SCOPE OF WORK:

SJCDPW-SJCDPW-RFP-25-01

EXHIBIT A

CONSTRUCTION QUALITY ASSURANCE SERVICES

RELATED TO THE

CONSTRUCTION OF LINED AREA 7

AT NORTH COUNTY LANDFILL

CONTENTS

FIGURES

RELATED DOCUMENTS

1. Construction Quality Assurance Manual for North County Landfill Area 7 (For RFP reference only).

I. DESCRIPTION

1. GENERAL

A. OBJECTIVE

The CQA Consultant will provide Construction Quality Assurance (CQA) services for the construction of Lined Area 7 at the North County Landfill (See attached maps). Lined Area 7 will be tentatively constructed in August 2025.

B. DEFINITIONS

C. Engineer: The authorized representative of San Joaquin County's Field Engineering Department. A person in this position is often referred to as the "Resident Engineer".

D. PRODUCT OWNERSHIP

Work product of this project, including intermediate work, shall be the property of the County of San Joaquin (County). Products include AutoCAD Drawings, reports, word documents and spreadsheets, hand-written notes, emails and all other correspondence used for the work.

E. WORK LOCATION

Work will be at the North County Recycling Center and Sanitary Landfill, 17720 East Harney Lane, Lodi, CA 95240 (Figure 1).

F. SAFETY

G. General

Consultant is solely and wholly responsible for the safety of workers and damage to equipment. Consultant shall comply with OSHA and other applicable safety regulations and procedures.

H. Refuse

Refuse present at these landfills is household refuse, demolition debris, tree trimmings, and miscellaneous refuse. Consultant shall minimize contact with refuse and its staff shall wear personal protective equipment.

I. Landfill Gas (LFG)

Landfill gas (LFG) will be present at the worksite. When buried in a landfill, refuse and other organic material produces LFG, which is approximately 50 percent methane by volume and may contain other contaminants. Methane gas is combustible and has a lower explosive limit of 5 percent by volume. Consultant shall ensure that work is conducted safely when working under conditions that meet OSHA Requirements.

2. USE OF SITE

The work will occur at an active landfill. CQA Consultant shall not interfere with landfill operations. Consultant shall provide drinking water for CQA staff at the site. Sanitary facilities will be provided by the construction Contractor.
Consultant shall be responsible for Consultant's materials and equipment. The County is not responsible for thefts, vandalism or damage to Consultant's material and equipment left on site. The site has perimeter fences but is not guarded. Smoking is not allowed at the landfill.

3. COMMUNICATIONS

Unless otherwise authorized, contact with regulatory agencies regarding this project will be by County staff only. The CQA Consultant will act as construction inspectors under the guidance of the County's Resident Engineer. Consultant shall follow all directives from the Resident Engineer or his/her designee.

The CQA Consultant will report to the Solid Waste Division for the purpose of regulatory compliance and ensuring that the lined Area 7 will be accepted by RWQCB staff at the end of the project. Consultant shall immediately alert the Resident Engineer and Solid Waste Division staff if a situation occurs in which the acceptance of the landfill liner may be impacted.

II. TASKS

TASK 1: PLANS AND SPECIFICATIONS REVIEW

Consultant shall review and become proficiently familiar with the plans and specifications of Area 7. Consultant shall provide comments to the County for any discrepancies in the projects plans, specifications and CQA plan during the review. Area 7's plans, specifications, and CQA Plan will be provided by the County to the Consultant once finalized.

TASK 2: SUBMITTAL REVIEW

Consultant shall review materials submittals submitted by the Contractor and provide comments or recommend for approval to the Engineer.

TASK 3: CONFORMANCE TESTING

Consultant shall conduct necessary testing of geosynthetics submitted by the Contractor as specified in the project's specifications and CQA plan.

TASK 4: MOBILIZATION

Mobilization shall include providing:

a. One full time CQA monitor. Provide one part-time CQA monitor as needed.

b. Accommodations: If Consultant's office is more than 50 miles away from the site, then the Consultant shall seek local housing for the CQA monitors during the duration of the project.

c. All necessary material testing and inspection equipment.

d. A four-wheel drive pickup truck for use by CQA monitor at the site.

e. Enclosed job site trailer with maximum size of 400 square feet. A meeting space for 8 people including table and chairs shall be provided inside the trailer. The trailer shall have air conditioning and lighting. Consultant shall provide video and telephone conferencing setup for meetings. Electricity is available at the flare station for CQA Consultant's trailer.

f. Working cell phones for each CQA monitor

TASK 5: AREA 7 CQA INSPECTION

Consultant shall perform CQA monitoring and testing as identified in the CQA Plan and Specifications. The work hours for CQA monitoring will be Monday to Friday from 7 am to 5 pm, except government holidays. Working hours schedule may change based on construction needs. Some night and weekend work may be required as necessary during liner installation. Construction is expected to last 120 working days.

Consultant shall:

1. Document daily construction activities by the Contractor. County will provide sample daily report template for the Consultant to follow. Daily reports shall be emailed on a weekly basis to the Engineer.
2. Document the following in the daily report:
    a. Type of equipment(s) used by the Contractor
    b. Number of personnel on site and their classifications
    c. Number of hours for each equipment used
    d. Number of hours each personnel worked per day
    e. Extra work activities done by the Contractor. The number of hours of equipment and labor used daily shall be documented.
    f. Daily quantities for the bid items listed in the specifications bid sheet
    g. Progress of construction at each phase with photos. All photos shall be labeled with notes.

3. Schedule weekly construction meeting between County and Contractor in the Consultant's trailer. Provide CQA monitoring discussion agenda to the Engineer and answer any questions regarding CQA monitoring. Take notes during the progress meetings and provide minutes to the Engineer and Contractor.
4. Notify the Engineer immediately of any non-compliance construction by the Contractor
5. Escort RWQCB inspectors for any scheduled field inspections.

Deliverables shall include:

1. Documented information as identified in the Specifications, CQA Plan and as directed by the Engineer.

TASK 6: LEAK LOCATION SURVEY

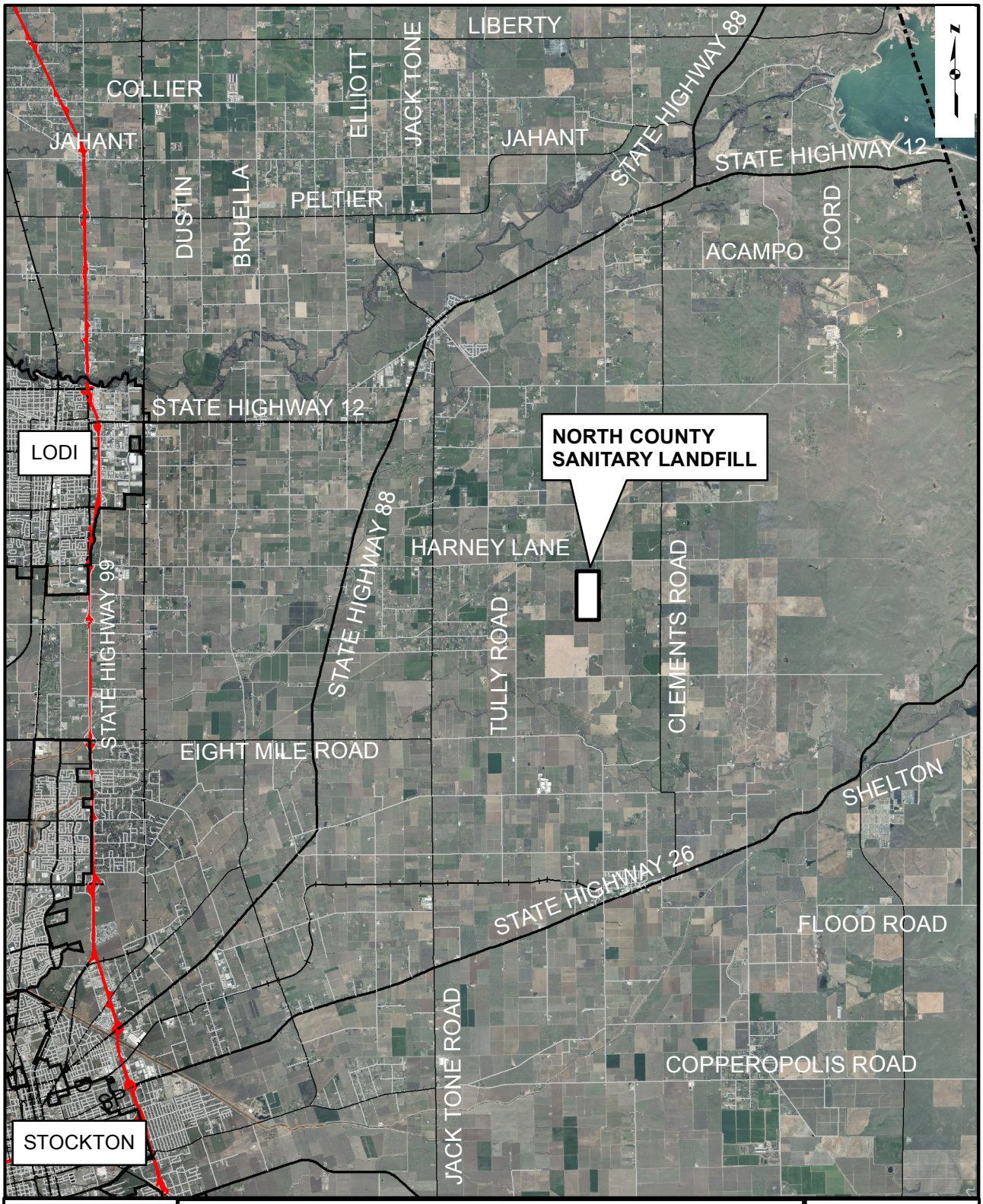
CQA Consultant shall perform leak location survey for liner covered with soil, and liner not covered with soil as specified in the CQA plan. Consultant shall then provide leak location survey report to the Engineer for review and comments. Consultant shall address all comments made by the Engineer in the final report.

TASK 7: CERTIFICATION REPORT

Consultant shall prepare a CQA Certification Report acceptable to the Central Valley Regional Water Quality Control Board (RWQCB), CalRecycle and San Joaquin Environmental Health Department. Consultant shall submit a draft Report (electronic version) to the County for review. This draft CQA report shall be submitted within 10 days after completion of all required CQA monitoring.

Consultant shall revise the draft report within 5 days of receiving County comments. Consultant shall then submit the Final CQA report with one hardcopy and a searchable PDF version to the County. County will then submit the report to regulatory agencies.

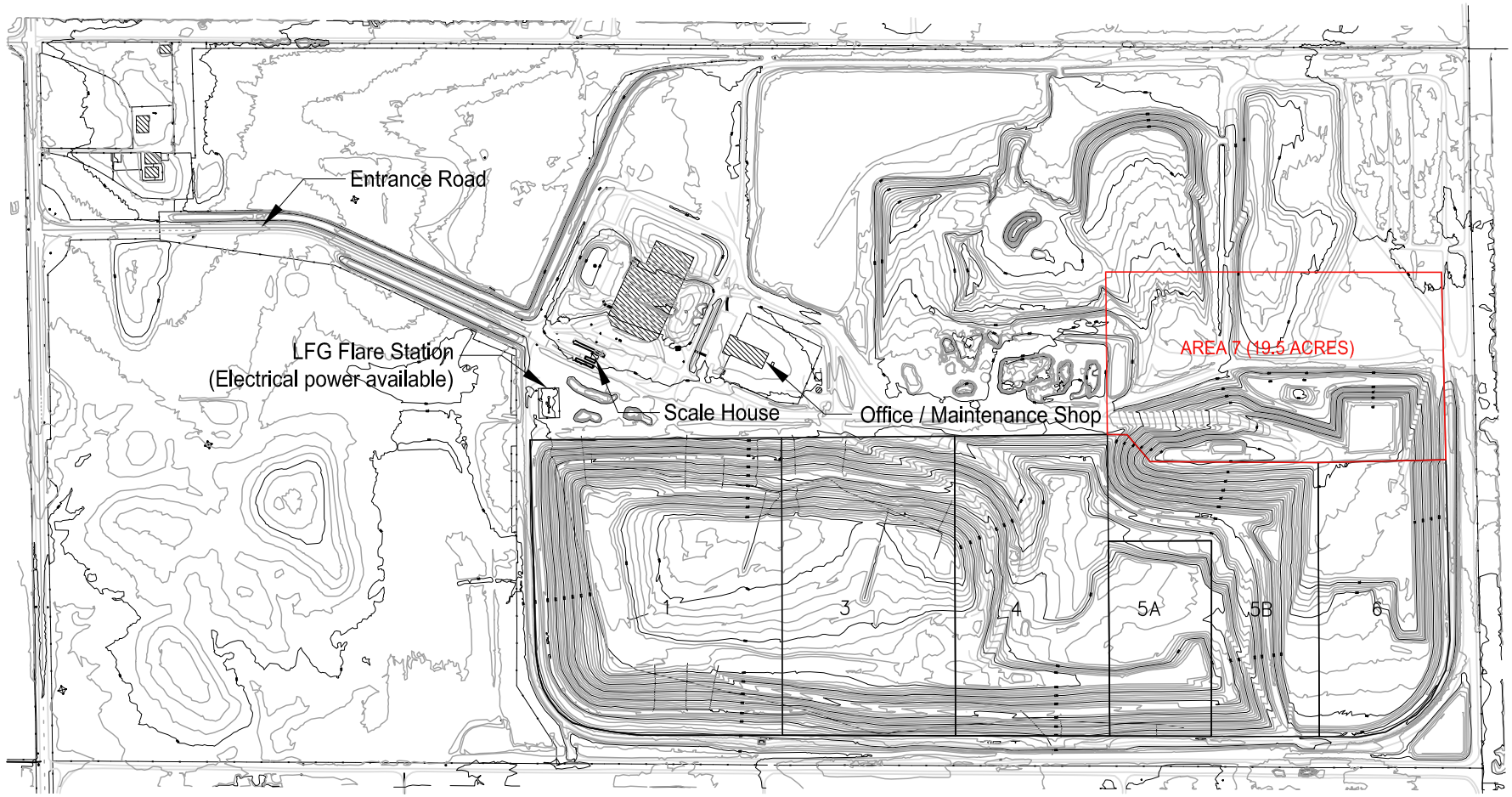
Consultant shall incorporate comments from the regulatory agencies and re-submit final CQA report.



Vicinity Map
NORTH COUNTY
SANITARY LANDFILL

0 1.5 3 4.5 6 Miles

Public Works
San Joaquin County
Working for YOU



COUNTY OF SAN JOAQUIN	SCALE: 1" = 600'	CONSTRUCTION QUALITY ASSURANCE SERVICES FOR AREA 7 AT THE NORTH COUNTY SANITARY LANDFILL	SITE MAP	FIGURE 1

Construction Quality Assurance Manual
Landfill Module 7 Construction
North County Recycling Center and Sanitary Landfill

Submitted to

San Joaquin County
Department of Public Works, Solid Waste Division
1810 E. Hazelton Avenue
Stockton, CA 95205

Prepared by

Geo-Logic ASSOCIATES

143E Spring Hill Drive
Grass Valley, California 95945
www.geo-logic.com
Project #AU24.1295.PW

February 2025

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Definitions

Wherever the terms listed below are used in this CQA, their intent and meaning shall be interpreted as defined in this section.

ASTM - ASTM International (formerly American Society for Testing and Materials), 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, 19428-2959; also, the numerical designation of a standard specification, test method, or practice established by ASTM International.

Caltrans - Caltrans (formerly California Department of Transportation), 1120 N Street, P.O. Box 942873, Sacramento, California 94273-0001; also, the numerical designation of a standard specification, test method, or practice established by Caltrans.

Contract Documents - The official document set issued for the project, including bidding requirements, contract forms, contract conditions, Construction Drawings, Construction Specifications, addendums and contract modifications.

Contractor - A person or persons, firm, partnership, corporation, or combination, whether private, municipal, or public, who, as an independent contractor, has entered into a contract with County to perform the construction activities for the project. This includes but is not limited to the earthwork contractor(s), geosynthetic installer(s), or their subcontractor(s).

Construction Completion Report - Report to be prepared at the completion of construction by the CQA Officer that documents the as-built conditions and record drawings as discussed further in Section 11.

Construction Drawings - The official plans, profiles, cross-sections, elevations, notes, and details, as well as their amendments and supplemental drawings, showing the locations, character, dimensions, and details of liner construction and grading.

Construction Manager - The designated representative of the County on the site, responsible for construction contract administration.

Construction Quality Assurance (CQA) - A planned series of observations and tests to verify and document that quality control functions have been performed adequately and to assess compliance with the Construction Drawings.

Construction Quality Assurance Consultant (CQA Consultant) - The party, independent from County or contractor that is responsible for observing and documenting activities related to the

quality of material manufacturing, material installation, and other construction activities related to the project. Also responsible for issuing a CQA report sealed by a Professional Engineer registered in the State of California.

Construction Quality Assurance (CQA) Laboratory - A laboratory capable of conducting materials testing required by this CQA Manual.

Construction Specifications (Specifications) - The official quality requirements for products, materials, and workmanship upon which the design and construction of the project are based. The Construction Specifications are on the Construction Drawings and in the Technical Specifications document.

CQA Officer - A professional, registered in the State of California as required by 27 CCR 20324(b)(2), who is responsible for observing, verifying, and documenting the construction and for preparing, signing, and sealing the Construction Completion Report.

CQA Monitor - A designated site representative of the CQA Officer responsible for observing and documenting field conditions and tests.

Daily Report - A record of construction progress prepared by the CQA monitor which documents construction on a daily basis.

Design Engineer - The individual(s) or firm(s) responsible for designing the liner and preparing the Construction Drawings and Construction Specifications, either by or under the direct supervision of a civil engineer registered in the State of California. The Design Engineer for this project is Geo-Logic Associates, Inc., 143E Spring Hill Drive, Grass Valley, California 95945.

Earthwork - Work performed by the Contractor using soil or soil-like materials, including (but not limited to) excavation, hauling, stockpiling, general fill and compacted earth fill.

Excavation - The removal of soil, soil-like material, and rock from in-place masses within areas identified on the Construction Drawings for excavation. Excavation may include the exclusion of unsuitable materials and preparation of the subgrade.

Foundation Layer - The soil layer immediately under the liner (also "Liner Subgrade") engineered to act as a foundation for the base liner system

Geosynthetic Clay Liner (GCL) - is a relatively thin layer of processed clay (typically bentonite) fixed between two sheets of geotextile or bonded to a geomembrane.

Geomembrane - A polymeric sheet material that is impervious to liquid, also referred to as flexible membrane liner, membrane, or liner.

Geotextile - Woven or nonwoven sheet synthetic fabric manufactured for use as a cushion, separator, or reinforcement in geotechnical applications.

Geocomposite - Woven or nonwoven sheet synthetic fabric material less impervious to liquid than geomembrane, manufactured for use as a cushion, separator, or reinforcement in geotechnical applications.

GRI - Geosynthetic Research Institute.

Installer – The Installer is responsible for installation of the geosynthetic components in accordance with the Drawings and Specifications. The Installer may be affiliated with the Manufacturer. Also called the Geosynthetic Installer.

Nonconformance - A deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate, including (but not limited to) physical defects, test failures, failure to conform to the requirements of the Construction Drawings or Construction Specifications, or inadequate documentation.

County – San Joaquin County, Department of Public Works.

Particle Size - Maximum size of individual soil grains or rock measured using a US Standard Sieve size or other method acceptable to the Engineer.

Procedure - A document that specifies or describes how an activity is to be performed.

Project Document - Any document, either required or incidental, prepared to further the construction of the liner, including (but not limited to) Contractor submittals, Construction Drawings, Construction Specifications, Technical Specification, Record Drawings, shop drawings, construction quality control and quality assurance plans, safety plans, and project schedules.

Quality Assurance - A planned and systematic program of procedures and documents to show that items of work or service meet the requirements of the Construction Drawings and Construction Specifications. Quality assurance does not include quality control, and will be performed by the CQA Officer, acting through the CQA Monitor when appropriate.

Quality Control - Actions that provide a means of measuring and regulating the characteristics of items of work or service so that they comply with the requirements of the Construction

Drawings and Construction Specifications. Quality control shall be performed by the Contractor, Subcontractors, manufacturers, and suppliers, as appropriate.

Record Drawings - Drawings recording the dimensions, details, coordinates, and characteristics of the project as they were actually constructed; informally referred to as "as-builts".

RWQCB – California Regional Water Quality Control Board, Central Valley Region.

Surveyor - The individual(s) or firm(s) responsible for locating project features, staking grades to establish required elevations, and measuring construction quantities as needed to carry out; and produce the data on which the record drawings are based. All such work being performed by or under the continuous supervision of a licensed land surveyor registered in the State of California.

Testing - Verification that an item meets specified requirements by subjecting that item to a set of physical, chemical, environmental, or operating conditions and recording the associated physical state or response of the item.

USCS - Unified Soil Classification System, as defined in ASTM D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) (if laboratory data are available) or ASTM D 2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) (if laboratory data are unavailable

1. Construction Quality Assurance

1.1 Introduction and Scope

This Construction Quality Assurance (CQA) Manual describes the tasks involved with the CQA for the Landfill Module 7 Construction at the North County Recycling Center and Sanitary Landfill (NCRCSL), located in San Joaquin County, California. The NCRCSL is owned and operated by San Joaquin County Department of Public Works (County). This CQA Manual also provides descriptions of portions of the quality control testing program that are to be performed by the Contractor. CQA refers to the duties of a third party CQA Consultant to monitor, inspect, and evaluate materials and workmanship during construction.

The CQA activities document the compliance of the Contractor with the Construction Drawings and Specifications for the Landfill Module 7 Construction (Project) which have been approved by the California Regional Water Quality Control Board (RWQCB). For the purposes of this CQA Manual, the term Contractor refers to the company or individual that is responsible for performing the specific work item being examined to complete the construction at the site.

The overall goal of this CQA Manual is to assure that proper construction techniques and procedures are used and that the project is built in accordance with the Construction Drawings and Specifications. The intent is to identify and define problems that may occur during construction and to verify that these problems are corrected before construction is complete. A written final report will be prepared by the CQA Consultant summarizing the construction activities and verifying that the installation was performed in general accordance with the Construction Drawings and Specifications. Where discrepancies between this document and the Specifications exist, the more stringent requirement shall govern the Project.

There are several components of the Project included within the contractor's scope of work that are not directly related to the construction of the lined Landfill Module 7 area. These include:

- Hydroseeding
- LCRS riser supports, bollards, enclosures and surface completion
- Aggregate base access roads
- Stormwater drainage inlets and culverts
- Drainage ditch excavation and flow line verification

- Stormwater BMP installation and maintenance

At the discretion of the County, the CQA of the above items will be performed by County personnel. All soil compaction will be observed and documents by the CQA Consultant.

1.2 Duties of CQA Personnel

It is the duty and responsibility of the CQA Consultant to implement the elements of this CQA Manual in order to ensure that the construction and installation of the cover system at the site is performed in accordance with the Construction Drawings and Specifications and State and Federal Regulations. The CQA personnel shall make every effort to communicate in an efficient and effective manner to the Contractor's representatives on issues concerning testing and observation procedures and results of materials or in-situ tests performed.

The CQA Consultant is not in a position to direct construction activities, but is encouraged to give advice to the Contractor, their employees, or the County on items which may improve the quality or speed progress of the construction. The CQA Consultant and its representatives shall make every effort to furnish test results to the Contractor in a prompt manner. The representatives of the CQA Consultant shall report to the County any nonconformance items, which cannot be resolved promptly.

The CQA monitor shall be on site as required during the construction project to ensure that all aspects of construction are monitored and documented.

1.3 Personnel Qualifications

1.3.1 CQA Officer

The CQA Officer will have formal academic training in civil engineering or a closely related discipline and will be a Registered Civil Engineer or Certified Engineering Geologist registered in the State of California. The CQA Officer will have experience in earthwork construction, landfill design and construction, and geomembrane, drainage systems, and leachate collection system installations. The CQA Officer will have practical technical and managerial experience that will allow the CQA Manual to be properly implemented. The CQA Officer must be able to communicate effectively with the County and the Contractor so that there will be a clear understanding of construction activities and the CQA Manual.

1.3.2 CQA Monitors

The CQA monitors will work directly for the CQA officer. Each CQA Monitor will have formal training and practical experience in inspecting and testing earthwork construction, geomembrane installations, leachate collection systems and drainage system installations, including conducting and recording inspection activities, preparing daily reports, and performing field testing. In addition, knowledge shall be required of the specific field practices and construction techniques for landfill cover construction and all ASTM or other testing standards involving material handling, observation of testing procedures, equipment and reporting procedures.

2. Meetings

2.1 General

Throughout the entire construction and installation of the liner system, close communication between all parties involved with the project is essential. In order to coordinate activities between the County, CQA Consultant, and Contractor, as well as set up proper lines of authority and reporting, meetings shall be held before and during construction. The type and purpose of meetings to be held for this project are described in this section.

2.2 Preconstruction Meeting

A preconstruction meeting will be held prior to project start-up. The parties that shall attend this meeting are the County, Contractor, Design Engineer, and CQA Consultant. The purpose of this meeting is to:

- Review the project Construction Drawings, Specifications, and CQA Manual
- Review project tasks and responsibilities
- Review the project schedule
- Define lines of communication and authority
- Establish reporting and documenting procedures
- Review testing equipment and test methods
- Establish protocol for submittal of CQA conformance testing data sheets

- Conduct a site inspection to review work areas, lay-down areas, stockpile areas, access roads, and related project issues

The CQA Consultant will provide meeting agenda, take meeting minutes and provide meeting minutes to all persons present at the meeting.

2.3 Daily Progress Meetings

A progress meeting shall be held before the start of each construction shift. The daily progress meetings shall be attended by the CQA Monitor and the Contractor. The purpose of this meeting shall be to:

- Review the proposed activities scheduled by the Contractor for the day
- Discuss any problems or deficiencies that have arisen during construction
- Review the results of any test data
- Discuss the Contractor's deployment of personnel and equipment
- Review the previous day's activities including the effectiveness of procedures taken to alleviate any deficiencies

All progress meetings will be documented by the CQA Monitor who will transmit minutes to all parties.

2.4 Weekly Progress Meetings

Weekly progress meetings will be held to review the previous week's activities or progress, discuss present and future work, and discuss any current or potential construction issues. The County, CQA Officer, CQA Monitor, Design Engineer, Contractor, and all active subcontractors shall attend. All weekly progress meetings will be documented by the CQA Monitor or CQA Officer who will transmit minutes by the end of the second working day to all parties.

2.5 Work Deficiency Meetings

As needed, meetings shall be held to discuss specific problems or deficiencies that occur during construction that cannot be easily resolved. Work deficiency meetings shall be attended by the CQA Monitor, CQA Officer, the County, and the Contractor. The purpose of these meetings is to:

- Identify the nature and extent of the problem
- Discuss the means necessary to correct the deficiency or problem

- Provide a solution to the problem and determine how the corrective action shall be implemented

All work deficiency meetings will be documented by the CQA Consultant or the County's Representative who will transmit minutes to all attending parties. Deficiency meeting documentation shall become part of the project documents.

3. Design Changes

3.1 Minor Design Changes

Minor changes to the Construction Drawings and Specifications may be necessary to maintain or enhance quality during the project or to make adjustments to unforeseen field conditions. Minor changes must be approved by the Design Engineer. Procedures for providing minor changes include the following:

- The need for a design change may become apparent during the course of construction of the project and a request for a change may be initiated by any individual associated with the project.
- All proposed design changes must be approved by the Design Engineer and submitted to the CQA Officer with necessary documentation supporting the change for approval. All design changes must meet the intended quality and technical requirements of the design.
- Approved changes will be distributed to the County, CQA Monitor, CQA Officer, Contractor, and the RWQCB as required.
- Minor changes will not apply for changes that decrease the environmental protection of the unit such as decreasing the number or thickness of liners, decreasing the number of sumps, changing the synthetic liner materials, etc.

3.2 Major Design Changes

Major changes to the Construction Drawings and Specifications are unlikely to occur but may become necessary during the course of construction. Major changes may include elimination of landfill design components and drainage features and addition or changes to liner components and the extent of liner installation. The following procedures will be implemented for all major changes:

- A special meeting will be scheduled immediately with the RWQCB and LEA as necessary to discuss the need for the change.
- County and Design Engineer will both attend the meeting to present the basis for the change. Requested changes and supporting documentation will be provided at the meeting.
- Major changes will not be implemented without the express written approval from pertinent regulatory agencies (e.g. RWQCB and/or LEA).
- Copies of approved changes will be distributed to County, Design Engineer, CQA Monitor, CQA Officer, Contractor, and pertinent states and local regulatory agencies.

4. Earthwork

4.1 General

This section outlines the requirements for earthwork operations for the construction of the Project. The Contractor shall excavate soils and construct the prepared surface as necessary to achieve the grades set forth within the Construction Drawings and Specifications. The Contractor shall also purchase (if necessary) and place various aggregate and piping materials within the LCRS and monitoring systems. Earthwork includes, but is not limited to:

- Excavation of the liner system subgrade, and drainage ditches
- Placement of earthfill materials
- Preparation of the foundation layer
- Preparation of the geosynthetic subgrade
- HDPE pipe installation
- Excavation of existing liner terminations
- Placement of Leachate Collection and Removal System (LCRS) drainage gravel
- Placement of the operations layer
- Placement of aggregate base
- Installation of surface water drainage structures

Specifically excluded from this section are the installation of the GCL, geomembrane, geotextile, and geocomposite, which are addressed within later sections of this CQA Manual.

The CQA Monitor shall observe that the Contractor has conducted all surveying and as-built drawing preparation as required by the Specifications. Where called for in this CQA Manual or in the Specifications, test methods listed in Table 4-1 may apply.

Table 4.1. Earthwork Testing Methods

Standards	Title and Test Description
ASTM D1556	Density and unit weight of soil in place by the sand-cone method
ASTM D1557	Laboratory compaction characteristics of soils using Modified Effort ("Modified Proctor" method)
ASTM D3017	Water content of soil and rock in place by nuclear methods (shallow depth)
ASTM D2216	Laboratory determination of water (moisture) content of soil and rock
ASTM D4643	Determination of water (moisture) content of soil by the microwave oven method
ASTM D2434	Permeability of granular soils (constant head)
ASTM D5084	Measurement of hydraulic conductivity of saturated porous materials using a flexible wall permeameter
ASTM D4318	Liquid limits, plastic limit, and plasticity index of soils (Atterberg limits)
ASTM C88	Test for soundness of aggregates using sodium sulfate or magnesium sulfate
ASTM C131	Test for resistance to degradation of small-size coarse aggregate by abrasion and impact in the Los Angeles machine
ASTM C136	Sieve analysis of fine and coarse aggregate
ASTM D2487	Standard classification of soils for engineering properties
ASTM D2488	Standard practice for description and identification of soils
ASTM D4220	Standard practices for preserving and transporting soil samples
ASTM D6938	In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods
ASTM D854	Specific Gravity of Soils
ASTM D6913	Particle Size Distribution (Gradation) of Soil using Sieve Analysis
ASTM D7928	Particle Size Distribution (Gradation) of Soil using Hydrometer

4.2 Soil Sampling

4.2.1 Sample Processing

The CQA Monitor is responsible for the timely processing and testing of soil samples. The CQA Officer must determine which samples will be tested on-site and which will be tested off-site. This determination will be made based on available manpower, available equipment, complexity of test, and time available to determine results. For expediency, samples tested off-site must be shipped the same day as they are obtained.

As test data is obtained from the on-site and off-site laboratories it must be summarized in the form it will appear in the CQA report.

4.2.2 Sample Numbering and Logging

The CQA Monitor must maintain a sample numbering system for all soil samples obtained for the project. These samples include those obtained prior to construction for conformance or slope stability testing, and samples obtained during construction such as samples obtained for moisture-density relationship testing.

Documentation of soil sampling must be summarized in the form it will appear in the CQA report, and be maintained throughout the project. The log must include soil sample numbers beginning with (0001) and proceeding sequentially. No sample number can be repeated, and re-tests of a sample that does not meet specified requirements must be given the original number with a letter suffix (i.e., re-tests for a sample 0021 not meeting specified requirements would be 0021A, 0021B, etc.). Information contained in the master soil sample log must include:

- Sample number
- Test(s) being performed
- Date the sample was obtained
- Name of CQA Monitor that obtained the sample
- Location that the sample was obtained, such as a stockpile, a fill, a borrow area, etc.
- Location testing will take place (on-site vs. off-site)
- Date sample sent off-site
- Date test results were completed on-site or received from off-site
- Name of CQA Monitor that performed the on-site testing
- Comments about the test results, such as pass / fail information

4.2.3 Sample Tagging

The CQA Monitor must maintain the identification of all samples obtained throughout the project from the time the sample is obtained to the time testing is completed. The monitor must place an identifying tag on the sample or mark the sample container with the sample number immediately upon sampling. The tag or identifying container must remain with the sample

throughout processing, testing and storage. The tag or container must have the following information:

- Sample number
- Soil material type
- Project name and project number
- Name of CQA Monitor that obtained the sample
- Date the sample was obtained

4.3 Conformance and Construction Phase Testing

Table 4-2 establishes test frequencies for earthwork CQA testing. It includes classification and conformance tests that must be performed prior to soil installation to assure soil materials meet quality standards established in the technical Specifications. In addition, Table 4-2 outlines construction testing to assure installed materials meet specified requirements.

The test frequencies listed establish the minimum intervals of required tests. Additional testing must be conducted whenever work or materials are suspect, marginal, or of poor quality. Extra testing may also be performed to provide additional data for engineering evaluation. Any re-tests performed as a result of a failing test cannot contribute to the total number of tests performed in satisfying the minimum test frequency.

Table 4.2. Earthwork Conformance and Construction Testing

REQUIRED TESTS	ASTM DESIGNATION	TEST FREQUENCY
Earthfill Conformance Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /10,000 cy
Sieve Analysis	D6913	1 /10,000 cy
Atterberg Limits	D4318	1 /10,000 cy
Moisture / Density Relationship	D1557	1 /10,000 cy
Earthfill Construction Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /10,000 cy
Sieve Analysis	D6913	1 /10,000 cy
Atterberg Limits	D4318	1 /10,000 cy
Moisture / Density Relationship	D1557	1 /10,000 cy
Density, Nuclear Method	D6938	1 /1,000 cy

REQUIRED TESTS	ASTM DESIGNATION	TEST FREQUENCY
Moisture Content, Nuclear Method	D6938	1 /1,000 cy
In Place Density (Sand Cone Method)	D1556	1 / 20 nuclear tests
Moisture Content Verification	D2216	1 / 20 nuclear tests
Prepared Foundation Layer Conformance Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /10,000 cy
Sieve Analysis	D6913/D7928	1 /10,000 cy
Atterberg Limits	D4318	1 /10,000 cy
Moisture Content by Oven or Microwave	D2216/D4643	1 /10,000 cy
Prepared Foundation Layer Construction Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /10,000 cy
Sieve Analysis	D6913/D7928	1 /3,000 cy
Atterberg Limits	D4318	1 /3,000 cy
Moisture / Density Relationship	D1557	1 /3,000 cy
Density, Nuclear Method	D6938	1 /500 cy
Moisture Content, Nuclear Method	D6938	1 /500 cy
In Place Density (Sand Cone Method)	D1556	1 / 20 nuclear tests
Moisture Content Verification	D2216	1 / 20 nuclear tests
LCRS Drainage Gravel Conformance Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /3,000 cy
Sieve Analysis	C136	1 /3,000 cy
Permeability	D2434	1 /3,000 cy
LCRS Drainage Gravel Construction Testing		
Sieve Analysis	C136	1 /1,500 cy
Permeability	D2434	1 /1,500 cy
Operations Layer Conformance Testing		
Identification and Classification of Soil Type	D2488/D2487	1 /10,000 cy
Sieve Analysis	D6913	1 /10,000 cy
Operations Layer Construction Testing		
Sieve Analysis	D6913	1 /5,000 cy
Moisture Content	D2216	1 /10,000 cy

4.4 Excavation and Stockpiling

The CQA Monitor shall verify that excavation is in accordance with lines and grades shown on the Construction Drawings. The excavated materials shall be stockpiled in the identified

stockpile areas as directed by the CQA Monitor or County. The CQA Monitor shall observe that the stockpiles conform to the requirements of the Specifications.

4.5 Earthfill

The CQA Monitor shall verify that the placement of earthfill is performed by the Contractor with suitable materials to the grades and dimensions required by the Construction Drawings and Specifications. CQA monitor shall immediately notify the County and Contractor of any unsuitable material.

Earthfill also includes the construction of all berms, drainage structures, roads, and other earthfills as shown on the Construction Drawings. Prior to fill placement, the CQA Monitor shall verify that all clearing, grubbing, and stripping has been performed by the Contractor in accordance with the appropriate sections of the project Specifications. The CQA Monitor shall observe fill placement and perform the necessary field and laboratory testing to ensure that materials are compacted at the specified moisture content and to the minimum density specified. Tests to be performed for earthfill prior to and during construction and their frequency are provided in Table 4-2.

4.6 Prepared Foundation Layer

The CQA Monitor and Contractor shall inspect the prepared foundation layer to ensure that it will provide a firm base for construction of the liner system. Tests to be performed and their frequency are provided in Table 4-2. The CQA Monitor shall:

- Verify that angular or sharp rocks, rocks larger than the specified diameter, and other debris that could damage the overlying geosynthetic materials are removed from the surface.
- Verify that the subgrade preparation and foundation layer are scarified, compacted, steel drum rolled smooth and is free of irregularities (ridges, protrusions, gouges, etc.), and tested per Table 4-2, prior to the placement geosynthetics.
- Verify that any soft or yielding areas of the subgrade/foundation layer are adequately excavated and replaced with suitable soils in accordance with the Specifications for earthfill materials.
- Verify that the prepared foundation layer has not desiccated or otherwise deteriorated prior to placement of overlying material.

4.7 LCRS Drainage Gravel

The CQA Monitor shall verify that no material is placed until the underlying components and materials and necessary pipes/structures have been installed and approved by the CQA Monitor. The CQA Monitor shall be present at all times during placement and spreading of the gravel materials. The CQA Monitor shall verify that the placement of the LCRS drainage gravel is in accordance with the Specifications: The CQA Monitor shall:

- Review relevant submittals
- Sample and test the LCRS drainage gravel in accordance with the Specifications and Table 4-2
- Verify that underlying geosynthetic installations and testing are completed, certified and accepted before material installation
- Verify thickness of completed work
- Verify that placement and spreading of materials do not damage underlying components such as piping and geosynthetics, and if damaged, repaired or replaced and tested in accordance with the Specifications
- Verify that the Contractor has scheduled placement of the LCRS Drainage Gravel material during cooler parts of the day in the event of warm weather to avoid placement of materials when the liner is wrinkled.
- Rerecord any damage to the geosynthetics and clearly marked the location for repair.

4.8 Operations Layer

The CQA Monitor shall verify that no material is placed until the underlying components and materials and necessary pipes/structures have been installed and approved by the CQA Monitor and CQA Officer. The CQA Monitor shall be present at all times during placement and spreading of the operations layer materials. The CQA Monitor shall verify that the placement of the operations layer is in accordance with the Specifications. The CQA Monitor shall:

- Verify that the Contractor constructs thick haul roads, turnouts, staging, and dump areas for all rubber-tired transport vehicles and loaders
- Sample and test the operation layer in accordance with the Specifications and Table 4-2
- Verify that the operations layer is placed at the thickness specified

The CQA Monitor shall record all observed damage and clearly mark the location for scheduled repair. The Contractor shall promptly repair all damaged layers in accordance with the Specifications. Testing requirements for the Operations Layer are shown in Table 4-2.

4.9 Anchor Trench Excavation and Backfilling

The CQA Monitor shall verify that anchor trench excavation and backfilling are in accordance with the Construction Drawings and Specifications. During excavation, geosynthetics placement in anchor trench and backfilling, the CQA Monitor shall:

- Verify that the anchor trenches for the geosynthetics are excavated to the lines and grades shown on the Construction Drawings
- Observe anchor trench excavation to ensure it has been excavated only to the extent or distance that required to carry out all geosynthetics installation in an expeditious manner
- Verify that the leading edges of the anchor trench is rounded to eliminate sharp bends in the liner material
- Observe the backfill, compaction, and placement of soil in specified lifts to ensure that the work is performed in accordance with the Construction Drawings and Specifications

The Contractor shall be responsible for reworking and recompacting any areas that do not appear to be compacted properly as determined by the CQA Monitor. When deficiencies are discovered, the CQA Monitor shall immediately determine the nature and extent of the problem, notify the Contractor of the problem, and complete the required documentation.

4.10 Excavation of the Existing Liner Termination

The CQA monitor shall observe the exposing of existing module liner for tie-in to ensure that the work is performed with caution and in accordance with the Construction Drawings and Specifications. The Contractor shall be responsible for the repair of any damage that occurs while exposing and tie-in to the existing liner. All repairs shall be recorded and observed by the CQA Monitor.

4.11 Drop Inlet Structures

The CQA Monitor shall observe and document that all drop inlets, excavations, and backfill materials are installed in general accordance with the Construction Drawings, Specifications, and Manufacturer's guidelines.

Backfill around manholes and inlet structures shall be observed and tested in accordance with the frequencies and requirements for earthfill, as specified in Table 4-2 and in the Specifications.

The CQA Monitor shall review product submittals and provide visual observation and documentation that the concrete is placed in accordance with the Construction Drawings and Specifications. The CQA Monitor shall observe that the subgrade is prepared to accept the concrete and that the specified reinforcing material is used.

4.12 Drainage Ditches and Channels

The CQA Monitor shall observe and verify that construction of stormwater drainage ditches and channels are in accordance with the Construction Drawings and Specifications. The CQA Monitor shall observe that ditches and channels are constructed to the alignments, slopes, flow line elevations, and dimensional cross-sections shown on the Construction Drawings. Any fills necessary for the construction of the drainage ditches shall be observed and tested by the CQA Monitor in accordance with the frequencies and requirements for earthfill, as specified in Table 4-2 and in the project Specifications.

The CQA Monitor shall review product submittals and provide visual observation and documentation that the rock slope protection products are in accordance with the thickness and gradation requirements outlined in the Construction Drawings and Specifications. The CQA Monitor shall observe that the geotextile is installed on the graded subgrade in accordance with the Construction Drawings and Specifications. Once the geotextile has been installed, the CQA Monitor or shall verify that the rock slope protection are placed to the approximate lines and grades shown on the Construction Drawings.

4.13 Surveys and As-Builts

The CQA Officer shall coordinate with the surveyor to confirm that minimum design thicknesses and grades are achieved prior to placement of any additional material over the prepared subgrade and foundation layer. An as-built grid with spacing as required by the Specifications, shall be used to confirm minimum thicknesses and lines and grades of finished surfaces. As-built surveys and submittals shall be in accordance with requirements of the Specifications.

