek and Lake receive stormwater, non-stormwater, and intermittent stream flows from within the Watershed. Downstream of the dam, the Creek receives stormwater, non-stormwater, and intermittent stream flows from the Lower San Marcos Creek Watershed, which then flows to Batiquitos Lagoon.

Originally nearby farmers used Lake water for irrigation. CDC bought the land corresponding to the current footprint of the Lake and its surrounding land in the mid-twentieth century, subdivided the land, developed a residential community around the Lake, and reshaped the central portion of the Lake to include five coves. CDC's Water Right License 7224 allows CDC to divert waters from Creek from November 1 through April 30 of each year. In a report for investigation of CDC's compliance with License 7224, the State Water Board states, "According to a memorandum of field visit by a State Water Rights Board engineer conducted on July 18, 1963, the principal use of water under the new ownership would be recreation, and use for irrigation would likely diminish because of the desire to maintain a full reservoir for recreation."¹⁴

2. **Upper San Marcos Creek Watershed.** The approximately 42-square-mile Watershed drains to the Lower San Marcos Creek Watershed,¹⁵ which then drains to the Pacific Ocean via Batiquitos Lagoon (Figure 3). The Watershed includes all or portions of the Cities of Escondido and San Marcos and unincorporated areas of San Diego County. The main water body flowing in the Watershed is the Creek. Farmers used the Watershed areas to grow citrus until urbanization began in the 1960s. A significant increase in urbanization occurred within the Watershed between 1967 and 1986.¹⁶ Land use within the Watershed was estimated in 2016 to be 2 percent golf courses, 3 percent institutional, 11 percent agricultural, 18 percent commercial and light industry, 32 percent residential, and 32 percent open space.

¹⁴ State Water Board, Division of Water Rights. 2011. Report of Investigation – Compliance by Citizens Development Corporation with Terms and Conditions of Water Right License 7224 (A010711) to Divert from San Marcos Creek in San Diego County.

¹⁵ The Upper and Lower San Marcos Creek Watersheds are collectively referred to as the San Marcos Creek Watershed.

¹⁶ Figures 23 and 24 of 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

E. Potential Threat to Human Health

Poor water quality due to excess nutrients in the Lake is a potential threat to human health through direct contact with or inhalation of harmful toxins produced by algae that bloom in waters with excessive nutrients.¹⁷

F. Lake, Creek, and Watershed Condition

1. **Lake Nutrient Levels.** Nutrients, primarily nitrate¹⁸ and phosphorus, are causing eutrophic conditions¹⁹ in the Lake. Total phosphorus and total nitrogen concentrations in Lake water exceed Basin Plan WQOs of 0.025 milligrams per liter (mg/L) total phosphorus and 0.25 mg/L total nitrogen. Natural surface flows (e.g., creeks and land surface runoff), groundwater flows, upstream stormwater and non-stormwater discharges from agriculture, private storm sewer systems, and MS4s²⁰ discharge nutrients into the Creek and the Lake. The Lake also receives nutrients from internal nutrient cycling, as bacterial activity within sediments releases nutrients stored within the sediments to the water column depending on the potential of hydrogen (pH) in Lake water. Nutrients in Lake water promote algae growth. Algae may release cyanobacteria toxins to water and air, and algae decay causes nuisance odors.
2. **Lake Stratification.** During the spring, summer, and fall months, warmer air temperatures and lack of Lake water mixing causes the Lake to thermally stratify into two water layers of different temperatures that do not mix vertically. When the Lake water is stratified, dissolved oxygen concentrations in Lake water decrease and the Lake water does not meet the Basin Plan WQO of 7 mg/L for 90 percent of the year for dissolved oxygen. The Lake water vertically mixes and de-stratifies during the winter months when temperatures between the shallower and deeper Lake are more similar. De-stratification of the Lake water brings low dissolved oxygen and nutrient-rich waters from the bottom of the Lake to the surface, which results in fish kills and algal blooms. When stratification does not occur at the Lake, some deep portions of the Lake still do not meet the Basin Plan WQO for dissolved oxygen.

¹⁷ [Harmful Algal Bloom \(HAB\)-Associated Illness](#), Sources of Exposure. Centers for Disease Control and Prevention. 2022.

¹⁸ Inorganic or organic ester or salt of nitric acid, containing the (NO₃⁻) ion. Nitrates are the most water-soluble of all salts and play a major part in nitrogen cycle and nitrate pollution. Inland surface waters shall not contain nitrate (as NO₃⁻) in concentrations in excess of the numerical objectives described in Table 3-9 of the Basin Plan. The nitrogen WQO from Table 3-9 for the San Marcos HA is described in I.J.

¹⁹ A eutrophic lake is rich in nutrients and supports a dense plant population, the decomposition of which kills animal life by depriving it of oxygen.

²⁰ Polluted stormwater runoff is commonly transported through MS4s, and then often discharged, untreated, into local water bodies. See [Stormwater Discharges from Municipal Sources Webpage](#). U.S. Environment Protection Agency. [Accessed April 2023]

3. **Creek and Watershed Condition.** Surface water analysis in the Watershed indicates that, in both Creek water and storm drains, total phosphorus and total nitrogen concentrations exceed the Basin Plan WQOs for biostimulatory substances for flowing waters. The highest concentrations of nutrients are in the Twin Oaks tributary, where agricultural land use is more common than in other areas of the Watershed.

G. Condition of Nuisance

Water Code section 13050, subdivision (m), defines “nuisance” as anything that meets all the following requirements:

1. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
2. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
3. Occurs during, or because of, the treatment or disposal of waste.

The presence of waste, including hydrogen sulfide²¹, pesticides, and toxins, in Lake water creates a condition of nuisance. This nuisance is proven by the following:

4. The excess nutrients in Lake water produce cyclical algal blooms and algal decays. During algal blooms, cyanobacteria may produce toxins that are harmful and a nuisance to Lake recreationists, pets, and wildlife. During algal decays, odor produced by the decaying algae may affect recreationists and residents of the Lake. Residents surrounding the Lake sent complaints and concerns about the Lake water quality to San Diego Water Board since the early 2000s.
5. SMGC staff irrigates the SMGC with Lake water, which may have cyanotoxins or odors during algal blooms or decays. Irrigation overspray can aerosolize waste and pollutants in the Lake that drift beyond the direct spray and pose health risks to nearby residents and wildlife. Irrigation overspray with contaminated Lake water can expose residents and recreationists to cyanotoxins through direct contact, inhalation, or ingestion of residential crops. Irrigation overspray from the SMGC onto nearby residential properties can create a condition of nuisance and obstruct the enjoyment of property.

²¹ See Appendices E and F of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

H. Beneficial Uses Impairment

Water quality impairments discussed in Finding F of this Order interfere with recreational and habitat beneficial uses of the Lake and Creek. The waste discharged at the Site exceeds Basin Plan WQOs and impairs beneficial uses as described below.

1. The Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) beneficial uses are impaired. Elevated phosphorus and nitrogen in Lake water may cause excessive algal growth. After death, the algae decompose in water and the excessive number of decomposing algae depletes concentrations of dissolved oxygen. The lack of sufficient dissolved oxygen in the water may trigger fish kills²² and negatively affect other aquatic organisms²³ (e.g., some invertebrates). Significant increases in algae impact water quality, food resources needed to sustain aquatic life, and aquatic life habitats. Algae impact water quality because when algae die, their decay consumes dissolved oxygen and dissolved oxygen levels in water decrease. Algae impact aquatic life habitats and food resources needed to sustain aquatic life because algae blooms degrade water clarity needed by fish and other aquatic life to find food and blocks sunlight needed by underwater plants, which impairs their growth. Fish and other aquatic life need underwater plants to hide from predators. The absence of underwater plants degrades the quality of aquatic life habitats.

The presence of pollutants in Lake and Creek sediments may pose a risk to benthic communities. Surficial Lake sediment chemistry analyzed by Great Ecology on behalf of CDC²⁴ in June 2013, September 2013, and January 2014 identified concentrations of arsenic, cadmium, copper, nickel, zinc, total dichlorodiphenyldichloroethylene (DDE), alpha and gamma chlordane, and total PAHs exceed threshold effect concentrations (TECs) established for these constituents.²⁵

2. The presence of cyanobacteria, including the microcystin toxin,²⁶ in Lake waters impairs the Lake Contact Water Recreation (REC 1) beneficial use.

²² Orville P. Ball and Associates Consultants. November – December 1974. Lake San Marcos, A Lake Management and Rehabilitative Investigation.

²³ See Appendix AK of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

²⁴ Great Ecology. January 2016 Lake San Marcos Investigation Surficial Sediment Investigation Results.

²⁵ TECs are developed from published sediment quality guidelines and identify contaminant concentrations below which adverse biological effects are unlikely to occur. Where concentrations exceed TECs, the risk of sediments impacting benthic communities is uncertain and additional evaluations may be needed to assess it. U.S. Environment Protection Agency. December 2002. A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems, Volume III – Interpretation of the Results of Sediment Quality Investigations.

²⁶ See Appendix H of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

Microcystin can be harmful to humans and animals through direct contact or inhalation. Phytoplankton monitoring events in 2012 and 2014 qualitatively recorded and reported microcystin present in all areas of the Lake. However, quantitative analysis indicating the presence of cyanobacteria²⁷ was only conducted on samples from two locations in the Lake: samples collected in 2005 by Lake residents near the center of the Lake and samples collected by the San Diego Water Board staff in 2021 in the shallow part of the Lake where the Creek enters the Lake.

3. The Non-Contact Water Recreation (REC 2) beneficial use is seasonally impaired every summer in the northern, shallower part of the Lake because of excess sedimentation and evaporation. The accumulation of sediments and lack of dredging in the Lake create navigational issues in the shallower part of the Lake. These shallow water conditions may impact the success of proposed Lake mitigative actions that need access by boat to Lake water (e.g., phosphorus inactivation). In winter, rain events recharge the Lake sufficiently to allow recreationists to use their boats in any part of the Lake (i.e., supporting REC 2 beneficial use).

