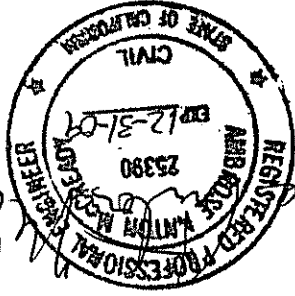


**TECHNICAL SPECIFICATIONS  
 VADOSE ZONE EXTRACTION WELLS  
 NEAL ROAD LANDFILL  
 BUTTE COUNTY, CALIFORNIA**

**Prepared for:**  
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 Department of Public Works  
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 Oroville, California 95965

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 March 6, 2008  
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NO.	REVISION	DATE
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NOT USED

**DIVISION 1 – GENERAL REQUIREMENTS**

**SECTION 01005**

**SPECIAL PROVISIONS**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

Plans, General Conditions, and Divisions 1 and 11 Specification Sections apply to this Section.

**1.2 DESCRIPTION**

This project involves Special Provisions as described in this Section of the Specifications. The Special Provisions include the following:

A. Limited onsite utility service is available to the CONTRACTOR as follows:

1. Construction water shall be obtained from the County at the Neal Road Landfill. The CONTRACTOR shall make arrangements with the County for payment of water used on the vadose zone well installation.

2. Electrical power is available to the CONTRACTOR at the CONTRACTOR TRAILER AND STAGING AREA as shown on the PLANS. The CONTRACTOR shall be responsible for arranging for and extending the power from the nearby power pole to his construction trailer. Electrical usage will be provided by the County at no charge to the CONTRACTOR.

3. The CONTRACTOR'S construction trailer may be located in the area indicated on the PLANS. A permit may be required by the Butte County Building Department for installing the trailer. The CONTRACTOR shall inquire and make arrangements with the County Building Department for approval and fees for the permit.

4. A telephone line is available at the scale house. The CONTRACTOR shall be responsible for extending the telephone line to his construction trailer or shall use cell phones. The CONTRACTOR shall make arrangements with the telephone company for payment of telephone bills associated with the CONTRACTOR'S use of telephone lines.

B. The Neal Road Landfill operates as a Class III landfill as defined by California Code of Regulations, Title 27. A Health and Safety Plan is required in Section 01010 of these Specifications.

END OF SECTION

C. Existing environmental systems are present at Neal Road Landfill. Groundwater monitoring wells and lysimeters are shown on the PLANS. **The environmental systems must not be damaged by the CONTRACTOR'S operations and must be accessible at all times.** The CONTRACTOR shall coordinate and obtain approval for the movement, replacement, installation, or decommissioning of any part of the environmental monitoring system with the County.

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Plans, General Conditions, Special Provisions, and Divisions 1, 11, and 15  
Specification Sections apply to this Section.

1.2 PROJECT DESCRIPTION

A. The Project: The Project consists of the installation of 4-vadose zone extraction wells, HDPE pipe, connection of the wells to the existing LFG collection system, and minor earthwork.

B. Specification sections have not been divided into groups for work of subcontractors or various trades. Questions concerning the applicability or interpretation of a particular section or part of section or drawing should be directed to the Engineer.

C. Piping work shown on the PLANS is intended to be a depiction and may not be an exact and complete representation of the actual finished work. The CONTRACTOR shall include fittings, pipe support, nuts, bolts, and other accessories required to provide complete and satisfactory piping system, as specified, even though some items may not be specifically shown on the PLANS.

D. A part of the work that is necessary or required to make each installation satisfactory and operable for its intended purpose, even though it is not specifically included in the Specifications or on the PLANS, shall be performed as incidental work as if it was described in the Specifications and shown on the PLANS.

E. The Work: The Work to be performed by the CONTRACTOR under this project consists of performing all work and providing all labor, services, tools, machinery, equipment, and materials necessary to complete the project. The Work consists of installing vadose zone extraction wells and connecting piping to the existing landfill gas collection system of the Neal Road Landfill. The Work includes but is not limited to the following items:

1. Mobilization and Demobilization.
2. Vadose Zone Extraction Wells and Well Heads. Construction of new vadose zone extraction wells as shown on the PLANS, including fittings, valves, wellbore seals, and multi-function wellhead assemblies.
3. Minor trenching, backfilling, and compacting

4. Welding and connection of HDPE pipe to the existing LFG collection system as shown on the PLANS.

- F. The CONTRACTOR shall furnish all labor, materials, equipment, tools, facilities, and services necessary for proper execution, testing, and completion of the work.
- G. Coordinate the progress of the work, including coordination between trades, subcontractors, suppliers, and public utilities.
- H. It is in the interest of the CONTRACTOR that the work precedes in the most expeditious manner possible.

1.3 CONTRACTOR USE OF PREMISES

- A. Work Days: The CONTRACTOR shall have equipment and material delivery access to and from the site as noted in the General Conditions.
- B. Access: No later than 10 days after Notice to Proceed, the CONTRACTOR shall arrange with the County a sequence of procedures, means of access, space for storage of materials and equipment, and use of approaches and roadways. CONTRACTOR'S use of the premises shall be confined to the areas approved by the County.
- C. Smoking: Smoking is prohibited on the landfill or within 100 feet of the landfill and geosynthetic materials storage area.
- D. Private Driveways: The CONTRACTOR shall not use private driveways or otherwise use private residential properties for vehicle turnarounds, parking, material storage or any other use.
- E. CONTRACTOR shall not dispose of waste oils, fuels, cleaners or other potentially hazardous substances on-site.

1.4 OCCUPANCY AND LANDFILL OPERATIONS

Neal Road Landfill is continuing to operate but not in the work area. However, subcontractors may require access to LFG system monitoring and groundwater monitoring wells.

1.5 SITE CONDITIONS

- A. Historical Use of Site: The Project is a Class III Landfill as defined by Title 27 of the California Code of Regulations. This landfill is capable of producing leachate and landfill gas as a result of the decomposition of waste. It may also be harmful to

Provide a single qualified full time superintendent as specified in the Bidder's Qualifications Questionnaire for the duration of the project. CONTRACTOR shall not change superintendent without County's written permission. CONTRACTOR's proposal to change personnel must be justifiable to the County, and must demonstrate that the proposed replacement possesses adequate qualifications.