5. Geomembrane Quality Assurance

5.1 General

This section sets forth the requirements for the CQA testing and observation requirements for installing the geomembrane materials detailed on the Construction Drawings and Specifications. This work includes the manufacturer's QC testing, conformance testing, shipping and handling, deployment, seaming, repairs, and non-destructive and destructive testing of the geomembrane liner. The Contractor shall furnish submittals in compliance with this Manual and conditions of warranty prior to construction for review by the CQA Officer and CQA Monitor, in accordance with the Specifications.

5.2 Shipping and Handling

The Contractor shall provide a copy of the QC certificates for production of each geomembrane roll manufactured for this project prior to construction for review by the CQA Monitor and CQA Officer. The certificate of compliance for the geomembrane must be received prior to installation as required by the Specifications. Materials shall be delivered to the site only after the CQA Officer receives and approves the required submittals.

The Contractor is responsible for the transportation, off-loading and storage of the geomembrane. The materials shall be packaged and shipped by appropriate means so that no damage is caused and shall be delivered to the site only after the CQA Monitor receives and approves the required submittals. Off-loading shall be performed in the presence of the CQA Monitor and any damage during off-loading shall be documented. The CQA Monitor shall keep a log of all geomembrane delivered to the site on the appropriate form for review by the CQA Officer.

Damaged materials shall be separated from undamaged materials until the CQA Monitor and CQA Officer determine proper disposition of the material. Final authority on the determination of damage shall be the CQA Monitor. The Contractor shall replace damaged or unacceptable material at no cost to the County.

5.3 Geomembrane Conformance Testing

After production, the geomembrane shall be sampled for conformance testing by a third party geosynthetics laboratory. Sampling shall be performed at the manufacturing plant by the third party geosynthetics laboratory, or by the CQA Monitor upon arrival at the site. One

geomembrane sample shall be obtained for every 100,000 square feet produced per lot. The CQA Monitor shall identify the roll numbers of the geomembrane, which are tested for conformance on the log of geomembrane received form. The samples shall be delivered to the third party geosynthetics laboratory to determine that the geomembrane properties conform to the requirements given in the Specifications. The CQA Officer shall review all test results and report any non-conformance test results to the County and Contractor. Third party geosynthetics testing shall be performed by a Geosynthetics Accreditation Institute (GAI) acceded laboratory.

The CQA Monitor shall collect samples for conformance testing across the entire width of the roll. This conformance sample shall not include the first 3 feet of the roll.

The conformance samples shall be 3 feet wide by the roll width in length. Each roll shall be marked with the manufacturer's name, product identification, lot number, roll number, and roll dimensions. No material shall be deployed until the CQA Monitor receives passing conformance values and approves the liner for installation.

The conformance testing for the geomembrane shall include but is not limited to the following parameters:

- Thickness (ASTM D-5994)
- Sheet Density (ASTM D-1505)
- Tensile Properties (ASTM D-6693)
- Carbon Black (ASTM D-1603)
- Carbon Dispersion (ASTM D-5596)
- Asperity Height (ASTM D7466)
- Puncture Resistance (ASTM 4833)
- Interface shear (ASTM D5321/D6243)

Required interface shear testing is described in the Specifications. The Specifications describe to requirements for sampling, sample labeling, test configurations, normal loading, and all other testing specifics. Interface shear testing is performed per ASTM D5321 or D6243 requirements.

5.4 Geomembrane Placement

Prior to placing the geomembrane panels, the Contractor and CQA Monitor shall observe and verify that the foundation layer has been properly placed, finished, surveyed and accepted. Once the foundation layer has been approved and accepted, deployment of the geomembrane may begin. The Contractor's QC Technician shall give each panel an identification number that shall be used by all parties. The CQA Monitor shall record the placement of each panel on a geomembrane panel deployment log form to be reviewed by the CQA Officer. The CQA Monitor shall observe that the Contractor has provided sufficient slack in the geomembrane to allow for contraction due to cold temperatures. The CQA Monitor shall record the ambient temperatures during seaming operations. As the geomembrane panels are deployed in the field, the CQA Monitor shall observe and verify the following:

- That any underlying geosynthetic material is protected and has not been damaged between acceptance and geomembrane panel placement.
- That the equipment used to transport and deploy the geomembrane does not damage the geomembrane or the underlying material.
- That there are no significant defects present in the sheet. Small defects shall be marked, along with the type of repair required (extrudate, patch, etc.).
- That the sheet is not deployed under adverse weather conditions such as fog, rain, or high winds.
- That the equipment and deployment methods do not cause excessive wrinkling of the geomembrane and that the sheet is not dragged along a rough surface. If the liner is dragged, the CQA Monitor shall inspect the underside of the material for damage.
- That personnel do not engage in activities that could damage the geomembrane.
- That the Contractor's QC personnel properly record identification information including roll number, panel number, seam number, date, etc.

The CQA Monitor shall record all of the above information in daily reports and log sheets and shall inform all parties of any deviations.

5.5 Geomembrane Test Welds

The Contractor shall conduct field test welds on pieces of scrap liner prior to production welding. The CQA Monitor shall verify that the Contractor conducts test welds in accordance with the Specifications.

The CQA Monitor shall record the shear and peel test results for the test weld coupons on a geomembrane start-up trial weld log form. The Contractor shall not begin welding of field seams unless the CQA Monitor has verified that the trial welds are acceptable. Once a welding technician has been approved on a specific welding apparatus, the technician may not change machines without first passing a test weld on the new equipment.

5.6 Geomembrane Seaming

The CQA Monitor shall verify that the geomembrane is seamed between the ambient temperatures described within the Specifications. The CQA Monitor shall measure and record the temperature in accordance with the Specifications.

The CQA Monitor shall verify that the geomembrane is not being deployed during precipitation, in the presence of excessive moisture, in areas of ponded water, or in the presence of excessive winds.

The Contractor's QC Technician and the CQA Monitor shall verify that geomembrane seams are oriented parallel to the maximum slope direction and that a seam numbering system compatible with the panel numbering system is used. The CQA Monitor shall verify that the Contractor has taken the following steps prior to seaming the geomembrane:

- That the liner surface has been cleaned of all foreign material including dirt, dust, debris, moisture, or oil.
- That grinding has been performed to remove the oxidation (extrusion welds only).
- That all areas where the sheet thickness has been thinned below the specified value from grinding are patched by the Contractor.
- That any bead grooves are covered with single extrudate.
- That wrinkles and fishmouths are cut out and the edges overlapped properly.
- That all seaming takes place over a firm, dry surface.
- That when the ambient temperature is below the prescribed temperature, a hot air device is used for preheating in front of the welder.
- That the approved type and quantity of welding devices are used on the job.
- That extrusion welders are purged of heat degraded material prior to use.
- That for cross or tee seams, the edge of the seam is ground to a smooth incline.

- That the seam numbering system and welding procedures agreed upon at the preconstruction meeting are strictly followed.

The CQA Monitor shall record the above information in his daily reports along with panel placement and seaming log forms to be reviewed by the CQA Officer.

5.7 Extrusion Welding

For extrusion welding, the CQA Monitor shall observe that the welding devices are purged of heat-degraded extrudate as described in the Specifications. All purged extrudate shall be disposed of off the liner. Each extruder shoe shall be inspected daily for wear to assure that its offset is equal to the liner thickness. All worn or damaged shoes or other parts shall be repaired. The CQA Monitor shall verify that no equipment is allowed to begin welding until the test weld, made by that equipment, passes the weld test. All test weld results shall be reviewed and recorded by the CQA Monitor.

5.8 Hot Wedge (Fusion) Welding

For hot wedge (fusion) welding, the CQA Monitor shall verify that the welding devices are automated, vehicular mounted, and equipped with gauges giving applicable speed, temperatures, and pressures. The speed, temperature, and pressure of the welding device should be determined during the test welding conducted prior to seaming of the panels.

5.9 Geomembrane Seam Nondestructive Testing

Prior to the start of construction, the Contractor shall submit to the CQA Officer for approval as per the Specifications a procedure for nondestructive testing of all field seams. When the seaming begins in the field, the CQA Monitor shall record the results of the geomembrane QC conducted by the Contractor on a geomembrane installer's field QC log form.

5.10 Geomembrane Vacuum Box Testing

For nondestructive seam testing, all extrusion welded field seams shall be tested over their full length using vacuum box test units. The vacuum testing shall be performed by the Contractor's QC Technician under the observation of the CQA Monitor. The CQA/CQC monitor does not need to observe each vacuum box test, but shall check periodically on the methods and equipment used and record all results. The CQA Monitor shall verify that the tests are conducted concurrently with the field seaming and that the vacuum box assembly consists of a rigid box

with a transparent viewing window and a vacuum gauge. The CQA Monitor shall verify that the Contractor's procedure for vacuum testing is as follows:

- Clean window, gasket surfaces, and check box for leaks.
- Energize vacuum pump and set to the proper pressure as required by the Specifications.
- Place soapy solution on section of seam to be tested.
- Place box over wetted area and press down.
- Close bleed valve, open vacuum valve, and ensure that a leak tight seal is created.
- Examine the length of weld through the viewing window for bubbles for the period described in the Specifications.
- If no bubbles appear, the vacuum valve should be closed, the bleed valve opened, and the box should be moved to the next adjoining area with the specified overlap.
- Areas where soap bubbles are detected shall be marked, repaired, and retested.

5.11 Geomembrane Seam Air Pressure Testing

If the double hot wedge seaming system is employed, air pressure testing shall be used in accordance with the Specifications. The CQA Monitor shall observe that air pressure testing is conducted by the Contractor as follows:

- Seal both ends of the seam to be tested.
- Insert a hollow needle or other approved pressure feed device into the tunnel created by the double hot wedge and insert a protective cushion between the air pump and geomembrane.
- Energize the air pump to the pressure specified, close the valve, and sustain the pressure for the specified time period.
- Check the entire seam being tested for indications that it has been fully pressurized. This shall be accomplished by opening the air channel at the opposite end of the seam and observing a loss of pressure.
- If a loss of pressure exceeds the specified value or does not stabilize, locate the faulty area and repair.
- Remove the approved pressure feed device and seal.

At a minimum the opening of the air channel of each seam shall be observed by the CQA Monitor. Should a loss of pressure be detected along a seam, the faulty area shall be identified, repaired, and re-tested as provided within the Specifications.

If blockage occurs along the seam, the area shall also be identified, repaired and re-tested. The Contractor shall be responsible for all costs associated with the seam repair. The results of both vacuum box and air pressure testing shall be recorded on the seam and panel QC form by the CQA Monitor for review by the CQA Officer.

5.12 Geomembrane Seam Destructive Testing

The CQA Monitor shall determine the location of all destructive tests. The CQA Monitor shall obtain a minimum of one sample per 500 feet of seam. The Contractor shall repair any suspicious looking welds before release of a seam for destructive sampling. Destructive samples shall be cut by the Contractor as the installation progresses and not at the completion of the project. The Contractor's QC Technician shall mark all destructive samples with consecutive numbers along with the seam number. The CQA Monitor shall keep a log with the date, time, location, seaming technician, apparatus, temperature, and pass or fail criteria. The CQA Monitor shall verify that all destructive sample holes are repaired immediately by the Contractor.

The Installer's QC Technician shall cut destructive samples at locations selected by the CQA Monitor. Samples dimensions shall be 12 inches wide by 48 inches long centered on the seam. The CQA Monitor shall:

- Mark each sample location with the sample bounds (48 inches by 12 inches), sample ID, technician ID, machine ID, date, and seam number, and the adjoining panel numbers.
- Record the sample location on the as-built geomembrane panel layout drawing and the geomembrane field seaming log form.
- A maximum frequency must be agreed to by the Contractor and CQA Monitor at the preconstruction meeting. However, if the number of failed samples exceeds 5 percent of the tested samples, this frequency may be increased at the discretion of the CQA Monitor. Samples taken as the result of failed tests do not count toward the total number of required tests.
- Test locations are at the discretion of the CQA Monitor and may be selected on the basis of liner distortion, weld contamination, or other potential areas of poor seaming.

- Record the sample location and reason for taking the sample (random sample, poor welding, etc.) on the destructive testing log.
- Promptly ship the destructive samples to the testing laboratory for testing.
- Record the results of the testing on the destruction testing summary form.
- In the event of testing failure, track the welding performed by the welding apparatus 50 feet before and after the failed sample location, and obtain additional samples. Continue tracking until the failed sample(s) are bounded by passing tests. Log the tracking on destructive test tracking form.
- Confirm that Installer caps or reconstructs the failed seam.

5.13 Geomembrane Repairs

For final seaming inspection, the CQA Monitor and Contractor shall check the seams and surface of the geomembrane for defects, holes, blisters, undispersed raw materials, or signs of contamination by foreign matter. If dirt inhibits inspections, the Contractor shall brush, blow, or wash the geomembrane surface as required. The CQA Monitor shall decide if cleaning the geomembrane surface and welds is needed to facilitate inspection. Repair areas shall be distinctively marked with a description of the required type of repair.

The CQA Monitor shall verify that all identified holes, tears, blisters, undispersed raw materials, and contamination by foreign matter are patched. The CQA Monitor shall verify that patches are not cut with the repair sheet in contact with the geomembrane and that the patches are extrusion welded to the geomembrane and then vacuum tested. The result of the vacuum test for the repair shall be marked by the Contractor's QC Technician with the date of the test and name of the tester on the sheet. Holes less than a quarter of an inch may be sealed with extrudate as described in the Specifications. The CQA Monitor shall record all repair areas on the repair log form.

5.14 Geomembrane Final Walk-through

The Contractor shall be responsible for maintaining the geomembrane (or portions thereof) until final acceptance by the CQA Monitor. The CQA Monitor shall recommend final acceptance when all seams have passed destructive testing, the Contractor has supplied all documentation, and all field and laboratory testing is complete and satisfactory. Prior to final acceptance, the Contractor, CQA Officer, CQA Monitor, and the County shall review the installation of the geomembrane (or portions thereof) for completeness. Any areas that are found to deviate from

the intended design, are incomplete, or in need of repair shall be recorded by the CQA Monitor for correction by the Contractor. When all repairs have been completed, the CQA Monitor shall release the geomembrane (or portions thereof) for installation of overlying materials.

The Contractor shall retain ownership of the liner throughout the installation of overlying materials as defined within his scope of work and until the project is complete.

5.15 Electric Leak Location (ELL) Testing

The CQA Consultant shall engage the services of an experienced leak location contractor for performing leak location surveys using bare liner survey methods (water puddle or arc testing) and covered liner survey methods (dipole) before and after LCRS layer and operations layer placement, respectively. The requirements for the leak locations survey shall be in accordance with the specification included as Appendix A of this CQA Manual.

Requirements for support and assistance by Contractor to the leak location survey contractor is described in the Specifications.

The locations of all identified or indicated leaks shall be repaired by the Contractor in accordance with the Specifications. All repairs and the required testing must be completed and accepted prior to full completion of associated components (LCRS gravel, piping, operations layer).

6. Geosynthetic Clay Liner

6.1 General

This section sets forth the requirements for the CQA testing and observation requirements for installing the Geosynthetic Clay Liner (GCL) materials detailed on the Construction Drawings and Specifications. This work includes the manufacturer's QC testing, conformance testing, shipping and handling, deployment, of the GCL. The Contractor shall furnish submittals in compliance with this Manual and conditions of warranty prior to construction for review by the CQA Officer and CQA Monitor, in accordance with the Specifications.

6.2 Shipping and Handling

The Contractor shall provide a copy of the QC certificates for production of each GCL roll manufactured for this project prior to construction for review by the CQA Monitor and CQA

Officer. The certificate of compliance for the GCL must be received prior to installation as required by the Specifications. Materials shall be delivered to the site only after the CQA Officer receives and approves the required submittals.

The Contractor is responsible for the transportation, off-loading and storage of the GCL. The materials shall be packaged and shipped by appropriate means so that no damage is caused and shall be delivered to the site only after the CQA Monitor receives and approves the required submittals. Off-loading shall be performed in the presence of the CQA Monitor and any damage during off-loading shall be documented. The CQA Monitor shall keep a log of all GCL delivered to the site on the appropriate form for review by the CQA Officer.

The CQA Monitor will observe the GCL rolls upon delivery at the site and any deviation from the above requirements will be reported to the CQA Officer and Construction Manager.

Damaged materials shall be separated from undamaged materials until the CQA Monitor and CQA Officer determine proper disposition of the material. Final authority on the determination of damage shall be the CQA Monitor. The Contractor shall replace damaged or unacceptable material at no cost to the County.

6.3 GCL Conformance Testing

After production, the GCL shall be sampled for conformance testing by a third party geosynthetics laboratory. Sampling shall be performed at the manufacturing plant by the third party geosynthetics laboratory. One GCL sample shall be obtained for every 100,000 square feet produced. or by the CQA Monitor upon arrival at the site. The CQA Monitor shall identify the roll numbers of the GCL which are tested for conformance on the log of GCL received form. The samples shall be delivered to the geosynthetics laboratory to determine that the GCL properties conform to the requirements given in the Specifications.

Conformance samples shall be collected across the entire width of the roll, but shall not include the first 3 feet of the roll. The conformance samples shall be 3 feet wide by the roll width in length. Each sample shall be marked with the Manufacturer's name and product identification, lot number, roll number, and type (double non-woven, single side woven, non-woven, 40-mil geomembrane-backed, etc.). In event that sampling is necessary at the site, the Contractor shall provide the personnel and equipment to obtain the sample in the presence of the CQA Monitor. No material shall be deployed until passing conformance values are obtained by the CQA Monitor and approved by the CQA Officer.

The GCL shall be tested for:

- Moisture content (ASTM D2216)
- Mass per unit area (ASTM D5993)
- Peel strength (ASTM D4632)
- Permeability (ASTM D5778), (one per project)

The number of specimens tested per conformance sample shall be in accordance with the respective ASTM standard. All relevant ASTM Standards shall be readily available for review. The average roll value in each direction shall be calculated from the specimen test values of each conformance sample and compared to the specified minimum average roll value of the tested physical property. The CQA Officer will review all test results and shall report any non-conformance to the CQA Monitor, the County, and to the Contractor.

6.4 Surface Preparation

The surface must be prepared in accordance with the technical Specifications. Before GCL installation, the surface will be inspected by the CQA Monitor and geosynthetics installation Contractor. The CQA Monitor must verify the following:

- All lines and grades for surface have been verified by the Contractor.
- The soil surface has been rolled and compacted to be free of surface irregularities, loose soil, and protrusions.
- The soil surface does not contain stones or other objects that could damage the GCL.
- The anchor trench dimensions have been checked, and the trenches are free of sharp objects and stones.
- There are no excessively soft areas.
- The soil surface is not saturated, and no standing water is present.
- The soil surface has not desiccated.
- All construction stakes have been removed and there is no debris, rocks, or any other objects in or on the soil surface.
- The Contractor has certified in writing that the surface on which the GCL will be installed is acceptable.

6.5 Installation

The CQA Monitor shall give each panel an identification number, which shall be agreed to and used by the CQA Monitor and the Contractor. The CQA Monitor shall establish a chart showing

correspondence between roll numbers, certification reports, and panel numbers. The CQA Monitor shall record the panel number on the GCL Panel Deployment Log.

During panel placement, the CQA Monitor shall:

- Observe the GCL as it is deployed and record all defects and disposition of the defects (panel rejected, patch installed, etc.). Verify that all repairs are made in accordance with the Specifications.
- Observe that equipment used does not damage the GCL by handling, trafficking, or by other means.
- Observe that people working on the GCL do not smoke, wear shoes that could damage the GCL, or engage in any activities that could damage the GCL.
- Observe that the GCL is anchored to prevent movement by the wind (the Installer is responsible for any damage resulting to or from wind-blown geosynthetics).
- Observe there are no rocks, construction debris, or other items beneath the GCL which could cause damage and verify that the surface beneath the GCL has not deteriorated since previous acceptance.
- Observe that the GCL is not dragged across the ground surface. If the GCL is dragged across the ground surface, it shall be rejected.
- Record weather conditions including temperature, approximate wind, and humidity. Information shall be recorded at appropriate intervals throughout the day. The GCL shall not be deployed in the presence of moisture (fog, dew, mist, rain, etc.).
- Observe that the GCL is not left exposed and is protected from moisture as recommended by the Manufacturer.
- Verify that GCL panels deployed are covered the same day. GCL must be inspected and approved by CQA Monitor before covering.
- Verify that the GCL is placed with the correct sides facing up and down per manufacturer's recommendations.

The CQA Monitor shall inform the CQA Officer and the Engineer if the above conditions are not met.

6.6 Repairs and Seaming

During GCL placement, the CQA Monitor shall observe that the Contractor performs the following activities for the GCL:

- The seams are overlapped and heat bonded in accordance with the Drawings and Specifications.
- Bentonite is spread along the seam in accordance with the manufacturer's recommendations, Drawings, and Specifications.
- Non-destructive and destructive seam testing is performed in accordance with the Specifications.

The CQA Monitor shall observe the placement and seaming activities for the GCL and document all areas that require repair prior to placement of the overlying materials. All repairs are to be performed by the Installer in accordance with the manufacturer's recommendations, the Drawings, and Specifications.

6.7 Materials in Contact with GCL

Equipment used for placing geomembrane material shall not be driven directly on the GCL or any overlying geosynthetics, unless otherwise approved by the Design Engineer.

Installation of the GCL in appurtenant areas, and connection of the GCL to appurtenances shall be made according to the Construction Drawings. The Contractor will ensure that the GCL is not damaged while working around appurtenances.

Geomembranes will be placed over each section of GCL as soon as practical to preclude precipitation or other moisture contact with the GCL. In no case shall the GCL remained exposed overnight.

6.8 GCL Acceptance

The Contractor shall be responsible for maintaining the GCL (or portions thereof) until final acceptance by the CQA Monitor. The CQA Monitor shall recommend final acceptance when all seaming is complete, the Contractor has supplied all documentation, and all laboratory testing is complete and satisfactory. Prior to final acceptance, the Contractor, CQA Monitor, CQA Officer, and the County (if necessary) shall review the installation of the GCL (or portions thereof) for completeness. Any areas that are found to deviate from the intended design, are incomplete, or in need of repair shall be recorded by the CQA Monitor for correction by the Contractor. When

all repairs have been completed, the CQA Monitor shall release the GCL (or portions thereof) for installation of overlying materials.

The Contractor shall retain ownership of the GCL liner throughout the installation of overlying materials as defined within his scope of work and until the project is complete.

7. Geotextile Quality Assurance

7.1 General

This section sets forth the requirements for the CQA testing and observation requirements for installing the geotextile detailed on the Construction Drawings and Specifications. The Contractor shall furnish submittals in compliance with this manual and conditions of warranty prior to construction for review by the CQA Officer and CQA Monitor. The Contractor shall also prepare and submit a time schedule for installation, including complete testing and acceptance of materials prior to construction.

7.2 Geotextile Shipping and Handling

The Contractor shall provide a copy of the certificate of compliance and the QC certificates for production of each geotextile roll manufactured for this project prior to construction for review by the CQA Monitor and CQA Officer. Materials shall be delivered to the site only after the CQA Consultant or the County receives, reviews, and approves the required submittals.

The CQA Monitor shall ensure that the materials were packaged and shipped by appropriate means so that no damage was caused to the materials delivered to the site. Off-loading shall be done in the presence of the CQA Monitor and any damage during off-loading shall be documented by the CQA Monitor and the Contractor. The CQA Monitor shall keep a log of all geotextile delivered to the site on a geotextile receiving log form.

Damaged materials shall be separated from undamaged materials until the CQA Monitor determines proper disposition of material. Final authority on the determination of damage shall be the CQA Monitor. The Contractor shall replace damaged or unacceptable material at no cost to the County.

The geotextile shall be stored on a prepared surface approved by the CQA Monitor and shall be protected from puncture, precipitation, dirt, grease, water, mechanical abrasions, excessive heat, ultraviolet light exposure or other damage. The CQA Monitor shall observe that the Contractor

uses appropriate handling equipment to load, move or deploy the material to ensure that no damage is caused to the material during handling of the geotextile.

7.3 Geotextile Conformance Testing

After production, the geotextile shall be sampled for conformance testing by a third party geosynthetics laboratory. Sampling shall be performed at the manufacturing plant by the third party geosynthetics laboratory or by the CQA monitor upon arrival at the site. One geotextile sample shall be obtained for every 100,000 square feet produced. The CQA Monitor shall identify the roll numbers of the geotextile which are tested for conformance on the log of geotextile received form. The samples shall be delivered to the geosynthetics laboratory to determine that the geotextile properties conform to the requirements given in the Specifications. The CQA Monitor shall review all test results and report any non-conformance test results to the Contractor and the CQA Officer.

The CQA Monitor shall collect samples for conformance testing across the entire width of the roll, but shall not include the first 3 feet of the roll. The conformance samples shall be 3 feet wide by the roll width in length. The CQA Monitor shall mark on each roll the Manufacturer's name, product identification, lot number, roll number, and roll dimensions.

The Contractor shall provide the personnel and equipment to obtain the sample in the presence of the CQA Monitor. The third party geosynthetics laboratory shall conduct the following conformance test on the geotextile:

- Grab strength (ASTM D4632)
- Mass Per unit area (ASTM D5261)
- Permittivity (ASTM D4491)
- AOS (ASTM D4751)
- Puncture Resistance (ASTM D4833)

7.4 Geotextile Installation

The CQA Monitor shall not allow installation of the geotextile until all conformance testing has been completed and passing results have been obtained. During geotextile placement, the CQA Monitor shall:

- Observe the geotextile as it is deployed and record all defects and disposition of the defects (panel rejected, patch installed, etc.).

- Observe that equipment used does not travel on or damage the underlying geomembrane.
- Observe that people working on the geotextile do not engage in activities that could cause damage.
- Verify that the geotextile is anchored to prevent movement by the wind (the Contractor is responsible for any damage resulting to or from windblown geotextile).
- Observe that the seams are overlapped and seamed in accordance with the Specifications.
- Observe that the Contractor has repaired any holes or tears in the geotextile.
- Inspect the geotextile as it is deployed for the presence of foreign materials and needles.

If any needles or other materials which the CQA Monitor feels may be detrimental to the underlying synthetic liner are present within the geotextile, the roll shall be rejected and shipped off-site permanently and the Contractor shall replace any rejected material at no additional cost to the County. The CQA Monitor shall notify the Contractor of any problem areas and observe and inspect the repair. The CQA Monitor shall record all of the above information on log sheets and in daily reports.

7.5 Geotextile Acceptance

The Contractor shall be responsible for maintaining the geotextile (or portions thereof) until final acceptance by the CQA Officer. The CQA Officer shall recommend final acceptance when all seaming has been completed, the Contractor has supplied all documentation, and all laboratory testing is complete and satisfactory. Prior to final acceptance, the Contractor, CQA Monitor, CQA Officer, and the County shall review the installation of the geotextile (or portions thereof) for completeness. Any areas that are found to deviate from the intended design, are incomplete, or in need of repair shall be recorded by the CQA Monitor for correction by the Contractor. When all repairs have been completed, the CQA Officer shall release the geotextile (or portions thereof) for installation of overlying materials.

The Contractor shall retain ownership of the geotextile throughout the installation of overlying materials as defined within his scope of work and until the project is complete.

8. Geocomposite CQA

8.1 General

This section sets forth the requirements for the CQA testing and observation requirements for installing the geocomposite detailed on the Construction Drawings and Specifications. The Contractor shall furnish submittals in compliance with this manual and conditions of warranty prior to construction for review by the CQA Officer and CQA Monitor. The Contractor shall also prepare and submit a time schedule for installation, including complete testing and acceptance of materials prior to construction.

8.2 Geocomposite Shipping and Handling

The Manufacturer shall provide a copy of the certificate of compliance and the QC certificates for production of each geocomposite roll manufactured for this project prior to construction for review by the CQA Monitor and CQA Officer. Materials shall be delivered to the site only after the CQA Consultant or the County receives, reviews, and approves the required submittals.

The CQA Monitor shall ensure that the materials were packaged and shipped by appropriate means so that no damage was caused to the materials delivered to the site. Off-loading shall be done in the presence of the CQA Monitor and any damage during off-loading shall be documented by the CQA Monitor. The CQA Monitor shall keep a log of all geocomposite delivered to the site on a geocomposite receiving log form.

Damaged materials shall be separated from undamaged materials until the CQA Monitor determines proper disposition of material. Final authority on the determination of damage shall be the CQA Monitor. The Contractor shall replace damaged or unacceptable material at no cost to the County.

The geocomposite shall be stored on a prepared surface approved by the CQA Monitor and shall be protected from puncture, precipitation, dirt, grease, water, mechanical abrasions, excessive heat, ultraviolet light exposure or other damage. The CQA Monitor shall observe that the Contractor uses appropriate handling equipment to load, move or deploy the material to ensure that no damage is caused to the materials during handling of the geocomposite.

8.3 Geocomposite Conformance Testing

After production, the geocomposite shall be sampled for conformance testing by a third party geosynthetics laboratory. Sampling shall be performed at the manufacturing plant by the third

party geosynthetics laboratory or by the CQA monitor upon arrival at the site. One geocomposite sample shall be obtained for every 100,000 square feet produced. The CQA Monitor shall identify the roll numbers of the geocomposite which are tested for conformance on the log of geocomposite received form. The samples shall be delivered to the geosynthetics laboratory to determine that the geocomposite properties conform to the requirements given in the Specifications. The CQA Officer shall review all test results and report any non-conformance test results to the Contractor and the CQA Monitor.

Conformance samples shall be collected across the entire width of the roll, but shall not include the first 3 feet of the roll. The conformance samples shall be 3 feet wide by the roll width in length. Each sample shall be marked with the Manufacturer's name and product identification, lot number, roll number, and type (8 oz. double-sided, single-sided, 250-mil, high flow, etc.). In event that sampling is necessary at the site, the Contractor shall provide the personnel and equipment to obtain the sample in the presence of the CQA Monitor. No material shall be deployed until passing conformance values are obtained by the CQA Monitor.

The conformance testing of the geocomposite shall include the following parameters:

- Transmissivity (ASTM D4716)
- Ply Adhesion (ASTM D7005)

8.4 Geocomposite Installation

The CQA Monitor shall not allow installation of the geocomposite until all conformance testing has been completed and adequate results have been obtained. During geocomposite placement, the CQA Monitor shall:

- Observe the geocomposite as it is deployed and record all defects and disposition of the defects (panel rejected, patch installed, etc.).
- Observe that equipment used does not damage the underlying geomembrane.
- Observe that people working on the geocomposite do not engage in activities that could cause damage.
- Verify that the geocomposite is anchored to prevent movement by the wind (the Contractor is responsible for any damage resulting to or from windblown geocomposite).
- Observe that the seams are overlapped and seamed in accordance with the project Specifications.

- Observe that the Contractor has repaired any holes or tears in the geocomposite.
- Inspect the geocomposite as it is deployed for the presence of foreign materials and needles.
- Observe geocomposite rolls for delamination of the geotextile and geonet core. Reject material with areas of delamination greater than allowed in the Specifications.
- If any needles or other materials which the CQA Monitor feels may be detrimental to the underlying synthetic liner are present within the geotextile component of the geocomposite, the roll shall be rejected and shipped off-site permanently and the Contractor shall replace any rejected material at no additional cost to the County. The CQA Monitor shall notify the Contractor of any problem areas and observe and inspect the repair. The CQA Monitor shall record all of the above information on log sheets and in daily reports.

8.5 Geocomposite Acceptance

The Contractor shall be responsible for maintaining the geocomposite (or portions thereof) until final acceptance by the CQA Monitor. The CQA Monitor shall recommend final acceptance when all seaming has been completed, the Contractor has supplied all documentation, and all laboratory testing is complete and satisfactory. Prior to final acceptance, the Contractor, CQA Monitor, CQA Officer, and the Consultant County shall review the installation of the geocomposite (or portions thereof) for completeness. Any areas that are found to deviate from the intended design, are incomplete, or in need of repair shall be recorded by the CQA Monitor for correction by the Contractor. When all repairs have been completed, the CQA Officer shall release the geocomposite (or portions thereof) for installation of overlying materials.

The Contractor shall retain ownership of the geocomposite throughout the installation of overlying materials as defined within his scope of work and until the project is complete.

9. HDPE Pipe

9.1 General

This section cover all HDPE pipe material supply and installation CQA, including CQA of all leachate collection pipes. The Contractor shall provide a copy of the certificate of compliance for production of the piping manufactured for this project prior to construction for review by the CQA Monitor and CQA Officer.

9.2 Delivery

The CQA monitor shall:

- Verify that materials are delivered to the site only after the CQA Monitor receives and approves the required submittals.
- Verify that the materials were packaged and shipped by appropriate means so that no damage was caused to the materials delivered to the site.
- Observe the off-loading and document any damage.
- Keep a log of all piping delivered to the site on a log of piping received
- Verify that damaged materials shall be separated from undamaged materials until the proper disposition of the material can be determined.
- Verify that the Contractor uses appropriate handling equipment to load, move or deploy the material to ensure that no damage is caused to the materials during handling of the piping.
- Verify that the leachate collection piping is not installed until the synthetic liner has been installed and approved.
- Verify that the pipes are correct sizes and perforations (for perforated pipes) are in accordance with Construction Drawings.

Final authority on the determination of damage shall be the CQA Monitor. The Contractor shall replace damaged or unacceptable material at no cost to the County.

9.3 Installation

The CQA Monitor shall verify and observe that:

- Trenches are excavated to the lines and grades shown in the Construction Drawings and are free of debris prior to pipe laying.
- Piping are installed to the lines and grades shown on the Construction Drawings.
- Pipe jointing is in accordance consistent with the Manufacturer's recommendations and Specifications.
- Pipe bedding is installed per Specifications and Construction Drawings.
- Backfilling is installed per Specifications and testing is in accordance with Table 4-2.

10. Concrete

The Contractor shall provide written certificates of compliance certifying that the concrete to be supplied meets the project requirements presented in the Construction Drawings and Specifications along with a mix design. The certificates of compliance shall be accompanied by certified laboratory test results showing that the concrete to be delivered to the job site was tested in accordance with, and meets, the requirements in the Construction Drawings and Specifications.

The certificates of compliance shall be signed by responsible personnel employed by the Contractor and submitted to the CQA Officer at least seven working days prior to shipment to the job site. The certificates of compliance shall include the following:

- The test procedures and the results of laboratory evaluations
- Certification that the tests described in the Specifications and herein were performed and that the results conform to the project requirements in the Construction Drawings and Specifications

The CQA Monitor shall collect representative samples of the concrete delivered to the site for use in conducting field tests and molding compressive strength test specimens in compliance with ASTM C31. The number of sets of concrete cylinder specimens created for each class of concrete placed on each day shall not be less than one set of four 6-inch by 12-inch (one 7-day, two 28-day, and a hold) or five 4-inch by 8-inch cylinders (one 7-day, three 28-day, and a hold), nor less than one set of cylinders for each 100 cubic yards of concrete placed. Samples collected for the molding of concrete compression test cylinders shall also be tested for the following:

- Concrete temperature (ASTM C-1064)
- Slump (ASTM C-143)
- Compressive strength (ASTM C-39)

If concrete delivered in another truck not sampled for the molding of compressive strength specimens appears to be out of the specification range for temperature and/or slump, the CQA Monitor shall conduct additional tests on those trucks to establish if the concrete meets the requirements of the Construction Drawings and Specifications.

Prior to the placement of concrete, the CQA Monitor shall observe the area to receive concrete for the following:

- The aggregate base subgrade has been prepared, compacted, and proof rolled as required by the Specifications
- Reinforcing steel is placed as required by the Construction Drawings
- Reinforcing steel is of the size and grade required by the Construction Drawings
- Reinforcing steel is free of rust, scale, or other deleterious material that could affect the quality of the concrete bond to it. A light layer of tightly-adhering mill scale shall not be cause for rejection or action by the contractor
- Reinforcing steel is adequately tied and supported as to preclude its displacement during concrete placement
- Forms are sturdy and of the dimensions shown on the construction drawings
- Subgrade is moistened immediately prior to concrete placement and no standing water is present
- No trash or other deleterious material is present within the forms

During the placement of concrete, the CQA Monitor shall observe the placing procedures for the following:

- The approved mix design is delivered and placed
- Concrete is not allowed to free fall greater than 4 feet without the use of a tremie
- Concrete is not handled in a way as to cause segregation
- Concrete is adequately consolidated via internal vibration as to preclude the development of voids or "honeycombing" and to create adequate adhesion of the concrete to the reinforcing steel
- Concrete is placed to the shape and dimensions shown on the Construction Drawings
- Concrete does not exceed 90 minutes in age from the initial addition of water
- Concrete does not exceed 90 degrees Fahrenheit during staging and/or placing
- Concrete is finished and scored as required by the Construction Drawings and/or Specifications
- Concrete is cured per the Specifications

10.1 Drop Inlet Structures

The CQA Monitor shall observe and document that all drop inlets, excavations, and backfill materials are installed in general accordance with the Construction Drawings, Specifications and Manufacturer's guidelines.

Backfill around manholes and inlet structures shall be observed and tested in accordance with the frequencies and requirements for engineered fill placement, as specified in the Specifications.

11. Quality Assurance for Other Improvements

This section describes CQA procedures for other improvements such electrical, and mechanical features. Specific requirements for electrical and mechanical features are included in the Drawings.

11.1 Structural and Miscellaneous Metals

Review the Contractor's approved material submittals to verify compliance with the technical specifications. Determine and note corrective action items if applicable.

- Verify that all delivered metal materials are new and free of warps, deformations, unspecified bends, and excessive oxidation.
- Verify that all metal materials are stored on blocking so that no metal touches the ground, is covered to prevent water from accumulating on finished metal, and will not bend under its own weight or superimposed loads.
- Verify that all bolted connections are fastened in accordance with Section 1.16 of the AISC Specification.
- Verify that all welded connections are welded in accordance with Section 1.17 of the AISC Specifications.
- Verify that areas where galvanizing was removed for welding or other purposes is touched up with a galvanizing coating with 95 percent zinc by dry weight.
- Verify that all metal not galvanized or embedded in concrete is primed and painted in accordance with the Specifications.

11.2 Mechanical Systems

Review the Contractor's approved submittals to review compliance with the Specifications.

- Care during storage, installation, lubrication, and startup of all pumps and motors shall be in strict conformance with the manufacturer's instructions.
- A field test shall be performed by the Contractor on all pumps in the presence of CQA personnel. If the equipment fails to perform, the burden will be on the Contractor to make such additional modifications as required to show such equipment is performing as specified.
- Prior to acceptance of the pump installed at the job site, the Contractor shall demonstrate proper operation of the pumps and motors throughout the full range of potential operating conditions.
- Verify that all piping, plumbing, and fittings are installed in strict conformance with the manufacturer's recommendations. The interior of all piping and fittings shall be cleaned of dirt and debris prior to connecting to equipment.

11.3 Electrical and Instrumentation

Review the Contractor's approved material submittals to verify compliance with the technical specifications. Determine and note corrective action items if applicable.

- Verify that the control panel, conductors, conduit, fittings, pullboxes, junction boxes, cable, receptacles, circuit breakers, disconnect switches, and motor starters are in compliance with the Specifications and approved by the Engineer.
- Verify that all panels, enclosures and conduit supports, racks, frames and structures are suitable for weight, lateral loads and stresses (including seismic), and are properly assembled and anchored.
- Verify all above grade conduit supports and clamps are properly secure and that they meet the minimum spacing requirements.
- Verify the correct location and application of hazardous location conduit seals and compound meet NEC and industry standards such that the migration of hazardous and explosive gasses are prevented.

- Verify that signal conductors and power conductors do not share common raceways, pullboxes, or junction boxes.
- Verify that conductors are continuous and that splices do not occur outside of pullboxes, junction boxes, or other similar approved equipment.
- Verify that installed conduit is of the size indicated and is not crushed or deformed.
- Verify that all conduits are capped with a watertight seal from the installation until the conductors are pulled through. The watertight caps for spare conduits shall remain.
- Verify that all metal conduit is reamed, cleaned, and has all burrs removed prior to the installation of conductors.
- Verify that all buried raceways emerge at right angles and have no curved portion exposed.
- Verify that a nylon pull cord is installed in each empty conduit for future conductors.
- Verify minimum of 2-foot cover above electrical conduit or as shown on the drawings.
- Verify conduit spacers are used in trenches containing four or more conduits.
- Verify spacers are nonmetallic and designed for the purpose.
- Verify ground rods are as specified and are driven full length into the earth.
- Verify ground connections are made by brazing, thermite welding, or with approved pressure terminals. Inaccessible connections shall be thermite welding.
- Verify ground rod and conductor resistance test.
- Verify that adequate working clearances and dedicated electrical spaces are maintained around electrical equipment.
- Verify that all conductor splices are wrapped in a vinyl plastic, weather-resistant tape with a minimum thickness of 8.5 mil.
- Verify that upon completion of work, materials, scraps, and debris are removed from the premises and the interior/exterior of all equipment and damaged surfaces are returned to new condition.

- Verify conductor insulation test (meggering) of all 480 volt conductors, and any power conductors in below grade conduits, or conductors feeding submersible pumps.
- Verify submersible pump motor and feeder conductor resistance for continuity.
- Verify that the motors are connected properly and that the rotation and pumping direction are as designed.
- Verify correct conductor and cable labeling/marking.
- Verify correct terminal ID/labeling.
- Verify that intrinsically safe conductors maintain minimum separation from power and non-intrinsically safe conductors.
- Verify that wiring methods in junction boxes, pullboxes and panels are supported, laid and cable tied neatly, such that normal access into enclosures and operation of panel door/hinged mounted electrical are not exposed to undue stress or physical damage.
- Verify that all conduit fittings, junction boxes, pullboxes and panel openings, knockouts, penetrations, seals, covers, and gaskets meet the minimum requirements for location, weather, dust, moisture, and water exposure.
- See the Operational Readiness Test (ORT) in the Electrical Work Specifications for procedures outlining the testing of conductor insulation, the entire grounding system, and the equipment line current.
- Verify that the instrumentation and controls system is fully tested as detailed in the specifications. The sequence test and calibration shall be performed prior to any functional acceptance testing.

Each ORT shall be completed, documented, and submitted to the CQA Officer prior to the Functional Acceptance Testing (FAT). Notify the CQA officer at least one week before the FAT so that the CQA Monitor can be present for all FAT procedures.

12. Work Deficiencies

When a failed test occurs during earthwork, (e.g. compaction test failure), the Contractor is directed to correct the deficiency by reworking the failed area extending halfway to the adjacent

passing test location. The CQA Monitor will then retest the reworked area. The process is repeated until passing result is obtained.