I. Remedial Investigation/Feasibility Study Report

CDC, the City of San Marcos, the City of Escondido, Vallecitos Water District, and the County of San Diego (collectively, the Parties²⁸) submitted a Remedial Investigation/Feasibility Study Report²⁹ (RI/FS Report) to the San Diego Water Board on September 30, 2016. This Order refers to findings and recommendations presented in the RI/FS Report.

The Parties studied nutrients entering the Lake and characterized the nature and extent of Lake impairments due to nutrients in the RI/FS Report. The RI/FS Report presents human and ecological risk assessments for the Lake and Creek that have data gaps. The Parties have not addressed these data gaps since 2016. The RI/FS Report presents Lake and Watershed models with quantities of nutrients entering the Lake from the Watershed. The Parties did not model the other wastes discussed in Finding B of this Order, or sample storm sewer systems within the Watershed for purposes of waste source identification. The Parties proposed remedies in the RI/FS Report to reduce nutrient loading to the Lake. The Parties did not propose Creek remedies to reduce nutrient loading to the Creek, except where the Creek enters the Lake. The Parties' proposed

²⁷ See Appendix A1 of the 2016 Remedial Investigation/Feasibility Study Report as referenced in footnote 26.

²⁸ All of the Parties are Dischargers named in Finding C of this Order.

²⁹ Daniel B. Stephens & Associates, Inc. September 2016. Remedial Investigation/Feasibility Study Report, Upper San Marcos Creek Watershed and Lake San Marcos, Prepared for Citizens Development Corporation and Public Agency Defendants. The Public Agency Defendants are the City of San Marcos, the City of Escondido, Vallecitos Water District, and the County of San Diego.

remedies have changed^{30,31} over time without a thorough evaluation³² of how the revised remedies will affect the remedial goals.

J. Basis for Cleanup and Abatement Order

Water Code section 13304 authorizes the San Diego Water Board to require dischargers to clean up or abate the effects of waste discharge(s) where the discharge creates or threatens to create a condition of pollution or nuisance.

This Order directs the Dischargers to clean up or abate the effects of waste discharged to the Lake and Creek from within the Watershed. This Order requires the Dischargers to implement remedial actions to restore the Lake and Creek water and sediment quality, as well as beneficial uses. Findings in this Order provide the explanation and evidence supporting the requirements of this Order.

K. Basis for Technical and Monitoring Reports

Water Code section 13267 authorizes the San Diego Water Board to require any person who has discharged, discharges, or is suspected of having discharged or is discharging waste within its region to prepare technical and monitoring reports. The burden, including the costs, of these reports shall bear a reasonable relationship to the needs and the benefits to be obtained from the reports. The Board estimates that compliance with the technical and monitoring directives of this Order will cost between \$728,000 and \$1,918,000. The technical and monitoring reports required by this Order are necessary to (a) assess the impact of the discharges to the Creek, (b) assess the potential risks posed by discharges to human health,³³ aquatic life, aquatic-dependent wildlife,^{34,35} and beneficial uses of the Lake and Creek, (c) assure compliance with the cleanup and abatement directives contained in this Order, and (d) assess the appropriateness of cleanup and abatement measures to remediate the impacts of the discharge consistent with Basin Plan requirements and Resolution No. 92-49, and protect the waters of the state from the conditions of discharge described above (also see Finding I of this Order). Based on the nature and consequences of the discharge and its effects at the Site, the burden of the technical and monitoring reports bears a reasonable relationship to the need for the reports and to the benefits to be obtained from the reports.

L. Cleanup Levels Pursuant to Resolution No. 92-49

³⁰ LimnoTech. April 17, 2017. Response to the March 15, 2017, letter to Mr. Pino Vitti and Mr. Reed Thornberry regarding the additional comments for the September 30, 2016, RI/FS Report.

³¹ LimnoTech. February 14, 2018. Upper San Marcos Creek Watershed Pilot Workplan.

³² LimnoTech. March 23, 2023. Lake San Marcos Bridge Document.

³³ See Sections 5.2.5 and 5.4.1 of the RI/FS Report.

³⁴ See Section 5.4.3.6 of the RI/FS Report.

³⁵ Great Ecology. August 2014. Toxicity Testing Report for Lake San Marcos.

Resolution No. 92-49 sets forth the policies and procedures the State Water Board and Regional Water Quality Control Boards must use during an investigation or cleanup of a discharge of waste and requires that cleanup levels be consistent with Resolution No. 68-16. Resolution No. 92-49 applies to the cleanup and abatement of the effects of waste discharged at the Site. Resolution No. 92-49 requires dischargers to clean up or abate the effects of discharges in a manner that promotes the attainment of background water quality, or the best water quality that is reasonable if background water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. Any alternative cleanup level greater than 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 waters of the state; 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.

M. CWA 303(d) List of Water Quality Limited Segments

1. **303(d) Listing in the Watershed.** Section 303(d) of the CWA requires states to find and list waters or segments of waters that are not meeting water quality standards. The Lake and Creek are on the California 303(d) list of impaired water bodies. The State Water Board listed the Lake as impaired for ammonia as nitrogen, copper, nutrients, and phosphorus and listed the Creek as impaired for benthic community effects, bifenthrin, DDE, indicator bacteria, nitrogen, phosphorus, pyrethroids, selenium, total dissolved solids, and toxicity.
2. **Total Maximum Daily Load (TMDL).** The state must establish a TMDL at a level necessary for the impaired waters (i.e., water bodies or segments listed on the California 303d list) to achieve the applicable water quality standards. This Order does not prevent the San Diego Water Board from adopting TMDLs or any other regulatory actions to address other impairments in the Lake, Creek, and Watershed.
3. **Amendment of this Order.** If the San Diego Water Board adopts a TMDL or takes other regulatory action(s) that changes applicable water and/or sediment quality standards for waters or sediments of the Site, the Board will amend this Order to reflect changes in water and/or sediment quality standards and compliance requirements.

N. Basin Plan

The Basin Plan presents water quality standards applicable for the Lake and Creek. The Basin Plan:

1. Designates beneficial uses for surface waters and groundwaters;

2. Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;
3. Describes implementation programs to protect the beneficial uses of all waters in the Region; and
4. Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan.

O. Water Quality Standards: Basin Plan Beneficial Uses

Beneficial uses are the cornerstone of water quality protection under the Basin Plan and are necessary for the survival or well-being of people, plants, and wildlife. The Basin Plan designates beneficial uses for all surface and groundwaters in the San Diego Region. Once beneficial uses are designated, appropriate WQOs can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses.

1. Surface waters at the Site are part of the San Marcos Creek Watershed, which is located within the Batiquitos, Richland, and Twin Oaks Hydrologic Subareas (HSA) of the San Marcos Hydrologic Area (HA). San Marcos Creek is a major surface water body within the San Marcos Creek Watershed. Other unnamed intermittent streams also flow through the San Marcos Creek Watershed. The Basin Plan designates the following beneficial uses for surface waters in the San Marcos Creek Watershed:
 - a. Agricultural supply (AGR)
 - b. Contact Water Recreation (REC 1)
 - c. Non-Contact Water Recreation (REC 2)
 - d. Warm Freshwater Habitat (WARM)
 - e. Wildlife Habitat (WILD)
2. Groundwater at the Site is located within the Richland and Twin Oaks HSAs of the San Marcos HA, of the Carlsbad Hydrologic Unit. The Basin Plan designates the following beneficial uses for groundwaters within Richland and Twin Oaks HSAs:
 - a. Agricultural (AGR)
 - b. Industrial Service Supply (IND)
 - c. Municipal and Domestic Supply (MUN)

3. The Basin Plan specifies that beneficial uses for groundwater in the Richland HSA between Highway 78 and El Camino Real do not apply and except this area from the sources of drinking water policy (Figure 4).³⁶

P. Water Quality Standards: Basin Plan Water Quality Objectives

1. The Basin Plan contains narrative and numeric WQOs developed to protect the most sensitive beneficial uses designated for a water body.
2. The Basin Plan, Table 3-9, designates specific numeric WQOs for surface waters in the San Marcos HA. The Basin Plan also designates the following WQOs for biostimulatory substances and dissolved oxygen, which apply to the Site:

- a. **Biostimulatory Substances.** Inland surface waters, bays and estuaries, and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients (e.g., nitrate), shall be maintained at levels below those which stimulate algae and emergent plant growth.

Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg/L in any stream at the point where it enters any standing body of water, nor 0.025 mg/L in any standing body of water. A desired goal to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10 percent of the time unless studies of the specific water body in question clearly show that WQO changes are permissible, and changes are approved by the San Diego Water Board.

Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight-to-weight basis, shall be used.

- b. **Dissolved Oxygen.** Dissolved oxygen levels shall not be less than 5.0 mg/L in inland surface waters with designated WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/L more than 10 percent of the time.

Q. California Environmental Quality Act (CEQA) Requirements

Adoption of this Order is being taken for the protection of the environment and as such is exempt from provisions of CEQA (Public Resources Code section 21000 et seq.) in accordance with title 14, Cal. Code Regs., sections 15061, subdivision

³⁶ See footnote 7 of Table 2-5, Chapter 2 of the San Diego Water Board Basin Plan.

(b)(3), 15306, 15307, 15308, and 15321. This Order requires the Dischargers to submit plans for approval prior to implementation of cleanup activities at the Site. The submittal of plans is exempt from CEQA as submittal will not cause a direct or indirect physical change in the environment and/or is an activity that cannot have a significant effect on the environment. CEQA review at this time would be premature and speculative, as there is not enough information concerning the Dischargers' proposed remedial activities and possible associated environmental impacts. If the San Diego Water Board finds that implementation of any plan required by this Order will have a significant effect on the environment, the Board will conduct the necessary and appropriate environmental review prior to Executive Officer's approval of the applicable plan.