1.7 SUPERINTENDENT

- D. Other submittals as specified in the Contract Documents.
- C. Submit Shop Drawings, Record Drawings, independent quality control laboratory test results, manufacturer's specifications and literature for various products, and other information as described herein. Shop drawings requested herein are intended to match elements of the work to actual conditions found in the field. The ENGINEER shall approve all shop drawings.
- B. Written plan of CONTRACTOR's proposed sequence of construction. Submit within ten (10) days after the Notice to Proceed and receive County approval prior to commencing the work.
- A. Site Health and Safety Plan: The work at the landfill is within a zone of potential landfill leachate and landfill gas migration. The CONTRACTOR is responsible for site health and safety for his employees. The County will make available to the selected CONTRACTOR all relevant laboratory analysis of landfill gas and landfill leachate recorded at the site. Within 10 days of starting work, the CONTRACTOR shall prepare a Site Health and Safety Plan, and provide a copy of this Plan to the County for informational purposes only. The Site Health and Safety Plan shall be prepared in accordance with applicable provisions of OSHA regulations 29 CFR 1910.120 and 1926, and "A Compilation of Landfill Gas Field Practices and Procedures", prepared by SWANA Landfill Gas Division, dated March 1992.

1.6 SUBMITTALS

- E. The CONTRACTOR shall enforce safety procedures to minimize hazards to workers, the public, and the environment.
  - D. Existing Features: The Contract Documents require the CONTRACTOR to field verify elevations and the location of existing features, see Section 01050, Surveying.
  - C. Existing Grades: The existing grades may vary from those indicated on the PLANS.
  - B. Access. The areas adjacent to the work area are closed, access is limited to authorized personnel only, no heavy equipment is allowed on the closed areas, CONTRACTOR to use perimeter roads for access and moving equipment.
- workers to contact the waste. The CONTRACTOR shall enforce safety procedures to minimize hazards to workers, the public, and the environment.

END OF SECTION

PART 3 - EXECUTION (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

<u>Description</u>	<u>Sheet Number</u>
Title Sheet	1
Site Plan, Existing Topography and LFG System	2
Proposed Vadose Zone Extraction Well Plan	3
Vadose Zone Well Schedule and Details	4

A. The following PLANS shall form part of the Contract Documents.

1.8 LIST OF PLANS

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. The items listed in Part 1.3 below, refer to and are the same pay items listed on the County's Bid Form. They constitute all of the lump sum and unit cost pay items for the completion of the work. Alternative pay items have been included on the Bid Form to be added to the contract at the County's discretion should additional work be deemed necessary in meeting the goals of this project.

No direct or separate payment will be made for providing miscellaneous temporary or accessory works, services, including but not limited to County's and CONTRACTORS field offices and sheds, job signs, sanitary requirements, testing, safety devices, submittals, record drawings, water supplies, dust controls, power, maintaining traffic, removal of contractor generated waste, watchmen, security, bonds, insurance, and all other conditions of the General Provisions. Compensation for all such labor, materials, and services shall be included in the bid prices stipulated for the lump sum, unit cost, and contingency pay items.

B. Each lump sum and unit price will be deemed to include an amount considered by the CONTRACTOR to be adequate compensation to cover the CONTRACTOR'S overhead and profit for each of the separately identified pay items.

C. CONTRACTOR mobilization and demobilization shall be paid for separately with a lump sum pay item.

D. Construction staking, layout surveys, record drawings, and construction quality control shall not be paid for separately and shall be included in the bid prices stipulated for the lump sum, unit price, and contingency pay items.

E. Siltation and erosion controls including, but not limited to silt fencing, straw bales, erosion control matting, and other measures, and compliance with all stormwater management/sediment control regulations shall not be paid for separately and shall be included in the bid prices stipulated for the lump sum and unit price pay items.

F. All CONTRACTOR Health and Safety provisions to perform the work will not be paid for separately and shall be included in the bid prices stipulated for the lump sum, unit price, and contingency pay items.

G. CONTRACTOR Quality Control and associated testing provisions during the progression of the work will not be paid for separately and shall be included in the bid

prices stipulated for the lump sum, unit price, and contingency pay items.

H. Monthly Payment Applications for Lump Sum and Unit Price Pay Items in progress shall be based on the percent complete at the end of each month as determined by the County. During the last week of each month, the CONTRACTOR is responsible for providing the County with records of construction that has occurred during the month. The County will consider the information provided by the CONTRACTOR and other information as necessary before making a determination on the percent complete on each pay item for the month. The CONTRACTOR'S monthly payment application should reflect the percent complete for each pay item as determined by the County.

## 1.2 RELATED DOCUMENTS

A. PLANS and general provisions of the contract, including General Provisions and Special Provisions and other Specification Sections, apply to this Section.

## 1.3 SUMMARY

A. This Section specifies administrative and procedural requirements for lump sum, unit price, and contingency pay items.

1. A Lump Sum price is an amount proposed by Bidders and stated on the Bid Form as a price where measurement will not be made for payment for materials, services and/or work identified in the PLANS and specifications for a particular pay item. The CONTRACTOR will not be entitled to any adjustment in a lump sum bid price as a result of any change caused by a variation in quantities as a result of more accurate measurements. The CONTRACTOR agrees to accept the aforesaid lump sum bid price as complete and total compensation for all work to be performed under a lump sum pay item.

2. A Unit Price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement based on the ENGINEER'S estimated quantities for materials and/or services. In the event the actual quantities of work are less than or exceed the ENGINEER'S estimated quantities, adjustment in the unit price bid for the work may be adjusted upon request by either the County or CONTRACTOR, as stipulated in the General Provisions of the CONTRACT.

3. Lump sum, unit price, and contingency bid prices shall include all necessary material, overhead, profit and applicable taxes.

4. Refer to individual Technical Specifications sections for construction activities requiring the establishment of bid prices.

5. The County reserves the right to reject the CONTRACTOR'S measurement of

work-in-place that involves use of established unit cost bid prices, and to have this work measured by an independent or County surveyor at his expense.

6. The County reserves the right to reject the CONTRACTOR's work in place until the work meets the requirements of the PLANS and Specifications.

**PART 2 - PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION**

**3.1 MEASUREMENT AND PAYMENT**

**A. BID ITEMS**

1. Mobilization/Demobilization (Bid Item 1)

Measurement by lump sum (LS), based on mobilizing of equipment and labor to perform work and demobilizing from and cleaning the site after all work and testing has been performed and accepted by the County.

Payment as follows: 50 percent of lump sum amount upon completion of 10 percent of the work, and 50 percent for demobilization and site cleanup; Payment includes all costs for mobilizing and demobilizing equipment, living expenses, permits, bonds, insurance, office and field overhead, and any other administrative costs necessary to complete the work. Includes work described in Section 01005, 01050, 01200, 01300, 01500, 02229, 11180, 15010, and 15012. Payment will be limited to 5 percent of the total contract price.

2. Vadose Zone Wells (Bid Item 2)

Measurement will be by the Lump Sum (LS).

Payment will be by the Lump Sum (LS) installed. Payment includes all costs to furnish and install the 10-inch boring, 2-inch PVC casing and screen, couplings, elbows, well heads, and caps as detailed on the PLANS and described in Section 1180.

3. Connection to Existing LFG System (Bid Item 3)

Measurement based on Lump Sum (LS).