The Contractor will be required to correct all deficiencies to the satisfaction of the CQA Monitor. If the Contractor is unable to correct the problem, the CQA Monitor shall develop and recommend a solution and provide to the CQA Officer for his approval. CQA Monitor then will provide the solution to the Contractor.

All corrected deficiencies shall be retested before the Contractor performs additional work. The CQA Monitor shall document all retests and the steps taken to correct the problem on a field construction inspection report and on construction problem and solution data sheet forms.

13. Documentation

13.1 Daily Records

At a minimum, daily records shall consist of field notes, a summary of the daily construction activities, associated testing activities, and observation and data sheets. All project records shall be maintained in a well-organized project file at the job site and shall be available for review by the County, Contractor, and jurisdictional agencies during working hours. The CQA Officer shall review the reports and field notes prepared by the CQA Monitor and prepare a summary report from the daily records and observation data sheets. The CQA Monitor's daily summary report shall be available to the CQA Officer and the Contractor for review. Except for special circumstances, copies of the daily reports shall be provided to the CQA Officer immediately upon completion for review and approval. Once reviewed and approved by the CQA Officer, daily reports shall be provided within 48 hours of the completion of the workday in question. The daily report shall include the following information:

- Date, project name, and location
- Weather data
- A description of on-going construction
- A summary of test results identified as passing, failing, or in the event of a failed test, retests
- Off-site materials received including drainage materials, plus status of certificates or off-site testing for the materials
- A summary of decisions regarding acceptance of the work and/or corrective actions taken

- The signature or initials of the CQA Monitor

13.2 Observation and Test Data Sheets

The CQA Monitor shall prepare observation and data sheets during all phases of construction of the cover system for review by the CQA Officer. Observation and data sheets for this project shall include, but may not be limited to the following:

- Field Construction Inspection and Meeting Reports
- Field Density Data Sheets
- Field Density Summary
- Sieve Analysis and Atterberg Limits Data Sheets
- Acceptance of Prepared Subgrade Forms
- Photograph Log

Additional observation and data sheets may be required. All entries shall be clear and legible. All documentation should be dated and signed or initialed clearly by the CQA Monitor.

13.3 Weekly Progress Reports

The CQA Monitor shall prepare a weekly progress report summarizing the CQA activities for the preceding period. The CQA Officer shall review the daily reports and summaries of observation and data sheets in addition to the weekly progress reports. The CQA Officer shall discuss progress and the results of all testing and CQA observation and documentation with the CQA staff to ensure that the construction is of excellent quality.

13.4 Design Change Reports

Design and Specification changes may be required during construction. In such cases, the CQA Monitor shall notify the CQA Officer. Significant design and specification changes shall only be made after they have been reviewed and approved by the CalRecycle, the LEA and the RWQCB, and with written agreement of the Design Engineer and the County.

13.5 Construction Difficulty Reports

In the event that the Contractor has extreme difficulty in the performance of any specified activities required, a special report shall be prepared to address the problem(s). The County staff, Contractor, CQA Monitor, and CQA Officer (if needed) shall meet to discuss any problems

encountered and to address the solution. If changes to the Construction Specifications are required, the Design Engineer, CQA Officer and the County shall be notified and approve any changes in writing.

13.6 Final Report

At the completion of the project, the CQA Consultant shall prepare a Statement of Certification to be submitted to the County and RWQCB. Within 30 days of project completion, the CQA Consultant shall prepare a final construction report suitable for presentation to the Regulatory agencies. Copies of all reports and test results prepared by the CQA Monitor shall be submitted to the CQA Officer for review. Copies of all the documents shall be maintained at the CQA Officer's office. This report shall verify that the work has been performed in compliance with the Construction Drawings and the Specifications. At a minimum this report shall contain:

- A summary of all construction activities
- A description of significant construction problems and the resolution of these problems
- A list of changes (if any) from the Construction Drawings and Specifications and the justification for these changes
- A statement signed and sealed by a Registered Civil Engineer or Certified Engineering Geologist registered in the State of California verifying that the project was constructed in general accordance with the Construction Drawings, Specifications, and CQA Manual

13.7 Record Drawings

A set of record drawings shall be prepared by the Contractor during the course of construction. The record drawings shall accurately locate all construction items including the location of piping and the extent of lining and collection system components, and other relevant construction components. This information shall be reviewed for completeness by the CQA Officer and included into the Final Report.

Construction Quality Assurance Manual
Landfill Module 7 Construction
North County Recycling Center and Sanitary Landfill

Appendix A

Electric Leak Location Testing

Geo-Logic ASSOCIATES

APPENDIX A

SECTION 02780

ELECTRIC LEAK LOCATION (ELL) TESTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section includes a description of the electric leak location (ELL) testing using bare liner survey methods (water puddle or arc testing) and covered liner survey methods (dipole) both before and after cover soil placement, respectively.

B. A bare liner survey method must be performed on the primary geomembrane and secondary sump geomembrane.

C. A dipole survey must be performed after placement and grading of the operations layer.

1.2 RELATED SECTIONS

A. Section 02589 – ELECTRICAL LEAK LOCATION SURVEY SUPPORT

1.3 REFERENCES

A. ASTM D6747 – Standard Guide for Selection of Techniques for Electrical Leak Location of Leaks in Geomembranes

B. ASTM D7002 – Standard Practices for Locating Leak on Exposed Geomembranes Using the Water Puddle System

C. ASTM D7953 – Standard Practice for Electrical Leak Location on Exposed Geomembranes Using the Arc Testing Method

D. ASTM D8265 – Standard Practices for Electrical Methods for Mapping Leaks in Installed Geomembranes

1.4 SUBMITTALS

A. Prior to commencement of the ELL surveys, the ELL consultant shall submit a Work Plan. The ELL Survey Work Plan shall include:

1. Qualifications of the proposed ELL consultant including the number of years the ELL consultant has performed the proposed survey method.

2. Description of the proposed survey method, procedures, site preparations, estimated duration of survey, and quality control and field calibration

procedures.

3. A Statement of Qualifications meeting the requirements of Section 2.1, Paragraph A.

B. If necessary, the ELL consultant shall provide installation instructions for any permanent electrodes or wires to the Contractor prior to the installation of the geomembrane cover.

C. The ELL consultant shall report the general results of the survey to the Contractor and County during the daily progress of the field work.

D. Prior to the demobilization of the survey personnel from the site, the ELL consultant shall submit a list of locations of the leaks detected.

E. The ELL consultant shall submit a letter report documenting the field work and results of the surveys within fourteen (14) days after completion of the field work signed by a Registered Civil Engineer in the state where the work was performed.

PART 2 PRODUCTS

2.1 LEAK LOCATION CONTRACTOR AND SUPERVISOR QUALIFICATIONS

A. The ELL consultant shall have qualifications and experience in conducting ELL surveys including having tested a minimum of 10,000,000 square feet of geomembrane liner and a minimum of 5,000,000 square feet of the proposed survey method on at least five projects. In addition, the ELL survey shall be supervised by a professional or technician with a minimum of 2,000,000 square feet of electrical leak location testing experience using the proposed method on at least three projects.

PART 3 EXECUTION

3.1 INFORMATION REQUIRED

A. The ELL consultant shall be provided with drawings showing:

1. All layers constituting the lining system and details of all liner penetrations.

2. Plan of the survey area.

3. Peripheral details, including welds to adjacent lining systems.

4. Structures and obstructions above the liner.

5. Electrical equipment above the geomembrane.

3.2 BARE GEOMEMBRANE TESTING

3.2.1 WATER PUDDLE LEAK LOCATION SURVEY

1. The water puddle leak location survey shall be performed after the installation of the primary HDPE geomembrane.

2. The survey area must be relatively clean and very dry. Any objects such as sand bags on the geomembrane must be removed for testing. A blower is sometimes useful.

3. The ELL consultant is responsible for calibrating equipment utilized to achieve optimum data quality and sensitivity for the site conditions. This usually involves drilling some holes in the geomembrane which may be required to be repaired by the Contractor.

4. All testing shall be performed in accordance with current industry and ASTM standards.

5. The survey works best when the geomembrane is in intimate contact with the subgrade. Wrinkles are an impediment to conducting a good survey. Defects on wrinkles may not be detected. Therefore, it is usually in the interest of the project to conduct the survey when the liner system is cool and flat, such as in the morning or during the night.

6. Working on slopes with smooth geomembrane can create safety hazards with slippery surfaces, and may require additional harnessing and slower production rates.

7. Leak locations shall be logged, visibly marked, and reported for repair.

8. The ELL consultant shall report the general results of the survey to the Lead CQA Monitor and Contractor during the daily progress of the field work.

9 Prior to the demobilization of the survey personnel from the site, the ELL consultant shall submit a list of locations of the leaks detected to the Lead CQA Monitor and Contractor.

10. The ELL consultant shall submit a letter report documenting the field work and results of the surveys to the Contractor within fourteen (14) days after completion of the ELL surveys.

3.2.2 ARC TESTING

1. Arc testing may be performed in lieu of the water puddle method after the installation of the secondary sump geomembrane.

2. The survey area must be relatively clean and very dry. Any objects such as sand bags on the geomembrane must be removed for testing.

3.3 DIPOLE LEAK LOCATION SURVEY

A. The dipole leak location survey shall be performed in accordance with ASTM D8265 after the placement of the protective cover layer.

B. The ELL consultant is responsible for calibrating all equipment utilized to achieve optimum data quality and sensitivity for the site conditions.

C. Data acquisition shall be GPS-based and a voltage map of the recorded dipole measurements shall be generated in three dimensions with appropriate contour intervals and colored voltage ranges.

D. Manual measurements shall be made to verify leak signals and to pinpoint the leak positions on top of the protective cover layer for excavation while the survey personnel are on site. Within one foot of the liner, the Contractor's laborers shall hand excavate possible leak locations to expose the liner.

E. Additional manual measurements should be made to guide the Contractor's personnel while they excavate the leak, if required.

F. After the identification and excavation of a leak, the soil around the leak location shall be tested while the leak is uncovered and cleaned to check for adjacent leaks.

G. Leak locations shall be logged, visibly marked, and reported for repair.

H. The ELL consultant shall report the general results of the survey to the Lead CQA Monitor and Contractor during the daily progress of the field work.

I. Prior to the demobilization of the survey personnel from the site, the ELL consultant shall submit a list of locations of the leaks detected to the Lead CQA Monitor and Contractor.

J. The ELL consultant shall submit a letter report documenting the field work and results of the surveys to the Contractor within fourteen (14) days after completion of the ELL surveys.

PART 4 SURVEY PREPARATIONS AND SUPPORT (Provided by the Contractor)

4.1 SITE PERPARATION

A. The Contractor is responsible for preparing the survey area for the ELL survey as follows:

1. Install necessary electrodes to support the ELL surveys

2. Dipole Survey: The Contractor shall coordinate with the ELL Consultant to provide an electrically isolated survey area. This usually entails placing cover material short of the liner termination(s) so that clean, dry

geosynthetics are visible around the entire testing area. The isolation trench should be at least 1’ wide.

3. Bare Liner Survey: If it is determined the survey must take place at night due to excessive wrinkles in the liner during the day, light plants shall be supplied by the Contractor at the time and for the duration of the survey.

4.2 SURVEY SUPPORT

A. The Contractor is responsible for providing support for the electrical leak location survey as follows:

1. Bare Liner Survey:

a. Provide water, water truck and driver, and wet the survey area prior to and potentially during the dipole survey, as deemed necessary by the ELL Consultant.

2. Dipole Survey:

a. The calibration process requires digging several holes down to the surface of the geomembrane to place the artificial and/or actual holes. The Contractor shall provide a backhoe or equivalent with operator to excavate the cover soils down to the geomembrane. In some cases, labor is acceptable to equipment. The ELL Consultant will place the artificial or actual holes and the Contractor shall then replace the cover materials in the order they were excavated.

b. Excavate and expose any anomaly locations requiring investigation.

c. Clean off and dry any leaks uncovered.

END OF SECTION

SJCDPW-RFP-25-01

COUNTY OF SAN JOAQUIN
DEPARTMENT OF PUBLIC WORKS
STOCKTON, CALIFORNIA

LANDFILL MODULE 7 CONSTRUCTION AT THE NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

To Be Supplemented by Standard Plans Dated October 2024
and Revised Standard Plans

FEBRUARY 4, 2025
DATE

Jake Russell, R.C.E. 64512
PROJECT MANAGER
Geo-Logic Associates

COUNTY OF SAN JOAQUIN

Submitted ____________________, 2025

FRITZ BUCHMAN
DIRECTOR OF PUBLIC WORKS

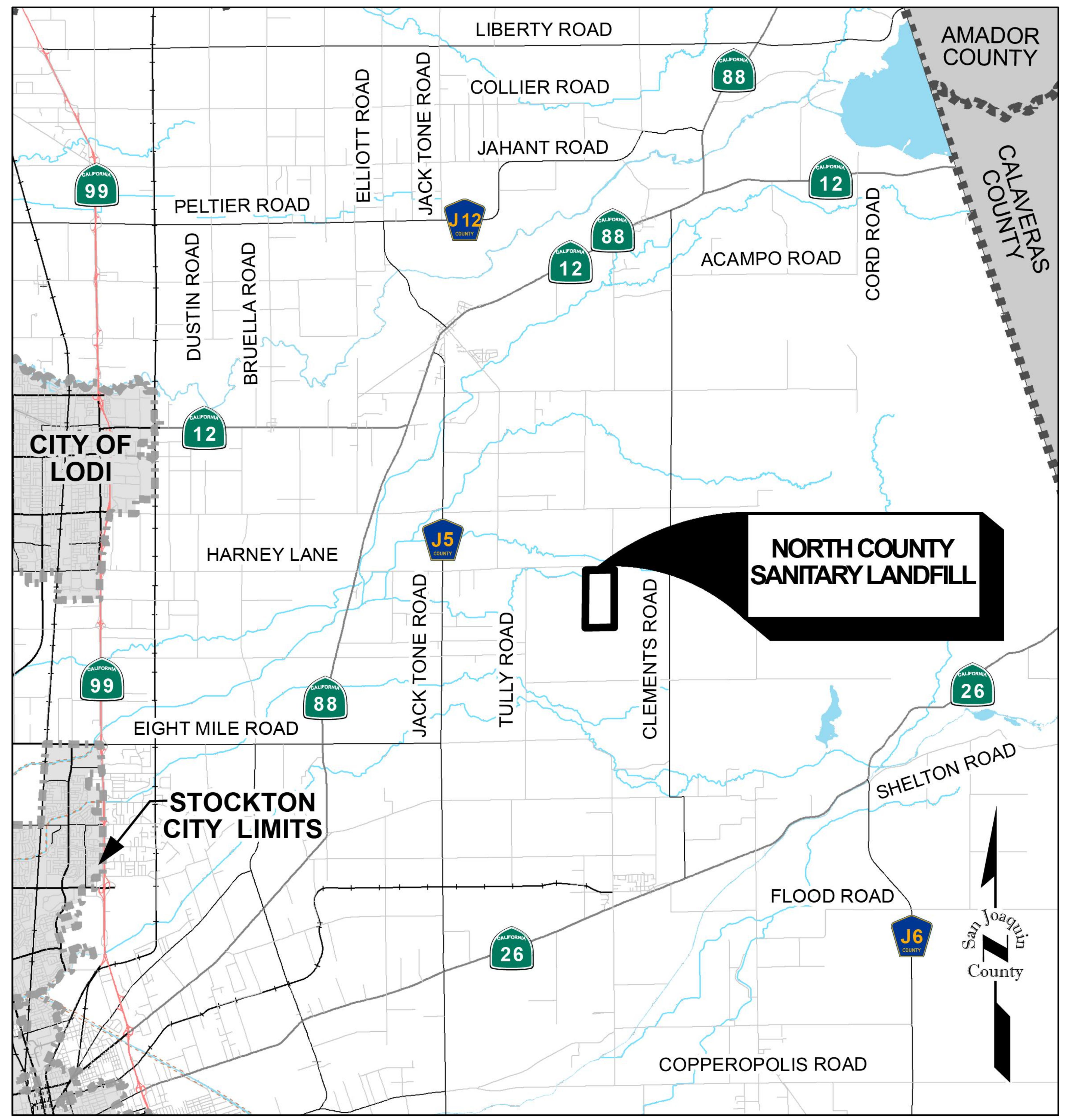
ABBREVIATIONS

(IN ADDITION TO ABREVIATIONS SHOWN ON CALTRANS STANDARD PLANS A3A, A3B, AND STANDARD SPECIFICATIONS 1-1.06 ABBREVIATIONS)

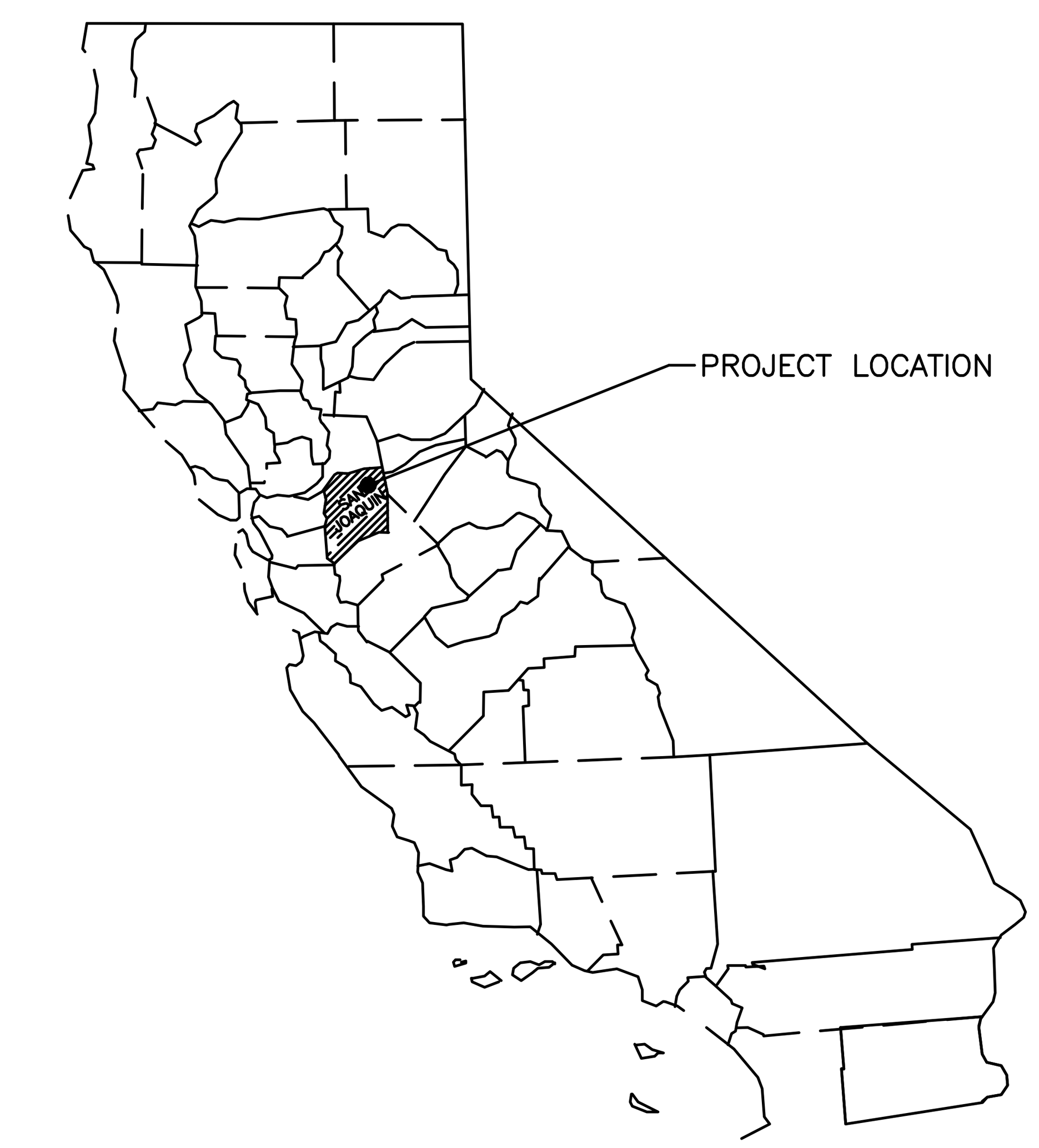
CP	CONTROL POINT
ø	DIAMETER
E	EASTING
EHD	SAN JOAQUIN ENVIRONMENTAL HEALTH DEPARTMENT
EL	ELEVATION
FT	FEET
GCL	GEOSYNTHETIC CLAY LINER
HDPE	HIGH DENSITY POLYETHYLENE
IE	INVERT ELEVATION
LCRS	LEACHATE COLLECTION AND RECOVERY SYSTEM
LFG	LANDFILL GAS
MAX	MAXIMUM
MIN	MINIMUM
MSL	MEAN SEA LEVEL, ZERO ELEVATION FOR LOCAL AREA
NAVD 88	NORTH AMERICAN VERTICAL DATUM OF 1988, GEODETIC DATUM BASED ON MSL AT FATHER POINT/RIMOUSKI, CANADA
N	NORTHING
NIC	NOT IN CONTRACT
NIS	NOT IN SECTION
NTS	NOT TO SCALE
OC	ON CENTER
OPS	OPERATIONS LAYER
OSD	OVER SIDE DRAIN
%	PERCENT
SCH	STANDARD DIMENSIONAL RATIO
SDR	STANDARD DIMENSIONAL RATIO
SS	STAINLESS STEEL
TYP	TYPICAL
VZ	VADOSE ZONE

DRAWING INDEX

DWG #	DESCRIPTION
GENERAL	
G01	TITLE SHEET
G02	EXISTING CONDITIONS AND SITE PLAN
CIVIL	
C01	BASE LINER SUBGRADE PLAN
C02	MODULE 7 LYSIMETER SYSTEM
C03	STORMWATER AND EROSION CONTROL PLAN
C04	SUMP PLAN VIEW
	C05-C09 RESERVED
C10	DETAILS
C11	DETAILS
C12	DETAILS
C13	DETAILS
C14	DETAILS
C15	DETAILS
C16	DETAILS
C17	DETAILS

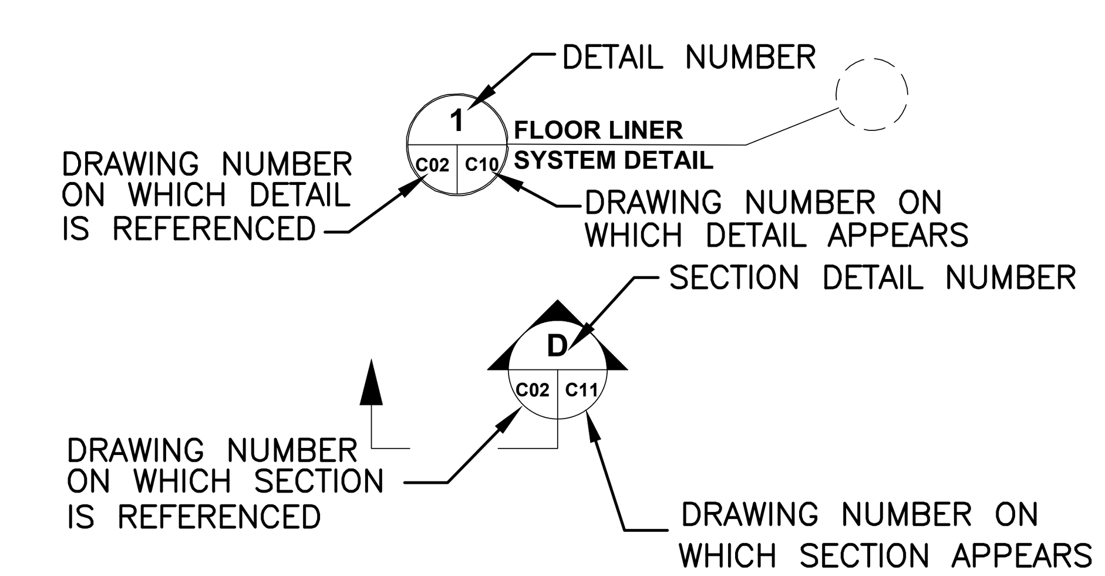


PROJECT LOCATION MAP
NO SCALE



VICINITY MAP

SYMBOLS

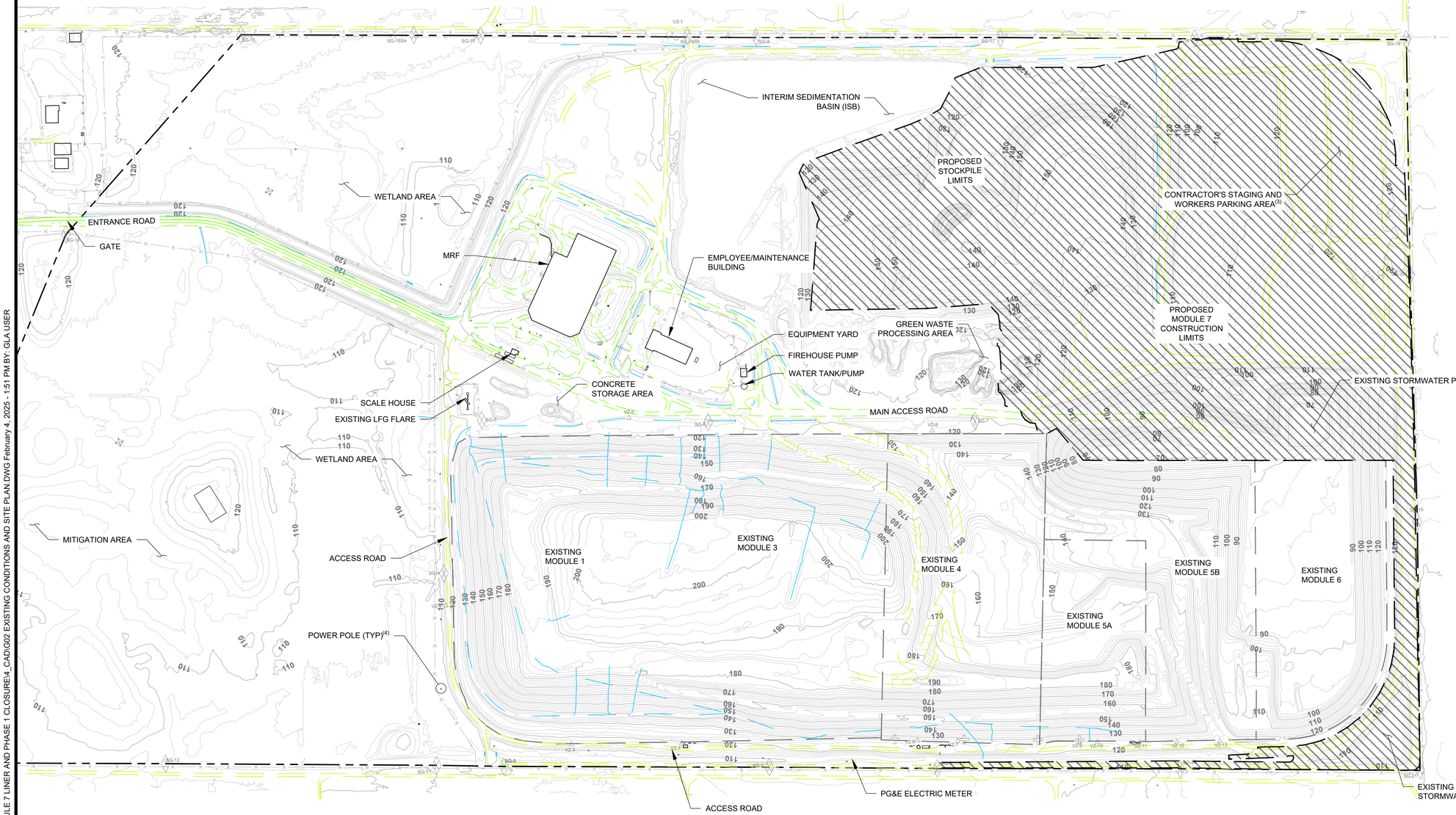


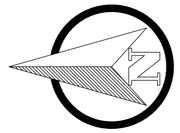
PROJECT ENGINEER	DATE	CHECKED	DATE	ACCEPTED	DATE
RDD		JVR	2/4/2025		

NO.	REVISION	BY	DATE
A	ISSUED FOR PERMITTING	JVR	2/4/2025

DWG. NO. G01

PROJECT NO. AU24.1294.00





LEGEND

- EXISTING 10' CONTOUR(1)
- EXISTING 2' CONTOUR(1)
- SITE BOUNDARY
- EXISTING FENCE
- EXISTING DRAINAGE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING LINER LIMIT
- EXISTING LFG PIPING(2)
- EXISTING BUILDINGS
- APPROXIMATE LIMITS OF MODULE 7 CONSTRUCTION
- EXISTING MONITORING WELL(2)
- EXISTING VADOSE ZONE SAMPLING POINT(2)
- CONTROL POINTS
- EXISTING SOIL GAS SAMPLING POINT(2)
- POWER POLE(4)
- TRANSMISSION TOWER

NOTES

1. REFERENCE AERIAL TOPOGRAPHY BASED ON THE DECEMBER 2023 AERIAL SURVEY AND APPROXIMATE WASTE FILL GRADING.
2. CONTRACTOR SHALL FLAG AND PROTECT ALL EXISTING MONITORING EQUIPMENT.
3. LOCATION OF CONTRACTOR'S TRAILER TO BE COORDINATED WITH ENGINEER.
4. PROTECT ALL POWER POLES. ANY DAMAGE TO POWER POLES OR LINES TO BE REPAIRED AT CONTRACTOR'S EXPENSE.
5. EXISTING STORMWATER POND TO BE DRAINED AND OVER-EXCAVATED TO REMOVE SATURATED AND SILTY SOILS.

ISSUED FOR PERMITTING

REV. NO.	DATE	DESCRIPTION	APPROVED BY
A	2/4/2025	ISSUED FOR PERMITTING	JVR

DATE OF ISSUE:	2/4/2025
DESIGNED BY:	RDD
DRAWN BY:	PLA
CHECKED BY:	JVR
APPROVED BY:	JVR

Geo-Logic ASSOCIATES
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SAN JOAQUIN COUNTY
DEPARTMENT OF PUBLIC WORKS
SOLID WASTE

NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

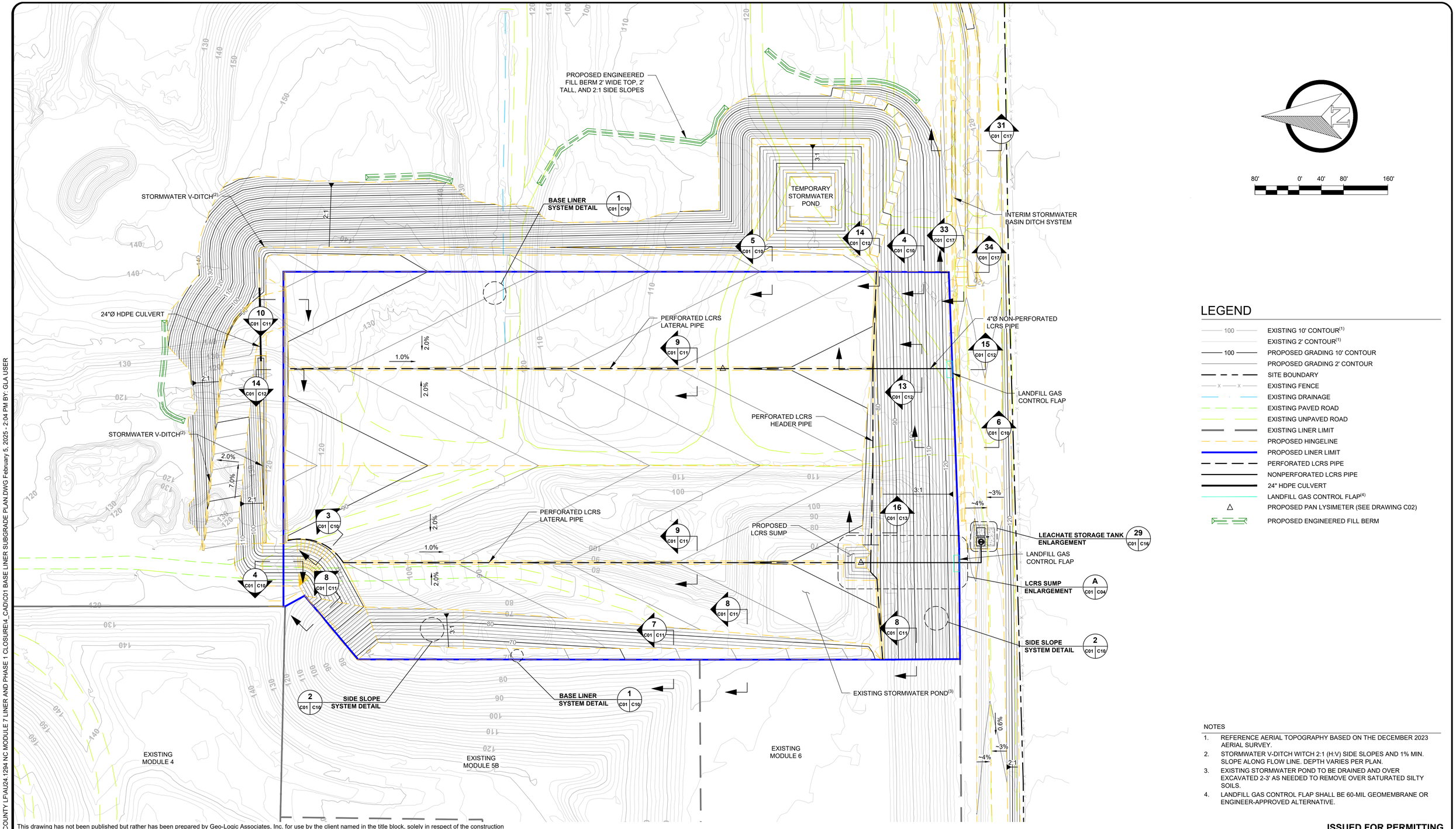
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

EXISTING CONDITIONS AND SITE PLAN

DRAWING NO. G02

PROJECT NO. AU24.1294.00



LEGEND

- EXISTING 10' CONTOUR(1)
- EXISTING 2' CONTOUR(1)
- PROPOSED GRADING 10' CONTOUR
- PROPOSED GRADING 2' CONTOUR
- SITE BOUNDARY
- EXISTING FENCE
- EXISTING DRAINAGE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING LINER LIMIT
- PROPOSED HINGELINE
- PROPOSED LINER LIMIT
- PERFORATED LCRS PIPE
- NONPERFORATED LCRS PIPE
- 24" HDPE CULVERT
- LANDFILL GAS CONTROL FLAP(4)
- PROPOSED PAN LYSIMETER (SEE DRAWING C02)
- PROPOSED ENGINEERED FILL BERM

NOTES

1. REFERENCE AERIAL TOPOGRAPHY BASED ON THE DECEMBER 2023 AERIAL SURVEY.
2. STORMWATER V-DITCH WITCH 2:1 (H:V) SIDE SLOPES AND 1% MIN. SLOPE ALONG FLOW LINE. DEPTH VARIES PER PLAN.
3. EXISTING STORMWATER POND TO BE DRAINED AND OVER EXCAVATED 2-3' AS NEEDED TO REMOVE OVER SATURATED SILTY SOILS.
4. LANDFILL GAS CONTROL FLAP SHALL BE 60-MIL GEOMEMBRANE OR ENGINEER-APPROVED ALTERNATIVE.

ISSUED FOR PERMITTING

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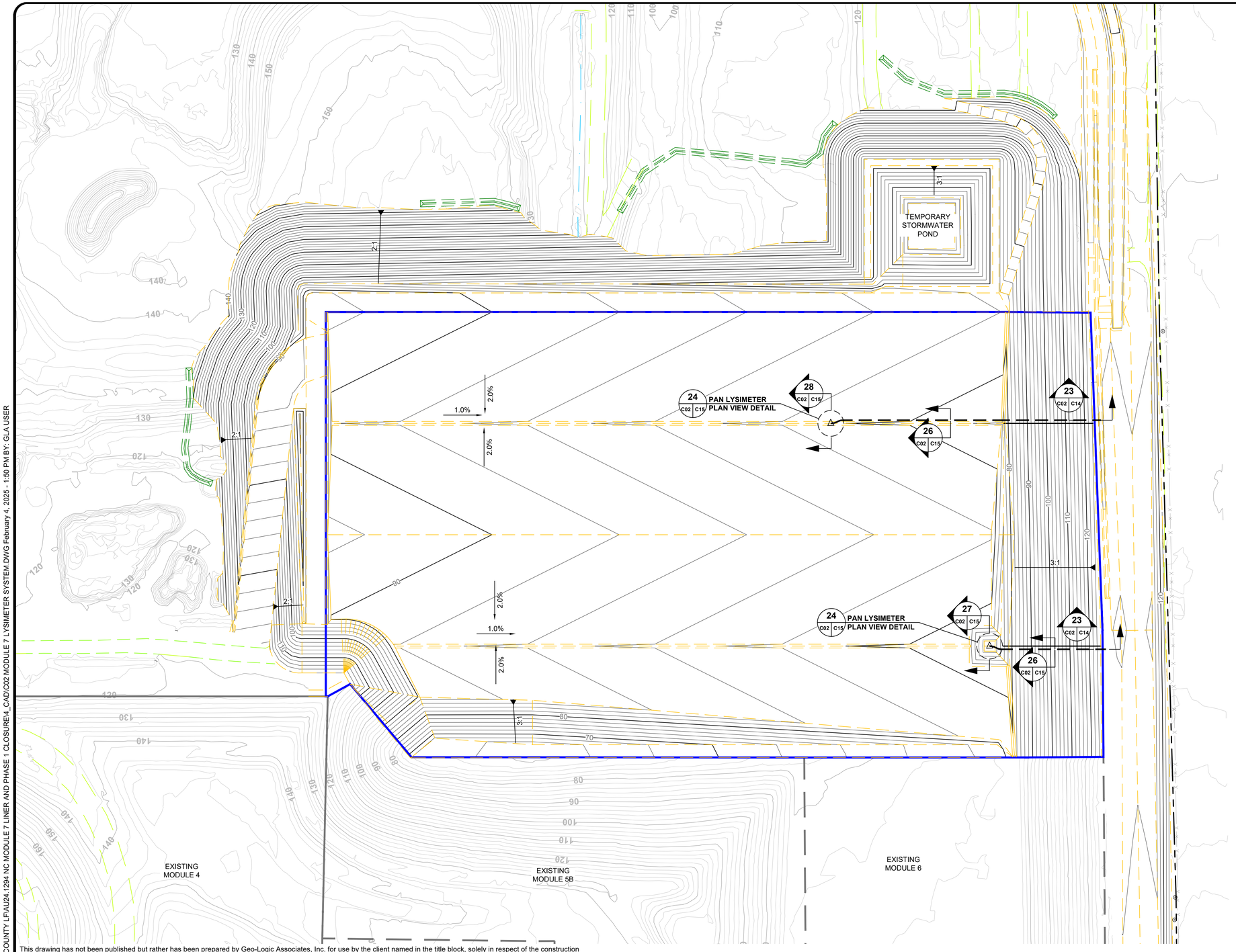
LANDFILL MODULE 7 CONSTRUCTION

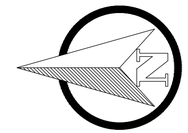
SAN JOAQUIN COUNTY, CALIFORNIA

BASE LINER SUBGRADE PLAN

DRAWING NO. C01

PROJECT NO. AU24.1294.00





LEGEND

- EXISTING 10' CONTOUR[1]
- EXISTING 2' CONTOUR[1]
- PROPOSED GRADING 10' CONTOUR[2]
- PROPOSED GRADING 2' CONTOUR[2]
- SITE BOUNDARY
- EXISTING FENCE
- EXISTING DRAINAGE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING LINER LIMIT
- PROPOSED MODULE 7 LYSIMETER TRENCH
- PROPOSED HINGELINE
- PROPOSED LINER LIMIT
- PROPOSED MODULE 7 PAN LYSIMETER
- PROPOSED ENGINEERED FILL BERM

NOTES

1. REFERENCE AERIAL TOPOGRAPHY BASED ON THE DECEMBER 2023 AERIAL SURVEY.
2. CONTOURS SHOWN WITHIN LINER LIMITS REPRESENT GEOMEMBRANE LINER GRADE.