R. Domestic Water Quality

The state established a policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring the Dischargers to meet Basin Plan WQOs. The San Diego Water Board established WQOs to protect human health and ensure that water is safe for domestic use.

S. Cost Recovery

Pursuant to Water Code section 13304, subsection (c), and consistent with other statutory and regulatory requirements, including, but not limited to, Water Code section 13365, the San Diego Water Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste, to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action required by this or a subsequent Order. Upon receipt of invoices, and per instruction therein, the Dischargers shall reimburse the Board for all reasonable costs incurred by the Board.

T. Public Notice

The San Diego Water Board notified all known interested persons and the public of its intent to adopt this Order and provided them with an opportunity to submit written comments and recommendations.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13267 and 13304, the Dischargers shall investigate and clean up or abate the effects of waste as soon as reasonably possible, but no later than the compliance dates listed in Table 6 below. The Dischargers shall comply with the following directives:

II. DIRECTIVES

A. Data Gaps Assessment

- 1. Storm Sewer Systems Investigation and Mitigation Plan.** The Dischargers shall prepare and submit to the San Diego Water Board a Storm Sewer Systems Investigation and Mitigation Plan (Plan) **within 60 days of adoption of this Order**. The Plan shall be designed to identify, characterize, and mitigate waste and waste sources in the Watershed that drain to the Lake and Creek outfalls. The Dischargers shall investigate both waste and waste sources related to storm and non-stormwater runoff. The Plan shall contain, at a minimum, the following:
 - a. Conceptual Site Model.** The Plan shall include a conceptual site model (CSM) showing all current, former, and potential waste sources and pathways for waste to enter the Watershed's Storm Sewer Systems that drain to the Lake and Creek outfalls.
 - b. Map.** The Plan shall include a detailed scaled map showing the location and all elements of, and potential waste sources within, the Storm Sewer Systems within the Watershed that drain to the Lake and Creek outfalls.
 - c. Sampling and Analysis Plan.** The Plan shall include a Sampling and Analysis Plan for the sediments within the Storm Sewer Systems at key locations, sufficient to characterize the water and sediments that may discharge to the Lake and Creek. The Dischargers' Sampling and Analysis Plan must specify the chemical analyses needed to adequately find the full range of Site-specific waste constituents including, at a minimum, constituents for which the state has listed the Lake and Creek on the 303(d) list.
 - d. Sample Locations.** At a minimum, the Discharger shall collect samples within major catch basins and similar junctions, where accessible, and at intervals adequate to detect potential waste sources within the Watershed. In addition, the Dischargers shall collect samples at locations designed to assess contributions from potential waste sources such as agricultural activities or other waste-generating activities within the Watershed. The Plan shall identify the number and location of the proposed sampling points and provide justification for the sampling intervals of catch basins within the streets.
 - e. Sampling Protocols and Quality Assurance Project Plan.** The Plan shall include the planned sampling protocols and a Quality Assurance

Project Plan (QAPP) presenting the quality assurance/quality control (QA/QC) protocols to ensure that all environmental data generated are scientifically valid and of acceptable quality to meet the Plan's goals.

- f. **Mitigation.** The Plan shall include, at a minimum, the following mitigation activities:
 - i. Removal and characterization of residual sediments in the Storm Sewer System.
 - ii. Installation of structural treatment control BMPs, where necessary and possible, in the Storm Sewer Systems to prevent or mitigate the entry of waste into the storm drains to the maximum extent possible.
 - iii. Maintenance of BMPs, as necessary, to prevent degradation of their performance.
 - g. **Activity Completion Schedule.** The Plan shall include a reasonable schedule for completion of all activities and submission of a final Storm Sewer Systems Investigation and Mitigation Report, described in Directive B.2.
- 2. Storm Sewer Systems Investigation and Mitigation Implementation and Report.**
- a. **Implementation.** The Dischargers shall implement the Storm Sewer Systems Investigation and Mitigation Plan according to the Activity Completion Schedule described in Directive B.1.g.
 - b. **Storm Sewer Systems Investigation and Mitigation Report.** The Dischargers shall notify the San Diego Water Board within 24-hours after implementation of the last mitigation activity. The Dischargers shall submit the Storm Sewer Systems Investigation and Mitigation Report (Report) to the Board **no later than 60 calendar days after the Dischargers have implemented the last mitigation activity**. The Report shall include the following:
 - i. Sampling protocols implemented.
 - ii. Location, type, and number of samples shown on detailed site maps and tables.
 - iii. Concentration and interpreted lateral extent of each constituent.
 - iv. Mass of residual sediments removed from the Storm Sewer Systems.

- v. Interpretations regarding the potential for waste within the Storm Sewer Systems to contaminate or recontaminate the Lake and Creek during or after the remedial activities.
 - vi. Evaluation of the effectiveness of the mitigation activities implemented.
 - vii. Recommendations for additional investigation and mitigation activities, if deemed necessary.
- 3. **Risk Assessment Work Plan.** The Dischargers shall submit a Risk Assessment Work Plan (Work Plan) to the San Diego Water Board **no later than 60 calendar days after the date this Order is adopted.** The Dischargers shall ensure the Work Plan addresses data gaps identified in the Screening-Level Human Risk Assessment (HHRA) and the Screening-Level Ecological Risk Assessment (SLERA)³⁷, and will answer the following study questions:
 - a. Does Lake water used for irrigation of the SMGC present a health risk to residents living at properties next to the SMGC via dermal contact and inhalation?
 - b. Are cyanotoxins present in Lake water at concentrations that may pose a health risk to Lake recreationists and their pets (e.g., incidental ingestion and dermal contact pathways)?
 - c. Are wastes present in Lake sediment at concentrations that pose a risk to in-Lake sediment-dwelling biota?
 - d. Are wastes present in Creek sediment at concentrations that pose a risk to benthic macroinvertebrate communities?

The Work Plan shall include, but not be limited to, the following:

- e. An updated CSM.
 - f. A sampling and analysis plan (SAP) to sample water and sediments, as applicable, in the Lake, in the Creek, and within the Watershed (e.g., storm drains, irrigation water). The SAP shall include a description of the activities required to assess data gaps, as well as data quality objectives appropriate to answer the study questions described in Directive A.3.
 - g. A QAPP that describes the project objectives and organization, functional activities, and QA/QC protocols as they relate to data collected for this risk assessment.

³⁷ See Finding K of this Order.

- h. A health and safety plan (HSP) that includes employee training requirements, a list of personal protective equipment for each task, medical surveillance requirements, standard operating procedures, and contingency plans.

The San Diego Water Board will review and consider approval of the Dischargers' Work Plan. The Dischargers shall implement the approved Work Plan within 30 days of receiving written approval from the Board.

- 4. **Risk Assessment Report.** The Dischargers shall prepare a Risk Assessment Report based on the implementation of the Work Plan. The Dischargers must notify the San Diego Water Board no later than 24-hours after completing the Work Plan tasks and receiving all final laboratory data. The Dischargers shall submit the Risk Assessment Report to the San Diego Water Board **no later than 60 calendar days after completion of the Work Plan tasks and receipt of all final laboratory data.** The Dischargers' Risk Assessment Report shall include, but may not be limited to, the following:

- a. The purpose and environmental setting, including a summary of the study questions.
- b. The risk assessment approach and results, including a discussion of the HHRA and SLERA investigation methods and results. This section of the report may be similar in format to the 2016 HHRA.³⁸
- c. A detailed discussion about the risk assessment results, the uncertainties related to the results, and answers to the study questions. The Dischargers shall use the risk assessment findings to identify impact(s) of waste on human health, aquatic life, and aquatic-dependent wildlife living in or near the Lake and Creek.
- d. A detailed discussion of conclusions and recommendations drawn from the risk assessment results.
- e. A detailed description of proposed risk management actions to achieve Lake and Creek WQOs and restore and maintain beneficial uses for the protection of human health, aquatic life, and aquatic-dependent wildlife. The proposed risk management actions shall include decisions regarding the need for, and practicability of implementing, risk reduction activities at the Lake and Creek. The Dischargers shall propose a communication plan, including a schedule and at least one public workshop in the City of San Marcos, to present the risk assessment results to the public.

³⁸ Appendix AK of the RI/FS Report.

B. Feasibility Analysis

The Dischargers shall prepare and submit a Feasibility Analysis to the San Diego Water Board for review and approval consideration. The Dischargers shall ensure the Board receives the Feasibility Analysis no later than 120 calendar days after the Risk Assessment Report is approved by the Board. The Dischargers' Feasibility Analysis shall evaluate the technical and economic feasibility of Lake remedies to achieve Lake WQOs and restore and maintain beneficial uses. The Feasibility Analysis shall also identify Creek remedial action objectives and evaluate Creek/Watershed remedies to achieve Creek WQOs and restore and maintain Creek beneficial uses throughout the Watershed. The Feasibility Analysis shall include:

1. **Conceptual Site Model.** The Dischargers shall develop a CSM using results presented in the Risk Assessment Report and previous Site investigations. The Dischargers shall discuss any findings and exposure pathways (i.e., incidental ingestion, dermal contact, and aerosol exposure pathways) of waste to receptors that the RI/FS Report did not evaluate. The San Diego Water Board may use the CSM to determine if the Lake and Creek/Watershed remedies evaluated in the Feasibility Analysis will achieve Lake and Creek WQOs and are protective of human and ecological health and beneficial uses.
2. **An Evaluation of Green Cleanup Methods and Technology.** The Dischargers shall evaluate the use of cleanup methods and technologies with reduced environmental footprints and resilient to climate change effects (e.g., increased storm surges, more intense stormwater discharges, and changes to groundwater levels and recharge rates). The Dischargers may consult the U.S. Environmental Protection Agency (EPA) Greener Cleanup guidance³⁹ and local climate change adaptation plans when conducting this evaluation.
3. **A Technical and Economic Evaluation.** The Dischargers shall evaluate the technical and economic feasibility of the Lake and Creek/Watershed remedies. The Dischargers shall provide a technical and economic evaluation consistent with the methods used in the RI/FS Report (e.g., Comprehensive Environmental Response, Compensation, and Liability Act criteria). The Technical and Economic Evaluation shall also include:
 - a. Hydrodynamic models comparing the RI/FS selective withdrawal system (SWS) and the SWS proposed since the RI/FS Report was submitted by some of the Dischargers.⁴⁰

³⁹ [Greener Cleanups](#). U.S. Environment Protection Agency. [Accessed May 2023]

⁴⁰ See Finding K of this Order.