Payment will be by the Lump Sum (LS). Payment includes all costs to connect the new vadose zone wells to the existing LFG collection system as shown on the PLANS and described in Section 02229, 11180, 15010 and 15012.

END OF SECTION

SECTION 01050

SURVEYING

PART 1 - GENERAL

1.1 SUMMARY

The County shall provide survey services for the project and for preparation of record documents.

1.2 COUNTY SURVEYOR

A. The County shall use its surveyor licensed in the State of California to provide surveying services as required for layout and construction of the project as indicated on the drawings and specified herein. The COUNTY'S surveyor shall:

- Locate sites for vadoze zone well installation,
- Provide survey base maps for Record Drawings,
- Record locations and elevations of project specific items

1.3 DEFINITIONS

A. Existing features: existing features include but are not limited to the following:

- Existing vadoze zone wells
- Landfill
- Existing LFG collection pipe alignments
- Groundwater monitoring wells
- Survey bench marks

1.4 SITE CONDITIONS

A. Existing Grades: The Contract Drawings depict surface elevations in feet mean sea level (MSL). Maintenance activities, regrading, and routine settlement may have occurred since the original survey.

B. Existing Features: CONTRACTOR is required to field verify elevations and the location of existing features. The County's record drawings are available to the CONTRACTOR. The existence and location of features are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and existing features. The County and the ENGINEER take no responsibility for the accuracy of these record drawings implied or otherwise.

C. Field Verification: Prior to construction, verify the elevations of existing features of the landfill and at points of connection or tie-in to the Work.

A. Recording

3.4 RECORD DOCUMENTS

1. Horizontal and vertical survey tolerances shall be 1.0 feet and 0.05 feet, respectively.

3.3 TOLERANCES

B. Surveyor's Log: Keep neat legible notes of all measurements and calculations made by him while surveying and laying out the work. Maintain a surveyor's log of control and other survey work. Make this log available for reference.

A. Site Improvements, Well Location Layout: The County will identify locations for vadose zone wells as shown on the PLANS. The CONTRACTOR shall, at his cost and as soon as possible, replace lost or destroyed project control points to the same accuracy of the existing project control points. Base replacements on the original survey control points. Relate all work to the facility elevation datum and coordinate system.

3.2 FIELD SURVEY WORK

The COUNTY shall provide a State of California licensed land surveyor.

3.1 QUALIFICATIONS OF SURVEYOR

PART 3 - EXECUTION

PART 2 - PRODUCTS (Not Applicable)

F. No Additional Payment: No claims shall be made for extra payment or extensions of Contract completion time if the CONTRACTOR fails to notify the County of any discrepancy before proceeding with that part of the Work.

E. Discrepancies: Should the CONTRACTOR discover any discrepancy between actual conditions and those indicated which prevent following good practice or the intent of the PLANS and Specifications, he shall notify the County in writing and request clarification and instructions on how to proceed. The CONTRACTOR shall not proceed with his work until he has received the same from the County.

D. Field Conditions and Measurements: The CONTRACTOR shall base all measurements, both horizontal and vertical, from established benchmarks. The CONTRACTOR shall be responsible for field verification of all dimensions and conditions at the job site.

1. Preparation of project record documents shall be by personnel skilled as a draftsman competent to prepare the required drawings.
2. The ENGINEER and CQA OFFICER shall notify the Surveyor when deviations occur that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
- C. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
- Mark record sets with red erasable pencil. Mark new information that is important to the County, but was not shown on Contract Drawings or Shop Drawings. Note related Change Order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Legibly mark each item to record actual construction, including:
  1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  2. Measured locations of cover systems, internal utilities, and appurtenances concealed in construction, referenced to visible and accessible features of construction.
  3. Field changes (dimensions and detail)
  4. Changes by Modifications made by the CQA OFFICER or County.
  5. Details not on original Contract Drawings.
  6. References to related Shop Drawings and Modifications.
  7. Depths of various elements of the Work in relation to datum.
  8. Record Specifications: Maintain one complete copy of the Specifications, including addenda and one copy of other written construction documents such as Change Orders and Field Order issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications, Change Order, and Field Order. Give

particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record to drawing information and product data. Legibly mark up each Section to record:

- 9. Changes made by Change Order or Field Order.
- 10. Other matters not originally specified.

E<sup>N</sup>D OF SECTION

SECTION 01090

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 - GENERAL

1.1 REFERENCES

Reference publications are cited in other sections of the Specifications along with identification of their sponsoring organizations. The addresses of the sponsoring organizations are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS (AASHTO)

444 N. Capital, NW, Suite 225  
Washington, DC 20001  
Ph: 202-624-5809  
Fax: 202-624-5806

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

11 West 42nd St  
New York, NY 10036  
Ph: 212-642-4900  
Fax: 212-302-1286

AMERICAN PLYWOOD ASSOCIATION (APA)

P.O. Box 11700  
Tacoma, WA 98411-0700  
Ph: 206-565-6600  
Fax: 206-565-7265

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1916 Race St.  
Philadelphia, PA 19103  
Ph: 215-299-5585  
Fax: 215-977-9679

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

United Engineering Center  
345 East 47th St.  
New York, NY 10017  
Ph: 212-705-7946  
Fax: 212-980-4681

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)  
22 Law Dr., Box 2300  
Fairfield, NJ 07007-2300  
Ph: 800-843-2763  
Fax: 201-882-1717

AMERICAN WATER WORKS ASSOCIATION (AWWA)  
6666 West Quincy  
Denver, CO 80235  
Ph: 303-794-7711  
Fax: 303-794-7310

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)  
P.O. Box 286  
Woodstock, MD 21163-0286  
Ph: 410-465-3169  
Fax: 410-465-3195

ASPHALT INSTITUTE (AI)

Research Park Dr.  
P.O. Box 14052  
Lexington, KY 40512-4052  
Ph: 606-288-4960  
Fax: 606-288-4999

CALIFORNIA DEPARTMENT OF TRANSPORTATION (Caltrans)  
1120 N Street  
Sacramento, California 95814  
Ph: 916-654-2852

NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING  
TECHNOLOGIES (NICET)  
1420 King St.  
Alexandria, VA 22314-2715

NATIONAL SANITATION FOUNDATION (NSF)  
3475 Plymouth Rd.  
P.O. Box 1468  
Ann Arbor, MI 48106  
Ph: 313-769-8010  
Fax: 313-769-0109

END OF SECTION

PLASTICS PIPING INSTITUTE (PPI)  
155 Route 46W  
Wayne Interchange Plaza II  
Wayne, NJ 07470  
Ph: 201-812-9076  
Fax: 201-890-7029

SECTION 01200

PROJECT MEETINGS

**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

PLANS and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section specifies administrative and procedural requirements for project meetings including but not limited to:

- A. Pre-Construction Conference
- B. Progress Meetings
- C. Coordination Meetings

1.3 DESCRIPTION

The COUNTY will schedule and administer a pre-construction conference, and one (1) construction progress meetings, and as necessary specially called meetings throughout the progress of work. The COUNTY will be responsible for preparing the agenda, making arrangements, preparing the meeting minutes and presiding at these meetings.