ISSUED FOR PERMITTING

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NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

LANDFILL MODULE 7 CONSTRUCTION

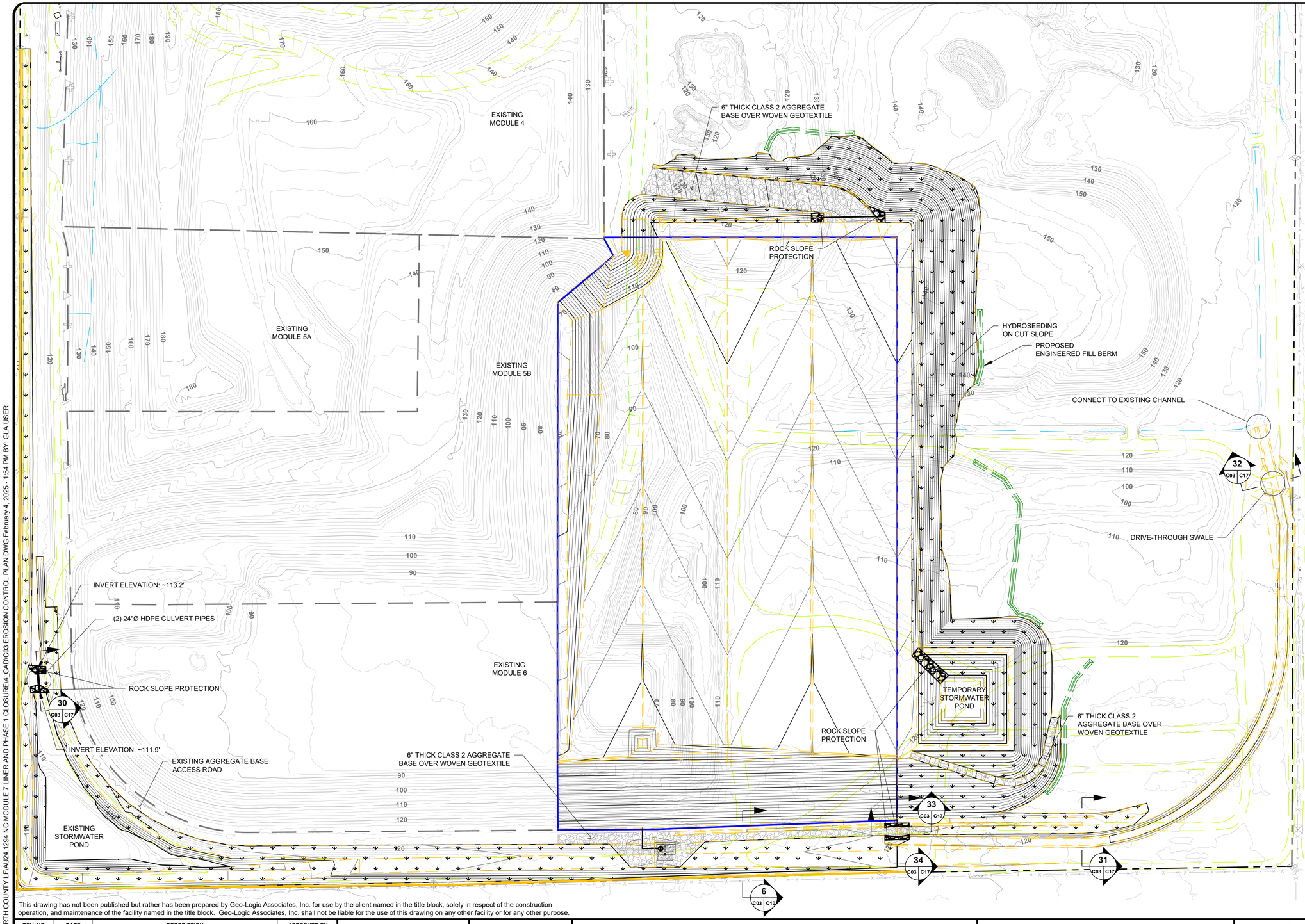
SAN JOAQUIN COUNTY, CALIFORNIA

MODULE 7 LYSIMETER SYSTEM

DRAWING NO. C02

PROJECT NO. AU24.1294.00

N:\SAN JOAQUIN\NORTH COUNTY LF\AU24.1294 NC MODULE 7 LINER AND PHASE 1 CLOSURE\4_CAD\C02 MODULE 7 LYSIMETER SYSTEM.DWG February 4, 2025 - 1:50 PM BY: GLA USER



100' 0' 50' 100' 200'

LEGEND

- EXISTING 10' CONTOUR[1]
- EXISTING 2' CONTOUR[1]
- PROPOSED GRADING 10' CONTOUR
- PROPOSED GRADING 2' CONTOUR
- SITE BOUNDARY
- EXISTING FENCE
- EXISTING DRAINAGE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- PROPOSED LINER LIMIT
- EXISTING LINER LIMIT
- PROPOSED HDPE CULVERT PIPE
- PROPOSED STRAW WATTLES
- PROPOSED ROCK SLOPE PROTECTION
- PROPOSED HYDROSEEDING
- PROPOSED AGGREGATE BASE
- PROPOSED REINFORCED CONCRETE SWALE
- EXISTING VADOSE ZONE SAMPLING POINT[2]
- EXISTING LEACHATE SAMPLING POINT[2]
- EXISTING SOIL GAS SAMPLING POINT[2]
- EXISTING MONITORING WELL[2]
- EXISTING STORMWATER SAMPLING POINT[2]
- POWER POLE[3]
- PROPOSED ENGINEERED FILL BERM

NOTES

1. REFERENCE AERIAL TOPOGRAPHY BASED ON THE DECEMBER 2023 AERIAL SURVEY.
2. CONTRACTOR SHALL FLAG AND PROTECT ALL EXISTING MONITORING EQUIPMENT.
3. PROTECT ALL POWER POLES. ANY DAMAGE TO POWER POLES OR LINES TO BE REPAIRED AT CONTRACTOR'S EXPENSE.

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LANDFILL MODULE 7 CONSTRUCTION

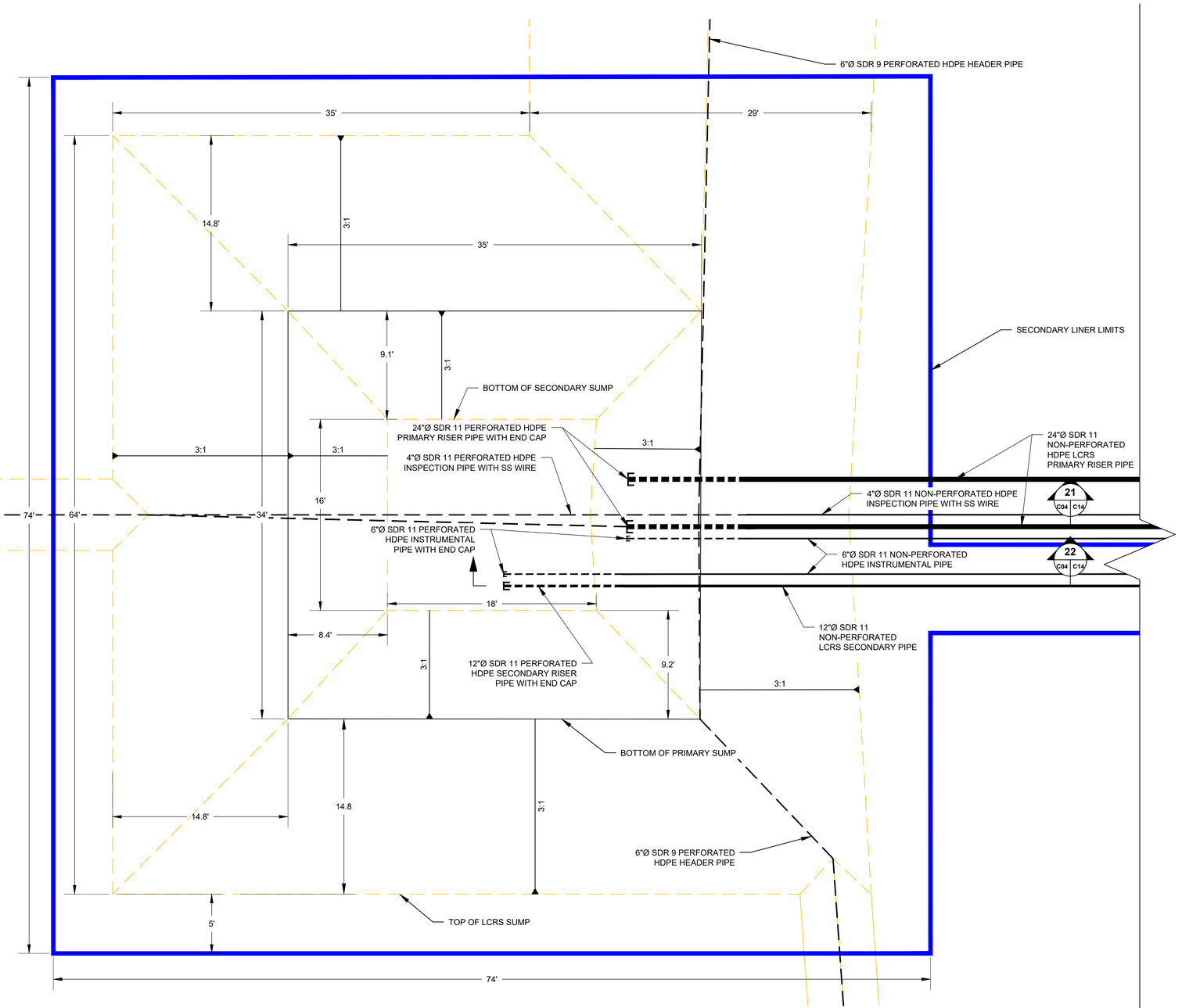
SAN JOAQUIN COUNTY, CALIFORNIA

STORMWATER AND EROSION CONTROL PLAN

DRAWING NO. C03

PROJECT NO. AU24.1294.00

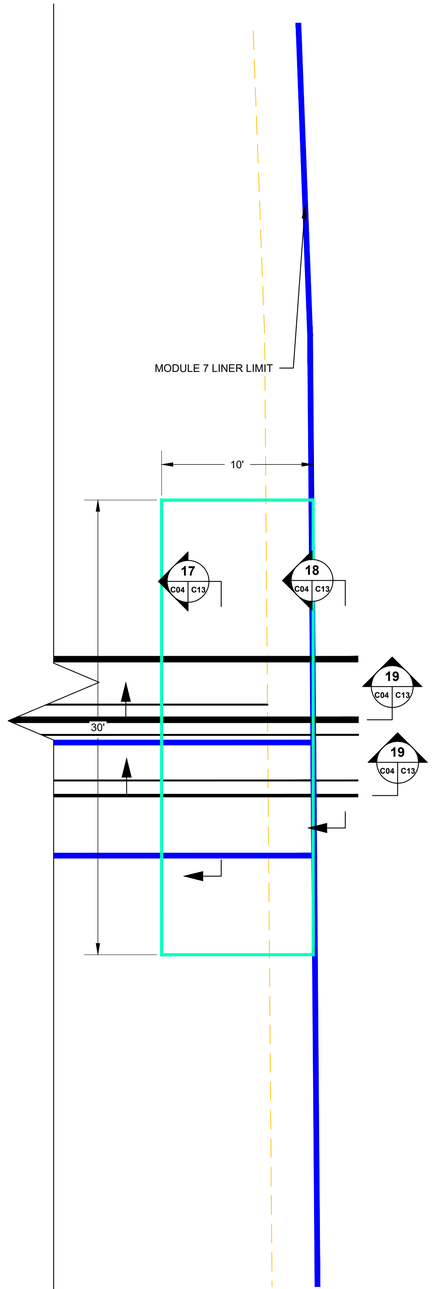
N:\SAN JOAQUIN\NORTH COUNTY LF\AU24.1294 NC MODULE 7 LINER AND PHASE 1 CLOSURE\4_CAD\C03 EROSION CONTROL PLAN.DWG February 4, 2025 - 1:54 PM BY: GLA USER

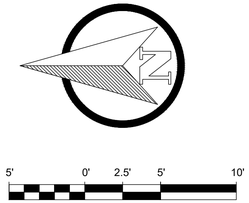


LCRS SUMP

ENLARGEMENT A (C01 | C04)

1" = 5'





LEGEND

- PROPOSED LINER LIMIT
- HINGELINES(1)
- NON-PERFORATED LCRS PIPE
- PERFORATED LCRS PIPE
- LANDFILL GAS CONTROL FLAP(2)

NOTES

1. DIGITAL AUTOCAD FILES WILL BE AVAILABLE TO CONTRACTOR PRIOR TO CONSTRUCTION.
2. LANDFILL GAS CONTROL FLAP SHALL BE 60-MIL GEOMEMBRANE OR ENGINEER-APPROVED ALTERNATIVE.

ISSUED FOR PERMITTING

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NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

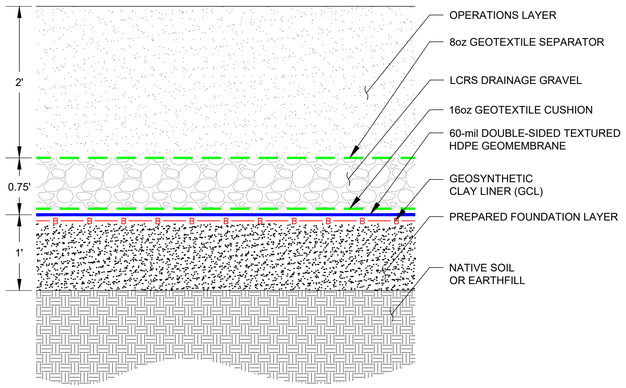
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

SUMP PLAN VIEW

DRAWING NO. **C04**

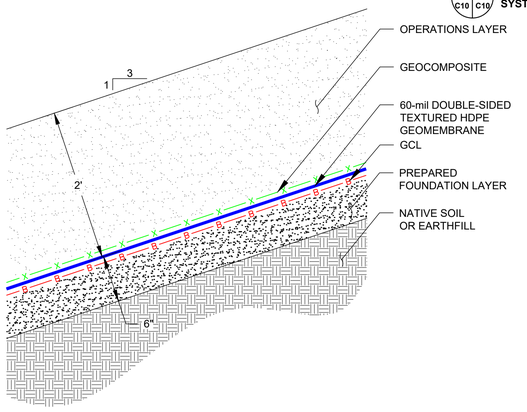
PROJECT NO. **AU24.1294.00**



BASE LINER SYSTEM

DETAIL 1 (C01 | C10)

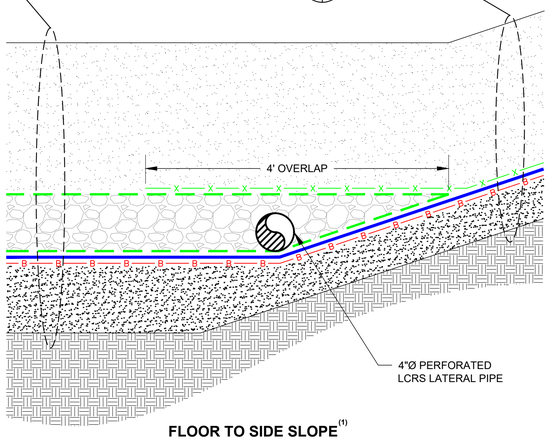
1" = 1'



SIDE SLOPE LINER SYSTEM

DETAIL 2 (C01 | C10)

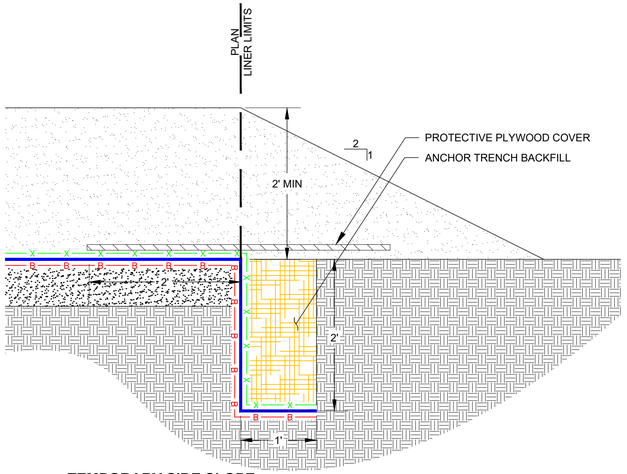
1" = 1'



FLOOR TO SIDE SLOPE LINER SYSTEM TRANSITION (1)

DETAIL 3 (C01 | C10)

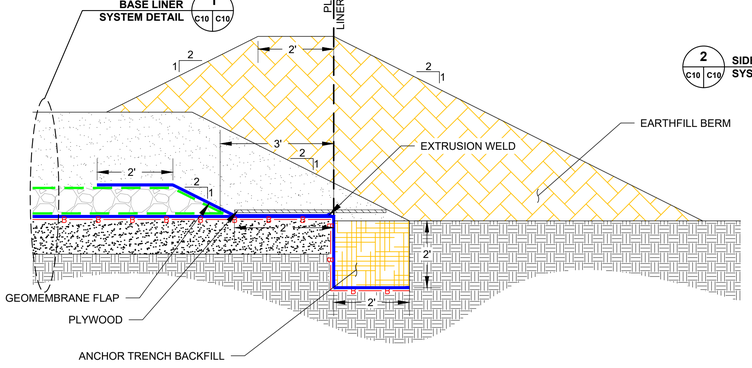
1" = 1'



TEMPORARY SIDE SLOPE TERMINATION

DETAIL 4 (C01 | C10)

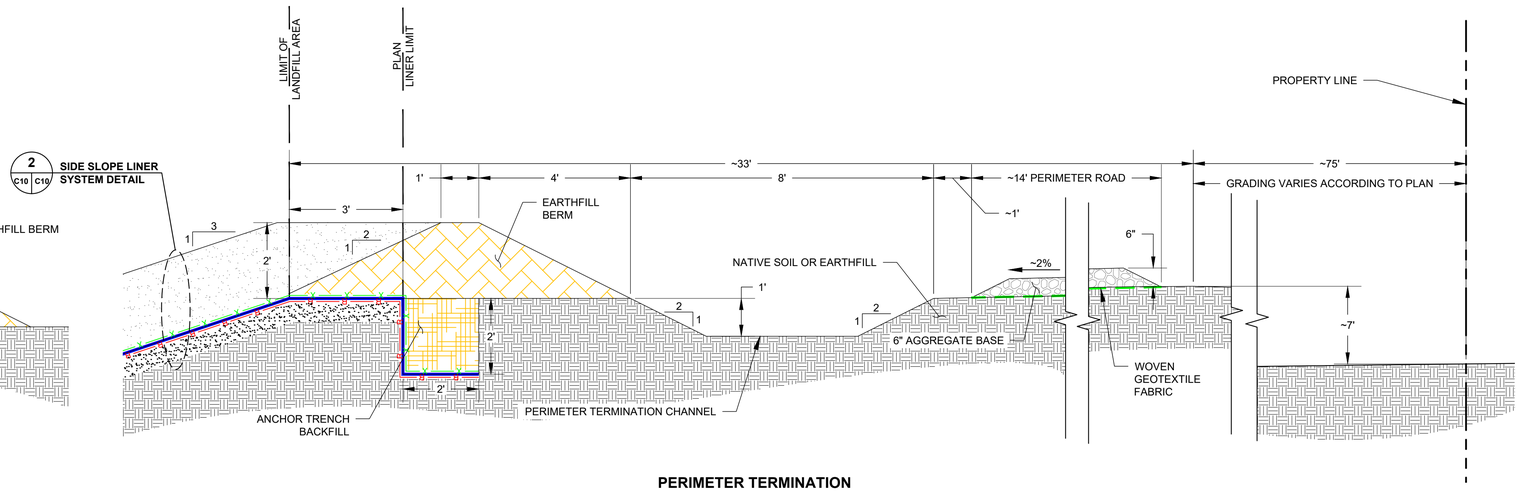
1" = 1'



TEMPORARY BASE LINER TERMINATION AND ANCHOR TRENCH

DETAIL 5 (C01 | C10)

1" = 2'



PERIMETER TERMINATION

DETAIL 6 (C01 | C10)

1" = 2'

NOTES

1. THE CONNECTION OF THE SIDE SLOPE AND FLOOR GEOMEMBRANE SHALL NOT BE WITHIN 5-FT OF THE TOE OF SLOPE AND SHALL NOT BE LOCATED IN THE LEACHATE COLLECTION PIPE TRENCH.

ISSUED FOR PERMITTING

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A	2/4/2025	ISSUED FOR PERMITTING	JVR

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DEPARTMENT OF PUBLIC WORKS
SOLID WASTE

NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

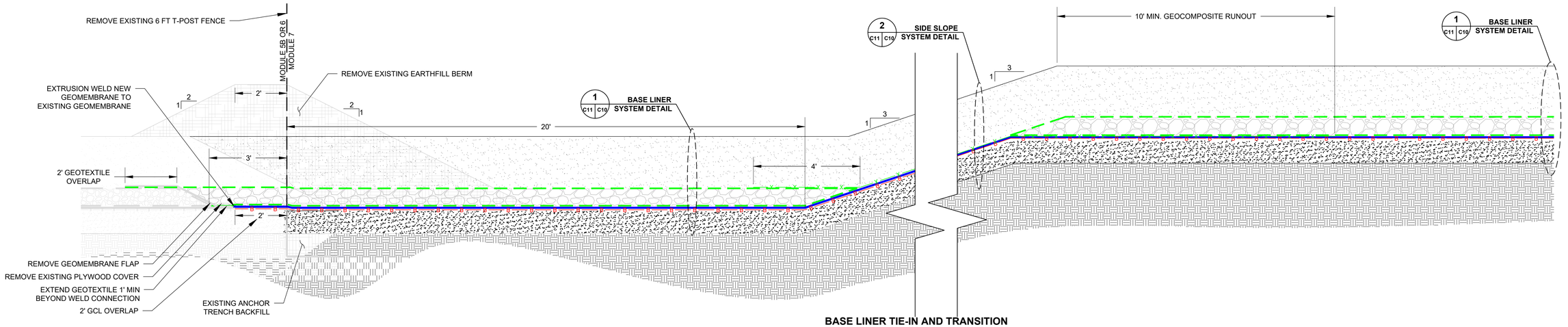
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C10

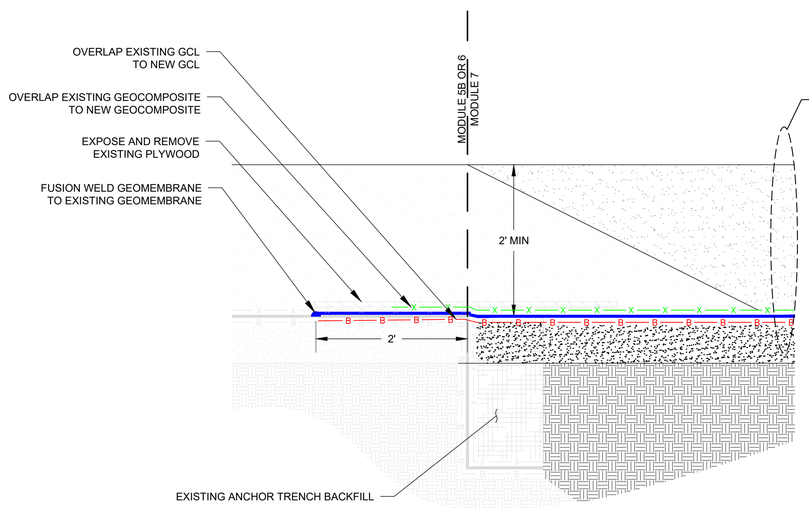
PROJECT NO. AU24.1294.00



BASE LINER TIE-IN AND TRANSITION BETWEEN MODULE 5B & 6 TO 7

DETAIL 7 (C01 | C11)

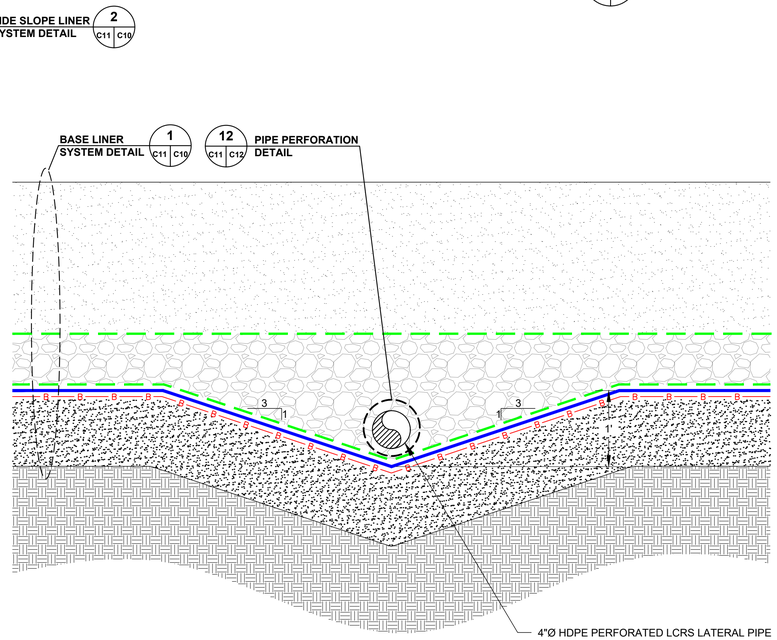
1" = 2'



SIDE SLOPE LINER SYSTEM TIE-IN MODULE 5B & 6 TO 7

DETAIL 8 (C01 | C11)

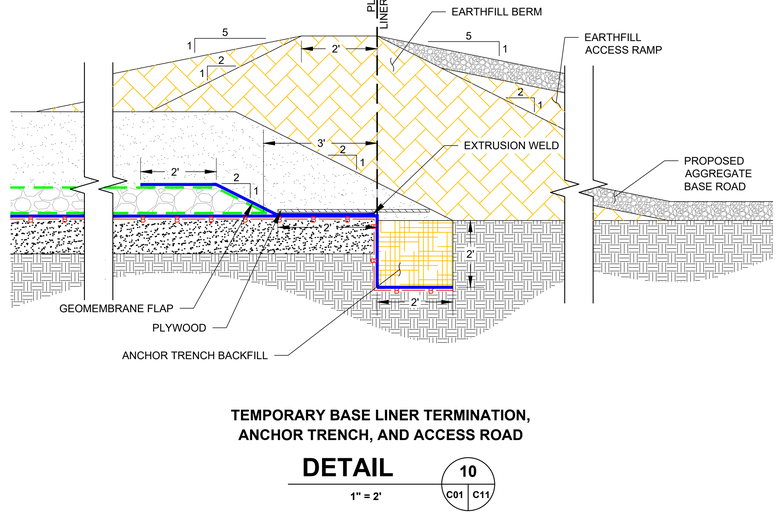
1" = 1'



TYPICAL LCRS TRENCH

DETAIL 9 (C01 | C11)

1" = 1'



TEMPORARY BASE LINER TERMINATION, ANCHOR TRENCH, AND ACCESS ROAD

DETAIL 10 (C01 | C11)

1" = 2'

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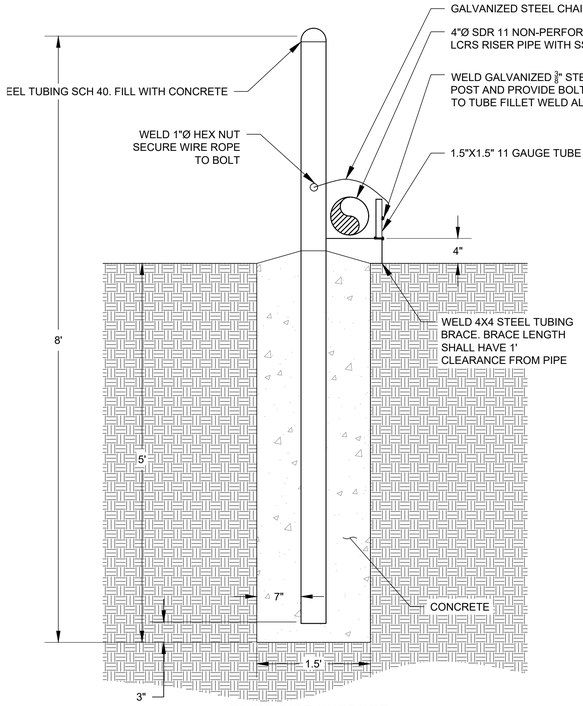
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C11

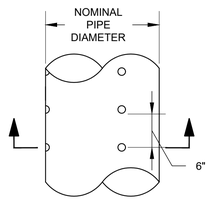
PROJECT NO. AU24.1294.00



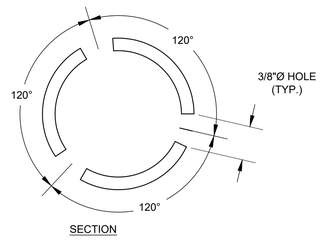
RISER PIPE SUPPORT

DETAIL 11 (C12 | C12)

1" = 1'



PLAN



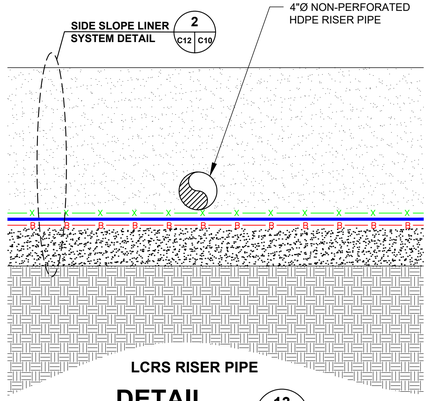
SECTION

PIPE PERFORATION NOTES:
1. TOLERANCES FOR HOLES LENGTH SHALL BE ⅞" MAX.
2. PROVIDE SIX ROWS OF HOLES AT 60° FOR 18"Ø PIPE.

PIPE PERFORATION

DETAIL 12 (C11 | C12)

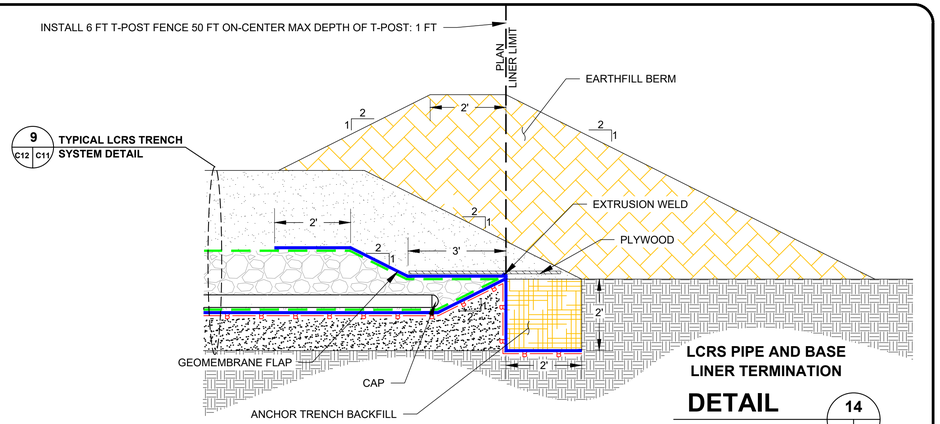
1"=1'



LCRS RISER PIPE

DETAIL 13 (C01 | C12)

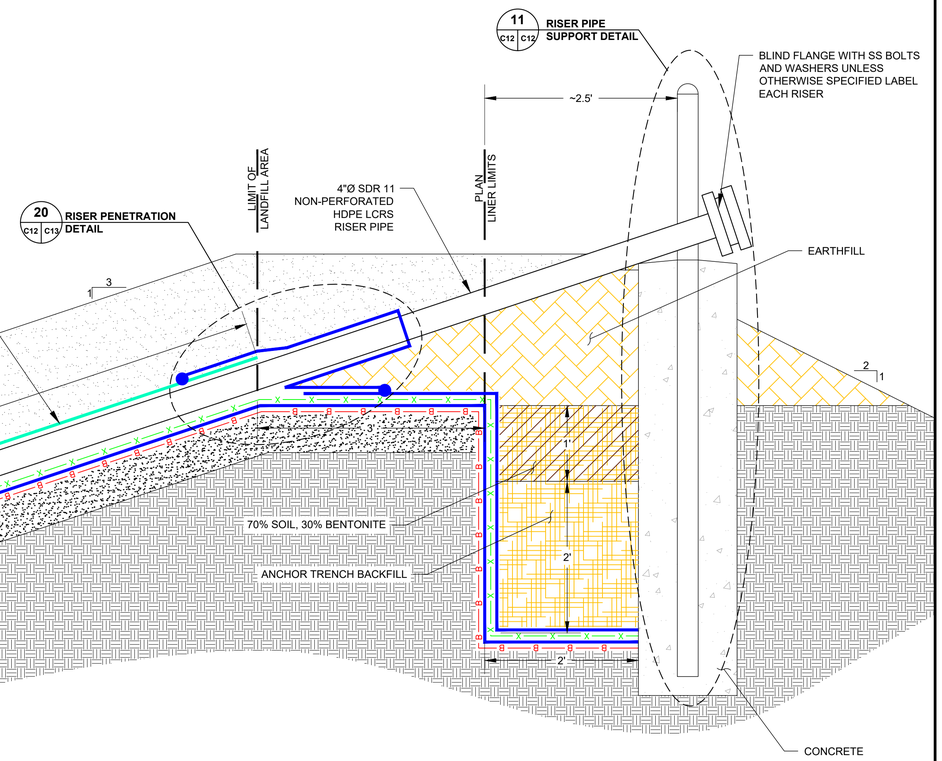
1"=1'

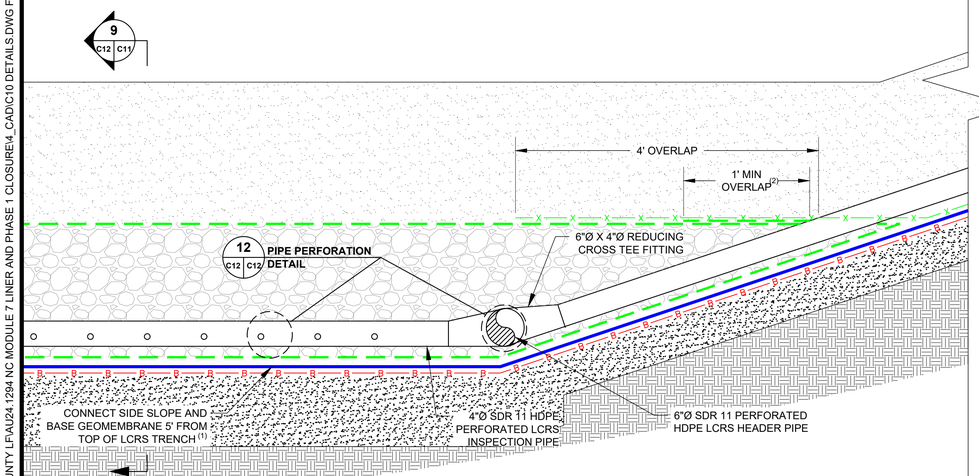


LCRS PIPE AND BASE LINER TERMINATION

DETAIL 14 (C01 | C12)

1"=2'





13 (C12 | C12) LCRS RISER PIPE SYSTEM DETAIL

PRIMARY LCRS INSPECTION PIPE

DETAIL 15 (C01 | C12)

1" = 1'

NOTES
1. THE CONNECTION OF THE SIDE SLOPE AND FLOOR GEOMEMBRANE SHALL NOT BE WITHIN 5-FT OF THE TOE OF SLOPE AND SHALL NOT BE LOCATED IN THE LEACHATE COLLECTION PIPE TRENCH.
2. THE OVERLAP OF THE SEPARATOR GEOTEXTILE SHALL BE HEAT BONDED.
3. LFG CONTROL FLAP SHALL BE 60-MIL GEOMEMBRANE OR ENGINEER APPROVED ALTERNATIVE.

ISSUED FOR PERMITTING

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A	2/4/2025	ISSUED FOR PERMITTING	JVR

DATE OF ISSUE:	2/4/2025
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DRAWN BY:	PLA
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APPROVED BY:	JVR

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SAN JOAQUIN COUNTY
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DEPARTMENT OF PUBLIC WORKS
SOLID WASTE

NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

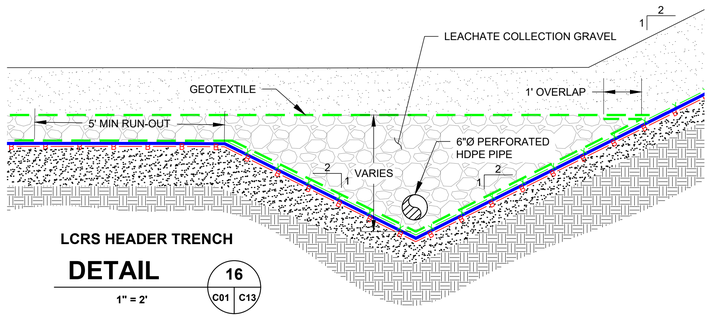
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C12

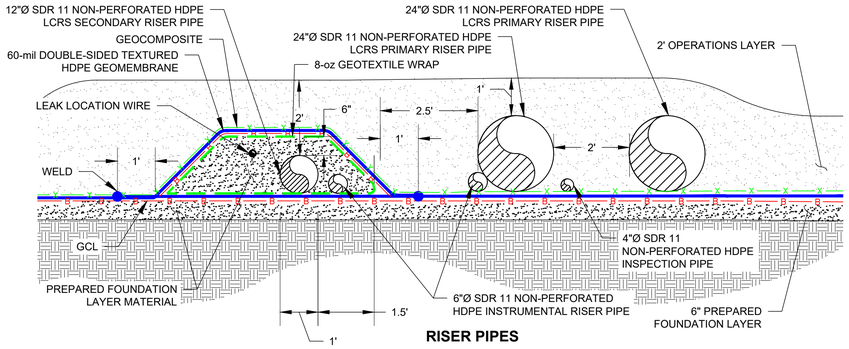
PROJECT NO. AU24.1294.00



LCRS HEADER TRENCH

DETAIL 16 (C01 | C13)

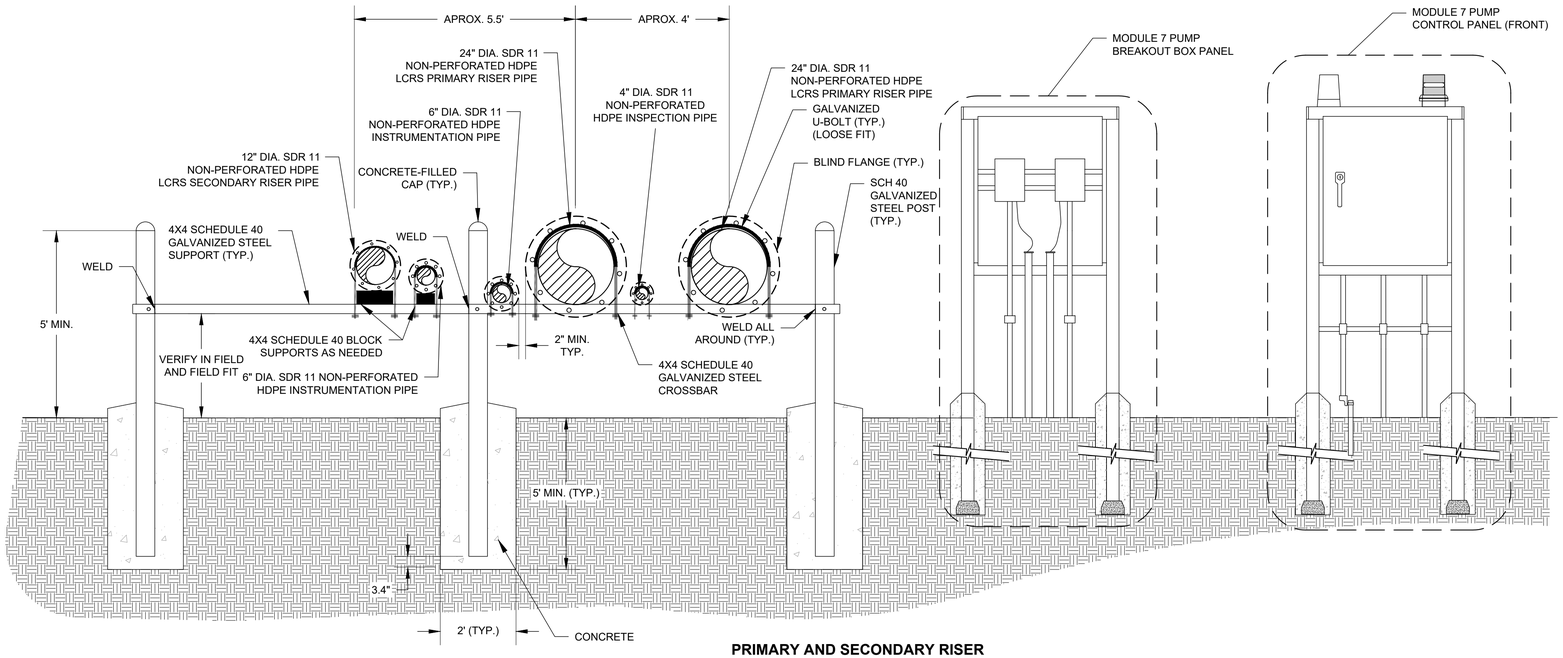
1" = 2'



RISER PIPES

DETAIL 17 (C04 | C13)

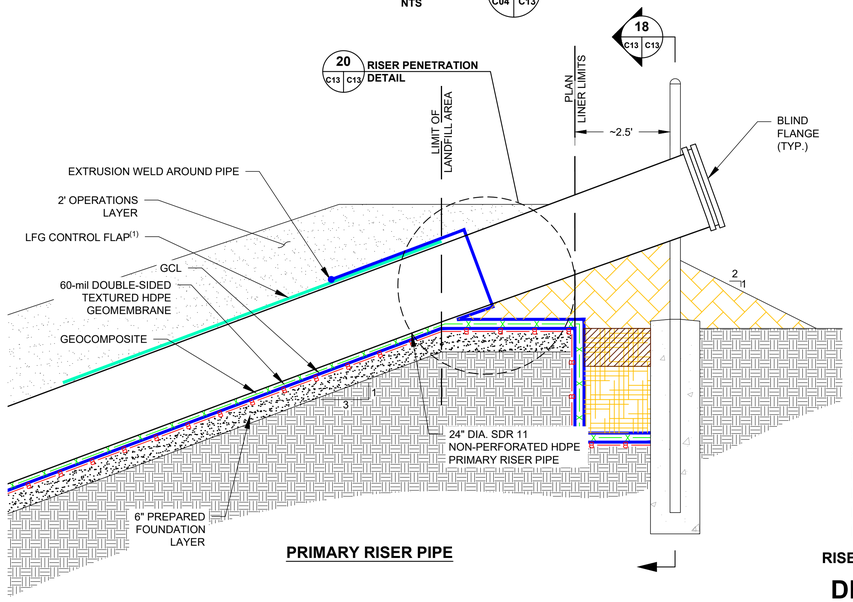
NTS



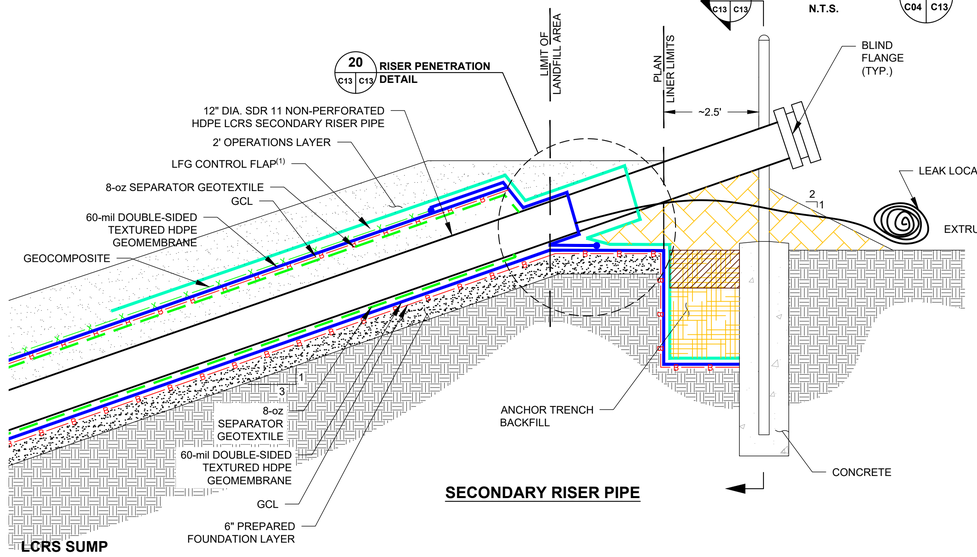
PRIMARY AND SECONDARY RISER SUPPORT STRUCTURE AND BOLLARDS

DETAIL 18 (C13 | C13) — 18 (C04 | C13)

N.T.S.



PRIMARY RISER PIPE

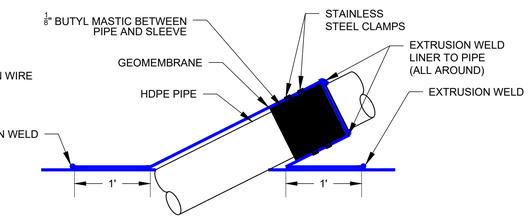


SECONDARY RISER PIPE

LCRS SUMP RISERS PENETRATIONS

DETAIL 19 (C04 | C13)

N.T.S.