- b. Estimations of nitrogen load reductions within the Watershed, Creek, and in the Lake resulting from implementation of the Lake and Creek/Watershed remedies being evaluated by the Dischargers.
- c. Revised remedial decision matrices (e.g., Table 66 of the RI/FS Report).

C. Clean Up or Abate Discharged Waste

The Dischargers shall take all corrective actions necessary to clean up or abate the effects of the discharges of waste to the Lake and Creek water and sediments to:

- 1. Attain Lake and Creek WQOs.
- 2. Protect human health, aquatic and aquatic-dependent wildlife, and warm freshwater habitats.
- 3. Restore and maintain Lake and Creek beneficial uses.

D. Remedial Action Plans and Implementation

- 1. **Remedial Action Plans.** The Dischargers shall prepare and submit RAPs for the Lake and Creek to the San Diego Water Board for review and approval consideration. The Dischargers shall ensure the Board receives the RAPs **no later than 120 calendar days after the Feasibility Analysis is approved by the Board**. The RAPs shall describe the activities needed to clean up or abate waste at the Site to achieve the Lake and Creek WQOs and restore and maintain beneficial uses. The RAPs shall include the following elements:
 - a. **Background and Problem Statement.** A brief description of the Site and Site history including a summary of investigation findings and concentrations and spatial extent of waste.
 - b. **Remedial Objectives and Performance Criteria.** A brief description of the remedial goals and performance criteria for the selected remedies, and the performance criteria used to evaluate the effectiveness of the remedial actions in achieving the remedial goals.
 - c. **Selected Remedies.** A brief description of all the remedial activities and technologies selected to achieve Lake and Creek WQOs and restore and maintain beneficial uses.
 - d. **Pre-Remedial Studies Workplan.** A workplan for any Pre-Remedial Studies or for the collection of any data needed to prepare and optimize the remedial design(s).
 - e. **Remedial Design Plan.** A detailed Remedial Design Plan that describes the remedial actions and remedial technologies to be implemented, a description of pre-construction activities, and the identification of all areas

where remedial action will be conducted on a scaled site map. The Remedial Design Plan must include engineering drawings and construction requirements.

- f. **Health and Safety Plan.** A detailed HSP that includes employee training requirements, a list of personal protective equipment for each task, medical surveillance requirements, standard operating procedures, and contingency plans.
- g. **Public Participation Plan.** A detailed Public Participation Plan (PPP) for informing the public about (i) activities related to the final remedial design, (ii) the schedule for the remedial actions, (iii) activities to be expected during construction and remediation, (iv) provisions for responding to emergency releases and spills during remediation, and (v) any potential inconveniences such as excess traffic and noise that may affect the community during the remedial action. The Dischargers' PPP must describe how the target audience will be determined.
- h. **Quality Assurance Project Plan.** A detailed QAPP that describes the project objectives and organization, functional activities, and QA/QC protocols as they relate to the remedial actions.
- i. **Sampling and Analysis Plan.** A detailed SAP that defines (i) sample and data collection methods to be used for the project, (ii) a description of the media and parameters to be monitored or sampled during the remedial actions, and (iii) a description of the analytical methods to be used and an appropriate reference for each.
- j. **Generated Waste Management Plan.** A detailed Generated Waste Management Plan that describes the Dischargers' proposed actions to manage, treatment, store, and dispose of all waste generated by the remedial actions.
- k. **Operations and Maintenance Plan.** A detailed Operations and Maintenance Plan that describes the procedures for maintaining the remedies selected for the Site. This plan shall describe operational objectives, maintenance schedules and procedures, responsibilities, training program, recordkeeping, and reporting requirements.
- l. **Summary of Regulatory Permits and Approvals.** A brief summary listing required federal, state, and local permits and approvals needed to conduct the remedial actions and a schedule to obtain all permits and approvals prior to remedial action implementation. The summary shall also include any other items (e.g., private road authorization) needed to implement the RAPs.
- m. **Performance Monitoring Plan.** A detailed Performance Monitoring Plan that describes the Dischargers' monitoring activities necessary to confirm

the Lake and Creek/Watershed remedies are effective and that remediation goals are achieved. The Performance Monitoring Plan shall consist of (i) water quality monitoring, (ii) sediment quality monitoring, (iii) fauna and flora surveying and monitoring by a qualified biologist, and (iv) disposal monitoring (e.g., for dredging activities). Water quality and sediment monitoring shall be sufficient to demonstrate that remedial activities implemented at the Site achieve compliance with Lake and Creek WQOs, and restore and maintain beneficial uses. Fauna and flora surveying and monitoring shall be sufficient to ensure that no wildlife, aquatic life, or aquatic-dependent wildlife is harmed, or their habitat threatened during planning and implementation of any remedy. Disposal monitoring shall be sufficient to adequately characterize the dredged sediments, should dredging be implemented as part of the remediation work, to identify appropriate disposal options.

- n. **Site Map.** A detailed site map shall show the location of water bodies, stormwater systems elements (e.g., outfalls and culverts), buildings, roads, property boundaries, remedial equipment locations, staging areas, boundaries of remedial activities, and other information pertinent to the remedial actions.
 - o. **Remediation Schedule.** A detailed schedule providing the sequence of events and activities for each event and activity.
2. **RAP Implementation.** The Dischargers shall implement the RAPs no later than **60 calendar days after receiving the San Diego Water Board approval of the RAPs**, unless otherwise directed in writing by the Board.

E. Semiannual Progress Reports

The Dischargers shall submit Semiannual Progress Reports to the San Diego Water Board following the wet season and the dry season of each year. The Dischargers shall ensure the Board receives wet season Semiannual Progress Reports by April 1 of each year, and dry season Semiannual Progress Reports by October 1 of each year. The Semiannual Progress Reports shall:

- 1. Describe the sample and data collection methods used for performance monitoring (i.e., post-remedial monitoring).
- 2. Describe the QA/QC protocols followed during sample and data collection activities.
- 3. Describe the sample analytical methods.
- 4. Describe operational effectiveness and maintenance of the remediation system(s) implemented at the Site as part of Directive D.2.
- 5. Describe any technical issues with the remediation system(s) and propose actions to rectify the issues.

6. Provide copies of all analytical results and all other verified or validated data received or generated by or on behalf of the Dischargers during the previous performance monitoring period.
7. Evaluate and interpret performance monitoring data. Include a graphical depiction of the progress of the remedial actions through concentration/level vs. time plots and other graphical depictions as appropriate.
8. Describe any deviations from the performance monitoring program, if applicable.
9. Describe if the Dischargers are meeting the remedial goals or are on track to meet them. If the Dischargers are not meeting the remedial goals or are not on track to meet them, propose corrective measures to alter or enhance the remediation system(s) and support attainment of the remedial goals.
10. Provide a map of the Site, showing the locations, type, and number of samples collected.

F. Exceedance Characterization Work Plan

The Dischargers shall prepare and submit an Exceedance Characterization Work Plan to the San Diego Water Board if two consecutive wet weather Semiannual Progress Reports identify 1) Lake or Creek WQO exceedances or 2) impairment of beneficial uses. The Dischargers shall ensure the Exceedance Characterization Work Plan is received by the Board within 30 calendar days following the submittal of the second wet or dry weather Semiannual Progress Report. The Board will review and consider approval of the Exceedance Characterization Work Plan.

The objective of the Exceedance Characterization Work Plan is to determine 1) why the remedial goals are not being achieved and 2) if modification or enhancement of the existing remedies is required to achieve compliance with this Order. The Exceedance Characterization Work Plan shall propose a Site investigation to find the source(s) of the Lake or Creek WQOs exceedances and/or the cause(s) of beneficial use impairment. The Exceedance Characterization Work Plan shall include the following study questions:

1. Which constituent(s) is/are responsible for the Lake or Creek WQO(s) exceedance(s) or impairment of beneficial use(s)?
2. Where is the waste (i.e., the mixture of constituent(s)) originating from (e.g., internal nutrient cycling, Watershed, other source(s))?
3. Who is responsible for the discharge(s) of waste (i.e., has authority to cease the discharge(s))?
4. What response action(s) will the Dischargers take to control the discharge of waste(s)?

5. What is the expected time for seeing positive impact(s) (e.g., compliance with Lake or Creek WQOs) on the Lake and Creek after implementing the response action(s)?

G. Exceedance Investigation and Characterization Report

The Dischargers shall prepare and submit an Exceedance Investigation and Characterization Report to the San Diego Water Board for review and approval. The Dischargers shall ensure the Board receives the Exceedance Investigation and Characterization Report within 60 days of receipt of investigation data or as otherwise directed by the Board. The Exceedance Investigation and Characterization Report shall describe the results of the investigation and characterization study conducted according to the Exceedance and Characterization Work Plan and shall:

1. Discuss the source(s) of the Lake or Creek WQO exceedances or the cause(s) of beneficial use impairment.
2. Recommend an approach to address the exceedance(s) or impairment(s).
3. Answer the study questions provided in Directive F of this order.