Representatives of CONTRACTOR, Subcontractor(s), and Suppliers attending these meetings shall be qualified and authorized to act on behalf of the entity each represents.

The CONTRACTOR shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.4 PRECONSTRUCTION CONFERENCE

Within ten (10) days after the Notice to Proceed and before starting the work, a joint meeting shall be held with representatives of the COUNTY, ENGINEER, CONTRACTOR and his Superintendent and other invited parties or government agencies which may be affected by or have jurisdiction over the project. This meeting is intended to introduce the various key personnel from each organization and to discuss the Contract Documents, the start of construction, order of work, labor and legal requirements, approved insurance requirements, names of the major subcontractors, method of payment, shop drawing submittal schedule, protection of existing facilities and other pertinent items associated with the Project. The CONTRACTOR shall bring three (3) copies of a construction schedule to this meeting.

The suggested agenda for the preconstruction meeting:

- A. Introduction of key personnel and roles
- B. Overview of project
- 1. Project summary
- 2. Contract completion time
- 3. Liquidated damages
- 4. Guarantee of work
- C. Project schedule
- D. Critical work sequencing
- E. Labor requirements
- F. Relationship and coordination with:
  - 1. Other contracts
  - 2. On-going manufacturing operations
  - G. Use of premises (SPECIAL CONDITIONS)
    - 1. Right-of-ways and easements
    - 2. Access and traffic control
    - 3. Office, work and storage areas
    - 4. Temporary facilities/utilities
    - 5. Safety and first aid procedures
    - 6. Security procedures
    - 7. Posting of signs
    - 8. Clean-up procedures
    - 9. County requirements
  - H. Procedures and processing of:
    - 1. Field decisions
    - 2. Change orders
    - 3. Applications for payment
    - 4. Partial payments
    - 5. Record documents
    - 6. Shop drawings
    - 7. Request for extension of Contract time
  - I. Construction facilities, controls and aids
  - J. Staking of work
  - K. Equipment to be used
  - L. Material/manufacturers/suppliers to be used
  - M. Major equipment/material deliveries
  - N. Requirements of railroads and highway departments
  - O. On-site material storage requirements
  - P. Laboratory testing of materials
  - Q. Project inspections
  - R. Permit requirements

1.5 PROGRESS MEETINGS

During the course of the Contract, progress meetings will be organized and conducted by the COUNTY to discuss the progress of the Contract weekly. The CONTRACTOR and his construction superintendent shall attend these meetings. The progress meetings will be held at a convenient location onsite, such as the landfill office.

The suggested agenda for these meetings:

- A. Review minutes of previous meeting.
- B. Review of work progress since previous meeting.
- C. Field observations, problems, conflicts.
- D. Problems which impede the construction schedule.
- E. Review of off-site fabrication and delivery schedules.
- F. Corrective measures and procedures to regain projected schedule.
- G. Revisions to construction schedule.
- H. Progress schedule during next work period.
- I. Coordination of schedule.
- J. Shop drawing submittals.
- K. Maintenance of quality standards.
- L. Pending changes and substitutions.
- M. Review proposed changes for:
  - 1. Effect on construction schedule and on completion date.
  - 2. Effect on other Contracts of the project.
- N. Other business.
- O. Construction schedule.
- P. Critical/long-lead items.

**PART 2 – PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION (Not Applicable)**

END OF SECTION

SECTION 01300

CONTRACTOR SUBMITTALS

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

PLANS and general provisions of the Contract, including general and supplementary conditions, and Division 3 Technical Specifications apply to this Section.

**1.2 SUMMARY**

This section identifies the required project submittals (Table 01300-1) and the process by which they will be reviewed and approved. Unless otherwise specified, 6 copies of submittal information will be provided by the CONTRACTOR to the CQA Officer in accordance with specified time frames.

A. Summary of Submittals is provided in Table 01300-1 for quick review by the CONTRACTOR. It shall be the CONTRACTOR'S responsibility to review the Specifications to identify the specific requirements for each submittal.

**Table 01300-1  
Summary of Submittals**

Submittal	Time Due	Approval Period	Approver
Health and Safety Plan	10 Days Before Start	10 Days	N.A.
Subcontractor List	5 Days After NTP	10 Days	County
Construction Schedule	10 Days Before Start Weekly Following	Informational	N.A.
Shop Drawings required by PLANS	10 Days Before Constructing	5 Days	Design Engineer
Material Samples/ Test Results	10 Days before Constructing	5 Days	Design Engineer
Product Information	10 Days After Close	Informational	County

B. The review process shall be as follows:

1. CONTRACTOR submits 3 copies of submittal information to COUNTY in Field.
2. The COUNTY and ENGINEER review the submittal and conduct telephone discussions, if needed.

END OF SECTION

4. The COUNTY stamps the submittal and checks one of the following actions:
    - Approved
    - Approved as Noted
    - Revise & Resubmit
    - Disapproved
  5. One copy is returned to the CONTRACTOR, one copy to the ENGINEER, and the COUNTY keeps one copy.
  6. Delays in the submittal review and approval process by parties other than the CONTRACTOR, do not automatically qualify for time extensions to the project. Any such claim by the CONTRACTOR must clearly demonstrate how the construction schedule has been impacted to the satisfaction of the COUNTY before a time extension will be granted.
- C. Re-submittal of Information
1. Re-submitted information shall be reviewed and approved within 5 Days.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

The requirements of this Section apply to, and are a component of, each section of the Specifications. The CONTRACTOR is responsible for furnishing all labor, equipment, materials, and provisions to provide temporary facilities and controls, including but not limited to the CONTRACTOR'S field office, CONTRACTOR'S storage area(s), utility connections/hooks and permits for water service, electrical service, telephone service, maintenance of traffic, barricades, fences, damage to existing property, security, access roads, drainage, erosion and sediment control measures, parking, and emergencies.

1.2 REFERENCES

The Plans, General Conditions, Special Provisions and General Requirements of the Contract, apply to this Section.

1.3 FIELD OFFICE

A. UTILITIES

The CONTRACTOR may furnish and maintain one temporary field office for use by the CONTRACTOR. This office shall be located on-site in the location shown on the PLANS and so as not to interfere with construction or landfill operations. The CONTRACTOR shall provide electrical service to the office. Electricity usage will be provided by the County at no charge to the CONTRACTOR. The CONTRACTOR shall obtain all permits for the facilities. If no field office is planned, the landfill office can be used for meetings.