RISER PENETRATION

DETAIL 20 (C13 | C13)

N.T.S.

NOTES

1. LFG CONTROL FLAP SHALL BE 60-MIL GEOMEMBRANE OR ENGINEER APPROVED ALTERNATIVE.

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NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

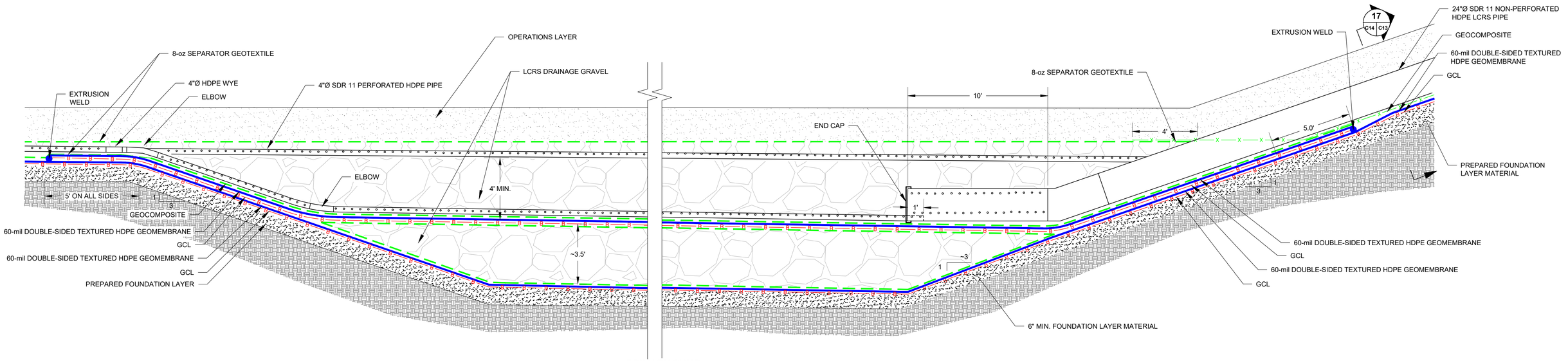
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C13

PROJECT NO. AU24.1294.00

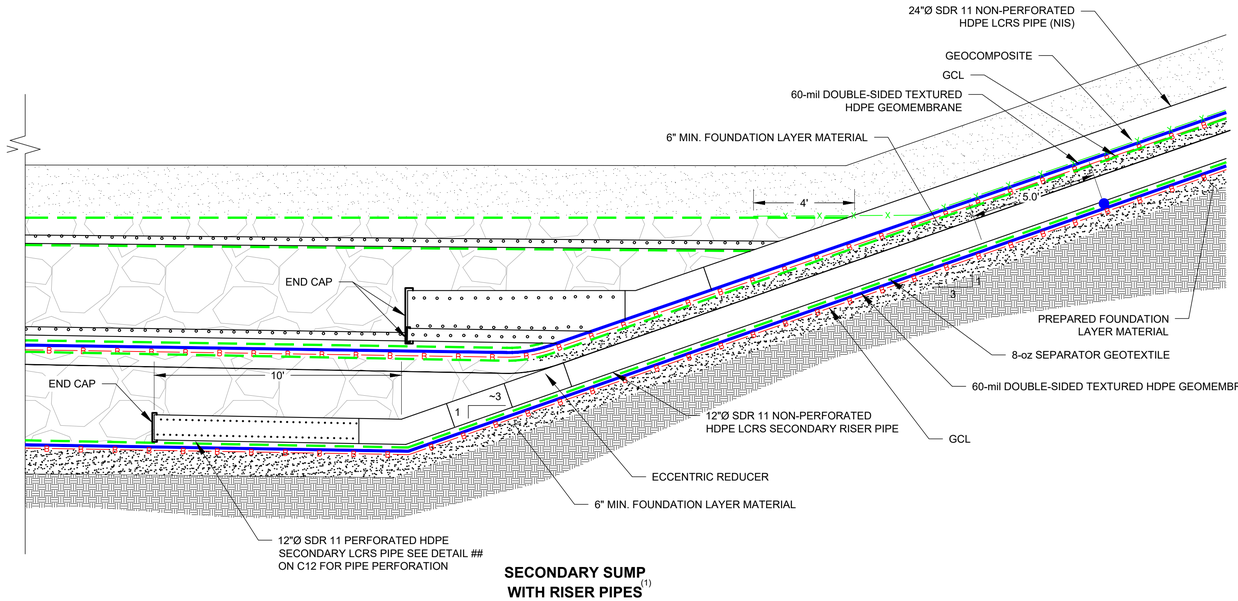


PRIMARY SUMP WITH RISER PIPES(1)

SECTION

NTS

21 | C04 | C14

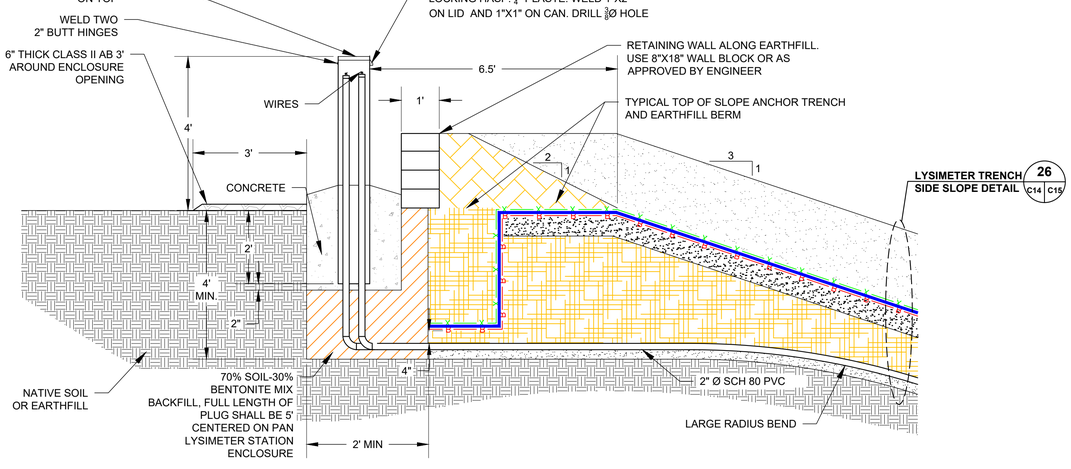


SECONDARY SUMP WITH RISER PIPES(1)

SECTION

NTS

22 | C04 | C14



PAN LYSIMETER STATION ENCLOSURE

DETAIL

1" = 2'

23 | C02 | C14

NOTES

1. PAN LYSIMETER AND TRENCH ARE NOT SHOWN. SEE SHEET C15 FOR DETAILED PAN LYSIMETER DESIGN.

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NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

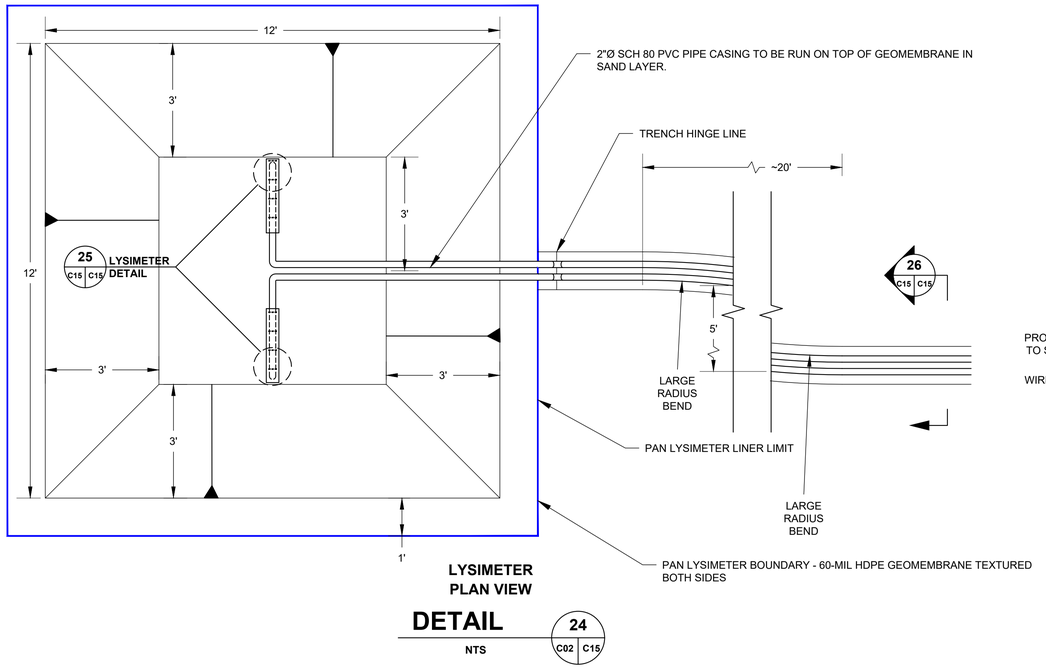
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C14

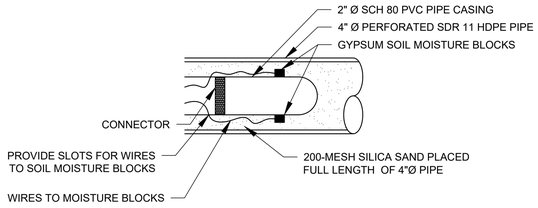
PROJECT NO. AU24.1294.00



LYSIMETER PLAN VIEW

DETAIL 24 (C02 | C15)

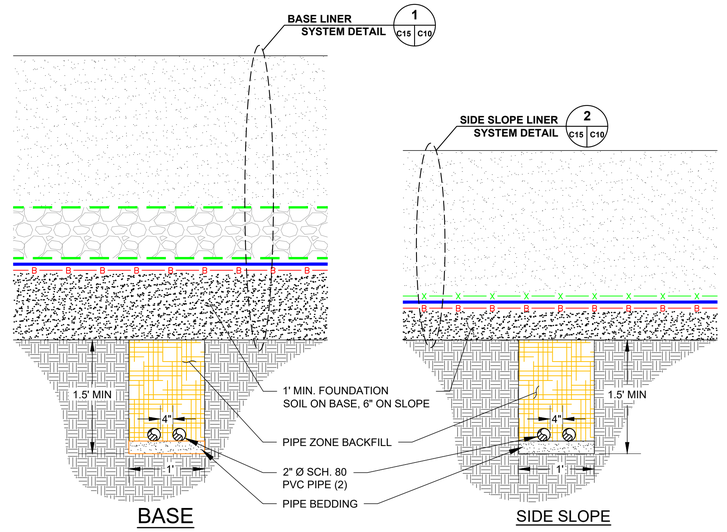
NTS



LYSIMETER

DETAIL 25 (C15 | C15)

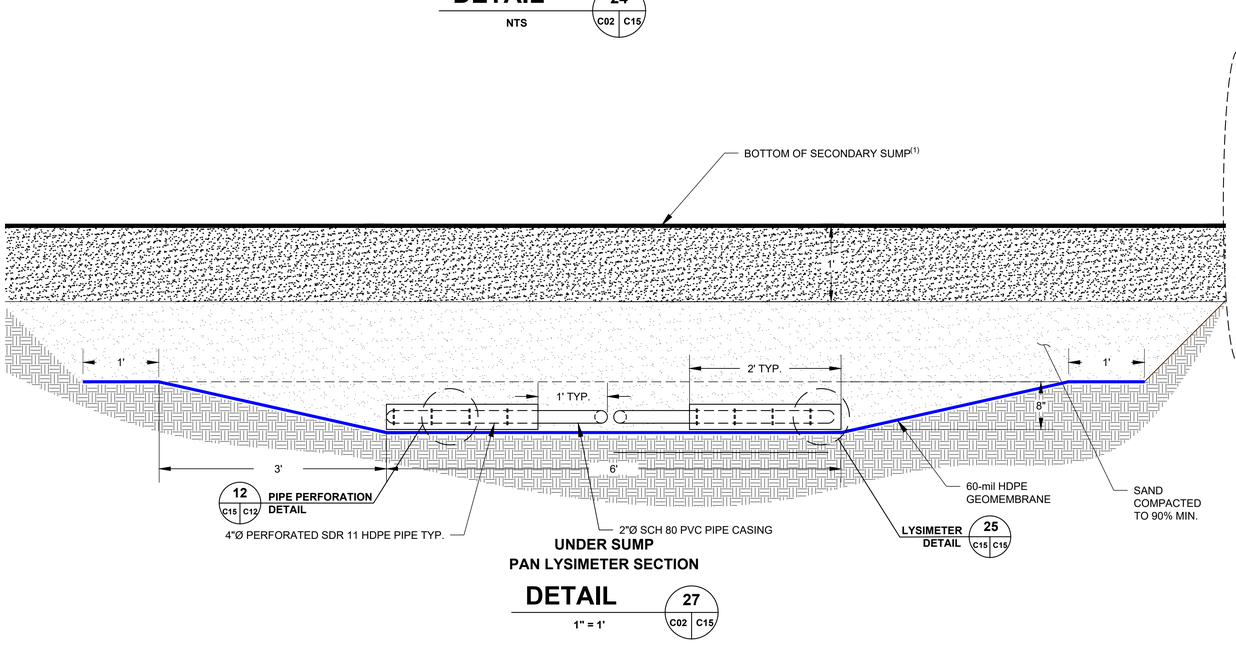
NTS



LYSIMETER TRENCH

DETAIL 26 (C02 | C15)

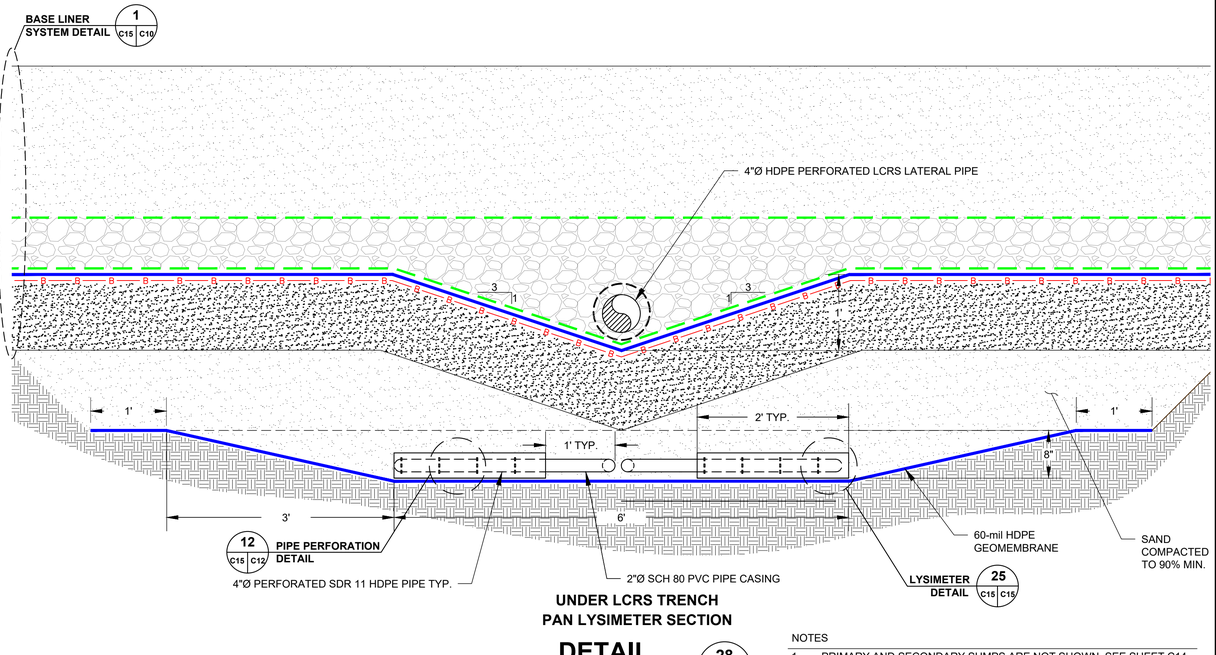
1" = 1'



UNDER SUMP PAN LYSIMETER SECTION

DETAIL 27 (C02 | C15)

1" = 1'



UNDER LCRS TRENCH PAN LYSIMETER SECTION

DETAIL 28 (C02 | C15)

1" = 1'

NOTES

1. PRIMARY AND SECONDARY SUMPS ARE NOT SHOWN. SEE SHEET C14 FOR DETAILED SUMP DESIGN.
2. BOTTOM OF PAN LYSIMETER TO BE LEVEL.

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NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

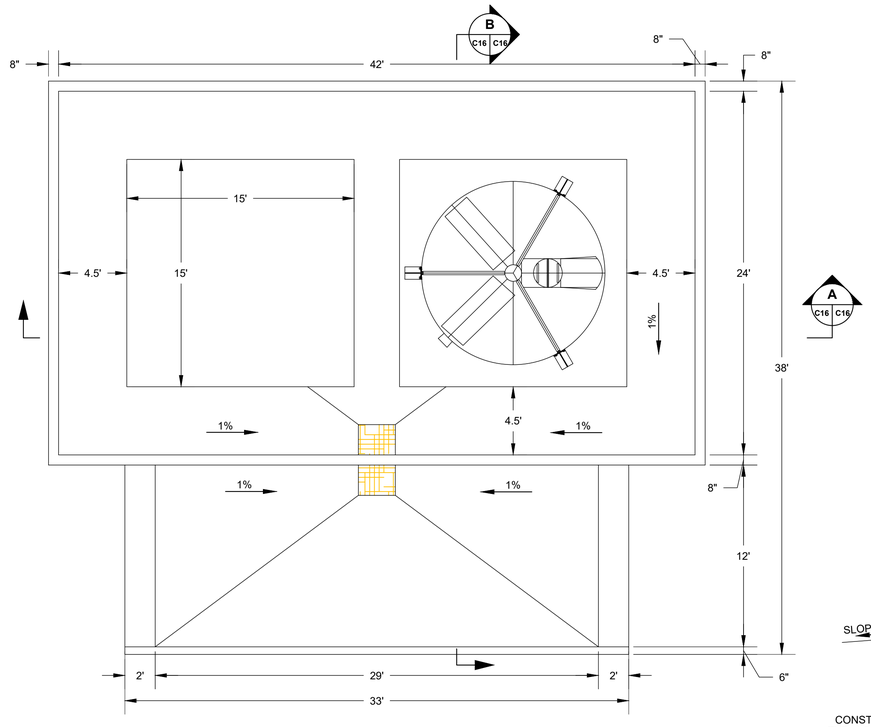
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

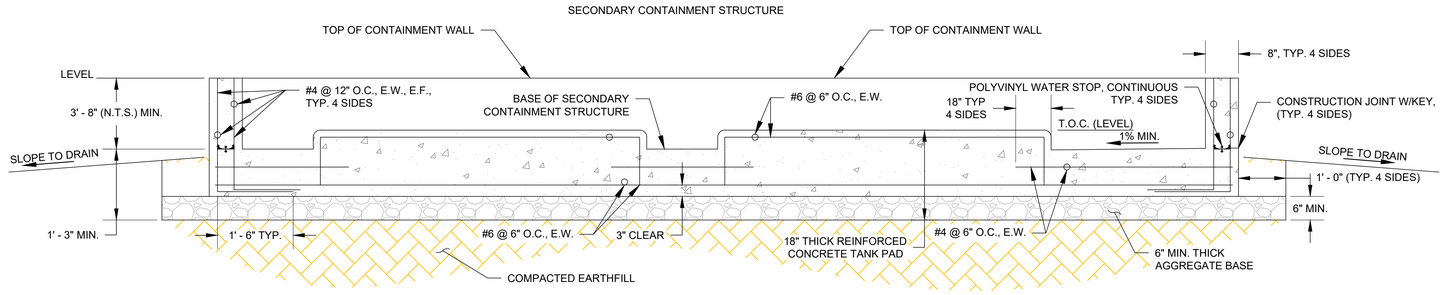
DRAWING NO. C15

PROJECT NO. AU24.1294.00

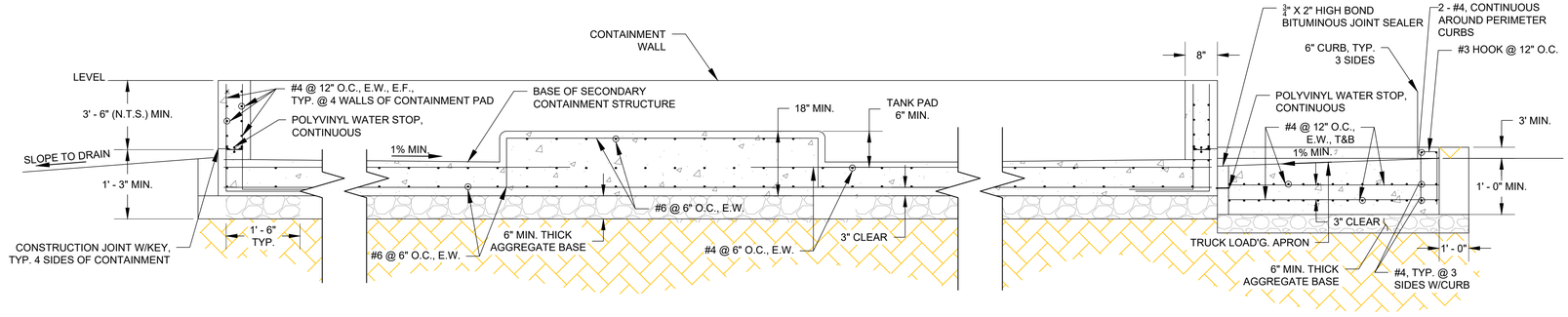


LEACHATE STORAGE TANK AND SECONDARY CONTAINMENT STRUCTURE

DETAIL 29
N.T.S. C01 C16



SECTION A
N.T.S. C16 C16



SECTION B
N.T.S. C16 C16

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SAN JOAQUIN COUNTY
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SOLID WASTE

NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

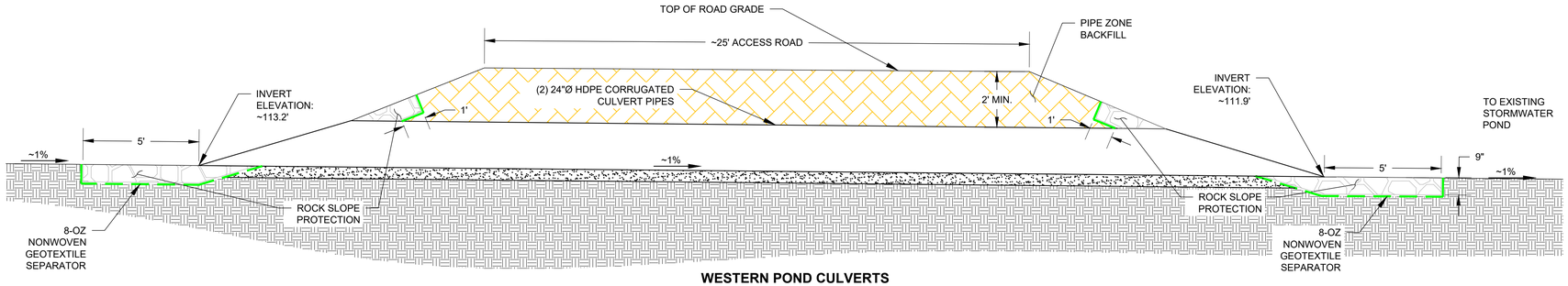
LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C16

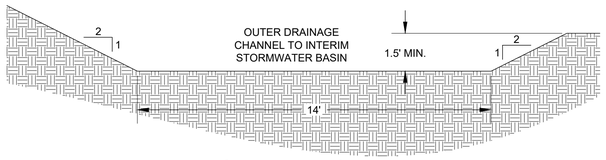
PROJECT NO. AU24.1294.00



WESTERN POND CULVERTS

DETAIL 30 (C03 | C17)

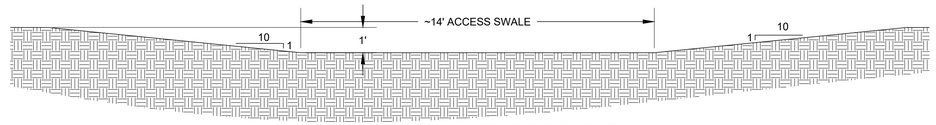
1" = 3'



OUTER DRAINAGE CHANNEL SYSTEM

DETAIL 31 (C01 | C17)

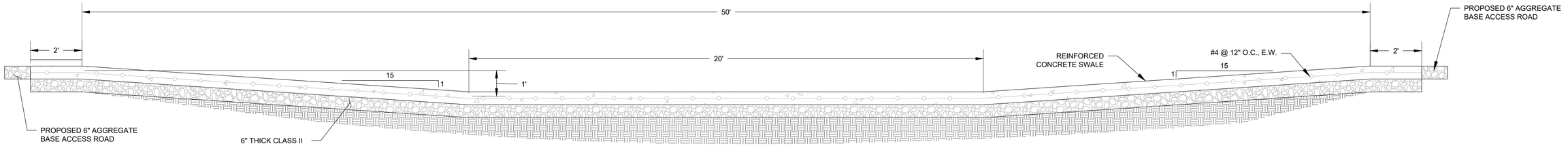
1" = 3'



DRIVE-THROUGH SWALE

DETAIL 32 (C03 | C17)

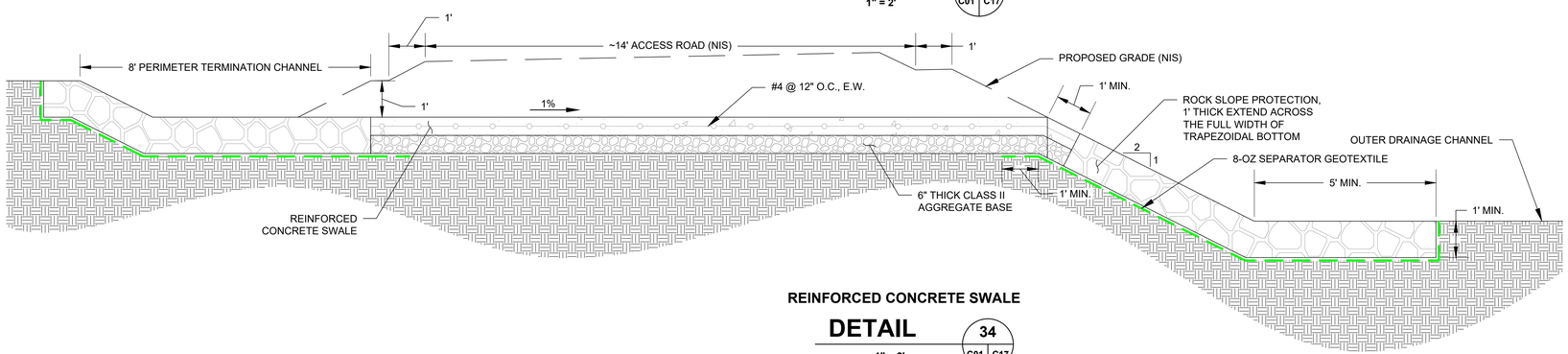
1" = 3'



REINFORCED CONCRETE SWALE

DETAIL 33 (C01 | C17)

1" = 2'



REINFORCED CONCRETE SWALE

DETAIL 34 (C01 | C17)

1" = 2'

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SAN JOAQUIN COUNTY
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DEPARTMENT OF PUBLIC WORKS
SOLID WASTE

NORTH COUNTY RECYCLING CENTER AND SANITARY LANDFILL

LANDFILL MODULE 7 CONSTRUCTION

SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

DRAWING NO. C17

PROJECT NO. AU24.1294.00

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2010-0016

WASTE DISCHARGE REQUIREMENTS
FOR
CONSTRUCTION, OPERATION, AND DETECTION MONITORING
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
NORTH COUNTY LANDFILL
CLASS III LANDFILL
SAN JOAQUIN COUNTY

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

1. The San Joaquin County Department of Public Works (hereafter "Discharger") owns and operates the North County Landfill, an active, Class III Municipal Solid Waste (MSW) landfill in northeastern San Joaquin County. The landfill is on East Harney Lane near Atkins Road, approximately nine miles east of Lodi, as shown in Attachment A, which is incorporated herein and made part of this Order. The landfill is on a 320-acre site in Section 21, T3N, R8E, MDB&M, corresponding to Assessor Parcel Numbers 065-120-02, 065-120-03, 065-120-08, and 065-120-09.

2. On 26 September 2008, the Discharger submitted an Amended Joint Technical Document (JTD) describing significant changes at the facility since 2002, and future construction plans, as follows:

   a. Construction of compositely-lined disposal module M-4;
   b. Installation of landfill gas (LFG) controls;
   c. A proposal to accept treated wood waste;
   d. Plans for vertical expansion of the landfill, including geotechnical review of landfill design;
   e. Revised Preliminary Closure and Post-Closure Maintenance Plan (PCP/PCMP); and
   f. Proposed Solid Waste Facilities Permit revisions.

   These revised waste discharge requirements (WDRs) include updated findings and requirements for the facility based on information in the amended JTD and in accordance with California Code of Regulations (CCR), title 27, division 2 (Title 27) regulations. Previous WDRs Order R5-2002-0219 therefore no longer adequately regulates the facility.

3. The landfill has been in operation since 1991, accepting primarily household and commercial wastes from the City of Lodi and surrounding areas. The facility includes a 185-acre landfill unit and associated precipitation and drainage controls; monitoring systems; LFG extraction facilities; access roads; office and

maintenance building; scale house; pump station; and a materials recovery facility (MRF), as shown in Attachment B, which is incorporated herein and made part of this Order.

4. The landfill currently consists of three waste disposal modules (M1, M3, and M4) constructed on 53 acres along the western side of the unit, as shown in Attachment B. Seven additional modules (M5 through M11) will be constructed on an as-needed basis on the remaining 132 acres of the unit area. The Discharger currently estimates that Module M5 will be constructed in 2012. The development status of the landfill may be summarized as follows:

Module	Year Constructed	Size, acres	Location	Status
1[1]	1991	27	NW	Inactive
3	1995	14	West-NW	Partially Active
4	2003	12	West-Central	Active
5 - 11	---[2]	132	SW, East Half	Not yet constructed

1. Includes area originally planned for Module 2, which was never constructed.
2. Future modules to be constructed on as needed basis.

SUBTITLE D

5. On 9 October 1991, the United States Environmental Protection Agency (USEPA) promulgated MSW landfill regulations under the Resource Conservation and Recovery Act (RCRA) known as “Subtitle D” (Code of Federal Regulations, title 40, part 258). Subtitle D applies to all California Class II and III landfills that both (a) accepted MSW and (b) accepted any waste on or after the effective date of Subtitle D (9 October 1991). Limited exceptions include (a) MSW landfills that ceased accepting wastes prior to the federal deadline (may only be required to comply with the closure requirements); (b) MSW landfills that were constructed prior to the federal deadline (may, to extent of pre-deadline footprint, be exempt from the design requirements); and (c) small rural landfills per 40 CFR 258.1(f) (in California, exempt from the design requirements).

WASTE AND UNIT CLASSIFICATION

6. The landfill accepts wastes defined as “inert” and “nonhazardous” under Title 27, sections 20230 and 20220, respectively. The landfill also accepts MSW as defined in Title 27, Section 20164. Recyclable wastes are generally diverted to the MRF.

7. Approximately 400 tons per day (144,000 tons per year) of wastes, including MSW, commercial wastes, and construction and demolition debris, were

discharged to the landfill in 2008. About 5.3 million cubic yards (CY) of waste are estimated to be in place at the landfill.

8. The JTD includes a proposal to accept "treated wood waste" (TWW), a hazardous waste under California Health and Safety Code (CHSC), division 20, chapter 6.5, article 5, Section 25150.7; and CCR, title 22, chapter 34, Section 67386.2 (see Information Sheet, Attachment 1). Title 22 allows TWW to be disposed of in any portion of an MSW landfill that is compositely lined, provided that the WDRs allow such disposal and that the TWW is handled in accordance with specified alternative standards consistent with the CHSC, Title 22 and the California Water Code. These WDRs allow the landfill to accept TWW provided that the Discharger complies with those standards. See Discharge Prohibition A.9 and Discharge Specifications B.7 through B.10.

9. The landfill is a "new" waste management unit under Title 27, Section 20080(d), since it did not operate on or before 27 November 1984. The landfill is a Class III landfill unit under Title 27, article 3, subchapter 2, chapter 3.

SITE DESCRIPTION

10. The site is in the Central Valley alluvial plain near the edge of the Sierra Nevada Foothills. The surrounding terrain is low rolling pastureland with an average grade of about 1/2% toward the west. Surface elevations range from about 105 feet MSL in the southwest corner of the site to about 125 feet MSL in the southeast corner of the site.

11. Land uses within the landfill vicinity include agriculture, livestock grazing, dairies, industrial, and low-density residential development. Other uses in the area include water conveyance, roads, utility easements, and a migrant labor housing facility.

12. An August 2004 Department of Water Resources (DWR) well survey identified 37 active municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the site. The wells ranged from about 100 to 700 feet deep and averaged about 225 feet deep. Three onsite supply wells were also identified, including one domestic, one agricultural and one industrial well. No wells were identified within 1000 feet of the landfill.

13. The site is not within a 100-year floodplain based on the Federal Emergency Management Agency's Flood Insurance Rate Map, Community Panel Number 060-299-0330A, effective May 15, 1980.

SURFACE AND STORM WATER

14. Surface drainage in the area is to South Paddy Creek (an intermittent stream that crosses the site immediately north of the landfill); thence to Paddy Creek (about 2.8 miles west of the site); Bear Creek; and Disappointment Slough, which is tributary to the San Joaquin River.

15. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition (hereafter Basin Plan) designates beneficial uses; establishes water quality objectives; contains implementation plans and policies for protecting waters of the basin; and incorporates by reference, plans and policies adopted by the State Water Resources Control Board.

16. The beneficial uses of the San Joaquin River (between Sack Dam and the mouth of the Merced River) are municipal and domestic supply; agricultural supply; industrial process supply; water contact recreation; non-contact water recreation; warm freshwater habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and wildlife habitat.

17. The site receives an average of 16.5 inches per year of precipitation as determined from Rainfall Depth Duration Frequency data provided by the State Department of Water Resources for the Linn Ranch Station about two miles north of the site. The 100-year, 24-hour precipitation event for this station is 3.3 inches. The estimated mean Class A pan evaporation rate is about 65 inches per year.

18. Storm water run-on is diverted around the site by means of a perimeter berm and outboard ditch within a 100-foot setback from the site boundary. Some landfill runoff is also captured in the ditch. Storm water discharge locations at the site include two outfalls from the landfill perimeter ditch to the wetlands mitigation area and (via culvert) South Paddy Creek, one on the eastern side of the site near the NE corner of future Module 11, and the other on the western side of the site near the NW corner of existing Module 1. Two other (inactive) culverts along the perimeter ditch are planned as future storm water discharge locations as the landfill is developed. See Attachment B: Site Map. Storm water discharges to South Paddy Creek are monitored under the General Industrial Storm Water Permit.

19. Runoff from existing landfill modules and undeveloped areas of the unit is directed via onsite ditches to an interim sedimentation basin (ISB) in the northeast part of the site. Water collected in module excavation areas and other low spots is pumped into ISB drainage system. See Finding 54. The ISB includes an overflow pipe that, during periods of heavy precipitation, discharges via culvert to the outboard drainage ditch. The remaining water in the ISB dissipates through percolation, evaporation, and/or use in site operations (e.g., dust control).

20. All landfill drainage facilities, including overside drains, perimeter ditches, culverts, and the ISB were designed to handle a 24-hour, 100-year storm event. See Finding 53.

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GEOLOGY

21. The regional geology in the site area represents a transition area between Cretaceous to Quaternary Period alluvial deposits of the Great Valley flood plain and Jurassic Period metamorphic rocks of the Sierra Nevada foothills. The valley deposits thin out within a few miles east of the site where the surface geology is primarily foothill terrain dominated by dissected alluvial uplands and exposed, uplifted bedrock.

22. There are no known Holocene faults within 1000 feet of the facility. The closest active fault is the Bear Mountains fault zone within the Foothills Fault system about 18 miles (29 km) east of the site in the Sierra foothills. Recorded magnitudes of seismic events along this fault zone range up to 5.8 on the Richter scale (1975 Oroville event). The Foothills Fault system has been characterized as producing a maximum credible earthquake of 6.5.

23. The Central Valley Coast Range Fault, approximately 54 km from the site, has a maximum probable earthquake (MPE) of 6.4, and the San Andreas Fault, approximately 126 km distant has an MPE of 8.0; peak horizontal ground accelerations associated with each MPE event are .10g and .09g, respectively.

24. Surface soils at the site consist of interbedded silts and clays to about 3 feet bgs, underlain by a thin (i.e., ½ foot) layer of hardpan. Beneath the surface soil layers, soils consist of laterally discontinuous Riverbank (northern half of site) and Turlock Lake (southern half of site) formation alluvium, including silts, clays, sand and gravel layers. These deposits show coarsening-up patterns typical of Pleistocene Age alluvial stream deposits flanking the eastern Sierra foothills.

UNSATURATED ZONE

25. The lowest elevation of solid waste in the landfill is about 60 feet MSL, corresponding to the base of M3. The lowest elevation of leachate in the landfill is about 56 feet MSL, corresponding to the base of the LCRS sump for M3.

26. The estimated capillary rise in the unsaturated zone is estimated to be less than five feet based on soil type. The minimum separation from waste to groundwater, taking into account the estimated capillary rise, is about 83 feet. See Findings 25 and 34.

27. Hydraulic conductivities ranging from 1×10^{-6} cm/sec to 1×10^{-8} cm/sec (based on testing of remolded laboratory samples) have been measured in the upper 10 feet of the unsaturated zone, which contains a greater percentage of clay and silt than in underlying layers (e.g., 30 to 60 feet bgs), where higher hydraulic conductivities (ranging from 1×10^{-4} to 2×10^{-7} cm/sec based on permeameter and laboratory testing) have been measured. See Finding 24.

Landfill Gas

28. In 2003, the Discharger installed a methane migration monitoring system, as required by the Local Enforcement Agency under Title 27 solid waste regulations (Section 20919 et seq.). Previous WDRs required that the system also be used to monitor soil gas for volatile organic compounds (VOCs). The system has since been expanded and presently includes 17 triple completion monitoring wells (i.e., SGs-1, 2, 3, and 8 through 22) installed along the site perimeter with nested probes screened in the upper, intermediate, and lower portions of the unsaturated zone. In addition to methane migration monitoring system wells, the site includes four singly completed soil gas monitoring wells (SGs-4, 5, 6 and 7) historically installed at the site along the interior perimeter of landfill modules M1 and M3 and screened in the upper portion of the unsaturated zone. Section E.1 of Monitoring and Reporting Program (MRP) No. R5-2010-0016 specifies the monitoring points and parameters for soil gas monitoring under this Order.

29. Subsequent LFG monitoring showed generally less than 1.0% methane by volume in all probes, except those within the site interior immediately adjacent to the landfill (i.e., not perimeter migration monitoring wells) where maximum methane concentrations ranged from 9.5% by volume in SG-2S to 59.7% by volume in SG-6, and carbon dioxide was detected up to 44.6% in SG-6. Fewer VOCs and lower VOC concentrations (generally less than 100 ppbv or non-detect) were similarly detected in the site perimeter wells compared to SG-6, where, for example, detected VOCs (e.g., Freon 12) were generally greater than 100 ppbv, but less than 1,000 ppbv. Since initiation of LFG extraction in June 2006 (see Finding 38), the concentration of methane in well SG-6 has been reduced to less than 2% by volume.

30. The unsaturated zone monitoring system consists of suction lysimeters installed beneath the landfill modules during their construction. There are currently eight lysimeters (VZs-1 through 8) installed at the locations shown in Attachment C. Lysimeter monitoring prior to 2000 showed elevated concentrations of general minerals and low concentrations of several VOCS in pore water at Module 1, such as follows:

Module 1
Lysimeter Monitoring Results, January 1995

Constituent	*Concentration*	
	Background	Detection
General Minerals, mg/L	VZ-1[1]	VZ-3[1]
Chloride	25	500
Bicarbonate Alkalinity	63	380
Total Dissolved Solids (TDS)	750	2,100

VOCs, µg/L		
Carbon Disulfide	<.5	5.1
1,2-Dichloroethane	<.5	3.9
Trichlorofluoromethane	<.5	1.5
1,1,1-Trichloroethane	<.5	1.9
Trichloroethene	<.5	0.6
Tetrachloroethene	<.5	1.1

1. Similar constituents and elevated concentrations also detected in VZs-2 and 4.

Neither the background nor any of the detection lysimeters have produced a sufficient amount of liquid for sampling since 2003. VZ-3 has been dry since April 2000. Provision G.8.b requires that Discharger investigate all lysimeters at the site and submit a status report as to their condition, including plans for repair or replacement, as necessary.

31. The quality of liquid detected in the leachate collection sumps of the landfill modules during the First Half 2008 was as follows:

Leachate Monitoring Results, First Half 2008

Constituent	*Concentration*		
	Module 1	Module 3	Module 4
General Minerals, mg/L			
Chloride	590	500	260
Bicarbonate Alkalinity	790	730	1,100
TDS	2,400	2,100	1,600
VOCs, µg/L[1]			
Acetone	31	14	20
Benzene	0.68	< 0.4	8.8
1,1-Dichloroethane	1.1	0.91	2.9
1,2-Dichloroethane	1.4	1.6	4.3
1,4-Dichlorobenzene	3.4	3.0	2.4
Cis-1,2-DCE	1.6	0.78	2.9
MTBE	8	11	50
Tert-Butyl Alcohol	220	150	110
Vinyl Chloride	3.0	2.9	19

1. Listing includes most, but not all, VOCs detected in the module sumps during the monitoring period.

MRP Section D requires that the discharger monitor leachate semiannually for the above leachate monitoring parameters.

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GROUNDWATER

32. The beneficial uses of the ground water at the site are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

33. The upper water-bearing zone (UWBZ) at the site is unconfined or semi-confined and occurs in the alluvial deposits of the Turlock Lake and/or Laguna formations (see Finding 24). The overall permeability of these deposits is estimated to be about 9×10^{-3} cm/sec based on slug testing data from the boring for well G-1 (see Table 3, *Geologic and Hydrogeologic Report*, Appendix C, JTD).

34. The average depth to groundwater at the site is about 154 feet bgs (-36.5 feet MSL) with about six (+/-3) feet of seasonal variation. The groundwater gradient is typically about 0.004 ft/ft toward the southwest (or west-southwest), corresponding to a groundwater flow velocity of about 13.5 ft/yr. At times the measured flow direction has shown substantial historical variation, however, and/or has not been consistent site-wide, indicating possible onsite or offsite influences (e.g., onsite sedimentation basin, localized pumping).