H. Compliance Dates

The San Diego Water Board has summarized the compliance dates for the requirements of this Order in Table 4 below.

I. Penalty of Perjury Statement

All documents submitted to the San Diego Water Board shall be signed by the Dischargers' corporate officers or duly authorized representatives, and must include the following statement by the official(s), under penalty of perjury, that the report is true and correct to the best of the officials' knowledge.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

J. Document Submittals

Electronic Reporting Regulations require electronic submission of any report or data required by a regulatory agency from a cleanup site after July 1, 2005.⁴¹ The electronic document submittals must be uploaded on or prior to the

⁴¹ Cal. Code Regs. title 23, chapter 30, division 3 and title 27, division 3.

regulatory compliance due dates set forth in this Order or addenda thereto. To comply with these requirements, the Dischargers must upload documents and information to the GeoTracker database, as well as to the CEDEN database. The Dischargers must submit the required documents as follows:

1. **GeoTracker.** All information submitted to the San Diego Water Board in compliance with this Order is required to be submitted electronically to the GeoTracker database (<https://geotracker.waterboards.ca.gov>) under **GeoTracker Global ID T10000003261**. The Dischargers shall upload the following minimum information to the GeoTracker database:
 - a. Reports. A complete copy of all work plans and assessment, monitoring, progress, and cleanup reports, including the signed transmittal letters, professional certifications, and all data presented in the reports in a text-searchable portable document format (PDF), and converted to text-searchable format. Reports larger than 400 megabytes (MB) shall be divided into separate files at logical places in the report to keep the file sizes under 400 MB.
 - b. Site Maps. A site map, as a stand-alone document, including notes, legends, north arrow, and other data as appropriate to ensure that the map is clear and understandable in a PDF file. When appropriate, the Dischargers should provide required information on multiple site maps.
 - c. Laboratory Analytical Data. Analytical data, including geochemical data, for all soil, water, sediment, and groundwater samples in Electronic Data File (EDF) format.
 - d. Sample Location Data. The Dischargers shall provide the latitude and longitude of all sampling locations for which they reported data as EDF.
 - e. Other Electronic Data. The Dischargers shall upload all analytical and locational data as a text file (e.g., comma-separated values or Excel spreadsheet xlsx file format). Polygon-based data (e.g., site investigation area, remedial footprint), polyline-based data (e.g., stormwater conveyance systems), and point-based data (e.g., outfalls) shall be submitted as archived/compressed shapefiles (e.g., .zip or .tar format). All submitted files shall be accompanied by the following metadata information in a separate PDF file (one PDF per text file or shapefile submitted must be created), at minimum:
 - i. Author: Person/Entity who created the file.
 - ii. Project Name and Project Description.
 - iii. Data Dictionary: A machine-readable explanation of the data table. Includes field title, field title definition, and data type.

- iv. Data Source: For instance, a link to the Geotracker report where the data is presented.
 - v. Date Last Updated.
 - vi. Temporal Coverage: Date or period the data was collected.
 - vii. Spatial Coverage/Extent: The location(s) the data represents.
 - viii. Geographic Coordinate System: For example, North American Datum 1983.
 - ix. Projection: If applicable.
 - x. Vertical Datum: If applicable.
 - xi. Files submitted must include geographic coordinates information (e.g., longitude and latitude fields) so that they are ready to upload into a geographic information system software (e.g., ArcGIS) without the need to manipulate the files.
2. **CEDEN.** The Dischargers shall electronically submit all data collected, analyzed, and presented to the San Diego Water Board in compliance with this Order to the CEDEN database. The Dischargers shall upload the data in a format compatible with CEDEN and meet the minimum data elements for Integrated Report assessments.⁴²
3. **Other Submittals.** The San Diego Water Board may also request information or documents in hard copy and/or electronic copies on universal serial bus (USB) drives, or other appropriate media, including email.
4. **Hard and Electronic Copies.** If requested by the San Diego Water Board, the Dischargers shall also provide the following to the Board: a hard copy of the complete document, a hard copy of the cover/transmittal letter, and a hard copy of oversized drawings or maps.
5. **Email.** If requested by the San Diego Water Board, the Dischargers shall also submit a PDF copy of all documents including signed transmittal letters, professional certifications, and all data presented in the documents to sandiego@waterboards.ca.gov.
6. **Compliance Determination for Document Submittals.** Upon receipt of the required documents, the San Diego Water Board will use the email date and

⁴² Information regarding submitting CEDEN compatible data and the minimum elements for Integrated Report assessments are available at: https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/data_requirements.html.

time, upload date and time, and/or receipt date and time to determine compliance with the due dates specified in the Order.

K. Violation Reports

The Dischargers shall notify the San Diego Water Board by telephone or email as soon as practicable of violations of the requirements of this Order or addenda thereto. The Board may, depending on violation severity, require the Dischargers to submit a separate technical report addressing the violation within no later than five working days of the notification.

L. Provisions

1. **Waste Management.** The Dischargers shall properly manage, store, treat, and dispose of contaminated media in accordance with applicable federal, state, and local laws and regulations. The storage, handling, treatment, or disposal of media associated with the assessment required by this Order shall not create conditions of nuisance as defined in Water Code section 13050, subsection (m).
2. **Contractor/Consultant Qualifications.** The Dischargers shall provide documentation certifying that documents (e.g., plans, reports, etc.) required under this Order have been prepared under the direction of appropriately qualified professionals. California Business and Professions Code sections 6735, 7835, and 7835.1 require licensed professionals to direct or perform engineering and geologic evaluations and judgments. The Dischargers shall provide upon request to the San Diego Water Board a statement of qualifications and license numbers of the responsible lead professionals. The lead professional preparing the engineering and geologic plans, specifications, reports, and conclusions shall sign and affix their professional geologist or civil engineer registration stamp to all documents submitted to the Board.
3. **Laboratory Qualifications.** The Dischargers shall ensure that all data produced and analytical data reports are submitted in accordance with this Order and must be generated by a laboratory accredited by the state's Environmental Laboratory Accreditation Program (ELAP). The laboratory must hold a valid certificate of accreditation for the analytical test method. The laboratory must include QA/QC data in all data reports required by this Order and submit electronic data as required by the San Diego Water Board. Data generated using field tests is exempt pursuant to Water Code Section 13176. Additional information can be found on the ELAP website (https://www.waterboards.ca.gov/drinking_water/certlic/labs/index.html). ELAP only accredits analytical test methods approved for regulatory purposes. If an analytical test method is not in the [Field of Accreditation Tables](#), ELAP does not offer the method for accreditation. If a method is not offered for ELAP accreditation, the Dischargers shall choose a certified laboratory (e.g., certified under the National Environmental Laboratory Accreditation Program

(NELAP)) that uses methods approved by the U.S. EPA for the analytical test method. To use a laboratory method not ELAP-accredited and prior to any sample collection, the Dischargers shall request approval from the San Diego Water Board and provide the laboratory's QA/QC methodology.

4. **Laboratory Analytical Reports.** The Dischargers shall ensure that any report presenting new analytical data, included the complete laboratory analytical report(s). The laboratory analytical report(s) shall be signed by the laboratory director and have the following:
 - a. Complete sample analytical reports.
 - b. Complete laboratory QA/QC reports.
 - c. A discussion of the sample and QA/QC data.
 - d. A transmittal letter that demonstrates the analytical work was supervised by the director of the laboratory and contains the following statement:

“Analyses were conducted at an ELAP-certified laboratory using methods accredited by ELAP or at a certified laboratory (e.g., NELAP-certified) using methods approved by the USEPA, after approval by the San Diego Water Board to use a non-ELAP certified laboratory.”
5. **Analytical Methods.** The Dischargers shall ensure that all analytical methods used are identified in all technical and monitoring reports. If the Dischargers propose to use methods or test procedures other than those included in the most current version of USEPA's "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-486" or Code of Federal Regulations, title 40, part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants," the methodology shall be submitted for review and approval by the San Diego Water Board prior to use.
6. **Amendment.** This Order in no way limits the authority of the San Diego Water Board to require additional investigation or cleanup consistent with the Water Code. The Board may revise this Order as additional information becomes available.
7. **Field Work Notice.** The Dischargers shall notify the San Diego Water Board 14 calendar days before beginning any field work or activities required by this Order.
8. **Corporate Signatory Requirements.** The Dischargers shall ensure the Dischargers' responsible corporate officer as described in paragraph (a) of this provision or a Dischargers' duly authorized representative as described in paragraph (b) of this provision signs and certifies all reports required under this Order.

- a. **Responsible Corporate Officer(s).** For the purposes of this provision, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - b. **Duly Authorized Representative.** A person is a duly authorized representative only if:
 - i. A person described in paragraph (a) of this provision provides a written authorization.
 - ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual (a duly authorized representative may either be a named individual or any individual occupying a named position).
 - iii. The Dischargers send a written authorization to the San Diego Water Board.
 - c. **Changes to Authorization.** If an authorization under paragraph (b) of this provision is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or for any activity, a new authorization satisfying the requirements of paragraph (b) of this provision shall be submitted to the San Diego Water Board prior to or together with any reports or information to be signed by an authorized representative.
9. **Duty to Submit Other Information.** The Dischargers shall immediately notify the San Diego Water Board in writing when the Dischargers become aware that they failed to submit any relevant facts in any submittal required under this Order or submitted incorrect information in any report. The Dischargers shall provide the Board with the relevant facts and/or corrected information.