A potable water supply is not currently available on-site. The CONTRACTOR shall provide a potable water supply.

The CONTRACTOR may be limited to the use of cell phones only at the site. The CONTRACTOR shall be responsible for paying any connection fees and services charges for telephone service for an office.

Sanitary sewer service is not available at this location. The CONTRACTOR shall provide temporary holding tank(s) and disposal for sewerage generated by the office or CONTRACTOR employees.

A. Maintenance of Traffic: The CONTRACTOR shall conduct his operations in a manner that will not close any thoroughfare or interfere in any way with site traffic except with written permission of the County. CONTRACTOR shall observe all traffic related requirements in this Agreement. Work shall be conducted so as to

1.6 TRAFFIC PROVISIONS

B. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be furnished for each 10 workers. CONTRACTOR shall enforce the use of such sanitary facilities by all personnel at the site. The use of existing toilet facilities at the sanitary landfill by CONTRACTOR'S personnel is strictly forbidden.

A. CONTRACTOR shall furnish temporary sanitary facilities at work locations, as provided herein, for the needs of all construction workers and others performing work or furnishing services in connection with this Contract.

1.5 SANITARY FACILITIES

A. A storage area will be provided on the project site for use by the CONTRACTOR for storage of his materials, tools, equipment, office and other items necessary for construction. The exact limits of the storage area will be designated at the preconstruction meeting and in the field by the CQA OFFICER/County. The CONTRACTOR shall be fully responsible for the security of this area, including fencing, watchmen, and other means of security. Under no circumstances will the COUNTY be responsible for the security of any property belonging to the CONTRACTOR, his subcontractors, or any of his work forces.

1.4 CONTRACTOR'S STORAGE AREAS

2. Copies of the Specifications, and other Contract Documents shall be kept at CONTRACTOR'S office at the site of the work and available for use by the County, ENGINEER, CQA Staff, or CONTRACTOR at all times.

1. During the performance of this Contract, CONTRACTOR shall maintain a suitable office at the site of the work which shall be the headquarters of his representative authorized to receive, instructions, or other communication or articles. Any communication given to the said representative or delivered at CONTRACTOR'S office in his absence shall be deemed to have been delivered to CONTRACTOR.

The field office shall consist of the following features:

B. CONTRACTOR'S FIELD OFFICE

- 1.7 FENCES
- A. All existing fences affected by the work shall be maintained by CONTRACTOR until completion of the work. Fences which interfere with construction operations shall not be relocated or dismantled until written permission is obtained from the County of the fence and the period the fence may be left relocated or dismantled has been agreed upon.
- B. On completion of the work, CONTRACTOR shall restore all fences to their original or to a better condition and to their original location.
- 1.8 DAMAGE TO EXISTING PROPERTY
- A. CONTRACTOR will be held responsible for any damage to existing structures, work, materials or equipment because of his operations and shall repair or replace any damaged structures, work, materials or equipment to the satisfaction of, and at no additional cost to the County.
- B. CONTRACTOR shall protect all existing structures and property from damage and shall provide bracing, shoring, or other work necessary for such protection.
- C. CONTRACTOR shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges or other public or private property, which may be caused by transporting equipment, materials, or men to or from the work. CONTRACTOR shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.
- 1.9 SECURITY
- A. CONTRACTOR shall be responsible for protection of the site, and all work, materials, equipment and existing facilities thereon, against vandals and other unauthorized persons.
- B. No claim shall be made against the County by reason of any act of an employee or trespasser, and CONTRACTOR shall make good all damage to the County's property resulting from his failure to provide security measures as specified.

END OF SECTION

PART 3 - EXECUTION (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

A. The CONTRACTOR shall display and update phone numbers of the local police, fire department, hospital, and emergency squad at all times and at all phones on site during the project.

1.14 EMERGENCIES

A. CONTRACTOR shall provide and maintain suitable parking areas for the use of all construction workers and other performing work by furnishing services in connection with the project, as required to avoid any need for parking personnel vehicles where they may interfere with public traffic, County operations, or construction activities.

1.13 PARKING

B. Erosion control shall comply with all applicable State and County Regulations.

A. Adequate control of erosion and siltation of a temporary nature on areas disturbed by the work specified in this Section shall be provided under this Contract, subject to the approval of the County. There will be a joint on-site inspection prior to commencing work, with CONTRACTOR, State and County Officials and the County to determine specific temporary sediment control requirements and temporary drainage pipes, slope drains, gutters etc.

1.12 EROSION AND SEDIMENT CONTROL MEASURES

A. The CONTRACTOR shall keep all natural drainage and water courses unobstructed or provide equal courses effectively placed, and prevent accumulations of surface water.

1.11 DRAINAGE

A. CONTRACTOR shall construct, grade, stabilize and maintain temporary access roads to various parts of the site as required to complete the project.

1.10 ACCESS ROADS

C. Security measures shall be at least equal to those usually provided by County to protect his existing facilities during normal operation, but shall also include such additional security fencing, barricades, lighting and other measures as required to protect the site.

SECTION 02229

TRENCHING, BACKFILLING, AND  
COMPACTION

**PART 1 - GENERAL**

1.1 SUMMARY

A. Section includes backhoe trenching, backfilling, and compacting for the lateral connection to the buried HDPE header as specified herein.

1.2 REFERENCES

A. American Society for Testing and Materials.

1. D 422, Method for Particle-Size Analysis of Soils.

2. D 1557, Test Methods for Laboratory Compaction Characteristics of Soil.

3. D 2487, Standard Test Method for Classification of Soils for Engineering Purposes.

B. Occupational Safety and Health Administration (OSHA).

1.3 DEFINITIONS

A. Backfill: Onsite materials meeting these specifications.

B. Cohesionless Materials: Materials classified by the Unified Soil Classification System (USCS) as GW, GP, SW, and SP.

C. Cohesive Materials: Materials classified by USCS as GC, SC, ML, CL, MH, and CH.

D. Lift: Lift thickness shall be limited to 12-inch maximum.

E. Soils laboratory: Laboratory testing shall be in accordance Caltrans Test Methods and ASTM Methods.

**PART 2 - PRODUCTS**

2.1 GENERAL (Backfill)

A. Sources: Obtained from identified on-site stockpiles or excavated from the trench.

**PART 3 - EXECUTION**

- B. Free of angular, and other deleterious materials.
- C. Greater than 30 percent fine material (#200 sieve).
- D. Maximum particle size of 2 inches.

**3.1 PREPARATION**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely, safe, and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected the County.

**3.2 FINISH ELEVATIONS AND LINES**

- A. Installed lines and elevations shall be as shown on the PLANS.

**3.3 PROCEDURES**

- A. The CONTRACTOR shall provide dust control as necessary and as directed by the County.
- B. Maintain access to adjacent areas at all times.