35. There are currently seven groundwater monitoring wells at the site (see Attachment B), including one upgradient (G-1 on eastern site perimeter), one side gradient (G-2 on the western site perimeter), and four down gradient (Gs-3D, 4, 5 and 6, all along the western site perimeter). Monitoring of side gradient well G-2 was discontinued in 1997 and the status of the well is not known. Provision G.8.c requires that the Discharger investigate well G-2 and submit a status report as to its condition, including plans for repair or replacement, as necessary.

36. Historical monitoring data for the landfill shows generally good water quality in the UWBZ, as follows:

Constituent	***Concentration*** (mg/L, except where noted)			
	Upgradient		Downgradient	
	Historical[1]	2008[2]	Historical[1]	2008[2]
Chloride	17	29	8	7
Bicarbonate Alkalinity	91	150	94	120
TDS	201	220	172	160
Specific Conductance, µmhos/cm	267	364	230	199

1. Based on annual average.
2. Based on First Half 2008 monitoring results.

Time series plots of the data do not indicate any clear exceedances over upgradient concentrations, but show moderately higher concentrations of bicarbonate alkalinity in both the upgradient and downgradient wells in recent

years compared to historical averages, a possible impact from carbon dioxide in LFG.

37. A release to groundwater consisting of low to trace concentrations of VOCs, primarily BTEX (benzene, ethylbenzene, toluene, and xylenes) compounds, was confirmed in down gradient well G-4 in July 2002. Subsequent evaluation monitoring found that the VOC impacts to groundwater did not extend down gradient to well G-6. By January 2003, maximum VOC impacts at G-4 had attenuated to trace concentrations. The EMP concluded that the VOC impacts were sporadic and likely associated with LFG. No VOCs have been detected in any of the wells since 2006

Corrective Action

38. In 2006, the Discharger installed an LFG extraction system in accordance with a May 2005 Corrective Action Plan (*Corrective Action Plan For the Prevention of Future Groundwater Impact by Landfill Gas at the North County Recycling Center and Sanitary Landfill*). The system (which became operable in June 2007) was intended to control off-site migration of landfill gas and to address concerns regarding LFG as a suspected source of VOCs sporadically detected in groundwater. The system included installation of 7 vertical extraction wells in existing modules M1 and M3; 2 LCRS risers between M1 and M3; horizontal wells installed in collection trenches in expansion module M4; and associated collection system piping, condensate handling facilities, blowers and a flare station. The plan anticipated that future modules would be constructed with LFG extraction facilities similar to Module 4 and tied into the system.

39. Based on the two semiannual monitoring events since startup of the LFG collection system in 2007, lower LFG constituent concentrations have been detected in interior well SG-6 compared to prior to system startup, including methane (<30% by volume), and carbon dioxide (<30% by volume) and VOCs (generally <100 ppbv). See Finding 29.

LANDFILL OPERATIONS

40. Refuse is spread and compacted in approximately two-foot lifts until 14 feet above surrounding refuse, as determined by laser. The top slope of the working face is usually graded (also by laser) to a 4% minimum slope for drainage.

41. The discharger uses onsite borrow for daily and intermediate cover soil. Tarps are also employed as alternative daily cover (ADC). Cover soil is obtained from excavation of the next module and/or from existing onsite stockpiles. A refuse to soil ratio of approximately 5:1 is maintained for daily cover, which is applied at the working face in 6-inch minimum lifts. Intermediate cover of 12-inches minimum thickness is placed in areas that will be inactive for at least 180 days per Title 27, CCR Section 20705.

Leachate and Condensate Management

42. Since 2002, the discharger has been pumping collected landfill leachate and LFG condensate back to the landfill, subject to approvals in previous WDRs, which incorporated liquids restrictions in Title 27 and Subtitle D regulations. In the Second Half 2008, approximately 124,000 gallons of leachate (including LFG condensate) were pumped from and returned to the landfill.

43. As described in the JTD, LFG condensate is pumped into the LCRS and handled like leachate. Leachate is pumped from the landfill sumps and/or AGTs to dedicated infusion points on the upper elevations of the compositely lined landfill Modules. No liquid is returned to Module 1, however, since it does not comply with Subtitle D. These WDRs allow the Discharger to continue returning landfill leachate and condensate to the landfill, provided that compliance with the applicable liquids restrictions is maintained. See Discharge Prohibition A.3 and Discharge Specification B.4.

LANDFILL DESIGN AND CONSTRUCTION

Existing Modules

Module 1

44. Module 1 (referred to as Modules 1 and 2 in previous WDRs) was constructed in 1991 with a non-prescriptive, non-composite containment system, as follows:

Component	Base Liner	Side Slopes
Operations Layer	≥ 2' soil	
Filter Fabric	Geotextile[1]	-------[2]
LCRS	Geonet	
Base Liner	60-mil HDPE[3]	
Foundation Layer	≥ 6" compacted soil	

1. 10 oz/yd^2 non-woven fabric.
2. No LCRS on side slopes.
3. HDPE smooth on both sides.

The module predated Subtitle D regulations and was therefore not required to have a Subtitle D composite liner (see Finding 5). Further, previous WDRs (Order No. 91-021) included a finding that natural geologic factors at the site (e.g., groundwater separation, soil type) were sufficiently protective of groundwater such that a Chapter 15 containment system was not required (see Title 27, Section 20260). Although not required under regulation, a 60-mil HDPE base liner and geonet LCRS were included in the design for additional protection.

45. Module 1's LCRS included perforated HDPE collection pipe (3-inch laterals and 6-inch headers) in gravel-filled troughs overlying the blanket layer of filter fabric/geonet. The foundation layer was graded at a 1.4% cross slope toward a leachate collection sump on the western side of the module. The system was plumbed for gravity drainage to the sump, which was constructed with a single composite liner. The sump was installed with a manually operated pump and no automatic flow recordation. The sump was plumbed to a 3,000 gallon above ground storage tank (AGT) in the southwest corner of the module.

    To ensure compliance with Discharge Specification B.5, Facility Specification C.4 requires that all manually operated LCRS sumps, including Module 1's, be upgraded to the automatic controls specified for new modules in Construction Specification D.2.d. Provision G.8.a requires that the Discharger submit a work plan and schedule for implementing these upgrades.

46. The interface between Modules 1 and 3 consisted of an anchor trench/berm approximately 3 feet in height.

Module 3

47. Module 3 was constructed in 1995 with a Subtitle D-compliant, engineered alternative design (EAD) to the Title 27 prescriptive standard for an MSW landfill, approved under previous WDRs (Order No. 95-068), as follows, from top to bottom:

<table>
<tr><th>Component</th><th>Base Liner</th><th>Side Slopes</th></tr>
<tr><td>Operations Layer</td><td colspan="2">≥ 2' soil</td></tr>
<tr><td>Filter Fabric</td><td colspan="2">Geotextile[1]</td></tr>
<tr><td>LCRS</td><td colspan="2">Geonet</td></tr>
<tr><td rowspan="2">Base Liner</td><td>60-mil HDPE[2]</td><td rowspan="2">80-mil HDPE[2]</td></tr>
<tr><td>GCL</td></tr>
<tr><td>Foundation Layer</td><td colspan="2">≥ 6" compacted soil</td></tr>
</table>

1. 10 oz/yd2 non-woven fabric.
2. HDPE single-side textured, placed smooth side up.

Module 3's LCRS was the same basic design as Module 4's (See Construction Specification D.2), but with a manually operated sump pump. Also, the collection sump for Module 3 was plumbed to the same AGT as Module 1. As with Module 1, Facility Specification C.4 requires that Module 3 sump be upgraded to the automatic controls specified for new modules in Construction Specification D.2.d, while Provision G.8.a requires submission of a work plan and schedule for implementing the required upgrade.

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Module 4

48. A 17 April 2001 letter issued by the Board's Executive Officer to solid waste landfill owners and operators required a liner performance appraisal for any liner system to be constructed after 1 January 2000, regardless of any liner expansion previously authorized in waste discharge requirements. The performance appraisals were required to include a demonstration that liner systems to be constructed will comply with Title 27 performance standards.

49. In response to the Executive Officer's April 2001 letter, the Discharger submitted a 14 May 2002 performance demonstration report for Module 4 and future modules (*Liner Performance Demonstration for Module 4 and Future Modules at the North County Sanitary Landfill*, prepared by EMCON/OWT, Inc.), which (after revision in response to Board staff comment) was incorporated into a September 2002 *Report of Waste Discharge* (RWD). The RWD proposed an EAD to the Title 27 prescriptive standard Subtitle D composite liner for Module 4 and future modules (see Construction Specifications D.1 and D.2).

50. The results of the Module 4 performance demonstration are summarized in the following table:

Data Source	Leachate Head	Leak Rate[1]	LCRS Flow Rate[2]			
			Blanket		LCRS Piping	
	Base Liner		Gravel	Geonet	Lateral	Header
	Inches	Gal/acre/day			Gal/min	
Title 27	<12	0.81	---	---	56.6	145.8[3]
Model	2.4	0.0007	7,295	4,660	28.3	72.9
Design	---	---	---	---	120	500

1. Assumed geomembrane defect rate of one hole (1 cm diameter each) per acre of liner placed based on best industry practice CQA.
2. Based on anticipated or "worst case" peak conditions (e.g., high precipitation, infiltration and runoff during initial waste filling operations) using Hydraulic Evaluation of Landfill Performance (HELP) Model, Version 3
3. Twice anticipated peak daily flow rates derived from HELP model.

The performance demonstration showed that the expected leachate head for the proposed design (2.4 inches) was within the maximum allowed under Title 27 for a MSW landfill (12 inches), and that the calculated leakage rate for the proposed design (0.0007 gal/acre/day) was much less than that for a Title 27 prescriptive MSW landfill (0.81 gal/acre/day). The LCRS lateral and header pipe capacities for the proposed design, 120 gal/min and 500 gal/min, respectively, also exceeded

Title 27 standards (56.2 gal/min and 145.8 gal/min, equal to twice the computed anticipated peak leachate flow rates). The results of site-specific unsaturated zone modeling (using V-Leach software) based on the above data indicated concentrations in groundwater below laboratory detection limits (i.e., < 1.0 μg/L) for all modeled constituents after 100 years.

51. Previous WDRs Order No. R5-2002-0219 approved the above EAD for Module 4 and future modules. Module 4 was constructed in 2004 consistent with the approved EAD and LCRS design. Construction of the module was documented in the November 2003 report *Final Construction Quality Assurance Report for Module 4 at the North County Recycling Center and Sanitary Landfill*, prepared by Vector Engineering, Inc.

Grading and Drainage

52. Modules 1 through 4 included the following grading features:
    a. 3H:1V interior excavation slopes;
    b. 3H:1V exterior slopes;
    c. Side slope benching every 50 vertical feet (20-foot wide benches).

53. Precipitation and drainage controls installed on the modules included:
    a. Top decks graded at 5% minimum for drainage.
    b. Soil berms along top deck perimeter to direct runoff to corner drop inlets.
    c. Overside (O/S) drains to capture top deck and side slope bench runoff.
    d. Side slope benches graded at 2% with central “V” drains to intercept and convey runoff to O/S drains.
    e. Soil berms and outboard ditch within 100-foot setback area along east, west, and south site perimeter to divert run-on and convey runoff to natural drains.

54. Runoff from the landfill is handled as follows:
    a. Inactive modules (i.e., M1, northern portion of M3) - runoff directed east into ISB ditch system.
    b. Active modules (i.e., M4, southern portion of M3) - runoff directed south to temporary pond in future Module 5 and 6 excavation areas.
    c. Future Module 5 and 6 areas - water from excavation area periodically pumped out to ditch that flows to ISB.
    d. Future Modules 7 through 11 areas – Runoff from these areas either flows directly to the ISB ditch system, or collects in low areas and is pumped into the ISB ditch system as part of site maintenance. The ISB ditch system drains to ISB.

Future Modules

55. Future module development will be in a sequential, counter-clockwise order. Each new module will be constructed in advance of filling the prior module to final refuse grade. The latter will occur before filling of the new module begins. Existing facilities in the eastern area of the site (e.g., MRF and gas wells SG-5, 6 and 7) will be decommissioned prior to development of that area.

56. The Discharger plans to construct future modules consistent with existing approvals for Module 4, or as separately proposed and approved for a new module. Specific designs and construction plans will be submitted for approval as each module is proposed for development. Construction Specifications D.1 through D.4 of these WDRs require that new modules be constructed in accordance with either the Title 27 prescriptive standard design or the approved EAD and performance demonstration for Module 4. Construction Specification D.4 further allows for the Executive Officer to approve less than significant changes to these designs, but requires Board approval of substantive changes.

Vertical Expansion Plan

57. The JTD submitted by the Discharger incorporates the Discharger's Vertical Expansion Plan (VEP) for the landfill (December 2007 report *30% Design Report for Vertical Expansion of the North County Recycling Center and Sanitary Landfill*, prepared by Shaw Environmental, Inc.). Vertical expansion is proposed as a component of a revision of the Facility Operating Permit. The VEP would increase the height of the landfill modules as follows:

Module	Fill Elevation, Feet MSL[1]		Fill Thickness, Ft [1, 2]	
	Avg. Base	Previous Maximum	Proposed Maximum	
1	87	190	235	148
3	65	190	230[3]	165
4	64	190	300	228
5 - 11	66	190	320	254

1. Maximum elevation includes cover material.
2. Maximum difference between proposed final grade and base elevation contours.
3. Fill height reduced from 260 feet MSL based on results of geotechnical analysis (see Finding 58).

Existing Modules 1 through 4 would be filled to the proposed maximum fill thickness (148 – 228 ft MSL) prior to filling at Module 5, which, in turn, would then be filled to its maximum thickness (254 ft MSL) before initiating operations in Module 6, and so on.

Existing grading plans for module slopes would be retained (e.g., 3H:1V interior and exterior, 20-foot wide benching every 50 vertical feet) and existing precipitation and drainage controls would be extended (and sized, as necessary) to handle the increased flows (and flow velocities) associated with the vertical expansion during a 100-year storm event. See Findings 52 and 53.

The VEP would increase the landfill capacity by approximately 72% from 20.9 million yd^3 to 35.9 million yd^3, based on a May 2009 aerial survey. Based on the existing disposal volume (5.3 million yd^3) and projected disposal rates, the landfill would reach capacity in the year 2055.

Geotechnical Analysis

58. Geotechnical issues evaluated for the vertical expansion plan included (a) the potential for puncture of the geomembrane liner from the overlying LCRS gravel; (b) the ability of LCRS pipes to withstand increased loads (e.g., wall crushing, buckling and deflection); (c) leachate production and head buildup on liner; (d) LCRS geonet and pipe flow capacities; (e) LCRS sump design and capacity; leachate storage and disposal; and slope stability analysis. The results indicated the need for modification of the design of Module 3 and future modules, as follows:

    a. Existing Modules--Reduce maximum fill height of Module 3 to accommodate vertical loading limits of existing (4 inch, 15.5 SDR) LCRS piping. Other modules within design limits. See Discharge Specification B.1.c.

    b. Future Modules--Cushion against liner puncture and use stronger LCRS piping to accommodate planned vertical loads. See Construction Specification D.4

59. Slope stability analysis identified the following critical cross sections:

    a. Module 1: N-S section of the northern slope.

    b. Module 3: E-W section of the western slope.

    c. Module 4: E-W section of the western slope.

    d. Module 4 and future modules:

        1) N-S section of the southern slope (Modules 6 and 7) where the landfill toe buttress is minimal; and

        2) NE-SW section of the NE slope (future Module 11) where the base liner slopes toward the perimeter.

    e. Interim slopes: N-S section of the central part of the landfill after completion of Module 10, before construction of Module 11.

60. Static slope stability analysis performed on the above critical cross sections (using Slide software developed by Rocscience, Inc.) employed two-dimensional limit equilibrium analysis and the method of slices. Both force and moment equilibrium

were considered using the Morgenstern-Price method. Critical interface failure envelopes were developed for the modules based on the results of laboratory shear testing (up to maximum expected loads) and other factors. Computed static factors of safety ranged from 1.5 (Module 1) to 2.0 (Module 3), while computed yield accelerations ranged from 0.055g (Module 4) to 0.11g (Modules 1 and 3), indicating that all critical slopes would be stable under static conditions. Dynamic slope stability analysis was also conducted based on both probabilistic and deterministic approaches that yielded the following sets of conditions:

a. Probabilistic Approach

   1) Spectral Period < 0.4 Seconds - MPE = 6.4 at 54 km, PGA = 0.098g (Central Valley Coast Range Fault System).

   2) Spectral Period > 0.4 Seconds - MPE = 8.0 at 126 km, PGA = 0.085g (San Andreas Fault System)

b. Deterministic Approach

   1) Small earthquake – MPE < 6.5, PGA = 0.115

Calculated dynamic factors of safety ranged from 1.04 (interim slope) to 1.43 (Modules 4 through 11). Since all dynamic factors of safety were below the 1.5 minimum specified under Title 27, Section 21750(f)(5)(D), a more rigorous analysis of the data (i.e., deformation analysis) was performed using the Makdisi-Seed method (1977). The maximum calculated displacement by this method was 0.17 inches (interim slope), well within the maximum specified under Title 27 for seismic slope stability (6 inches).

CLOSURE AND POSTCLOSURE MAINTENANCE

61. As described in the PCP/PCMP (Appendix B, JTD), landfill closure activities will include grading and cover installation; improvements to precipitation and drainage controls; additional/modified leachate and LFG control facilities; installation of LFG and groundwater monitoring systems; removal of structures and other closure-related activities.

    a. After reaching final refuse elevations, the landfill will be contiguously graded as a single unit. Landfill grades will be generally the same as those for the individual modules described in Finding 52 (e.g., 5% minimum slopes on top deck, 3H:1V maximum exterior slopes, benching).

    b. Landfill precipitation and drainage controls will also be generally the same as those for the individual modules described in Findings 52 through 53 (e.g., top deck grading and berms, bench drains, O/S drains etc.), except as follows:

       1) There will be no ISB. Runoff from the eastern fill area will be discharged via the perimeter drain to the wetlands mitigation area and South Paddy Creek in the northern part of the site.

2) Runoff from the western fill area (i.e., Modules 1 through 6) will be directed to the outboard ditch and discharged offsite via culverts previously noted (see Finding 18 and Attachment B).

62. The Discharger may propose partial landfill closure upon reaching final elevations on some, but not all modules. In such case, the Discharger will submit a partial FCPMP(s) for the modules proposed for closure in accordance with Title 27 requirements.

63. The PCP/PCMP includes a conceptual plan for the landfill cover consisting of GCL in lieu of one foot of compacted clay for the LHC layer, an engineered alternative to the prescriptive design under Title 27. The plan states that demonstration for any such EAD proposal will be included in the Final Closure Plan when it is submitted. Construction Specification D.10 requires that any such cover proposal address the requirements of Title 27 and Subtitle D, including the requirement that the cover not create a "bathtub effect".

64. Landfill postclosure maintenance/monitoring activities will include final cover maintenance; leachate management; maintenance and monitoring of LFG facilities; groundwater, vadose zone, and surface water monitoring; maintenance of precipitation and drainage controls; and other postclosure related activities.

FINANCIAL ASSURANCES

Closure

65. The Discharger is required to demonstrate financial assurances (F/As) for closure to the California Integrated Waste Management Board (CIWMB) pursuant to Title 27, Section 22205, since the landfill operated after January 1, 1988. The total estimated cost of closure provided in the PCP/PCMP after vertical expansion of the landfill is $14,006,200 in 2008 dollars. The Discharger has established an enterprise fund account (San Joaquin County Resolution No. R-90-1190) funded from solid waste revenues as the mechanism for landfill closure F/A.

66. Section 22206 of Title 27 requires that the closure F/A demonstration be, at a minimum, in the amount of the current closure cost estimate. The latter is the minimum enterprise account funding balance required by the CIWMB under Section 22225 of Title 27. The following table summarizes the status of closure F/A provided to the CIWMB as of a September 2008 and F/A demonstration parameters for vertical expansion of the landfill:

Parameter	Closure F/A Demonstration	
	Before Vertical Expansion[1]	After Vertical Expansion[2]
Landfill Capacity (yd^3)	20,900,000	36,900,000

Closure Cost Estimate ($)[2]	5,608,551	14,006,200
Cumulative Filled (yd^3)	5,240,928	---[3]
% Capacity	25.3	---[3]
Minimum Required Fund Balance ($)	819,768	---[3]
Actual Fund Balance ($)	1,715,813	---[3]

1. Based on September 2008 demonstration to CIWMB.
2. After issuance of Solid Waste Facilities Permit by LEA authorizing vertical expansion.
3. As updated annually in closure F/A demonstration to CIWMB.

Provision H.5.a of these WDRs requires that the Discharger maintain closure financial assurances in at least the amount of the minimum balance required by the CIWMB.

Postclosure

67. The Discharger is required to demonstrate F/A for postclosure maintenance to the CIWMB pursuant to Section 22212(b), since the landfill operated after January 1, 1988. The total estimated annual cost for postclosure maintenance and monitoring provided in the FCPMP after vertical expansion of the landfill, including 20% contingency, is approximately $596,300 in 2008 dollars (see Finding 64). The estimated 30-year cost for landfill postclosure activities, including 20% contingency, is $17,859,000 in 2008 dollars. Provision E.25.b requires that the Discharger provide updated cost estimates, as necessary under these WDRs, for postclosure maintenance and monitoring, while Provision H.5.b requires that the Discharger provide and maintain updated F/As to the CIWMB in the amount of such updated cost estimates, as approved by the Regional Water Board.

68. In 1993, the CIWMB approved a Pledge of Revenue Agreement (*No. 93-605*) proposed by the Discharger as the postclosure F/A mechanism per Section 22228 to cover the estimated annual cost of landfill postclosure maintenance and monitoring. This agreement is still in effect.

69. The Discharger is required to demonstrate F/A for third party corrective action to the CIWMB pursuant to Title 27 Section 22220(b), since the landfill operated after July 1, 1991. Title 27 Section 22221(a) requires that such corrective action funding be sufficient to address a known or reasonably foreseeable release, as approved by the Regional Water Board. In October 2008, Regional Water Board staff approved an estimate of $1,520,265 in 2008 dollars submitted by the Discharger for corrective action F/As, based on costs necessary to address VOC impacts to groundwater from a reasonably foreseeable release of LFG from the landfill. In January 2009, the CIWMB approved the corrective action F/As mechanism (a Pledge of Revenue) provided by the Discharger.

Provision E.25.c requires that the Discharger provide an updated cost estimate, as necessary under these WDRs, for corrective action, while Provision H.5.c requires that the Discharger provide and maintain updated F/As to the CIWMB in the amount of the updated cost estimate, as approved by the Regional Water Board. Provision G.11 further requires that initially, and at least every five years thereafter, the Discharger submit a report to the Regional Water Board's Executive Officer as to the ongoing viability of F/A instruments and, on an annual basis, evidence of acceptance by the CIWMB of its required annual demonstration under Title 27.

CEQA AND OTHER CONSIDERATIONS

70. The action to revise the WDRs is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Title 14, CCR Section 15301 for existing facilities.

71. The San Joaquin County Board of Supervisors certified a final environmental impact report (EIR) addressing plans for vertical expansion of the landfill (*San Joaquin County Department of Public Works*, *Final Environmental Impact Report for North County Recycling Center and Sanitary Landfill*, prepared by Jones & Stokes; State Clearinghouse No. 2006062113) on 5 December 2006. The San Joaquin County Clerk filed a Notice of Determination on 11 December 2006 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The report found that the vertical expansion project would not have a significant impact on landfill waste containment facilities and controls nor on water quality provided compliance with applicable state and federal regulations and permit requirements is maintained (i.e., Subtitle D, Title 27, NPDES storm water, landfill WDRs). These WDRs implement such regulations. See Finding 74.

72. Section 13267(b) of California Water Code provides that: "In conducting an investigation specified in subdivision (a), the Regional Water Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports." The monitoring and reporting program required by this Order (MRP No. R5-2010-0016, attached) is necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

73. On 17 June 1993 (and as amended 21 July 2005), the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of MSW landfills that is consistent with the federal MSW regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D). Title 27 incorporates *State Water Resources Control Board (SWRCB) Resolution No. 93-62*.

74. This Order implements:

    a. *The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition;*

    b. Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;

    c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and

    d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993 and amended 21 July 2005.

PROCEDURAL REQUIREMENTS

75. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.

76. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

77. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

78. Any person aggrieved by this action of the Regional Water Board may petition the State Water Board to review the action in accordance with CWC 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 the 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.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 2002-0219 is rescinded, and that the San Joaquin County Department of Public Works, its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. With the exception of TWW handled in accordance with this Order, the discharge of 'hazardous waste' or 'designated waste' is prohibited. For the purposes of this Order, the term "hazardous waste" is as defined in Title 23, California Code of Regulations, Section 2510 et seq., and "designated waste" is as defined in Title 27, Section 20164.

2. The discharge of wastes outside of a Unit (or portions of a Unit specifically designed for their containment) is prohibited.

3. The following discharges of leachate and/or gas condensate liquids to the landfill are prohibited:

   a. Liquids not generated by the landfill.

   b. Discharges to Module 1 or any future module or unit not constructed with a Subtitle D composite liner (or approved EAD) and an LCRS.

   c. Any discharge that could result in leachate seeps, excessive head on the liner, or leachate runoff from the unit.

   d. Wet cell operations.

4. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.

5. The discharge of treated or untreated wastewater or groundwater to any surface water or any surface water drainage course is prohibited without a National Pollutant Discharge Elimination System (NPDES) permit authorizing the discharge.

6. The landfill shall not cause pollution or a nuisance, as defined by the California Water Code, Section 13050, and shall not cause degradation of any water supply.

7. The discharge shall not cause the release of pollutants, or waste constituents in a manner which causes a condition of nuisance, degradation, contamination, or pollution of groundwater, unsaturated zone, or surface water

to occur, as indicated by the most appropriate statistical or nonstatistical data analysis method and retest method listed in this Order.

8. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State in either the liquid or the gaseous phase, and cause a condition of nuisance, degradation, contamination, or pollution.

9. TWW shall not be discharged to landfill modules that are leaking. Upon confirmation of a leachate release (or of a LFG release containing one or more TWW constituents) from the landfill to the unsaturated zone and/or groundwater, all TWW discharges to that module shall be ceased until such time as corrective action measures result in cessation of the leak/release. Such cessation of waste discharge shall be noted in solid waste reporting under MRP Reporting Requirement H.2.a.ii. (See also Discharge Specifications B.8 and B.10.)

10. The waste discharge prohibitions herein shall supersede any conflicting or contradictory provisions in the April 2000 Standard Provisions and Reporting Requirements (SPRR) applicable to waste discharge to an active or closed landfill. See also SPRR Section I.E.

B. DISCHARGE SPECIFICATIONS

1. The discharge of solid waste to the landfill shall be limited to the following:
   a. The existing landfill footprint (i.e., Modules 1, 3, and/or 4);
   b. Lateral expansions of the existing footprint within the unit area constructed with a Subtitle D composite-liner and LCRS or approved EADs per under Construction Specifications D.1 through D.3; and;
   c. Vertical expansion over B.1.a and/or B.1.b up to the maximum fill elevations listed in Finding 57 of this Order, including cover material, as supported by geotechnical analysis (Findings 58 and 59) and approved by the Local Enforcement Agency.

2. The discharge shall remain within the designated disposal area at all times.

3. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.

4. Consistent with liquids restrictions in Title 27, Section 20340(g) and Subtitle D (40 CFR 258.28), the return of landfill leachate and/or LFG condensate back to the landfill shall be limited to those modules constructed with a Subtitle D composite liner (or equivalent approved EAD) and LCRS (i.e., Modules 3, 4

and any lateral expansions constructed in accordance with Construction Specifications D.1 through D.5). See Discharge Specification VI.E, SPRR.

5. The LCRS sump shall be designed and operated so as to prevent/minimize both (1) leachate head build-up on the baseliner beyond the limits of the sump; and (2) leachate storage within the sump. See also Construction Specifications VIII.O and Q, SPRR.

6. Waste discharged within the initial two feet of the unit, or any lateral expansion of the unit, as measured from the top of the operations layer over the liner system, shall consist only of "packer waste"; that is, waste free of objects that could pose a danger of physical damage to the liner system.

7. The discharge of TWW to the landfill may include, but is not limited to, waste wood that has been treated with chromated copper arsenate (CCA), pentachlorophenol, creosote, acid copper chromate (ACC), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or chromated zinc chloride (CZC).

8. The discharge of TWW to the landfill shall be limited to modules equipped with a Subtitle D composite liner and LCRS, or approved EADs, as prescribed in Construction Specifications D.1 through D.4. (TWW may therefore be discharged to modules M3, M4 and future Subtitle D-compliant modules, but shall not be discharged to module M1.)

9. TWW must be managed to ensure consistency with CHSC Sections 25143.1.5 and 25150.7.

10. Except as noted in B.10.b below, the Discharger shall comply with the alternative management standards applicable to TWW set forth in CCR, title 22, chapter 34, Section 67386.11 (copy attached to Information Sheet), as prescribed under these WDRs, or other State or Local permit relevant to TWW operations, as follows:

    a. Alternative Management Standards

        (1) Discharge Specification B.8 above**.**

        (2) TWW handling at the landfill shall be in accordance with the prohibitions of Section 67386.3 (see Information Sheet, Attachment I).

        (3) Ensure that any management of the TWW at the landfill prior to disposal complies with CCR, title 22, chapter 34.

        (4) Discharge Prohibition A.9. The landfill shall notify the Department of Toxic Substances Control (DTSC) and Regional Water Board of the following:

i. Cessation TWW discharges to any module from which such a leak or release has been confirmed and;

ii. Resumption of TWW discharges to any module where corrective action measures result in cessation of the leak/release (e.g., where sufficient repairs to the containment system have been implemented and the Executive Officer has approved suspension or termination of corrective action measures under Monitoring Specification E.32).

(5) Handle TWW in a manner consistent with all applicable requirements of the California Occupational Safety and Health Act of 1973, including all rules, regulations, and orders relating to hazardous waste.

b. Limited Exemption

In accordance with CHSC Section 25143.1.5(b), TWW removed from electric, gas or telephone service (e.g., treated poles, pilings, posts) shall be exempt from all of the above alternative management standards except B.10.a(1), provided that it complies with this standard. See also Discharge Specification B.9.

C. FACILITY SPECIFICATIONS

1. The Discharger shall immediately notify the Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures. See also Facility Specification VII.D, SPRR.

2. Water and leachate used for facility maintenance shall be limited to the minimum amount necessary for dust control and construction. Any such application of leachate shall be subject to restrictions of this Order applicable to liquid wastes (see Discharge Prohibition A.3 and Discharge Specification B.1).

3. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with this Order, including, but not limited to, the landfill cover, cover grade, containment system, leachate controls, precipitation and drainage controls, monitoring wells, gas extraction system, and related landfill facilities.

4. To reduce the potential for a leachate release and ensure that all LCRS sumps are operated in compliance with Discharge Specification B.5, all modules with manually-operated LCRS sumps (i.e., Modules 1 and 3) shall, **within two years** of adoption of this Order, be upgraded to meet the sump pump specifications described in Construction Specification D.2.d (i.e., automatic

sump pump, alarms, flow meter, and recordation device). See Provision G.8.a.

5. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled as needed to prevent adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.

6. All wells within 500 feet of the waste management units shall have sanitary seals that meet the requirements of the San Joaquin County Environmental Health Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Water Board and to the State Department of Water Resources.

7. The Discharger shall maintain a copy of this Order and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

D. CONSTRUCTION SPECIFICATIONS

1. Lateral expansions of the existing Unit (i.e., new modules) shall be constructed in accordance with one of the following composite liner designs:

   a. Title 27 Prescriptive Standard – Subtitle D Composite Liner and LCRS (top to bottom):

Component	Base Liner	Side Slopes
Operations Layer	Soil	
LCRS	1’ gravel drainage blanket	
Base Liner	40 mil synthetic FML or 60-mil HDPE[1]	
	$\geq$ 2’ compacted clay soil ($k < 1x10^{-7}$ cm/sec)[2]	
Foundation Layer	$\geq$ 1’ compacted soil[3]	

1. In direct and uniform contact with the underlying clay soil layer.
2. Minimum relative compaction of 90%.
3. See Construction Specification D.3.

   b. Title 27 Engineered Alternative Design (EAD) – Approved per Module 4 Performance Demo (from top to bottom):

Component	Base Liner	Side Slopes
Operations Layer	$\geq$ 2’ soil	
Filter Fabric	Geotextile[1]	Geocomposite[2]

LCRS	¾-foot gravel drain layer	
Base Liner	60-mil HDPE[3]	
	GCL[4]	
Foundation Layer	≥ 1' compacted subgrade ≥ 1/2'	

1. 8 oz/yd2 non-woven fabric.
2. Consists of geonet with overlying and underlying filter fabric.
3. Textured on both sides.
4. Shall exhibit appropriate strength characteristics (hydrated) to accommodate stresses associated with specific landfill design parameters, with particular attention to interface, long-term creep, shear, and bearing capacity.

2. Lateral expansions of the existing Unit (i.e., new modules) shall be constructed in accordance with the following LCRS design:

   a. Foundation layer - graded at 2.2% cross slope toward collection sump.

   b. Blanket layer –

      1) ≥ ¾-foot thick layer of rounded gravel over base liner

      2) Geocomposite (or equivalent combination of geonet and filter fabric) over slide slopes.

   c. French drain – perforated HDPE pipes installed in gravel filled troughs above the base liner, including the following:

      1) 4-inch diameter laterals installed at 1% minimum slope. Laterals shall be equipped pipe risers at each end for inspection and cleaning, if necessary, and a wire rope to enable video camera inspection of the lines.

      2) 6-inch diameter header pipe at a minimum 2% slope.

   d. Collection Sump – The collection sump shall be constructed as follows, from top to bottom:

Component		Specification
Tank[1]	Gravel	Sump gravel
	Volume	
	Pump	Automatic with high and low alarms, flow meter
Filter Fabric		Geotextile[2]
Primary Composite Liner		60-mil HDPE/GCL
Secondary LCRS[3]		Geonet

Secondary Composite Liner	60-mil HDPE/GCL
Foundation Layer	≥ 1' compacted subgrade

1. Sump shall be equipped with an automatic pump, flow meter, and recordation device, allowing instantaneous measurement of rate and volumes removed. High and low liquid level sensors and associated alarms shall also be included in design.
2. 8 oz/yd^2 non-woven fabric.
3. 12-inch HDPE riser included for leachate monitoring and removal.

3. The foundation layer in the above composite liner designs (D.2.a and D.2.b) shall be constructed as follows:

   a. Project CQA shall include preparation of the foundation surface so as to minimize the risk of liner puncture and leak detection testing. In both of the above designs, the foundation layer shall consist of select fine-grained soil materials compacted as follows:

      1) In lifts of 6 inches or less; and
      2) To 90% of maximum dry density at 0 to 4% wet of optimum moisture content, in accordance with the approved CQA plan; and
      3) To a minimum hydraulic conductivity of 1 x 10^{-5} cm/sec; or
      4) In accordance with the following gradation criteria:
         i. A maximum size of 3/8-inch; and
         ii. At least 30% of the material, by dry weight, passing the No. 200 U.S. Standard sieve; and
         iii. A gradation series (i.e., well-graded) that is amenable to compaction.

   b. Additionally, for the EAD (D.2.b), the subgrade for the bottom and side slopes shall be prepared in an appropriate manner using accepted engineering and construction methods so as to provide a smooth surface free from rocks, sticks, or other debris that could damage or otherwise limit the performance of the GCL.

4. The Discharger may propose changes to the liner system design prior to construction provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design, including, but not necessarily limited to, changes affecting the landfill containment system; LCRS; precipitation and drainage controls; final cover; and/or slope stability shall require re-evaluation as an EAD and approval by the Board.

5. The design and construction of all landfill module LCRS and containment system components shall incorporate adequate factors of safety to handle the increased vertical loads associated with vertical expansion. Consistent with geotechnical analysis of the proposed EAD (see Finding 58), the construction specifications for future modules shall incorporate the following recommendations to prevent damage to the LCRS and liner from vertical loading:

   a. Protection From Liner Puncture -- Use of 3/8-inch diameter, rounded gravel in the LCRS blanket layer and/or cushion with geotextile (16-oz/yd2).

   b. Protection From LCRS Pipe Failure (e.g., buckling, deflection, rupture) -- Use thicker (i.e., 13.5 SDR) perforated HDPE pipe in French drain. Also use select gravel bedding and backfill in LCRS troughs

   Construction specifications in addition to, or in lieu of, the above may be incorporated into the design provided that the Discharger demonstrates, to the satisfaction of the Executive Officer, that the proposed construction specifications will not result in (1) Reduced factors of safety and/or protection associated with the design; and (2) Any change inconsistent or incompatible with Construction Specifications D.1 through D.4 above.

6. The Discharger shall, **at least 90 days prior to construction of new modules** or units, submit for Executive Officer review and approval the following:

   a. A construction design report, including plans, drawings and a construction quality assurance (CQA) plan per Section 20324 of Title 27;

   b. A geotechnical evaluation of the area soils, evaluating their use as the foundation layer;

   c. A proposed unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and postclosure maintenance periods of the Unit, which shall be installed beneath the composite liner system in accordance with Title 27, Section 20415(d); and

   d. A revised groundwater detection monitoring program, as necessary, to monitor the new module so as to maintain compliance with Title 27.

7. Construction shall proceed only after all applicable CQA plans have been approved by Executive Officer.

8. Following the completion of construction of a lateral expansion of a unit, and prior to discharge onto the newly constructed liner system, final documentation required under Section 20324(d)(1)(C) of Title 27 shall be submitted to the Executive Officer for review and approval. Such documentation shall contain sufficient information and test results to verify that construction was in

accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27. A registered civil engineer or a certified engineering geologist shall certify the report.

9. A third party independent of both the Discharger and the construction contractor shall perform all of the CQA monitoring and testing during the construction of a liner system.

10. Any proposal for final cover included in the FCP shall meet the requirements of Title 27 and Subtitle D, including the requirement that that the permeability of the LHC layer be no greater than that of the base liner or underlying natural geologic materials (whichever is less) in order to prevent a "bathtub effect". See Section 21090(a)(2), Title 27; Section 258.60(a)(1), Subtitle D.

11. Closure or partial closure of the unit shall proceed only after submission of a FCP meeting the requirements of Title 27 to, and adoption of closure WDR by, the Regional Water Board.

12. LFG extraction facilities necessary to control LFG shall be installed as each new module is constructed and developed. New modules shall be tied into the existing LFG extraction system in order to help control LFG.

E. MONITORING SPECIFICATIONS

1. The Discharger shall comply with the background and detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with MRP No. R5-2010-0016. Background monitoring shall be conducted for the purpose of establishing and updating concentration limits as part of the Water Quality Protection Standard (WQPS) per Title 27 Section 20400(a). Detection monitoring shall be conducted for the purpose of detecting a release from the unit (or from individual modules in the unit) per Section 20420.

2. In the event of a release from the unit, the Discharger shall comply with the evaluation and corrective action monitoring provisions of Title 27 and MRP No. R5-2010-0016. Evaluation monitoring shall be conducted for the purpose of assessing the nature and extent of the release and designing corrective action measures. Corrective action monitoring shall be conducted for, and for assessing the progress of corrective action in returning to compliance with the WQPS (Title 27 Section 20430(d)).

3. The Discharger shall provide Board staff a minimum of one week notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior

to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.

4. The Discharger shall comply with the WQPS as specified in MRP No. R5-2010-0016 and the SPRR.

5. The concentrations of the COCs in waters passing the Point of Compliance shall not exceed concentration limits established in accordance with MRP No. R5-2010-0016. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the WQPS using procedures specified in the Section 20415(e) of Title 27.

6. The Discharger shall maintain and implement a Sample Collection and Analysis Plan (SCAnP) that includes the following elements:

   a. Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
   b. Sample preservation information and shipment procedures;
   c. Sample analytical methods and procedures; Sample quality assurance/quality control (QA/QC) procedures; and
   d. Chain of custody control.

   The SCAnP shall also be consistent with Monitoring Specifications E.7 through E.15 below.

7. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.

8. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of

   a. Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series),
   b. Test Methods for Evaluating Solid Waste (SW-846, latest edition), and;
   c. Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved SCAnP.

9. Specific methods of collection and analysis must be identified. If methods other than USEPA-approved methods or Standard Methods are used, the

exact methodology shall be submitted for review and approval by the Executive Officer prior to use.

10. The methods of analysis and the detection limits used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90 non-numerical determinations (i.e., “trace” or “ND”) in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

11. “**Trace**” results - results falling **between** the **MDL and** the practical quantitation limit (**PQL**) - shall be reported as such, and shall be accompanied by both the estimated MDL and PQL values for that analytical run.

12. **MDLs and PQLs** shall be **derived by the laboratory** for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall **reflect** the detection and quantitation capabilities of the **specific analytical procedure and equipment** used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.

13. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL** shall always be calculated such that it **represents the lowest achievable concentration** associated with a 99% reliability of a nonzero result. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent’s actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

14. **Unknown chromatographic peaks** shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.

15. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation

limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (e.g., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.

Monitoring Data Analysis

16. All monitoring data analysis methods shall be consistent with the performance standards specified in Section 20415(e)(9) and sampling standards specified in Section 20415(e)(12).

17. Any PQL validated pursuant to Section 20415(e)(7) that is used in the statistical method shall be the lowest concentration (or value) that can be reliably achieved within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. Any Section 20415(e)(7) technical report submitted by the Discharger shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy.

18. The statistical method shall account for data below the PQL with one or more statistical procedures that are protective of human health and the environment.

    a. For any given constituent monitored at a background or down gradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (i.e., a trace detection) shall be identified and used in appropriate statistical or nonstatistical tests.

    b. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".

Concentration Limits

19. Concentration limits (CLs) for monitoring shall be developed consistent with Monitoring Specifications E.20 through E.23 below.

20. For inorganic COCs for which at least 10% of the data from background samples equal or exceed their respective MDL (i.e., naturally occurring COCs), the Discharger shall use one of the following statistical data analysis methods for determination of CLs and detection of a release:

    a. Upper Tolerance or Prediction Limit (e.g., Parametric or Gamma);

b. Control chart (e.g., CUSUM);
c. Analysis of Variance (ANOVA); and/or
d. Other Methods
    1) Any statistical method per USEPA's Unified Guidance (2009);
    2) Any alternative statistical method authorized under Section 20415(e)(8) and approved by the Executive Officer under Section 20415(e)(7).

21. For **inorganic COCs** for which less than 10% of the data from background samples equal or exceed their respective MDL (i.e., nonstatistical COCs), including those not detected in background, the CL shall be the PQL.