M. Notifications

1. **Applicable Permits and Permissions.** The Dischargers shall obtain all permits and access agreements needed to implement the requirements of this Order. This Order does not relieve the Dischargers of the responsibility to obtain permits or other entitlements to perform necessary assessment activities. This includes, but is not limited to, actions that are subject to local, state, and/or federal discretionary review and permitting.
2. **Cost Recovery.** Upon receipt of invoices, and in accordance with instruction therein, the Dischargers shall reimburse the State Water Board for all reasonable costs incurred by the San Diego Water Board to investigate discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order and consistent with the annual estimation of work.
3. **Enforcement Discretion.** The San Diego Water Board reserves its right to take any enforcement action authorized by law for violations of the terms and conditions of this Order.
4. **Failure to Comply.** The Discharger may be subject to enforcement actions by the San Diego Water Board for failure to comply with requirements of this Order, including but not limited to: (1) administrative enforcement orders requiring the Dischargers to cease and desist from violations, (2) imposition of administrative civil liability, pursuant to Water Code section 13268 in an amount not to exceed \$1,000 for each day in which the violation occurs, or imposition of civil liability pursuant to Water Code section 13350 in an amount not to exceed \$5,000 for each day in which the violation occurs, (3) referral to the State Attorney General for injunctive relief, and (4) referral to the District Attorney for criminal prosecution. The Dischargers are jointly and severally liable for the entire amount of the administrative civil liability. The Board reserves the right to seek administrative civil liability from any or all the Dischargers.
5. **Request for Administrative Review by the State Water Board.** Any person affected by this action of the San Diego Water Board may petition the State Water Board to review the action per Water Code section 13320 and title 23, section 2050 of the Cal. Code of Reg. The petitioner must send their petition to the State Water Board (Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812) within 30 calendar days of this Order's issuance date. The Board Copies will provide copies of the laws and regulations applicable to filing petitions upon request.

TABLES

Table 1: Maximum and Current Concentrations of Ammonia, Nutrients, and Dissolved Oxygen in Lake Water

Constituent	Maximum and Current Concentrations and WQOs (mg/L)		
	Maximum Concentration(s)	Current Concentration(s) ⁴³	WQO
Total Phosphorus	1.5	0.44	0.025 ⁴⁴
Nitrate	19.3	0.75	0.25
Ammonia as N	9.9	0.22	0.025
Total Nitrogen	34.6	1.9	0.25
Dissolved Oxygen	0.02(b) & 3.93(s) ⁴⁵	3.08(b) & 3.91(s)	Minimum of 5

- a) mg/L = milligrams per liter
- b) WQO = Water Quality Objective
- c) bold = value exceeds WQO
- d) (b) = at the bottom of the Lake at station B (Figure 6)
- e) (s) = at the surface of the Lake at station B (Figure 6)

⁴³ Great Ecology. January 31, 2022. Fourth Quarter 2022, Nutrient Impairment Investigation Report.

⁴⁴ WQO for standing body of water, not to be exceeded 10 percent of the year.

⁴⁵ Minimum dissolved oxygen concentration recorded in the deepest part of the Lake on September 4, 2012, as reported in Appendix H of the RI/FS Report. Page 167 of the RI/FS Report states, "Concentrations of DO [dissolved oxygen] were much lower than surface samples, with only 24 percent of bottom samples exceeding the WQO of 5 mg/L (76 percent of samples were below this numeric objective). The median bottom DO concentration was 2.2 mg/L, while the average was 2.8 mg/L."

Table 2: Maximum Concentrations of Nutrients in Lake Sediments

Constituent	Maximum Concentrations and WQOs		
	Maximum Concentration ⁴⁶ (mg/kg dw)	Estimated Nutrient Flux Rate ⁴⁷ (mg/m ² /d) ⁴⁸	WQO
o-Phosphate	15	1.96 ± 1.33	N/A
Ammonia as N	220	52.9 ± 7.17	N/A

a) mg/kg dw = milligrams per kilogram, dry weight

b) mg/m²/d = milligrams per square meter per day

c) o-Phosphate = orthophosphate

d) N/A = none available

Table 3: Maximum and Current Concentrations of Ammonia and Nutrients in Creek Water

Constituent	Maximum and Current Concentrations and WQOs (mg/L)		
	Maximum Concentration	Current Concentration	WQO
Ammonia as N	0.38	non-detect ⁴⁹	0.025
Nitrate	4.91	3.9¹¹	0.5
Total Phosphorus	0.31	0.19⁵⁰	0.1
Total Nitrogen	1.51	4.35¹¹	0.5

⁴⁶ Great Ecology. January and April 2016. Lake Surficial Sediment Investigation Results and Sediment Core Investigation Reports.

⁴⁷ The nutrient flux rate is the mass of nutrients transferring from the Lake sediments to the Lake water due to bacterial activity per surface area and per day.

⁴⁸ Section 4.2.2.2 and Appendix AH of the RI/FS Report.

⁴⁹ San Diego Water Board. Surface Water Ambient Monitoring Program. San Marcos Creek TWAS 1b station (SM-TWAS-1b) sampled on February 26, 2019.

⁵⁰ San Diego Water Board. Surface Water Ambient Monitoring Program. San Marcos Creek TWAS 1b station (SM-TWAS-1b) sampled on February 26, 2019.

Table 4: Summary of Compliance Dates

Directive	Requirement	Due Date
A.1	Storm Sewer System(s) Investigation and Mitigation Plan	Submit no later than 60 calendar days after the date this Order is issued
A.2	Storm Sewer System(s) Investigation and Mitigation Report	Submit no later than 60 calendar days after Dischargers have implemented the last mitigation activity
A.3	Risk Assessment Work Plan	Submit no later than 60 calendar days after the date this Order is issued
A.4	Risk Assessment Report	Submit no later than 60 calendar days after completion of the Work Plan tasks and receipt of all final laboratory data
B	Feasibility Analysis	Submit no later than 120 calendar days after the San Diego Water Board approves the Risk Assessment Report
D.1	Remedial Action Plans	Submit no later than 120 calendar days after the San Diego Water Board approves the Feasibility Analysis
D.2	Implementation of Remedial Action Plans	Begin no later than 60 calendar days after the San Diego Water Board approves the Remedial Action Plans
E	Semiannual Progress Reports	Submit twice a year: by April 1 and October 1 of each year
F	Exceedance Characterization Work Plan	If two consecutive wet weather Semiannual Progress Reports show exceedance(s) of WQOs or/and beneficial uses impairment(s), submit no later than 30 calendar days following the submittal of the second wet weather Semiannual Progress Report
G	Exceedance Characterization Report	If Exceedance Characterization Work Plan is submitted and work approved, submit no later than 60 days of receipt of final laboratory data or as otherwise directed by the San Diego Water Board