**3.4 TRENCHING**

**A. Trenching:**

- 1. Excavate trenches.
  - 2. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the County.
  - 3. When the void is in the side of the trench or open cut, use suitable soil or sand compacted or consolidated as approved by the County, but in no case to a relative compaction less than 90.0 percent of ASTM D 1557.
  - 4. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the County.
- B. Trench to the minimum width necessary for proper installation of the pipe with sides as nearly vertical as possible. Uniformly grade the bottom to provide uniform bearing for the utility.

1. Except for special materials for drainage trenches, backfill the remainder of the trench with trench backfill material.
2. General earthfill: Deposit trench backfill material in layers not exceeding 8 inches in thickness, and compact each layer to 90.0 percent relative compaction based on ASTM D 1557.

C. Remainder of trench:

1. Trench bedding: Take special care in backfilling and bedding operations to not damage pipe and pipe coatings. Place 3/8 inch pea gravel to completely surround pipe without voids. Lightly tamp bedding to compact.

B. Lower portion of trench:

1. Backfill and compact trenches to the ground surface at 90.0 percent with materials as shown on the PLANS.
2. Reopen trenches which have been improperly backfilled. Backfill and compact as specified, or otherwise correct to the approval of the Design Engineer.
3. Do not allow or cause any of the Work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, tests, and approvals.
4. Should any of the Work be so enclosed or covered up before it has been approved, uncover all such Work and, after approvals have been made, backfill and compact as specified, all at no additional cost to the County.

A. General:

3.5 BACKFILLING

D. Shoring:

1. Provide shoring to meet OSHA requirements.
2. Where rock is encountered, over excavate rock to a minimum over depth of 4 inches below the trench depth indicated or specified and backfill with 3/8 inch pea gravel.
1. Except where rock is encountered, do not excavate below the depth indicated or specified.

C. Depressions:

3.6 FIELD QUALITY CONTROL

A The COUNTY shall inspect open cuts and trenches before installation of pipes, and will make the following tests:

1. Verify that trenches are not backfilled until all tests have been completed.
2. Check backfilling for proper layer thickness and compaction.
3. Verify that test results conform to the specified requirements, and that sufficient tests are performed.
4. Verify that defective work is removed and properly replaced.

PART 4. MEASUREMENT AND PAYMENT

No separate measurement and payment will be made for Trenching, Backfilling, and Compaction. Costs shall be included in bid items requiring Trenching, Backfilling, and Compaction.

END OF SECTION

SECTION 11180

VADOSE ZONE WELLS

**PART 1 – GENERAL**

1.1 DESCRIPTION

A. Work Included:

1. The work described in this section consists of furnishing all labor, materials, equipment, and appurtenances necessary to drill, install, test, and make ready vadose zone extraction wells, including multifunctional wellhead assemblies, at the locations shown on the PLANS and specified herein.

B. The vertical extraction well screens, seals, gravel, and soil backfill packs shall be set at depths shown on the PLANS or as designated in the field by the ENGINEER. It is expected that combustible gas will be venting from boreholes drilled to install extraction wells. The CONTRACTOR's bid price shall include provision for all equipment and procedures necessary to safely install wells under this condition.

C. Related Work Described Elsewhere:

1. Section 02229 – Trenching, Backfilling, and Compaction.

D. Qualified workmen shall perform all work in accordance with the best standards and practices of the trade.

E. The CONTRACTOR, at all times, shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. Upon completion of the work, he shall remove all his waste materials and rubbish from the site, as well as all his tools, construction equipment, machinery, and surplus materials, and shall leave the work "Broom Clean."

1.2 SUBMITTALS

A. Submittals shall be made in accordance with Section 01300 – CONTRACTOR SUBMITTALS. In general, the following data or Shop Drawings shall be submitted to the ENGINEER for approval prior to construction:

1. Solid and slotted PVC pipes.

2. Sieve analysis for sand and gravel.

3. Bentonite data.

4. Multifunctional wellhead assembly (Accu-Flo or approved equal).

1.3 SAFETY REQUIREMENTS

A. The CONTRACTOR shall be required to comply with the safety requirements as specified in Section 01005 – SPECIAL PROVISIONS.

**PART 2 – PRODUCTS**

2.1 PIPE AND FITTINGS

A. All PVC pipe and fittings shall conform to the requirements of Section 15010 - POLYVINYL CHLORIDE (PVC) Piping.

2.2 GRAVEL

A. Gravel used for backfilling annular space around the slotted well casing (LFG extraction well) shall be clean, washed, and well graded in size 3/4-inch to 1-1/2-inch. The gravel shall be composed of clean, hard, and durable fragments or particles, free from dirt, vegetation, or other objectionable matter, and free from an excess of soft, thin elongated, laminated or disintegrated pieces.

2.3 BENTONITE

A. The bentonite material shall be granular bentonite and shall be Benseal as manufactured by Baroid Drilling Fluids, Inc. of Houston, Texas, Crumbles 8 Mesh as manufactured by Colloid Environmental Technologies Company (CETCO), Enviroplug No. 8 as manufactured by WyoBen, or approved equal.

2.4 FLEXIBLE CONNECTORS

A. A flexible connector shall be used to connect the wellhead to the wellhead lateral or LFG lateral.

B. The connector shall be of size shown on the PLANS, and shall be U.V. resistant reinforced PVC hose as manufactured by Kanaflex Corporation of California, Compton, California, or approved equal.

C. Flex connector shall be capable of withstanding a vacuum of 29.8 inches of mercury, a pressure of 5 psi, have an operating range of -65 to 325 ° F, and provide 50 percent contraction and 20 percent extension. The connector bend radius shall be, at minimum, 1.5 times the diameter of the hose.

2.5 WELLHEADS

A. LFG extraction wells shall be equipped with a multifunctional wellhead with a precalibrated gas measurement tube assembly, as shown on the PLANS and as specified herein.

B. The multifunctional wellheads shall be suitable for measuring LFG flow up to 75 scfm and

shall incorporate built-in features, including the following:

1. Measurement Tube:
  - a. The measurement tube shall be Schedule 80 PVC pipe, and shall fit concentrically into the vertical collector casing.
  - b. The measurement tube shall be of sufficient length to allow gas to achieve uniform flow before being measured, but shall not extend below the upper level of the vertical collector screens or gravel backfill.
2. Impact Tube:
  - a. The impact tube shall be type 316 stainless steel.
  - b. The entrance of the impact shall be in an area of uniform gas flow.
  - c. A stainless steel centralizer shall be installed on the impact tube.
3. Union:
  - a. The wellhead shall have a Tru-Union PVC union fitting or approved equal, immediately upstream of the flow control valve.
4. Fittings:
  - a. All PVC fittings shall be Schedule 80 socket fittings. Adapters shall be Schedule 80 PVC.
5. Temperature Gauge:
  - a. The temperature gauge shall have a stainless steel probe, watertight dial cover, and calibration nut. It shall be connected to the wellhead with a quick-connect fitting.
6. Lab Cock Valve Ports:
  - a. Lab cock valve ports shall be positive sealing and shall be constructed of polypropylene, or chrome-plated brass.
7. Valves and flex connectors shall be as specified in above Items 2.4 and 2.5, respectively.
8. The wellhead shall be as shown on the PLANS and shall be Accu-Flo, Model No. 200V, as manufactured by Landtec of Colton, California, or approved equal.