22. CLs for **inorganic COCs** shall be periodically updated, as necessary, to reflect current background conditions.
    a. Statistical CLs
        1) Background data shall be screened for trends prior to calculating CLs to ensure that the data represents a single statistical population (i.e., one that does not show appreciable variation per Section 20415(e)(10)). If a significant trend is identified that reflects changes in background conditions, data prior to development of the trend shall not be included in updating CLs. Otherwise CLs shall include prior historical data.
        2) Statistical CLs shall also take into account any seasonality in the data.
        3) Borderline statistical CLs (e.g.., those for which less than 20% of the data from background samples equal or exceed their respective MDL) should be periodically rechecked per E.20 to verify that they are still statistical.
    b. Nonstatistical CLs

        Borderline nonstatistical CLs (e.g.., those for which almost 10% of the data from background samples equal or exceed their respective MDL) should be periodically rechecked per E.21 to verify that they are still nonstatistical.

23. For VOCs and all other organic COCs, the CL shall be the MDL.

Release Triggers

24. Any inorganic COC (statistical or nonstatistical) that exceeds its CL shall provide a preliminary indication [or, for a retest, measurably significant evidence] of a release at that monitoring point.

25. For VOCs and other organic COCs, the trigger for detection of a release shall be as follows:

a. From the COC or monitoring parameter list, identify each analyte in the current sample that exceeds its respective MDL. The Discharger shall conclude that the exceedance provides a preliminary indication [or, for a retest, provides measurably significant evidence] of a release (existing or new) at that monitoring point, if either:
   1) The data contain two or more analytes that equal or exceed their respective MDLs; or
   2) The data contain one analyte that equals or exceeds its PQL.

26. If the above statistical or non-statistical trigger procedures used for monitoring data analysis for a given media provide a preliminary indication of a release (i.e., new release or a previously unconfirmed constituent of the existing release) at a given monitoring point, the Discharger shall immediately notify Regional Water Board staff by phone or e-mail of a preliminary indication of a release, and, within 30 days of such indication, conduct confirmation (retest) sampling, subject to the following.
    a. Exceedances for constituents that have been previously confirmed as part of a release at a given monitoring point, including regularly-detected and sporadically detected (e.g., as a result of seasonal or lateral fluctuations in the plume) COCs, shall be considered confirmed without notification and retest.
    b. Exceedances for any constituent for which the Discharger fails to conduct a retest will be considered confirmed without retest unless and until the Discharger demonstrates its absence through subsequent monitoring per Section 20420(k)(7).

Discrete Retest

27. Confirmation sampling shall consist of taking two new (retest) samples from the monitoring point where the release is preliminarily indicated. For any given retest sample, the Discharger shall include in the retest analysis only the laboratory analytical results for those analytes detected in the original sample.
    a. As soon as the retest data are available, the Discharger shall apply the same tests [i.e., E.24 for inorganic COCs or E.25 for organic COCs], to separately analyze each of the two suites of retest data at the monitoring point where the release is preliminarily indicated.
    b. If either (or both) of the retest samples trips the applicable trigger above, then the Discharger shall conclude that there is measurably significant evidence of a release at that monitoring point for the analyte(s) indicated in the validating retest sample(s) and shall:
       1) Immediately notify the Regional Water Board about the constituent verified to be present at the monitoring point, and follow up with written

notification submitted by certified mail within seven days of validation; and

2) Proceed in accordance with E.28 and/or E.29, below, as applicable.

28. Exceedances that the Discharger demonstrates per Section 20420(k)(7) are the result of sample corruption, laboratory interferences, error, natural variation in the water quality, statistical evaluation, or other cause not associated with a release from the unit shall not provide a preliminary indication of a release, or, in the case of a discrete retest, confirm a release. Retesting may be necessary, however, to make such demonstration or, such as in the case of error or laboratory interferences, to obtain valid monitoring data.

29. Any COC confirmed by retest as part of a release (new or existing) shall be added to the monitoring parameter list such that it is monitored during each regular monitoring event.

30. Notwithstanding the results of preliminary and/or confirmation testing under E.26 and E.27 above, the Discharger shall consider whether there is significant physical evidence of a release from the Unit per Title 27, Section 20385(a)(3), which states:

Significant physical evidence of a release includes unexplained volumetric changes in surface impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the Unit and any other change to the environment that could reasonably be expected to be the result of a release from the Unit. . .

If the Discharger determines that there is either measurably significant or physically significant evidence of a release from the Unit at any monitoring point, the Discharger shall immediately implement the *Response to a Release* requirements contained in Section XI of the SPRR.

Corrective Action Progress

31. In the event of a release, the data analysis methods shall also include trend analysis; an evaluation of the water chemistry; and preparation of contaminant contour plots to monitor the nature of the release and effectiveness of corrective action measures, as specified in the MRP.

32. Prior to termination of corrective action measures required under Section 20430(c), the discharger shall demonstrate, pursuant to Section 20430(f), and 40 CFR 258.58(e)(2) for an MSW landfill, that the constituents of the release have been reduced to levels below concentration limits throughout the entire

zone affected by the release. During this "proof period", the Discharger shall demonstrate that:

a. The concentration of each constituent in each sample from each monitoring point remained at or below its concentration limit for at least three years, beginning immediately after the suspension of corrective action measures; and

b. The individual sampling events for each monitoring point must have been evenly distributed throughout the proof period and have consisted of at least four sampling events per year per monitoring point (i.e., quarterly monitoring).

c. At the end of the proof period, a single data analysis method (statistical or nonstatistical, as appropriate) shall be used for each monitoring parameter at each monitoring point to determine whether that parameter has been reduced to levels at or below concentration limits at that monitoring point.

The Discharger shall notify the Board and obtain Executive Officer approval prior to (1) suspending corrective action measures prior to making the above demonstration; and (2) terminating corrective action measures after making the above demonstration.

33. Any proposal for concentration limits greater than background (CLGBs) shall be accompanied by the requisite demonstration under Section 20400(c) (i.e., that it is technologically or economically infeasible to achieve the background value for that constituent and that the constituent will not pose a substantial present or potential hazard to human health or the environment). Approval of CLGBs shall require approval of revised WDRs by the Regional Water Board.

F. REPORTING REQUIREMENTS

1. The Discharger shall comply with the reporting requirements specified in this Order, MRP No. R5-2010-0016, and the SPRR.

2. The Discharger shall immediately notify the Regional Water Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions that could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

3. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow by the Unit or portion of the Unit, such that the depth of fluid on any portion of the LCRS (excluding the leachate removal pump sump) exceeds **30 cm**, the Discharger shall immediately notify the Board in writing within seven days. The notification shall include a

timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

4. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Regional Water Board office by telephone as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

5. The Discharger shall report by telephone any seepage from the disposal area immediately after it is discovered. A written report shall be filed with the Regional Water Board within seven days, containing at least the following information:
   a. A map showing the location(s) of seepage;
   b. An estimate of the flow rate;
   c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
   d. Verification that samples have been submitted for analyses of the COCs and Monitoring Parameters, and an estimated date that the results will be submitted to the Regional Water Board; and
   e. Corrective measures underway or proposed, and corresponding time schedule.
6. All reports and transmittal letters shall be signed by persons identified below:
   a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
   b. For a partnership or sole proprietorship: by a general partner or the proprietor.
   c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
   d. A duly authorized representative of a person designated in a, b or c above if;
      1) The authorization is made in writing by a person described in a, b, or c of this provision;
      2) 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 Unit,

superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

3) The written authorization is submitted to the Regional Water Board.

i. Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

7. The Discharger shall notify the Regional Water Board in writing of any proposed change in ownership or responsibility for construction or operation of the landfill. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional Water Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Water Board, and a statement. The statement shall comply with the signatory requirements contained in Reporting Requirement G.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Water Board.

8. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

(or the current address if the office relocates)

9. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with MRP No.

R5-2010-0016, as required by California Water Code sections 13750 through 13755 of the California Water Code.

G. PROVISIONS

1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.

2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.

3. The Discharger shall comply with the MRP No. R5-2010-0016, which is attached to and made part of this order. A violation of the MRP is a violation of these waste discharge requirements.

4. The Discharger shall comply with the Standard Provisions and Reporting Requirements (SPRR), dated April 2000, which are hereby incorporated into this Order. The SPRR contain important provisions and requirements with which the Discharger must comply. A violation of any of the SPRR is a violation of these waste discharge requirements.

5. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

6. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.

7. If the Discharger or Regional Water Board determines that the corrective action program is not adequate (i.e., does not satisfy the provisions of Section 20430), the Discharger shall, within 90 days of making the determination, or of receiving written notification from the Regional Water Board of such determination, submit an amended report of waste discharge (RWD) to make appropriate changes to the program. The amended RWD shall include the following:

    a. A discussion as to why existing corrective action measures have been ineffective or insufficient.
    b. A revised evaluation monitoring plan if necessary to further assess the

nature and extent of the release.

c. A discussion of corrective action needs and options.

d. Proposed additional corrective action measures, as necessary.

e. A plan to monitor the progress of corrective action measures consistent with the MRP.

f. Cost estimates for implementing additional corrective action, including monitoring.

g. An implementation schedule.

8. Consistent with required facility monitoring under MRP Section B, the Discharger shall investigate the following monitoring facilities and, by **31 March 2010**, submit a facility status report that includes the items identified below:

   a. LCRS Sumps

      1) A report describing current condition and operational controls.

      2) A work plan and schedule for upgrading manually operated sumps (i.e., Modules 1 and 3), as necessary, to comply with Facility Specification C.4 of this Order.

   b. Lysimeters

      1) A report as to condition and operational status, including, but not limited to, those lysimeters typically reported as dry (e.g., VZs-1 through -3).

      2) A work plan and schedule for repair or replacement of any lysimeter found not to be in good working order.

   c. Monitoring Well G-2

      1) A report as to condition and operational status, including monitoring history of the well.

      2) A work plan and schedule for repair or replacement of the well, as necessary.

9. By **30 April 2010**, the Discharger shall submit for approval an updated preliminary closure and postclosure maintenance plan (PCPMP) to reflect current operations (including vertical expansion plans, if approved by LEA) and requirements under these WDRs, including MRP No. R5-2010-0016. The PCMP shall meet the requirements of Title 27 Section 21769(b) applicable to an active landfill. The updated plan shall include updated third party cost estimates for the following items, as necessary:

   a. Landfill closure (e.g., grading, installation of cover)

   b. Postclosure Maintenance (e.g., cover repairs, facility maintenance,

groundwater monitoring)

1) Annual estimate
2) 30-year estimate

c. Corrective Action – Lump sum cost estimate for corrective action measures to address a known or reasonably foreseeable release per Title 27 Section 22220(b).

Copies of the updated PCMP shall also be provided to the Local Enforcement Agency and the CIWMB.

10. The Discharger shall obtain and maintain assurances of financial responsibility that comply with Title 27, Sections 22207 (Closure Fund), 22212 (Post-Closure Fund), and 22220 et seq. (Corrective Action Fund) and 40 CFR parts 257 and 258. The financial assurance (F/A) instruments(s) shall be submitted to the CIWMB, Financial Assurance Division, which determines if the instrument(s) meet the requirements of Chapter 6, Title 27. The Discharger shall provide adequate funding for the following:

    a. Landfill closure in at least the amount of the minimum fund balance required by the CIWMB under Section 22225 based on current approved closure cost estimates under Provision E.25.a;

    b. Landfill postclosure maintenance and monitoring in at least the amount of the approved cost estimates under Provision E.25.b; and

    c. Corrective action in at least the amount of the approved cost estimate under Provision E.25.c.

11. **Within 120 days** of adoption of this Order, the Discharger shall submit to the Executive Officer evidence that instrument(s) or mechanism(s) are in place for required F/As under this Order (i.e., closure, post-closure maintenance, and corrective action). The most recent acceptance letter from the CIWMB, Financial Assurance Division (required to be included in the Annual Report submitted under MRP Section H.2.e.iii) may suffice for this purpose.

    By **30 November 2010** and **every five years** thereafter (or earlier if requested by the Executive Officer), the Discharger shall also submit for the Executive Officer's review and approval a report as to the status of required F/As. The report shall identify the following:

    a. Required F/As for the facility, including type and current amount;

    b. F/A instrument(s) or mechanism(s) provided to satisfy the required F/As;

    c. Validity and ongoing viability of instrument(s)/mechanism(s) in D.4.b, including any needed changes.

12. By 31 July 2012, the Discharger shall submit, for the Executive Officer's approval, an updated Water Quality Protection Standard (WQPS) Report for each monitored media under this Order (i.e., unsaturated zone, groundwater, and surface water). The report shall include updated Constituents of Concern, Concentration Limits, Monitoring Points, Points of Compliance, and Compliance Periods, consistent with the requirements of this Order, including MRP Section C.

13. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.

14. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.

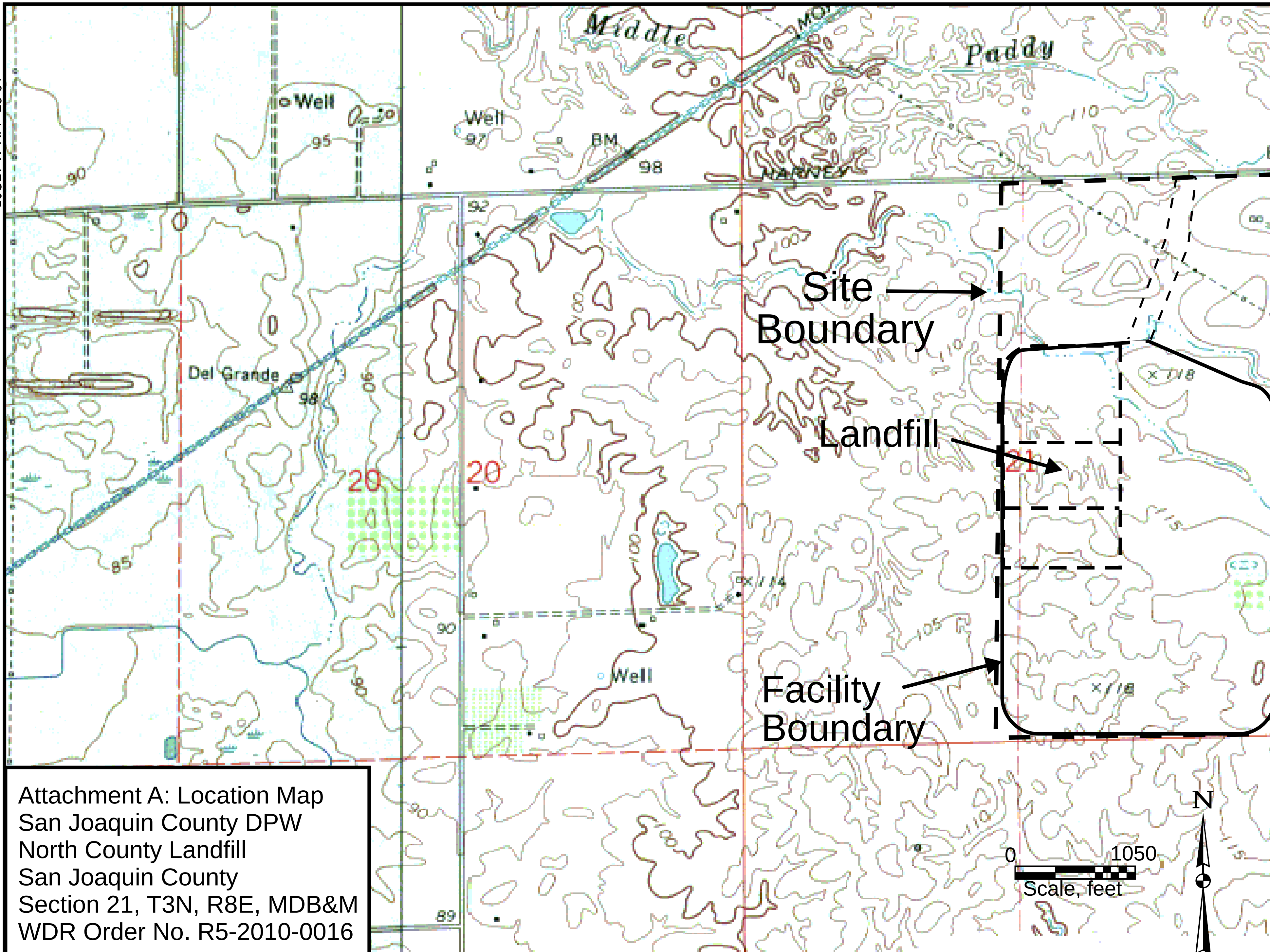
15. The Regional Water Board will review this Order periodically and will revise these requirements when necessary.

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 29 January 2010.

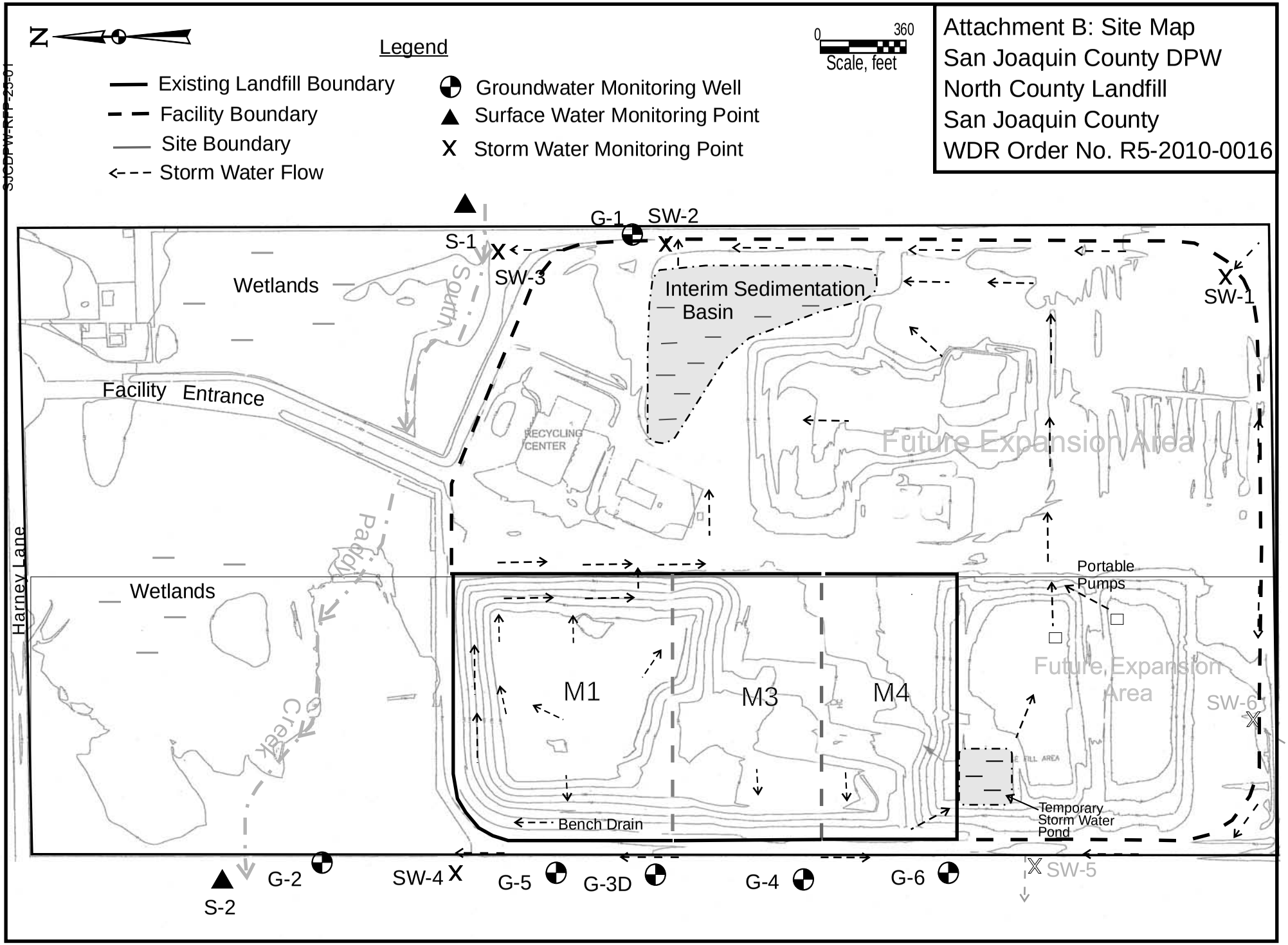
Original Signed By

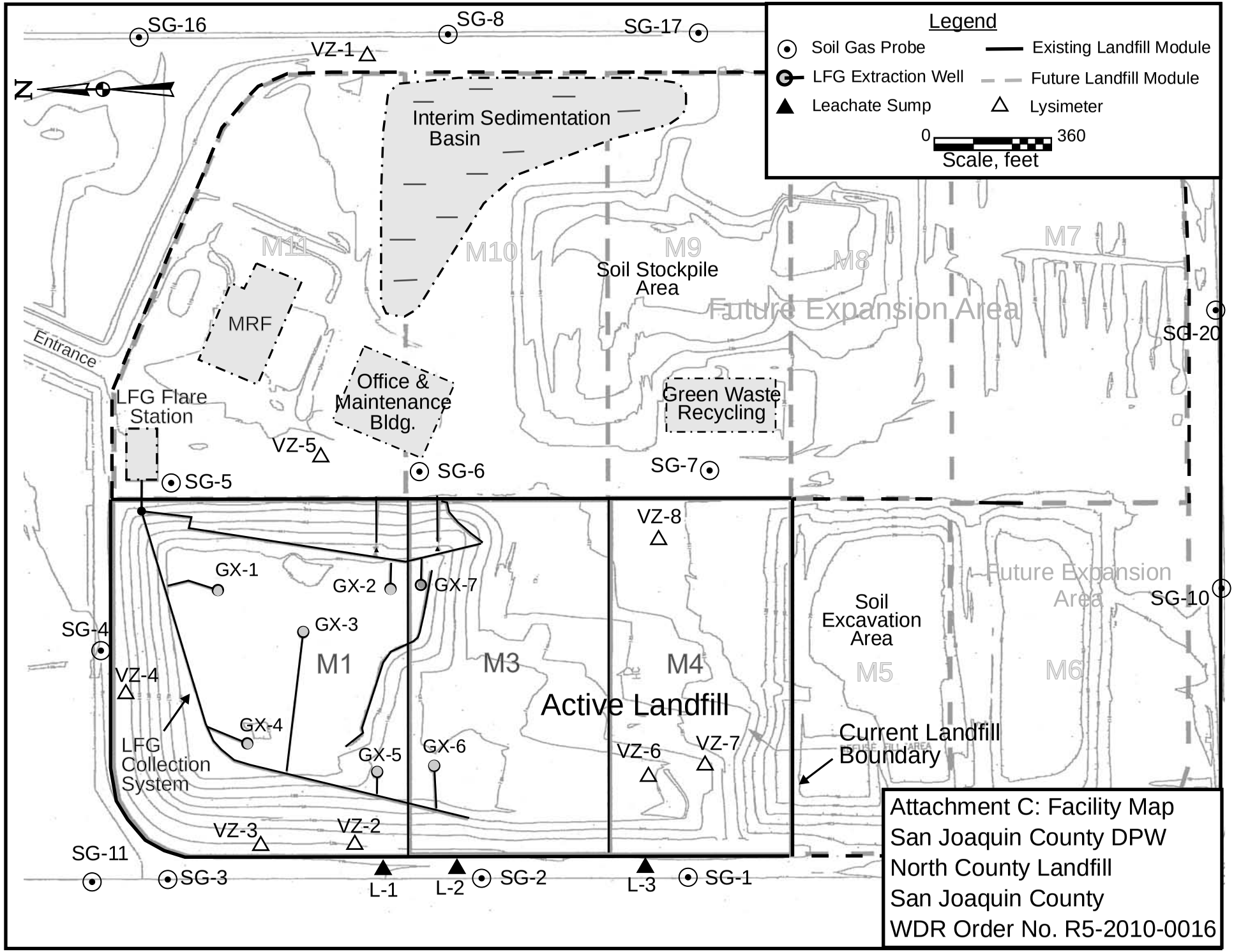
PAMELA C. CREEDON, Executive Officer

Attachments
JDM: 2 February 2010



Attachment A: Location Map
San Joaquin County DPW
North County Landfill
San Joaquin County
Section 21, T3N, R8E, MDB&M
WDR Order No. R5-2010-0016


SJCDPW-RFP-23-01
N
Legend
Existing Landfill Boundary
Facility Boundary
Site Boundary
Storm Water Flow
Groundwater Monitoring Well
Surface Water Monitoring Point
Storm Water Monitoring Point
0
360
Scale, feet
Attachment B: Site Map
San Joaquin County DPW
North County Landfill
San Joaquin County
WDR Order No. R5-2010-0016
S-1
G-1
SW-2
SW-3
SW-1
Wetlands
South
Interim Sedimentation Basin
Facility Entrance
RECYCLING CENTER
Future Expansion Area
Harney Lane
Wetlands
Paddy
Creek
Portable Pumps
M1
M3
M4
Future Expansion Area
SW-6
Bench Drain
Temporary Storm Water Pond
SW-5
S-2
G-2
SW-4
G-5
G-3D
G-4
G-6


SJCDPW-RFP-25-01
N
Legend
Soil Gas Probe
LFG Extraction Well
Leachate Sump
Existing Landfill Module
Future Landfill Module
Lysimeter
0
360
Scale, feet
SG-16
SG-8
SG-17
VZ-1
Interim Sedimentation Basin
M11
M10
M9
M8
M7
Soil Stockpile Area
Future Expansion Area
MRF
Entrance
LFG Flare Station
Office & Maintenance Bldg.
Green Waste Recycling
SG-20
VZ-5
SG-6
SG-7
SG-5
VZ-8
GX-1
GX-2
GX-7
Future Expansion Area
SG-10
Soil Excavation Area
SG-4
GX-3
M1
M3
M4
M5
M6
VZ-4
Active Landfill
GX-4
LFG Collection System
GX-5
GX-6
VZ-6
VZ-7
Current Landfill Boundary
VZ-3
VZ-2
SG-11
SG-3
L-1
L-2
SG-2
L-3
SG-1
Attachment C: Facility Map
San Joaquin County DPW
North County Landfill
San Joaquin County
WDR Order No. R5-2010-0016

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2010-0016
CONSTRUCTION, OPERATION, AND DETECTION MONITORING
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
NORTH COUNTY LANDFILL
CLASS III LANDFILL
SAN JOAQUIN COUNTY

This monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for landfill monitoring and maintenance contained in California Code Regulations title 27, division 2 (Title 27), Waste Discharge Requirements (WDRs) Order No. R5-2010-0016, and the April 2000 Standard Provisions and Reporting Requirements (SPRR). Compliance with this MRP is ordered by the WDRs. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

Pursuant to Sections 20415(b)(1)(B) and 20420, the Discharger shall maintain water quality monitoring systems for background and detection monitoring, as set forth below.[1]

MRP SUMMARY TABLE

Section	Requirement	Frequency
A	Standard Observations	Weekly
B	Facility Monitoring:	
	1. Maintenance Inspections	Monthly
	2. After Significant Storm Events	Within 7 Days After Event
	3. Site Winterization	Annually
C	Water Quality Protection Standard	Update as necessary
D	Leachate Monitoring	
	1. LCRS Sumps	Monthly/Semiannually
	2. Secondary Sumps	Quarterly/Semiannually
E	Unsaturated Zone Monitoring	
	1. Soil Gas	Quarterly
	2. Pore Liquid	Semiannually
F	Groundwater Monitoring	
	1. Elevation	Quarterly
	2. Background Monitoring	Semiannually
	3. Detection Monitoring	Semiannually
	4. Constituents of Concern (COCs)	Every 5 years
G	Surface Water Monitoring:	
	1. Storm Water	Semiannually

1. Regulatory sections quoted in the text and titles of this MRP refer to Title 27 unless otherwise noted.

Section	Requirement	Frequency
	2. South Paddy Creek	Semiannually
H	Reporting	
	1. Records	Continuous
	2. Semiannual Report	Semiannually
	3. Annual Monitoring Summary	Annually
	4. COC Monitoring Report	Every 5 years
	5. Other Reports	See Section H.5

A. STANDARD OBSERVATIONS

1. **Definition**

Standard Observations shall include the following:

a. For the Unit:
   1) Evidence of ponded water at any point on the facility (show affected area on map);
   2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
   3) Evidence of erosion and/or of day-lighted refuse.

b. Along the perimeter of the Unit:
   1) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
   2) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
   3) Evidence of erosion and/or of day-lighted refuse.

c. For receiving waters:
   1) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
   2) Discoloration and turbidity - description of color, source, and size of affected area;
   3) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
   4) Evidence of water uses - presence of water-associated wildlife;
   5) Flow rate; and
   6) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.

2. **Monitoring Requirements**

Standard observations of the site (e.g., landfill cover, perimeter ditches, sedimentation basin, South Paddy Creek) shall be performed **weekly** and recorded in field logs. Any landfill leachate seeps detected during these inspections (or at any other time) shall be reported in accordance with WDR Reporting Requirement F.5, and any leachate that enters a module excavation area or facility drainage system shall be sampled and analyzed for the COCs referenced in Table C.1 herein.

B. FACILITY MONITORING

The discharger shall inspect the landfill and associated facilities (e.g., cover, precipitation and drainage controls, gas extraction system, monitoring wells, access roads), as necessary, to ensure that such facilities are functioning properly and are in adequate maintenance and repair. Any damage to the landfill facilities observed during these inspections shall be flagged and repaired. Facility inspections and repairs shall be conducted in accordance with the following schedule:

	Purpose	Inspection Frequency	Complete Repairs[1]
1.	Regular Maintenance	Monthly	Within 30 days
2.	Storm Response	Within one week of significant storm event[2]	Within two weeks of storm event
3.	Site Winterization	By September 30 of each year	By October 31 of each year

1. If necessary repairs cannot be completed within specified time frame, the Discharger shall, within 7 days, notify the Regional Water Board and provide a schedule for completing them.
2. A "significant" storm event shall be one that produces 1.4 inches or more of precipitation within a 24-hour period, as measured at the Linn Ranch Station.

The results of these inspections, including documentation of any significant damage and/or repairs (e.g., field logs, site map showing location of damage, before and after photos) shall be included in the semiannual monitoring report for the period and summarized in the Annual Report. If no inspection and/or repairs were conducted as required above, the report shall so state, providing the reason and circumstances (e.g., no significant storm event during monitoring period).

C. WATER QUALITY PROTECTION STANDARD (Section 20390)

The Water Quality Protection Standard (WQPS) shall consist of all COCs, Concentration Limits (CLs) for each COC, Monitoring Points, Point of Compliance, and the Compliance Period.

1. **Constituents of Concern (Section 20395)**

The COC list includes all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The COCs for all monitored waters at the site (i.e., unsaturated zone, groundwater, and surface water) shall be as listed in Tables

G.1 and G.2, which are incorporated herein and made part of this Order by reference. The COC list groups are as follows:

Table C.1

Constituents of Concern	Units	Test Method
Field Parameters		As specified in Table G.1
Inorganic:		
General Minerals	mg/L	See Table G.1
Dissolved Metals	µg/L	See Table G.1
Organic:		
Volatile Organic Compounds	µg/L	USEPA Method 8260B
Semi-Volatile Organic Compounds	µg/L	USEPA Method 8270
Organophosphorus Pesticides	µg/L	USEPA Method 8141A
Chlorinated Herbicides	µg/L	USEPA Method 8151
Organochlorine Pesticides	µg/L	USEPA Method 8081A
Polychlorinated Biphenols (PCBs)	µg/L	USEPA Method 8082

2. **Concentration Limits (Section 20400)**
Statistical CLs shall be developed and updated using historical background monitoring data. Data analysis shall be in accordance with WDR Monitoring Specifications E.20 and E.22.a using an "interwell comparisons" approach (e.g., comparing downgradient with upgradient, or downstream with upstream). CLs for nonstatistical COCs shall be developed and updated, as applicable, in accordance with WDR Monitoring Specifications E.21, E.22.b, and E.23.

a. Unsaturated Zone

CLs not yet developed due to lack of liquid recovery from lysimeters. CLs shall be developed (and updated thereafter) once a sufficient amount of background monitoring data has been collected under Section E.2 herein.[1]

b. Groundwater

1) Statistical CLs

CLs for general minerals (specified in Table G.1) were calculated using the interwell tolerance method. CLs for dissolved metals have not yet been developed due to limited background monitoring data (9 events). Interim CLs for 11 out of 24 dissolved metals tentatively identified as statistical COCs are listed in Table G.1. Revised CLs for these dissolved metals shall be developed once additional background monitoring has been conducted for these constituents per Section F.2.c herein.

1. WDR Provision G.8.b requires that the Discharger investigate the lysimeters and submit a workplan for any repairs that may be necessary to ensure that they are in good working order.

2) Nonstatistical CLs

Interim CLs for the remaining 13 dissolved metals (i.e., those not detected in any of the 9 monitoring events) and CLs for VOCs and other organic COCs were set equal to the PQL.

c. Surface Water

CLs for statistical COCs shall be based on either of the following:

1) Concurrent upstream monitoring data; and/or
2) Statistical analysis of historical upstream monitoring data (assumed for interim CLs under this Order).

Interim statistical CLs based on available monitoring data from sampling point S-1 are provided in Table G.1. Revised CLs for these dissolved metals shall be developed once additional background monitoring has been conducted for these constituents under Section G.2 herein.

3. **Monitoring Points (Section 20405)**

The monitoring points for unsaturated zone, groundwater, and surface water monitoring shall be as specified in Sections E.2; F.2 and 3; and G.2, respectively.

4. **Compliance Points**

a. Unsaturated Zone

The compliance points for the unsaturated zone shall consist of all existing and future lysimeters installed along the landfill perimeter, as referenced in Section E.2 herein.

b. Groundwater

The compliance points for groundwater monitoring shall consist of all groundwater monitoring wells installed along the landfill perimeter, as referenced in Section F.3 herein and described as follows:

1) Point of Compliance Wells

Section 20405 defines the Point of Compliance (POC) as a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

The groundwater monitoring wells along the POC shall consist of all downgradient (and cross gradient) landfill perimeter wells, including Gs-2, 3D, 4, 5 and 6;

2) Upgradient Wells

All upgradient perimeter wells within the zone of influence of LFG (e.g., G-1);

3) Future Wells

Any future wells that meet either (or both) of the criteria in 4a and 4b.

c. Surface Water

The compliance points for surface water monitoring shall consist of downstream monitoring point S-2 (see Section G.2).

5. **Compliance Period (Section 20410)**
The compliance period (the minimum period for a landfill during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit) is equal to the active life of the Unit plus the closure period. The compliance period shall be as follows:

a. The landfill began operations in 1991 and is projected to close in 2050. The compliance period is therefore 59 years.

b. If the landfill is in corrective action at the scheduled end of the compliance period, the compliance period shall be extended until the discharger can demonstrate that the Unit has been in continuous compliance with its WQPS for a period of at least three consecutive years, including proof period under Section 20430(f). See WDR Monitoring Specification E.32.

D. LEACHATE MONITORING

1. **LCRS Sumps**
   a. Monitoring Points – Modules 1, 3, 4 and future modules
   b. Monitoring Parameters & Schedule

   All LCRS sumps shall be inspected **at least monthly** for leachate generation and monitored (i.e., sampled) in accordance with the parameters and frequencies of Section F.3.c (except quarterly elevation monitoring shall be replaced with monthly volume monitoring). Until such time as they are upgraded with automatic controls (required **within two years** of adoption of this Order under WDR Facility Specification C.4), manually operated LCRS sumps shall be pumped dry **twice per week** and the volumes removed recorded. Volumes pumped from automatically operated sumps shall also be recorded.

2. **Secondary Sumps**
   a. Monitoring Points – same as D.1.a.
   b. Monitoring Parameters & Schedule

   All secondary sumps shall be inspected **at least quarterly** for the presence of liquid. Notice to the Regional Water Board shall be the same as in response to a release (i.e., within 7 days). Any liquid detected in a sump shall be removed after completion of sampling. Monitoring shall be in accordance with Section F.3.c, except that the volume detected (and removed) shall also be measured.

E. UNSATURATED ZONE MONITORING

1. Soil Gas

The Discharger shall monitor soil gas for LFG to assess its ongoing potential as source of impacts to groundwater. Field meters shall be calibrated for each parameter before use. Field and calibration logs for each monitoring event shall be included in each monitoring report.

a. Major Gases

Major gases (i.e., methane and carbon dioxide) shall be monitored at all perimeter migration monitoring wells in accordance with the perimeter migration monitoring requirements of the LEA. Major gases shall also be monitored at the VOC monitoring points specified in Section E.1.b below. The monitoring parameters and schedule shall be as follows:

Table E.1.a

Parameter	Units	Frequency	Method
Ambient Temperature[1]	^oC, ^oF	Quarterly	Meter
Gas Pressure[1]	psig	Quarterly	Meter
Methane[2]	%	Quarterly	Meter
Carbon Dioxide[2]	%	Quarterly	Meter

1. Measured prior to monitoring
2. Measured at each well.

b. VOCs

VOCs shall be monitored at soil gas wells SG-1 (deep probe), SG-3 (deep probe) and SG-6. VOCs shall also be monitored in any perimeter migration monitoring well in which the methane concentration exceeds 5% by volume. The monitoring parameters and schedule shall be as follows:

Table E.1.b

Parameter	Units	Frequency	Method
Major Gases		Same as Table E.1.a.	
VOCs[1]	ppbv	Semiannually	EPA Method TO-15 or 8260B

1. If more than one probe in perimeter well exceeds 5% methane, only the lower of the probes need be monitored for VOCs.

2. Pore liquid Monitoring

The Discharger shall monitor soil pore liquid as follows:

a. Monitoring Points

Lysimeter	Type	Location
VZ-1	Background	Undeveloped area near G-1
VZ-2	Detection	SW perimeter Module 1, NW perimeter Module 3
VZ-3	Detection	NW perimeter Module 1
VZ-4	Detection	Northern perimeter, Module 1
VZ-6, 7	Detection	Under Module 4 (western half)
VZ- 8	Detection	Under Module 4 (eastern half)

1. Lysimeters installed in shallow soil beneath lined excavation slopes.

Lysimeter monitoring locations shall also include future lysimeters installed to monitor future expansion modules per WDR Construction Specification D.5.c. Pore liquid monitoring shall also include any lysimeters or other monitoring devices beneath leachate collection sumps.

b. Monitoring Parameters & Schedule

The pore liquid monitoring shall be conducted **monthly.** Any liquid recovered shall be analyzed in accordance with the parameters in Section F.3.c, except that volume of liquid recovered shall be recorded in lieu of elevation. In the event that a release is tentatively indicated, the Discharger shall proceed with confirmation sampling under WDR Monitoring Specification E.27, and follow the Response to Release requirements of the WDRs and SPRR, as indicated. The Discharger shall also consider whether the detection of liquid in the lysimeter constitutes significant physical evidence of a release under WDR Monitoring Specification E.30.

F. GROUNDWATER MONITORING

1. Elevation Monitoring (Section 20415(e)(13))

The groundwater surface elevation (in feet and hundredths, MSL) in all wells and piezometers shall be measured on a **quarterly** basis. Groundwater elevations taken prior to purging the well and sampling for Monitoring Parameters may be used to fulfill this requirement. Groundwater elevations for all monitoring wells for a given groundwater body shall be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater gradient and direction. The results of groundwater elevation monitoring shall be displayed on a water table contour map and/or groundwater flow net for the site and included in each monitoring report. The Discharger shall use the groundwater elevation monitoring data to estimate the following, as feasible:

a. The groundwater flow velocity
b. The gradient direction in the upper aquifer, and in any additional zone of saturation monitored pursuant to this MRP
c. Times of highest and lowest elevations of the water levels in the wells
d. Separation of groundwater from the lowest point of the unit

Each of these estimations shall be included in the semi-annual reports.

2. **Background Monitoring (Section 20415(b)(1)(A))**

Background monitoring shall be performed for the purpose of developing and updating concentration limits as described in Section C.2.

a. Monitoring Points

The Discharger shall install and operate a sufficient number of background monitoring wells at appropriate locations and depths to yield ground water samples from the uppermost aquifer that represent the quality of ground water that has not been affected by a release from the unit. The background monitoring system may include wells that are not hydraulically upgradient of the Unit if:

1) Samples from such wells are more representative than those provided by upgradient wells; or

2) Installation of an upgradient background well is not feasible; and

3) It can be demonstrated that samples from such wells are representative of background groundwater quality.

The background monitoring points for groundwater shall be as specified in Section F.3.a herein.

b. Monitoring Parameters - See Section F.3.b.

c. Monitoring Schedule

The background monitoring schedule shall be as specified in Section F.3.c herein, except for five-year inorganic COCs (i.e., dissolved metals) for which concentration limits have not yet been developed. For such COCs, background monitoring shall be conducted **annually** until a sufficient amount of data has been collected for statistical (or nonstatistical) determination of concentration limits. Thereafter, such monitoring may be reduced to every five years in accordance with Section F.4.

3. **Detection Monitoring (Sections 20415(b)(1)(B) and 20420)**

The Discharger shall install, operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Sections 20415 and 20420 of Title 27. Such system shall be appropriate for detecting, at the earliest possible time, a release to groundwater from the Unit. Detection

monitoring (and any evaluation and/or corrective action monitoring required in the event of a release) shall be conducted in compliance with WDR Monitoring Specifications E.1 through 33, as applicable.

a. Monitoring Points - The groundwater detection monitoring points shall be as specified below.

Module	Well	Orientation	Location
1	G-5	Down gradient	NW unit perimeter
1, 3	G-3D	Down gradient	Western site perimeter
3	G-4	Down gradient	Western unit perimeter
4	G-6	Down gradient	SW unit perimeter
All	G-1	Background	NE unit perimeter
All	G-2[1]	Side gradient	NW site perimeter

1. Well historically inactive. WDR Provision G.8.c requires status report, including plans for repair or replacement, as necessary.

The detection monitoring points shall further include any future onsite or offsite groundwater monitoring wells installed to monitor the facility. In the absence of an approved proposal to the contrary, all detection monitoring points shall become evaluation and corrective action monitoring points in the event of a confirmed release from the unit.

b. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for the landfill shall be as specified in Section F.3.c and Tables G.1 and G.2. Any five-year COC confirmed by retest (per WDR Monitoring Specification E.27) to be a constituent of a release shall also be added to the monitoring parameter list per Monitoring Specification E.29. In such cases, the Discharger shall also follow the Response to Release requirements of the WDRs and SPRR, as necessary.

c. Monitoring Schedule

A sufficient number of samples shall be taken from all monitoring points to satisfy the data analysis requirements for a given reporting period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection and analysis of samples shall be in accordance with procedures set forth in the SCAnP per WDR Monitoring Specification E.6. The groundwater monitoring schedule shall be as specified in Table F.3.c below.