**ATTACHMENT A – FIGURES
ORDER NO. R9-2023-0102**

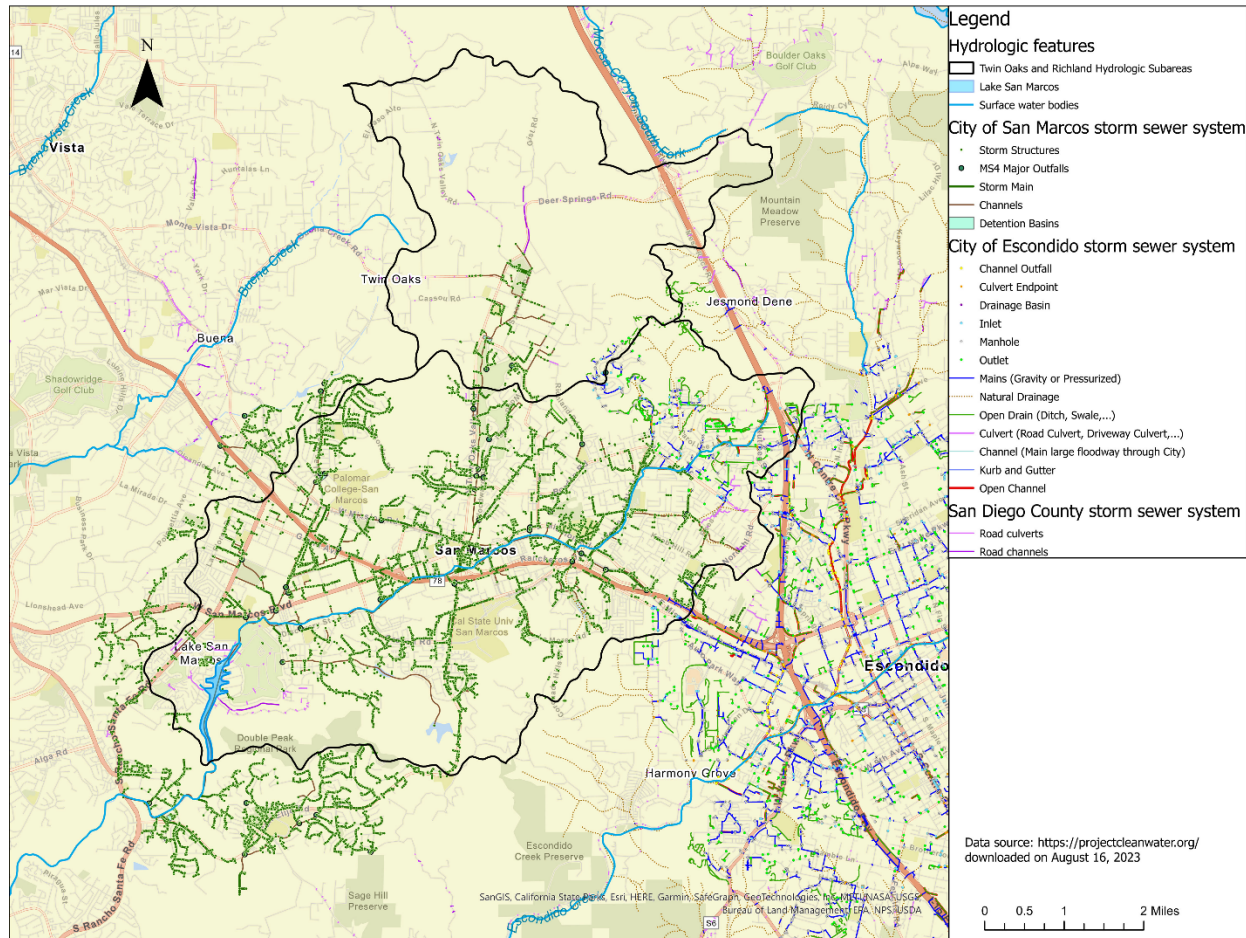


Figure 1: Municipal Storm Sewer Systems in the Upper San Marcos Creek Watershed

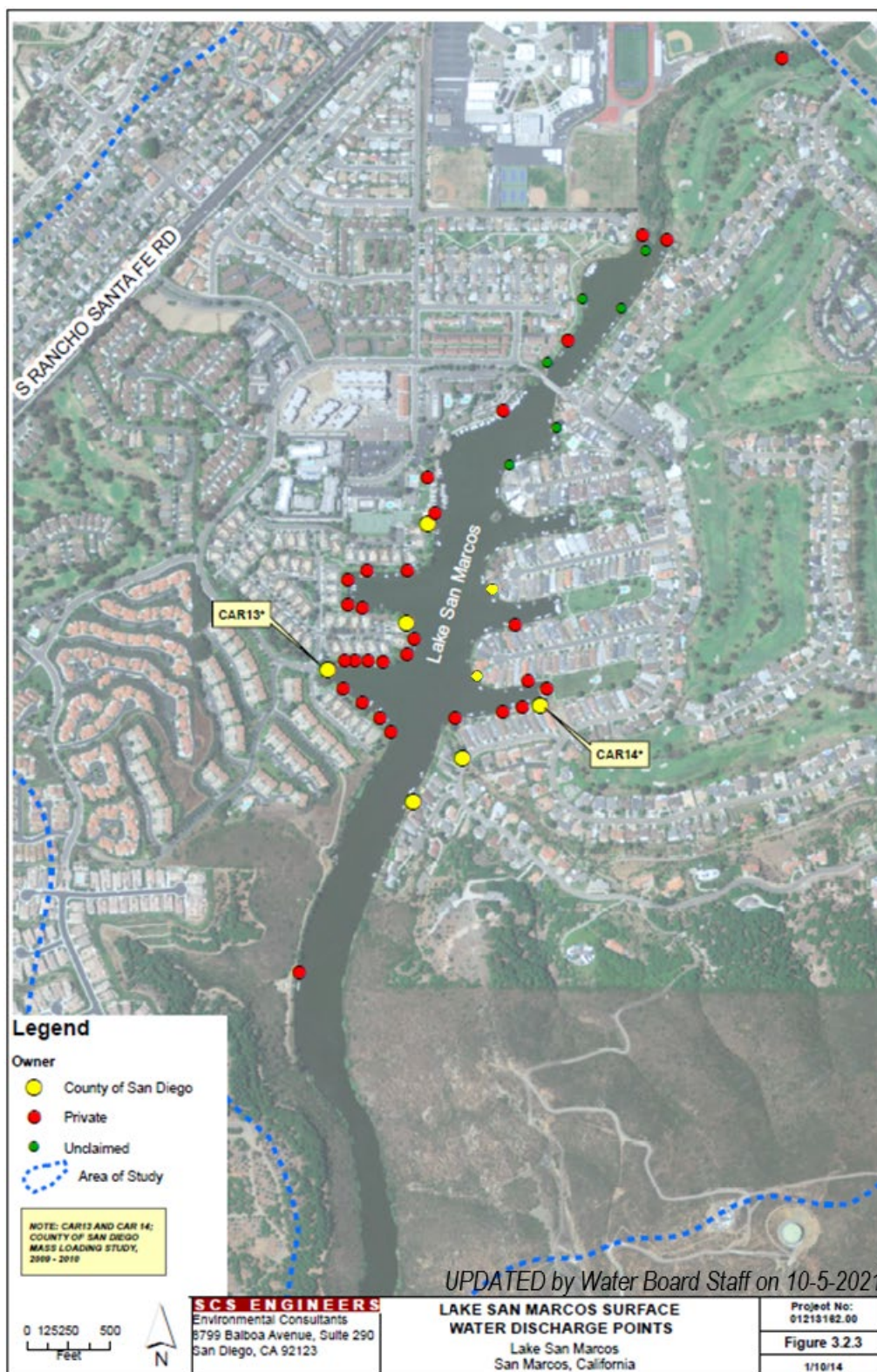


Figure 2: Outfall Locations by Lake San Marcos

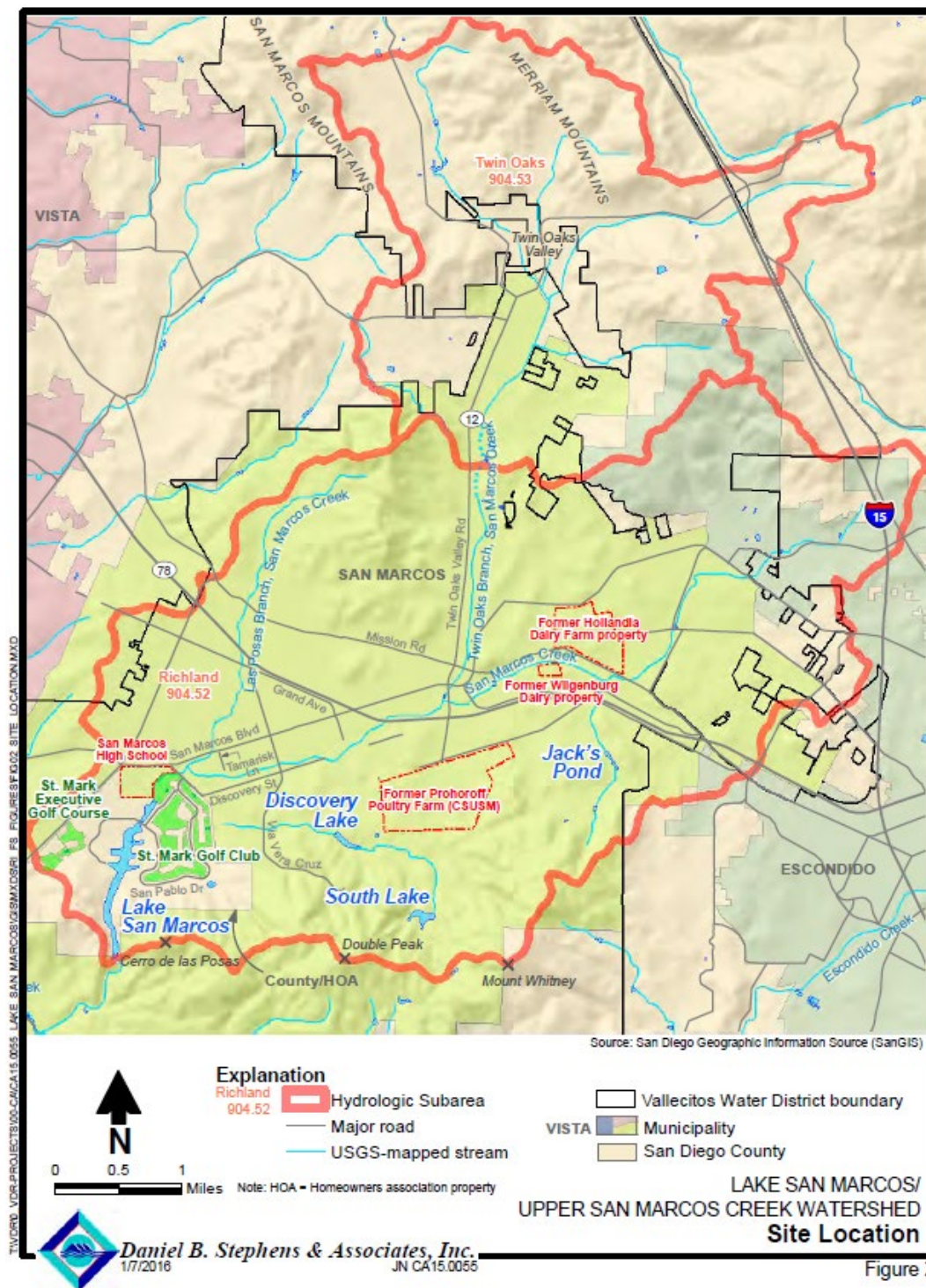


Figure 2

Figure 3: Site Location and Overview of Site Elements

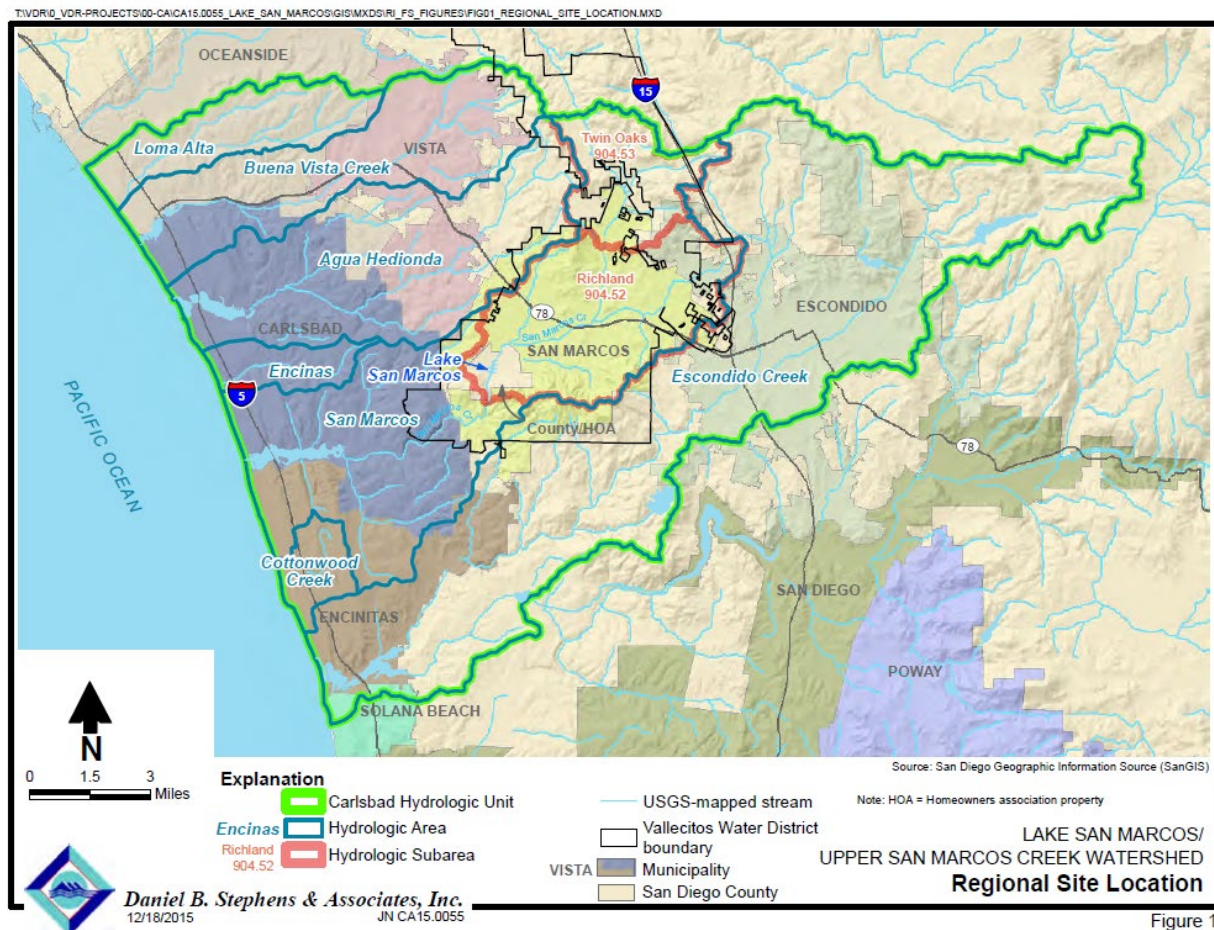


Figure 4: Upper San Marcos Creek Watershed Composed of Twin Oaks and Richland Hydrologic Subareas