2.6 NUTS AND BOLTS

A. For above- and below-ground installation, bolts shall conform to the requirements of ASTM A307. Unless stated otherwise, all bolts shall be carbon steel, Grade B, heavy hex, hot dip zinc-coated in accordance with the requirements of Class C of ASTM A153. Nuts shall conform to the requirements of ASTM A563. Nuts shall be Grade A, heavy hex, hot dip zinc-coated in accordance with Class C of ASTM A153. Washers shall be Grade A, hot dip zinc-coated in accordance with Class C of ASTM A153.

**PART 3 – EXECUTION**

3.1 WELL INSTALLATION

A. General:

1. Materials delivery, storage, and handling:
  - a. All PVC blank casing and slotted casing supplied under this PLANS shall be shipped, stored, and handled in accordance with the recommendations of the Manufacturer.
2. Material Inspection:
  - a. Prior to well installation, all PVC pipes, fittings, slotted casing, valves, gravel, and bentonite shall be inspected by the COUNTY for conformance with the standards and specifications.
  - b. All materials not meeting the requirements of the applicable specifications shall be rejected.

B. Borehole Drilling:

1. The COUNTY shall stake out locations of the wells, as shown on the PLANS, prior to beginning drilling. Well locations will be approved and may be adjusted by the ENGINEER to suit site conditions, prior to beginning drilling. The COUNTY shall survey in the final locations of the wells for preparation of the As-Built drawings.
2. CONTRACTOR shall coordinate the start of drilling with the COUNTY and/or ENGINEER.
3. Provide at all times a thoroughly experienced, competent driller during all operations at the drill site.
4. Boreholes shall be of diameter as shown on the PLANS.
5. Drilling shall continue in each vadose zone well borehole to the depths as indicated on the PLANS.

6. In the event that a borehole must be abandoned, the CONTRACTOR shall plug and abandon the hole from the bottom to within 5 feet of the surface using sand/bentonite mixture (5 pounds of bentonite per cubic foot of soil) and from 5 feet to the surface using a cement grout or graded bentonite plugging material, in a manner approved by the ENGINEER. The ENGINEER will determine the need for abandonment. The CONTRACTOR will be paid for the time and materials expended in plugging the abandoned borehole, provided that the abandonment is not due to the CONTRACTOR's negligence, carelessness, or defective equipment.
  7. On completion of the drilling operation and before commencement of well casing installation, the CONTRACTOR shall place a working platform, made from either steel or wood, over the borehole. The platform shall be of sufficient size and structural strength to support expected loads during well installation. Platform size shall be such that all the edges rest on the undisturbed ground at least 3 feet from the edge of the borehole, which will give workers sufficient time to get away from the borehole in the event of a well cave-in.
  8. The COUNTY will be responsible for logging the bore-hole and the well completion.
- C. PVC Casing Placement:
1. The blank and slotted casing shall be installed straight and plumb in the center of the borehole at the depths shown on the PLANS. During installation, a cap shall be placed over the top of the casing to prevent introduction of dirt and debris. If the pipe is installed out of plumb, the CONTRACTOR shall correct the alignment at his own expense.
- D. Gravel Placement:
1. The annular space surrounding the slotted well casing shall be filled with specified filter pack of clean gravel backfill to an elevation above the top of the slotted casing, as indicated on the PLANS.
- E. Bentonite Plug Placement:
1. Bentonite plugs shall be placed from the bottom to the top of the plug level as shown on the PLANS. Bentonite plugs shall be of thickness as shown.
  2. Consistency, method of mixing and placement of the bentonite plug shall be submitted to the ENGINEER for his review and approval prior to placing of the bentonite plug. The CONTRACTOR will not be allowed to install the bentonite plug prior to written approval of the consistency, method of mixing, and placement of the plug. No method will be permitted that does not force bentonite plug from the bottom of the plug to the top. The CONTRACTOR shall contact the manufacturer for his recommendations regarding method of mixing and placement of bentonite plug. The following is one of the method CONTRACTOR may adopt for bentonite plug placement:

- 3.2 DISPOSAL OF CUTTINGS
- A. The CONTRACTOR will not be allowed to dispose cuttings from the boreholes and other
1. The CONTRACTOR shall install wellheads as shown on the PLANS.
  2. The wellhead shall be lifted and handled according to the written procedures supplied by the Manufacturer.
  3. The wellhead shall be installed such that the measurement tube assembly is concentric with the LFG extraction well casing.
  4. The orientation of the lateral connection and valve shall be in the direction shown on the PLANS or as approved by the ENGINEER.
  5. All joints and fittings in the wellhead assembly shall be made airtight.
  6. CONTRACTOR shall repair any damage to wellheads as a result of construction operations, at CONTRACTOR's sole expense.
- G. Wellhead (Multifunctional):
1. Bentonite grout mixture shall consist of 15% bentonite and cement grout.
  2. Place grout seal from the bottom to top of seal zone.
- F. Cement Bentonite Grout Placement:
3. No backfilling operations shall be permitted until the bentonite has hydrated. Hydration time for bentonite plug is a minimum 20 minutes or as recommended by the manufacturer.
- After placing the gravel in the borehole to an elevation of 1 foot above the slotted casing, the CONTRACTOR shall place on top of gravel a soil plug of the thickness shown on the PLANS. Prior to placement of the bentonite plug, the CONTRACTOR shall thoroughly wet the soil plug. He shall then pour Bensal bentonite and water simultaneously (through a hose pipe lowered to the bottom elevation of the plug and pulled slowly upwards as bentonite is being poured in the borehole) into the hole in a systematic way to achieve a uniform plug. The amount of water necessary to be poured into the borehole will be as recommended by the bentonite manufacturer or by predetermining through experimenting with a small quantity of bentonite the actual amount of water required to achieve a good thick mud consistency mixture. When the bentonite plug has reached the specified thickness, more water shall be poured on top of the plug and adequate hydration time will be allowed before any backfilling operation commences. A minimum hydration time for bentonite seal shall be 20 minutes or as recommended by the manufacturer.

generated refuse on the site. The CONTRACTOR shall dispose of all such materials to active face of the landfill. No tipping fees shall be paid by the CONTRACTOR.