Table F.3.c - Detection Monitoring Schedule

Parameter	Units	Frequency	Data Analysis
Field Parameters			
Elevation	Feet MSL	Quarterly	---
pH	pH units	Semiannually	Statistical
Temperature	^{O}C, ^{O}F	Semiannually	---
Turbidity	NTU	Semiannually	---
Dissolved Oxygen (DO)	%	Semiannually	---
Redox potential	millivolts	Semiannually	---
Specific Conductance	µMhos/cm	Semiannually	Statistical
Monitoring Parameters			
VOCs[1]	µg/L	Semiannually	Nonstatistical
General Minerals:			
Chloride	mg/L	Semiannually	Statistical
TDS	mg/L	Semiannually	Statistical
Total Alkalinity	mg/L	Semiannually	Statistical
Total Hardness	mg/L	Semiannually	Statistical
Chemical Oxygen Demand (COD)	mg/L	Semiannually	Statistical
Major Anions[1]	mg/L	Annually	Statistical
Major Cations[1]	mg/L	Annually	Statistical
COCs[1]	See Table C	Every 5 years[2]	Statistical/Nonstatistical

1. See Tables G.1 and G.2 for full list of constituents and EPA test methods.
2. More frequent monitoring may be required in certain circumstances per Section F.4.

4. **COC Monitoring**

COC monitoring shall be conducted as part of background and detection monitoring under Sections F.2 and F.3, respectively. COC monitoring shall be conducted by **30 June 2010** and at least every five years thereafter. Additional or more frequent COC monitoring may be required to establish CLs (see Section F.2.c) or in response to a release (see SPRR, Section XI).

G. SURFACE WATER MONITORING (Section 20415(c))

1. **Storm Water**

The Discharger shall maintain coverage under the State Water Resources Control Board General Industrial Storm Water Permit, Water Quality Order No. 97-03-DWQ. The discharger shall also monitor storm water flows semiannually for the semiannual field and monitoring parameters specified in Table F.3.c. Sampling shall be conducted at the following discharge locations, as applicable (see Attachment B):

Sampling Point	Sampling Location	Source of Flow	Type
SW-1[1]	Representative upstream location	Runon or direct rainfall Runon	
SW-2	Outfall to eastern perimeter ditch	ISB	Runoff
SW-3[2]	Outfall to South Paddy Creek - Upstream	Eastern Perimeter Ditch	Runoff
SW-4	Outfall to South Paddy Creek - Down stream	Western Perimeter Ditch	Runoff
SW-5[3]	SW Outfall to natural drain	Western Perimeter Ditch	Runoff
SW-6[3]	SW Outfall to natural drain	Southern perimeter ditch	Runoff

1. SW-1 may be any upstream location in the storm water drainage system representative of background storm water conditions.
2. No sampling required at this monitoring point if at time of sampling only source of flow is that from SW-2.
3. Future discharge locations.

The results of storm water monitoring for these constituents shall be summarized in the monitoring reports submitted under this Order. If there is no discharge from the site during the monitoring period, or the Discharger did not obtain samples of the discharge, the Discharger shall state the reasons and circumstances in the monitoring report.

2. **Surface Water**

Surface water sampling shall be collected at upstream monitoring point S-1 and down stream monitoring point S-2, as shown on Attachment B: Site Map. Monitoring shall be conducted for the parameters and constituents, and at the corresponding frequencies, listed in Table F.3.c, except for Redox potential, which need not be monitored. Creek elevation may be estimated based on observation.

H. REPORTING

1. **Records**

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the postclosure period. Such legible records shall show the following for each sample:

a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
b. Date, time, and manner of sampling;
c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
e. Calculation of results; and
f. Results of analyses, and the MDL and PQL for each analysis.

2. **Semiannual Reports**
The Discharger shall report monitoring data and information as required in this MRP and as required under WDRs Order No. R5-2010-0016 and the SPRR. Monitoring reports shall be submitted **semiannually**. Each semiannual monitoring report shall include the following information:

a. A compliance summary for the monitoring period that includes:
   i. A narrative summary of any **violations** that occurred during the monitoring period;
   ii. The quantity and types of wastes discharged and the locations in the unit where waste has been placed since submittal of the last such report.
   iii. A summary and certification of the completion of all Standard Observations.
   iv. An evaluation of the effectiveness of all landfill control facilities, including, but not necessarily limited to, leachate, precipitation and drainage, and landfill gas.
   v. Maps and/or aerial photographs, as appropriate, showing relevant facility details, including the landfill and all monitoring locations.

b. A tabular summary of monitoring well information from the installation logs, including well name, top casing elevation, total well depth, relevant geologic information (e.g., soil type), aquifer(s) and zones (e.g., upper water bearing zone), and screened intervals (bgs and MSL).

c. **Groundwater elevation** monitoring results for each quarter, including:
   1) A narrative description of groundwater flow at the site, including flow direction, gradient, and rate; and
   2) A groundwater elevation contour map approximately scaled and clearly labeled to show the information in H.2.c.1).

d. **Tabular summaries** of the monitoring results obtained during the period for each monitoring schedule herein. Tables shall have appropriate headers and show monitoring point, sampling date, constituent or parameter, concentration

or measurement, units, and CLs, as applicable. Any exceedances of CLs shall be highlighted or otherwise clearly shown. Non-detect results shall indicate the applicable detection limit (e.g., "<0.3").

e. An **analysis of the monitoring data**, including the following:

1) Background Monitoring
   i. Identifying historical trends
   ii. Developing/updating CLs for monitoring parameters and COCs, as appropriate

2) Detection Monitoring
   i. Comparing monitoring data with CLs to identify any exceedances
   ii. Retesting, as required, if release tentatively indicated.
   iii. Checking for previous similar or potentially related exceedances (e.g., sporadic, recurring) in same media.
   iv. Checking for similar or potentially related exceedances in other media (e.g., unsaturated zone).
   v. Whether a release was indicated by physically significant evidence.
   vi. Whether a leak occurred in a sump or containment system.

3) Graphics
   i. Water chemistry analysis
      ⇒ Cation/anion balance
      ⇒ Graphs (e.g., Piper, Trilinear, Schueller, and/or Stiff plot)

   ii. Time series plots
      ⇒ Provide for each constituent for which there are three or more data points, including non-detect values, at each monitoring point.
      ⇒ Data for multiple monitoring points, or multiple constituents, may be plotted on same graphic if scaling compatible.
      ⇒ Scale for maximum range of data (excluding outliers).
      ⇒ Use compatible graphics (e.g., symbols, line type, color, icon size) so each plot can be easily distinguished and read
      ⇒ Limit amount of information (e.g., number of constituents or monitoring points) on each graphic to maintain clarity
      ⇒ Use plotting program that reads sampling dates

   iii. Trend analysis
      ⇒ Provide for representative parameters/constituents for which there are four or more data points above the PQL, at each monitoring point.

⇒ Use appropriate graphical/statistical methods (e.g., Mann-Kendall, Sen's Slope, best fit).

Note: The above graphical methods may also be used to evaluate whether there has been a release under H.2.e.2).

4) Overall evaluation of the effectiveness of the detection monitoring program and need for additional measures, controls and/or monitoring wells.
   i. Identify potential sources of impacts and transport mechanisms
   ii. Discuss evidence that detection monitoring program is or is not working.

5) In Event of Release:
   i. Same as H.2.e.3) above.
   ii. Preparation of contaminant contour maps for representative constituents/parameters

The information above (H.2.a through H.2.e) shall be provided in the main body of the report, and the information below (H.2.f) in the appendix to the report.

f. Appendix Items

1) Field logs of Standard Observations
2) Sample collection information for each monitoring point:
   i. Time of water level measurement;
   ii. Type of pump (or other device) used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
   iii. Method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
   iv. Type of pump (or other device) used for sampling, if different than the pump or device used for purging; and
   v. A statement verifying that the sampling procedure was conducted in accordance with the SCAnP.
3) Field logs, chain of custody, and laboratory test sheets.
4) Copies of other relevant reports or data (e.g., results of soil gas/LFG monitoring required by Local Enforcement Agency)
5) An electronic copy of the monitoring report on compact disk (CD) in (preferably combined) PDF format.

Appendix Items f.i through f.iv above may be submitted in electronic form (per f.v) in lieu of submitting paper copies.

3. **Annual Monitoring Summary Report**
An Annual Monitoring Summary Report (Annual Report) shall also be prepared and submitted **annually**. The report may be submitted as part of the Second Semiannual Report for each year. The Annual Report shall include the following information:

a. A written summary of the monitoring results for the year, indicating any changes made or observed since the previous annual report.

b. A comprehensive discussion of the compliance record, including any necessary repairs, improvements, and/or corrective action measures implemented or planned to bring the Discharger into full compliance with the WDRs and WQPS.

c. Tabular and graphical summaries of the results of the prior year, including, representative time series plots.

d. A summary of the results of water chemistry analysis of water quality data collected during the prior year.

e. Appendix Items

1) A copy of the SCAnP as updated per WDR Monitoring Specification E.6 and the SPRR (Monitoring Specification X.B).

2) Electronic copies of the following on CD

i. Historical monitoring data collected under this and previous MRPs

⇒ Provide in a tabular format necessary for statistical analysis (e.g., Excel) per Section 40420(h)

⇒ Provide for all monitoring systems, including leachate; LFG; soil gas; soil pore water; groundwater (including elevation, flow direction, gradient, and quality); surface water; and storm water.

⇒ Provide for at least previous 10 years (or for as long as monitoring has been conducted at a given monitoring point).

⇒ Organize tables as specified in H.2.d.

ii. The monitoring report in (preferably combined) PDF format.

3) Evidence to the Regional Board's Executive Officer that acceptable financial assurance instrument(s) have been provided for post-closure and corrective action (e.g., an acceptance letter from the CIWMB's Financial Assurance Division).

4. **COC Monitoring Report**
The five year COC monitoring report may be submitted separately or in the semiannual report for the monitoring period in which five year sampling was conducted. In either case, the report shall be submitted in accordance with the due dates specified in Table H.6 below.

5. **Other Reports**
   a. Notifications -- Required notifications under Title 27 (e.g., tentative release, leachate seep, extended repairs) shall be submitted within 7 days of event unless otherwise specified under this Order or the SPRR.

   b. Updated WQPS Report -- shall be submitted by the due date specified in WDR Provision G.12 and thereafter concurrent with the five-year COC monitoring report under Section H.4 herein. (The WQPS shall be updated on an ongoing basis, as described in Section C herein.)

6. **Reporting Schedule**
The semiannual and annual reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

Table H.6

Report	End of Reporting Period	Date Report Due
First Semiannual	30 June	**31 July**
Second Semiannual	31 December	**31 January**
Annual Report	31 December	**31 January**

7. **Transmittal Letter**
A transmittal letter explaining essential points shall accompany each monitoring report. At a minimum, the transmittal letter shall:

   a. Identify the enclosed monitoring report and monitoring period for which it is being submitted under the MRP. Also, identify the last monitoring report submitted under the MRP and monitoring period for which it was submitted.

   b. State whether any WDR violations (including reporting violations) or exceedances of concentration limits have occurred during the monitoring period, or since the end of the monitoring period for which the last monitoring report was submitted; what those violations were; and how they have, or will be, corrected. If no such violations or exceedances have occurred, the transmittal letter shall so state.

   c. State that a discussion of any such violations or exceedances, and a description of the actions taken or planned for correcting them (including any references to previously submitted time schedules), is contained in the enclosed report.

d. Comply with the signatory requirements of WDR Reporting Requirement F.6, including certification by the discharger (or the discharger's authorized agent) under penalty of perjury that, to the best of the signer's knowledge, the report is true, accurate and complete.

Reports that do not comply with the above-required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: Original Signed By
PAMELA C. CREEDON, Executive Officer

29 January 2010

Attachments
JDM: 2 February 2010

INORGANIC CONSTITUENTS OF CONCERN (COCs),
APPROVED USEPA ANALYTICAL METHODS, & CONCENTRATION LIMITS

Table G.1

Constituent	USEPA Test Method	Concentration Limit[1]		
		Unsaturated Zone	Ground-water	Surface Water[3]
Field Parameters				
Elevation, Ft. MSL	----	n/a	----	n/a
pH, pH units	150.1 or meter	----	≥6, ≤8	----
Temperature, ^{O}C, ^{O}F	----	----	----	----
Turbidity, NTU	----	----	18	209
Dissolved Oxygen	360.1 or meter	----	----	----
Oxidation-Reduction (Redox) Potential, mv	----	----	----	n/a
Specific conductance, µMhos/cm	120.1 or meter	----	450	695
General Minerals, mg/L				
Total Dissolved Solids (TDS)	2540C	----	300	468
Total Alkalinity	2320B	----	165[2]	334
Total Hardness	2340B	----	----	----
Chemical Oxygen Demand (COD)	410.4	----	----	565
Major Anions				
Bicarbonate	2310B	----	130	----
Chloride	300	----	40	61
Nitrate – Nitrogen	300	----	4	10
Sulfate	300	----	31	69
Major Cations				
Calcium	200.7/6010	----	31	----
Magnesium	200.7/6010	----	23	----
Potassium	200.7/6010	----	7	----
Sodium	200.7/6010	----	31	----
Dissolved Metals, µg/L[5]				
Aluminum	200.7/6010	----	210[2]	3,050
Antimony	200.7/6010	----	PQL	----
Arsenic	200.9/200.8	----	PQL	----
Barium	200.7/6010	----	90[2]	254
Beryllium	200.7/6010	----	PQL	----
Boron	200.7/6010	----	170[2]	----
Cadmium	200.7/6010	----	PQL	----

Chromium	200.7/6010	----	PQL	12
Hexavalent Chromium	7199/1636	----	----	----
Cobalt	200.7/6010	----	PQL	----
Copper	200.7/6010	----	PQL	140
Cyanide	335.4/9010	----	10[2]	----
Iron	200.9/200.8	----	620[2]	3,340
Lead	200.9/200.8	----	10[2]	----
Manganese	200.7/6010	----	2[2]	579
Mercury	7470A	----	PQL	----
Molybdenum	200.7/6010	----	PQL	----
Nickel	200.9/200.8	----	PQL	138
Selenium	200.9/200.8	----	PQL	----
Silver	200.7/6010	----	PQL	----
Sulfide	9030	----	750[2]	----
Thallium	200.7/6010	----	PQL	----
Tin	200.7/6010	----	PQL	----
Vanadium	200.7/6010	----	30[2]	81
Zinc	200.7/6010	----	36[2]	482

1. "----" means insufficient data to compute CL for this constituent.
2. Interim CL equal to 1.5 x highest concentration historically detected in background well, excluding outlier(s).
3. Interim CL set at 90% tolerance limit estimated by statistical analysis of historical upstream data, excluding outlier(s).
4. Samples shall be filtered prior to performing dissolved inorganics analysis.

ORGANIC COCs & APPROVED USEPA ANALYTICAL METHODS (CONCENTRATION LIMITS = MDL)

Table G.2

Volatile Organic Compounds (VOCs)[1] (USEPA Method 8260B)

Acetone
Acetonitrile
Acrolein
Acrylonitrile
Allyl chloride (3-Chloropropene)
Tert-Amyl methyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
Tert-Butyl alcohol

Table G.2

n-Butlybenzene
sec-Butlybenzene
tert-Butlybenzene
tert-Butyl ethyl ether
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- l ,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (1,1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane
2,2-Dichloropropene
1,1-Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Iodomethane (Methyl iodide)
Isobutyl alcohol
di-Isopropyl ether
Methacrylonitrile
Methyl bromide (Bromomethene)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl chloride (Chloromethane)

Table G.2

Methyl ethyl ketone (MEK: 2-Butanone)
4-Methyl-2-pentanone (Methyl isobutylketone)
Methyl tert-butyl ether (MtBE)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile
Styrene
1,1,1,2-Tetrachloroethane
1,1.2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloethane (Methylchloroforrn)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl chloride
Xylenes (total)

Semi-VOCs[1] (USEPA Method 8270 - base, neutral, & acid extractables):
Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methyethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
p-Chloroaniline
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene

Table G.2

2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isophorone
Isosafrole
Kepone
Methapyrilene
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)

Table G.2

N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-Nitrosospyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Organochlorine Pesticides[1] (USEPA Method 8081A)
Aldrin
α-BHC
β-BHC
γ-BHC (Lindane)
δ-BHC
Chlorobenzilate
α-Chlordane
γ-Chlordane
Chlodane – not otherwise specified
DBCP
4,4’-DDD
4,4’-DDE
4,4’-DDT
Diallate
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde

Table G.2

Endrin ketone
Heptachlor
Heptachlor epoxide
Hexachlorocyclopentadiene
Isodrin
Methoxychlor
Toxaphene

Polychlorinated Biphenols[1] (PCBs, USEPA Method 8082)
Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260

Organophosphorus Pesticides[1] (USEPA Method 8141A):
Chlorpyrifos
Diazinon
Dimethioate
Disulfoton
Ethion
Famphur
Malathion
Parathion
Parathion-ethyl
Parathion-methyl
Phorate

Chlorinated Herbicides[1] (USEPA Method 8151A):
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dicamba
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
MCPA
MCPP
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Pentachlorophenol

_____

1. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per WDR Monitoring Specification G.14.

INFORMATION SHEET

ORDER NO. R5-2010-0016
SAN JOAQUIN COUNTY DEPARTMENT OF PUBLIC WORKS
NORTH COUNTY LANDFILL
SAN JOAQUIN COUNTY

Background

The North County Landfill is an active, Class III, municipal solid waste (MSW) landfill on East Harney Lane near Atkins Road, approximately nine miles east of Lodi. The landfill has been in operation since 1991, accepting primarily household and commercial wastes. The 320-acre site includes the existing landfill, a materials recovery facility, wetlands area, and a future landfill development area. The landfill currently consists of three waste disposal modules - M1, M3, and M4, covering an area of about 53 acres. Other landfill facilities include storm water drainage systems; leachate collection systems; landfill gas controls; monitoring systems; access roads; maintenance facilities; an office and scale house; pump station; and other facilities. Approximately 400 tons per day (144,000 tons per year) of wastes, including MSW, commercial wastes, and construction and demolition debris were discharged to the landfill in 2008. Approximately 5.3 million cubic yards of waste are estimated to be in place at the landfill.

Development Plans

An additional 132 acres (the remainder of the landfill unit area) are planned for future landfill development. Seven additional modules (M5 through M11) will be constructed in phases for a total of 11 modules at build-out. Development will proceed module-by-module on an as needed basis. The Discharger currently estimates that Module M5 will be constructed in 2012. In addition to lateral expansion, the Discharger is proposing a vertical expansion over existing and future modules to increase landfill capacity. The maximum elevation of fill, including cover, would increase from 190 feet MSL to 320 feet MSL and total landfill capacity would increase from about 20.9 million cubic yards to about 36.9 million cubic yards. The maximum thickness of the fill, including cover, would increase to 148 feet (Module 1) and 254 feet (future modules).

Landfill Design

Module 1 was constructed in 1991 with a pre-Subtitle D containment system consisting of a single 60 mil HDPE liner and geonet blanket LCRS and collection piping. Module 3 was constructed in 1995 with a similar LCRS, but a single composite liner meeting Subtitle D and Title 27 requirements. Module 4 was constructed in 2004 in accordance with a liner performance demonstration and engineered alternative design (EAD) approved under previous WDRs (Order No. R5-2002-0219). The approved EAD included a single composite liner similar to Module 4, but with a gravel LCRS blanket. The Discharger plans to construct future modules consistent with existing approvals for Module 4, or as separately proposed and approved by the Board. Specific designs and construction plans will be submitted for approval as each module is proposed for development.

Groundwater
The average depth to groundwater at the site is about 154 feet bgs (-36.5 feet MSL) with about six (+/-3) feet of seasonal variation. The gradient is typically about 0.004 ft/ft toward the southwest. The upper water-bearing zone occurs in the alluvial deposits of the Turlock Lake and Laguna formations. There are currently six groundwater monitoring wells at the site including one upgradient (G-1), one side gradient (G-2), and four down gradient (Gs-3D, 4, 5 and 6). Monitoring of well G-2 was discontinued in 1997.

In 2002, a VOC release to groundwater consisting primarily of low to trace concentrations of BTEX constituents was confirmed. Subsequent monitoring showed attenuation of the VOCs, however; no VOCs have been detected in groundwater since startup of a LFG extraction system installed as a corrective action measure in 2006. Historical monitoring data for the landfill shows good upper zone groundwater quality, with no indication of impacts from leachate constituents. In the First Half 2008, for example, the maximum concentration of TDS and chloride detected down gradient of the landfill were 160 mg/L and 7 mg/L, respectively.

Revised WDRs
These revised WDRs prescribe updated requirements for landfill construction, operations and monitoring.

Construction
The WDRs (Construction Specifications 1 and 2) require that future landfill modules be constructed in accordance with Subtitle D; the approved EAD for Module 4; or as separately proposed and approved by the Regional Water Board. Discharge Specification B.1 limits vertical expansion to the maximum proposed elevations for each module under the Discharger's Vertical Expansion Plan, as supported by geotechnical analysis and approved by the Local Enforcement Agency.

Facilities and Operations
Provision G.8 requires that the Discharger investigate the condition of certain landfill facilities, including manually operated LCRS sumps, lysimeters that have been historically dry, and inactive monitoring well G-2. A report as to the status of these facilities, including work plans and schedules for necessary/required repairs and improvements, must be submitted by **31 March 2010**. (Facility Specification C.4 requires that manually sumps must be upgraded with automatic controls **within two years** of adoptions of this Order.)

Discharge Prohibition A.3 and Discharge Specification B.4 allow the Discharger to continue returning landfill leachate and LFG condensate to Subtitle D-lined modules consistent with liquids restrictions in Title 27 and Subtitle D. The WDRs also prescribe requirements for the handling and disposal of hazardous treated wood waste (TWW) under the California Health and Safety Code (division 20, chapter 6.5, article 5, section 25150.7); and CCR, title 22 (chapter 34, section 67386.2). The WDRs allow the landfill to accept TWW, provided that the discharge is limited to Subtitle D-lined modules and that it is handled in accordance with specified alternative management standards under Title 22. A copy of Title 22, Chapter 34

Alternative Management Standards for Treated Wood Waste is attached to this Information Sheet for reference.

Financial Assurances

Provision G.9 requires that, by **30 April 2010**, the Discharger submit an updated preliminary closure and postclosure maintenance plan (PCPMP) for the Executive Officer's approval. The PCPMP is required to be updated to reflect current operations and WDR requirements, including vertical expansion plans and cost estimates for closure, postclosure maintenance, and corrective action. Provision G.10 requires that the Discharger maintain financial assurance (F/A) balances with the CIWMB in at least the amount of these cost estimates, while Provision G.11 requires that, by **30 November 2010** and every five years thereafter, the Discharger demonstrate to the Executive Officer that F/As in acceptable amounts and mechanism(s) under Title 27 have been provided to the CWIMB. A copy of the letter of acceptance of the annual F/A demonstration to the CIWMB is also required under the MRP.

Monitoring

The monitoring and reporting program (MRP) in the WDRs requires regular facility maintenance inspections and semiannual monitoring of leachate, the unsaturated zone, and groundwater for representative monitoring parameters. Monitoring every five years is required for a longer list of landfill constituents of concern. The MRP also requires that the Discharger perform semiannual surface water monitoring at the site and maintain coverage under the General Industrial Storm Water Permit.

The MRP requires that the Discharger update concentration limits as background data is collected under the MRP. For inorganic COCs (i.e., dissolved metals) for which concentration limits have not yet been developed, the MRP specifies that background monitoring be conducted annually until a sufficient amount of data has been collected for determination of concentration limits. Thereafter, such monitoring may be reduced to every five years. WDR Provision G.12 requires that the Discharger submit an updated WQPS report for the Executive Officer's approval by **31 July 2012.**

Drainage

The site receives an average of 16.5 inches per year of precipitation. Surface drainage at the site is to South Paddy Creek, tributary to Paddy Creek, Bear Creek, and the San Joaquin River. (JDM)

Chapter 34. Alternative Management Standards for Treated Wood Waste

§ 67386.1. Scope

(a) This chapter provides an alternative set of management standards in lieu of the requirements for hazardous waste pursuant to articles 6, 6.5, and 9, chapter 6.5, division 20, Health and Safety Code, and chapters 12, 13, 14, 15, 16, 18, and 20 of this division for a person managing treated wood waste (TWW). All other chapters of this division, and section 66264.101, chapter 14, division 4.5, title 22, apply to persons managing TWW.

(b) Nothing in this chapter is a limitation on the power of this or any other governmental agency to adopt or enforce additional requirements related to the management of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History

1. New chapter 34 (sections 67386.1-67386.4) and section filed 12-27-2006 as an emergency; operative 1-1-2007 (Register 2006, No. 52). A Certificate of Compliance must be transmitted to OAL by 5-1-2007 or emergency language will be repealed by operation of law on the following day.
2. Editorial correction of History 1 (Register 2007, No. 17).
3. New chapter 34 (sections 67386.1-67386.4) and section refiled 4-23-2007 as an emergency; operative 4-30-2007 (Register 2007, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-28-2007 or emergency language will be repealed by operation of law on the following day.
4. Repealer and new section and amendment of Note filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No.25).

§ 67386.2. Applicability

(a) The alternative management standards of this chapter apply only to wood waste that meets all of the following:

(1) is a hazardous waste pursuant to chapter 11 of this division;

(2) is a hazardous waste solely due to the presence of a preservative in or on the wood that is registered in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for use as a wood preservative; and

(3) is not subject to regulation as a hazardous waste under the federal Resource Conservation and Recovery Act (RCRA).

(b) The alternative management standards of this chapter do not apply to wood waste exempted from hazardous waste management standards pursuant to Health and Safety Code section 25143.1.5.

(c) The following wood wastes are not eligible for the alternative management standards of this chapter:

(1) wood waste that is hazardous due to the presence of coatings, paint, or other treatments that are not registered in accordance with FIFRA for use as a wood preservative; or

(2) wood waste when designated to be burned.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25143.1.5, 25150.7 and 25150.8, Health and Safety Code.

History

1. New section filed 12-27-2006 as an emergency; operative 1-1-2007 (Register 2006, No. 52). A Certificate of Compliance must be transmitted to OAL by 5-1-2007 or emergency language will be repealed by operation of law on the following day.
2. Editorial correction of History 1 (Register 2007, No. 17).
3. New section refiled 4-23-2007 as an emergency; operative 4-30-2007 (Register2007, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-28-2007 or emergency language will be repealed by operation of law on the following day.
4. Amendment of section heading, repealer and new section and amendment of Note filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section11343.4 (Register 2007, No. 25).

§ 67386.3. Prohibited Activities

(a) TWW managed in accordance with the alternative management standards of this chapter shall not be:

(1) burned;

(2) scavenged;

(3) commingled with other waste prior to disposal, if previously segregated;

(4) stored in contact with the ground;

(5) recycled, with or without treatment, except as provided for in subsection (c)

(6) treated except in compliance with section 67386.10; and

(7) disposed to land except in compliance with section 67386.11.

(b) Any label or mark that identifies the wood waste as TWW shall not be intentionally removed, obliterated, defaced, or destroyed prior to disposal in a landfill.

(c) TWW may be recycled only by reuse pursuant to conditions specified in (1) – (3) of this subsection. During reuse, the TWW is not subject to sections 67386.5 through 67386.11. TWW may only be reused when all of the following apply:

(1) reuse is onsite;

(2) at the time of reuse, reuse is consistent with a FIFRA approved use of the preservative with which the TWW has been treated; and

(3) prior to reuse, the TWW is handled in compliance with all applicable management standards of this chapter.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History

1. New section filed 12-27-2006 as an emergency; operative 1-1-2007 (Register 2006, No. 52). A Certificate of Compliance must be transmitted to OAL by 5-1-2007 or emergency language will be repealed by operation of law on the following day.
2. Editorial correction of History 1 (Register 2007, No. 17).
3. New section refiled 4-23-2007 as an emergency; operative 4-30-2007 (Register 2007, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-28-2007 or emergency language will be repealed by operation of law on the following day.
4. Amendment of section heading, repealer and new section and amendment of Note filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section11343.4 (Register 2007, No. 25).

§ 67386.4. Definitions

The definitions set forth in section 66260.10 of this division shall apply unless otherwise defined. The following definitions shall apply to the terms used in this chapter:

“Agent” means a person hired by a generator for the removal, collection, or transportation of TWW.

“Class 1 hazardous waste landfill” means a landfill as defined in section 66260.10, which is also authorized as part of a permitted facility as defined in section 66260.10.

"Composting Facility" means a facility that produces compost as defined in Public Resources Code, section 40116 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Gasification Facility" means a facility that utilizes a gasification process as defined in Public Resources Code, section 40117 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Limited Volume Transfer Operation" means an operation that receives less than 60 cubic yards, or 15 tons of solid waste per operating day for the purpose of storing the waste prior to transferring the waste to another solid waste operation or facility and which does not conduct processing activities, but may conduct limited salvaging activities and volume reduction by the operator and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

“Resizing” means the minimal cutting, breaking, or sawing, but does not include planing, grinding, chipping, sanding, shredding, mulching, or other mechanical handling or any other treatment.

"Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation" means a site that receives less than 25 tons of any combination of construction and demolition debris and Type A inert debris per operating day for the purposes of storage, handling, transfer, or processing that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Solid Waste Landfill" means a facility as defined in Public Resources Code, section 40195.1 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transfer or Processing Station" means a facility as defined in Public Resources Code, section 40200 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transformation Facility" means a facility that utilizes a transformation process as defined in Public Resources Code, section 40201 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

‘‘Treated wood’’ means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. § 136 and following).

"Treated Wood Waste" means a waste that meets the requirements of section 67386.2(a).

"TWW" means "Treated Wood Waste."

"TWW approved landfill" means either a class 1 hazardous waste landfill, or a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or treated wood waste and that is in compliance with this chapter.

"TWW facility" means either:
(a) a solid waste landfill, as defined in this section, that is in compliance with this chapter; or
(b) a transfer or processing station, as defined in this section, that is in compliance with this chapter; or
(c) a gasification facility, as defined in this section, that is in compliance with this chapter; or
(d) a TWW approved landfill, as defined in this section, that is in compliance with this chapter; or
(e) a class 1 hazardous waste landfill; or
(f) Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation, as defined in this section, that is in compliance with this chapter; or
(g) Limited Volume Transfer Operation, as defined in this section, that is in compliance with this chapter.
TWW Facility shall not include composting facilities, or transformation facilities.

"TWW handler" means a person who generates, handles, collects, processes, accumulates, stores, transfers, transports, treats, recycles, or disposes of TWW.

"Unit" means a pile, stack, container, bundle, or other discernable aggregation of TWW for purposes of this chapter.

"Wood waste" means all waste timber products and failed timber products including solid sawn lumber and engineered wood products, offcuts, shavings and sawdust that meet the definition of "waste" pursuant to Health and Safety Code section 25124. "Wood Waste" does not mean forest residues, green waste, or garden waste materials such as branches, bushes and tree stumps.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code; Sections 40116, 40117, 40195.1, 40200, and 40201, Public Resources Code; and Section 13173 Water Code.

History
1. New section filed 12-27-2006 as an emergency; operative 1-1-2007 (Register 2006, No. 52). A Certificate of Compliance must be transmitted to OAL by 5-1-2007 or emergency language will be repealed by operation of law on the following day.
2. Editorial correction of History 1 (Register 2007, No. 17).
3. New section refiled 4-23-2007 as an emergency; operative 4-30-2007 (Register 2007, No. 17). A Certificate of Compliance must be transmitted to OAL by 8-28-2007 or emergency language will be repealed by operation of law on the following day.
4. Amendment of section heading, repealer and new section and amendment of Note filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section11343.4 (Register 2007, No. 25).

§ 67386.5. Labeling

(a) TWW generated, accumulated, stored, or transported within California shall be clearly marked and visible for inspection. The person managing the TWW shall ensure that each unit and/or area designated for accumulation of TWW is labeled. The area designated for accumulation of TWW shall be clearly identified and used solely for the accumulation of TWW.

(b) In order to clearly identify the nature of the waste to the receiving party and/or any observer, the TWW shall be labeled or marked with the following:

"**TREATED WOOD WASTE – Do not burn or scavenge**.

TWW Handler Name and Address: _____

Accumulation Date". _____."

(c) The TWW handler shall ensure that labels are maintained in compliance with the requirements of subsections (a) and (b) during transport.

(d) TWW accumulated for a period not to exceed thirty (30) days by a household at the site of generation in compliance with the requirements of section 67386.6 is exempt from the labeling requirements of this section.

(e) TWW, generated by a household, while being self-transported to an approved TWW facility is exempt from the labeling requirements of this section if the TWW is identified to the TWW facility as TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

HISTORY

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to GovernmentCode section 11343.4 (Register 2007, No. 25).

2. Amendment of subsection (e) filed 10-3-2007; operative 11-2-2007 (Register 2007, No. 40).

§ 67386.6. Accumulation

(a) TWW shall be maintained in a manner that prevents unauthorized access and minimizes release to the environment.

(1) Unauthorized access shall be prevented by means of visual control or physical barrier when not under the direct control of the person responsible for the TWW.

(2) The TWW shall be accumulated in a manner that is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water, which may be accomplished by one of the following:

(A) Block and Tarp:

The TWW may be accumulated when all the following requirements are met;

1. TWW is elevated to prevent contact with the soil and to protect from reasonably foreseeable run-on;

2. TWW is covered to protect from precipitation; and

3. TWW is accumulated no longer than 90 days from the date the TWW is generated or received from another handler.

(B) Containerize:

The TWW may be accumulated in containers no longer than one year from the date the TWW is generated or received from another handler. The containers shall be;

1. designed, constructed, maintained, filled, its contents so limited, and closed, so that under conditions normally incidental to handling, there will be no identifiable release of TWW materials or its constituents to the environment; and

2. water-resistant if exposed to precipitation, run-on or run-off under reasonably foreseeable conditions.

3. transported to a TWW facility within 90 days of being filled to capacity.

(C) Storage Building:

The TWW shall be accumulated no longer than one year from the date the TWW is generated or received from another handler in a structurally sound building with a water-resistant floor designed to prevent the movement of water into or out of the building.

(D) Containment Pad:

The TWW may be accumulated no longer than 180 days from the date the TWW is generated or received from another handler on a containment surface and all the following requirements are met;

1. TWW does not contact soil;

2. TWW is protected from reasonably foreseeable run-on;

3. TWW is covered to protect from precipitation; and

4. TWW managed in accordance with this subsection may be accumulated uncovered if the containment surface is designed and operated to contain all precipitation and the resulting water is managed in accordance with all applicable laws and regulations.

(E) Other:

The TWW may be accumulated no longer than 90 days from the date the TWW is generated or received from another handler in any other manner in which the TWW handler can clearly demonstrate that the TWW is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water.

(b) Except as provided in subsection (c), in no case shall TWW be accumulated for more than one year from the date of generation or the date received from another handler.

(c) A handler may accumulate TWW for longer than one year from the date the TWW is generated or received from another handler, if the accumulation is solely for the purpose of accumulation of quantities of TWW necessary to facilitate disposal pursuant to section 67386.11. However, the handler bears the burden of proving that the accumulation was solely for the purpose of accumulation of quantities of TWW necessary to facilitate proper disposal.

(d) A person who accumulates TWW shall be able to demonstrate the length of time the TWW has been accumulated from the date it becomes a waste or is received.

(e) TWW generated incidental to the maintenance of a household and accumulated by the resident of the household at the site of generation is exempt from the accumulation requirements of this section if all of the following requirements are met;

(1) TWW is not physically altered except as provided in section 67386.10; and

(2) TWW is accumulated no longer than thirty (30) days.

(f) TWW generated incidental to the operation of a business accumulated at the site of generation for a period not to exceed thirty (30) days is exempt from the accumulation requirements of this section if:

(1) TWW is not physically altered except as provided in section 67386.10; and

(2) the business accumulates no more than 1,000 pounds of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No. 25).
2. Amendment of subsections (a)(2)(B)1.-2. and new subsection (a)(2)(B)3. filed 10-3-2007; operative 11-2-2007 (Register 2007, No. 40).

§ 67386.7. Offsite Shipments

(a) Except as provided in subsection (c), a TWW handler is prohibited from sending or taking TWW to a place other than a TWW facility, or a TWW approved landfill.

(b) Prior to sending a shipment of TWW to another TWW handler, the originating handler shall ensure that the receiving handler agrees to receive the shipment.

(c) A TWW handler who initially collects TWW at a remote site may transport that TWW to a consolidation site operated by the generator if all the following conditions are met;

(1) the TWW is transported by the generator, employees of the generator or by the generator's agent;

(2) a shipping document containing all of the following information accompanies the TWW while in transport;

(A) the quantity, by weight or volume, of TWW being transported;

(B) the location of the remote site where the TWW was initially collected;

(C) the date that the generator first began to accumulate the TWW at the remote site, the date that the shipment leaves the remote site, and the date that the shipment arrives at the consolidation site;

(D) the name, address, and telephone number of the generator, and, if different, the address and telephone number of the consolidation site to which the TWW is being transported; and

(E) the name of the individual or individuals who transport the TWW from the remote site to the consolidation site; and

(3) the TWW handler shall retain the shipping document described in subsection (c)(2) of this section for at least three years from the date the TWW leaves the TWW consolidation site.

(d) TWW shall be shipped and/or transported in a manner that prevents unauthorized access; protects the TWW from precipitation; and prevents loss, dispersion, and leaching of TWW constituents.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No. 25).

§ 67386.8. Tracking Shipments

(a) Shipments off-site. A TWW handler shall keep a record of each shipment of TWW sent from the handler to TWW facilities. The record may take the form of a log, invoice, manifest, bill of lading, shipping document, or receipt from a TWW facility. The record for each shipment of TWW shall include the following information:

(1) name and address of the TWW facility to which the TWW was sent;

(2) weight of TWW, the estimated weight of TWW, or the weight of the TWW as measured by the receiving TWW facility. (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and

(3) date the shipment of TWW left the handler.

(b) Receipt of shipments. A TWW handler shall keep a record of each shipment of TWW received at the facility. The record may take the form of a log, invoice, manifest, bill of lading, or other shipping document. The record for each shipment of TWW received shall include the following information:

(1) name and address of the originating TWW generator from whom the TWW was sent;

(2) weight of TWW or the estimated weight of TWW. (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and

(3) date of receipt of the shipment of TWW.

(c) Reporting receipt of shipments. A TWW facility or a TWW approved landfill that receives TWW shall submit, to the department, semi annual reports for the periods ending June 30 and December 31 of each year. Reports shall be required beginning December 31, 2007 and shall be submitted in an electronic format provided by the department within 30 days of the end of each reporting period. Each semi annual report shall include the following information:

(1**)** reporting facility information;
1. Facility name, location address, contact person's name, and telephone number; and
2. Identification Number.
(2) for all TWW shipments received, other than those reported under subsections (3), (4), and (5) the TWW facility shall report the following information;
1. generator's Identification Number, or, if the generator does not have an Identification Number, the name, address, contact person's name, mailing address, and telephone number of the generator;
2. dates of shipments; and
3. weight of TWW per shipment.
(3) TWW household information;
1. weight summary of all TWW quantities received that were generated by households.
(4) TWW load check information;
1. Weight summary of all TWW quantities discovered and separated from solid waste as part of an on-site load checking program.
(5) for shipments received from another TWW facility the following information shall be reported by the receiving TWW facility;
1. TWW facility's Identification Number or the name, address, contact person's name, mailing address, and telephone number of the TWW facility;
2. dates of shipments; and
3. weight of TWW per shipment.
(d) The department shall make all of the information in the semi annual reports submitted pursuant to this subdivision available to the public, through its usual means of disclosure, except the department shall not disclose the association between any specific TWW handlers and specific facilities. The list of TWW handlers served by a facility shall be deemed to be a trade secret and confidential business information for purposes of Health and Safety Code section 25173 and section 66260.2 of title 22 of the California Code of Regulations.
(e) Record retention.
(1) a TWW handler shall retain the records described in subsection (a) of this section for at least three years from the date the shipment left the handler; and
(2) a TWW facility shall retain the records described in subsection (b) of this section for at least three years from the date of receipt of a shipment.
(f) Households are exempt from the recordkeeping requirements of this section when the TWW is generated incidental to that household.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7, 25150.8 and 25173, Health and Safety Code.

History
1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No. 25).

§ 67386.9. Notification
(a) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW, the TWW handler shall obtain or maintain an Identification Number within 30 days of exceeding the weight threshold.
(b) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW the handler shall send written notification to the Department within 30 days of exceeding the 10,000 pound limit.
(c) The notification shall include;
(1) TWW handler's name and mailing address;
(2) generator's Identification Number;
(3) name and business telephone number of the person at the TWW handler's site who should be contacted regarding TWW management activities;
(4) address or physical location of the TWW management activities;
(5) date the TWW handler exceeded the 10,000 pound limit; and
(6) a statement indicating that the handler is generating more than 10,000 pounds of TWW per calendar year.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History
1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (register 2007, No. 25).

§ 67386.10. Treatment
(a) Treatment, as defined in Health and Safety Code section 25123.5, of treated wood waste managed in accordance with the alternative management standards of this chapter is prohibited except as provided in subsections (b) and (c).

(b) Resizing is exempt from the permitting requirements of this division when resized to facilitate transport or reuse and the following requirements are met;

(1) TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment; and

(2) if size reduction of the TWW results in sawdust, particles, or other material smaller than one cubic inch, the material shall be captured and managed as TWW.

(c) Sorting and segregating are both exempt from the permitting requirements of this division. The TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment.

(d) An employer resizing, sorting, or segregating TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;

(2) procedures for identifying and segregating TWW;

(3) safe handling practices;

(4) requirements of the alternative management standards; and

(5) proper disposal methods.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

HISTORY

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (register 2007, no. 25).

§ 67386.11. Disposal

(a) When disposed to land, TWW shall be disposed in either a Class I hazardous waste landfill, or in a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or TWW.

(b) A solid waste landfill that accepts TWW shall:

(1) comply with the prohibitions in section 67386.3 for handling TWW;

(2) ensure that any management of the TWW at the solid waste landfill prior to disposal complies with the applicable requirements of this chapter;

(3) monitor the composite-lined portion of a landfill unit at which TWW has been disposed. When a release is verified, cease discharge of TWW to that landfill unit until corrective action results in cessation of the release. The landfill shall notify the department that TWW is no longer being discharged to that landfill unit and when corrective action results in cessation of the release; and

(4) handle TWW in a manner consistent with all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code; and Section 13173 Water Code.

HISTORY

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No. 25).
2. Amendment of subsection (b)(3) filed 10-3-2007; operative 11-2-2007 (Register 2007, No. 40).

§ 67386.12. Training

(a) An employer managing TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;

(2) procedures for identifying and segregating TWW;

(3) safe handling practices;

(4) requirements of the alternative management standards; and

(5) proper disposal methods.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code. Reference: Sections 25150.7 and 25150.8, Health and Safety Code.