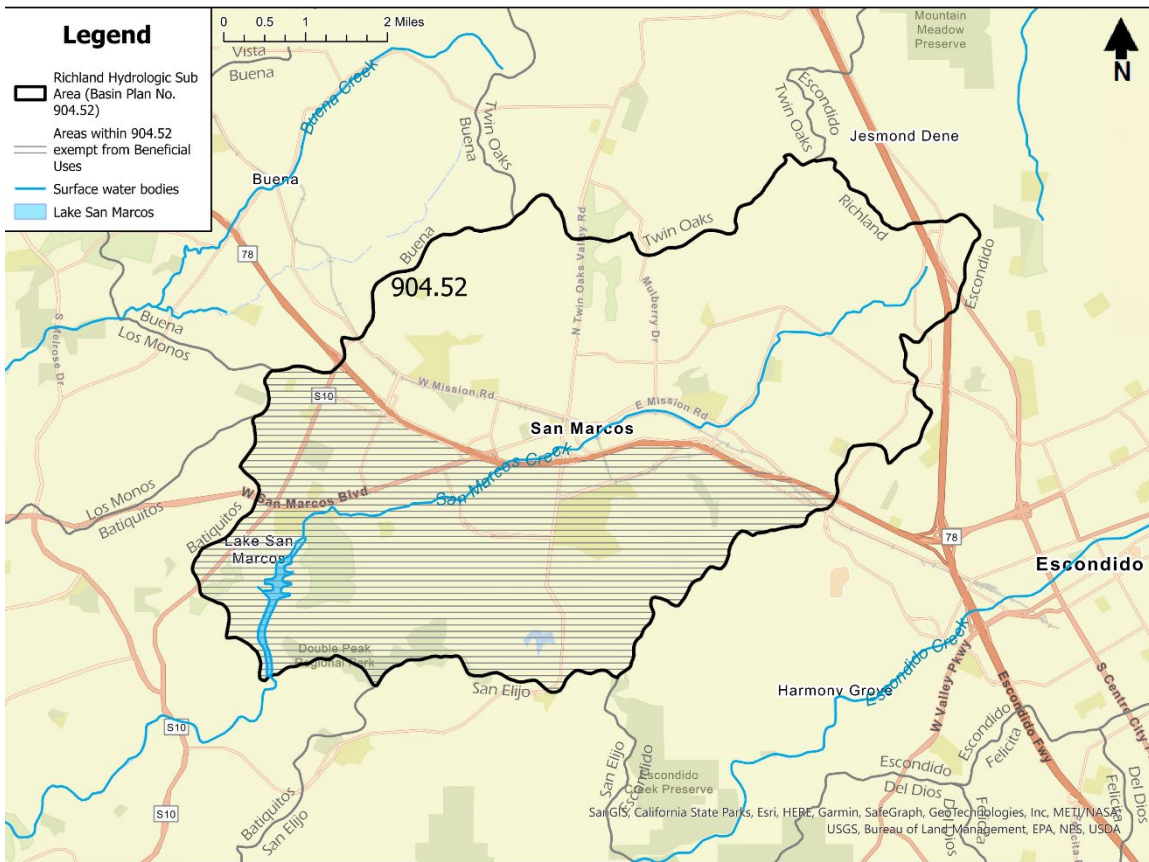


Figure 5: Areas Without Beneficial Uses in the Richland Hydrologic Subarea



Figure 6: Locations of Lake San Marcos Monitoring Stations A through E and Other Locations Sampled for the Remedial Investigation/Feasibility Analysis Report

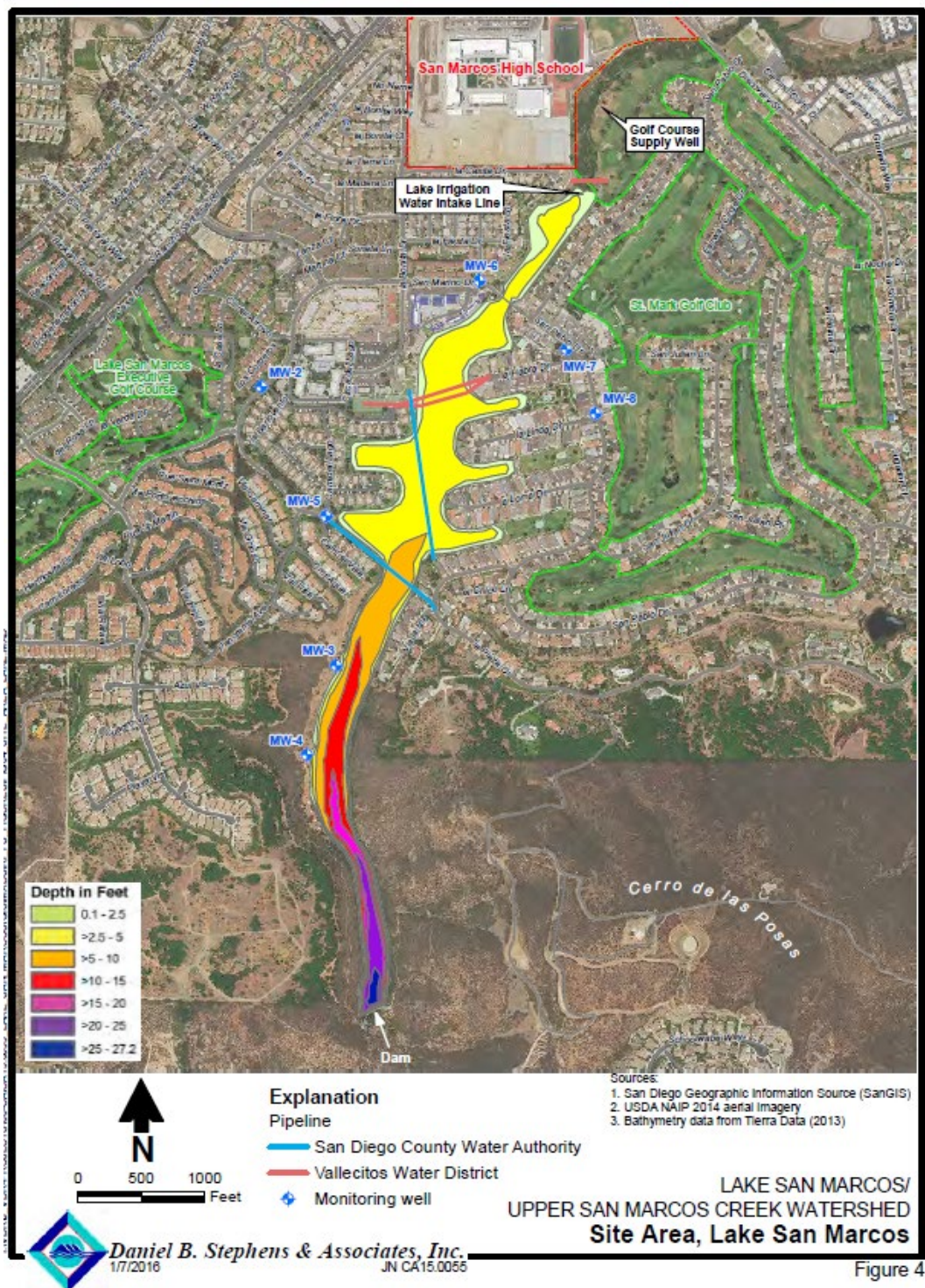


Figure 4

Figure 7: Lake San Marcos Bathymetry (Water Depths), Locations of Nearby Golf Courses and Irrigation Intake Line, and Location of Dam