3.4 CONTROL OF BOREHOLE EMISSION

A. CONTRACTOR shall monitor and control emissions from boreholes in accordance with these Specifications. It is expected that combustible gas containing trace toxic constituents will vent from boreholes. It shall be CONTRACTOR's sole responsibility to control emissions in such a manner as to safely construct the wells, prevent violation of all applicable air quality regulations, and prevent worker exposure.

PART 4 – MEASUREMENT AND PAYMENT

Vadose Zone Wells  
(Bid Item 2)  
Measurement will be by the Lump Sum (LS).

Payment will be by the Lump Sum (LS) installed. Payment includes all costs to furnish and install the 10-inch boring, 2-inch PVC casing and screen, couplings, elbows, well heads, and caps as detailed on the PLANS and described in Section 11180.

Connection to Existing LFG System  
(Bid Item 3)  
Measurement based on Lump Sum (LS).

Payment will be by the Lump Sum (LS). Payment includes all costs to connect the new vadose zone wells to the existing LFG collection system as shown on the PLANS and described in Section 02229, 11180, 15010 and 15012.

END OF SECTION

SECTION 15010

POLYVINYL CHLORIDE (PVC) PIPING

PART 1. GENERAL

1.1 DESCRIPTION

A. Work Included:

1. The work described in this section consists of furnishing all labor, materials, equipment, and incidentals necessary to install and test polyvinyl chloride (PVC) piping for well casings, complete in place with flexible connectors and ready for use.

2. All piping system components shall be the product of one manufacturer.

1.2 SUBMITTALS

A. Submittals shall be made in accordance with Section 01300 – CONTRACTOR SUBMITTALS. In addition, the following specific information shall be provided:

1. Catalog information confirming the pipes and fittings conform to the requirements of the Specifications.

1.3 DAMAGE CONTROL

A. Transportation. Care shall be taken during transportation of the pipe to ensure that it is not cut, kinked, or otherwise damaged.

B. Handling Pipe Lengths:

1. Ropes, fabric, or rubber-protected slings and straps shall not be used when handling pipes.

2. Chains, cables, or hooks inserted into the pipe ends for lifting shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground.

C. Storage. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe.

1. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions.

2. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

PART 2. PRODUCTS

2.1 PIPING MATERIALS

A. Except where noted, all LFG pipes and fittings shall be Schedule 80 polyvinyl chloride (PVC).

B. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Type 1, Grade 1 PVC, as outlined in ASTM D1784. A Type 1, Grade 1 compound is characterized as having the highest requirements for mechanical properties and chemical resistance.

C. The compound from which pipe is produced shall have a design stress rating of 2,000 psi at 73 degrees Fahrenheit, as listed by the Plastic Pipe Institute (PPI).

D. Pipe shall conform to the requirements of ASTM D1785. Pipe shall be homogeneous throughout and shall be free from cracks, holes, foreign inclusions, and other defects.

E. Pipe and fittings shall be manufactured from materials approved by the National Sanitation Foundation (NSF).

F. Fittings shall conform to the requirements of ASTM D2466 for socket type and ASTM D2464 for threaded type.

G. When required, flanges shall be socket-type ANSI Class 125 pound with soft rubber gaskets. The bolts for the flanges shall be stainless steel.

H. All pipe and fittings shall be manufactured by CertainTeed, Carlon, National Pipe Company, or approved equal.

PART 3. EXECUTION

3.1 INSTALLATION

A. Each pipe and fitting delivered to the job site shall be inspected by the CONTRACTOR in the presence of the ENGINEER for flaws, cracks, dimensional tolerances, and compliance with referenced standards. Only pipe and fittings accepted by the ENGINEER shall be installed.

B. The installation of PVC pipe and fittings shall be strictly in accordance with the Manufacturer's recommendations and as outlined in ASTM D2774, at locations shown on the PLANS.

C. Except where noted, PVC pipes shall be plain or bell end to be joined with socket and solvent cementing. Joining of pipes shall be in accordance with the manufacturer's recommendations. At a minimum, the following procedures shall be followed when joining PVC pipe:

1. All burrs, chips, etc., shall be removed from the pipe interior and exterior.

2. All loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

3. A coating of CPS primer, as manufactured by the pipe supplier, shall be applied to the entire interior surface of the fitting socket and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

4. The solvent cement shall comply with the requirements of ASTM D2564 and shall be applied in strict accordance with the Manufacturer's Specifications.

5. Pipe should not be primed or solvent welded when it is raining or when atmospheric temperature is below 40 degrees Fahrenheit or above 90 degrees Fahrenheit when under direct exposure to the sun.

6. All pipe shall be inspected for cuts, scratches, gouges, etc., prior to installation. Any imperfections shall be removed as a complete cylinder.

7. All taps in the pipe shall be made, and necessary plugs shall be inserted by the CONTRACTOR, as shown on the PLANS.

8. Pipe and fittings shall be selected such that there be as small a deviation as possible at the joints and inverts present a smooth surface. Pipe and fittings, which do not fit together to form a tight-fitting joint, shall be rejected.

9. Pipe cutting shall be done only with mechanical cutters.

PART 4. MEASUREMENT AND PAYMENT

No separate measurement and payment will be made for PVC Piping. Costs shall be included in bid items requiring PVC piping.

END OF SECTION

SECTION 15012

HIGH-DENSITY POLYETHYLENE (HDPE) PIPING

PART 1. GENERAL

1.1 DESCRIPTION

A. The work described in this section consists of furnishing all labor, materials, equipment, and incidentals necessary to install and test high density polyethylene (HDPE) piping and pipe fittings for LFG laterals, complete in place and ready for operation as shown on the PLANS and as specified herein.

B. Related Work Described Elsewhere:

1. Section 02229 – Trenching, Backfilling, and Compaction

2. Section 11180 – Vadose Zone Wells.

1.2 SUBMITTALS

A. Submittals shall be made in accordance with Section 01300 – CONTRACTOR SUBMITTALS. In addition, the following specific information shall be provided:

1. A statement, in writing, from the pipe manufacturer, stating that he is listed with the Plastic Pipe Institute as a qualified extruder for polyethylene resin being used to manufacture the pipe for this project.

2. Catalog information confirming the pipes and fittings conform to the requirements of the specifications.

3. Certification and Test Reports. The CONTRACTOR shall submit to the ENGINEER a manufacturer's certification and test reports as follows: That the HDPE pipe was manufactured from resins in compliance with these Specifications. The certificate shall state the specific resin, its source, and the specific information required by ASTM 1248. The pipe shall not contain recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the raw material. The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other deleterious defects and shall be identical in color, density, melt index, and other physical properties.

4. The HDPE pipe manufacturer shall provide certification that stress regression testing has been performed on the specific product. This stress regression testing shall have been done in accordance with ASTM D-2837, and the manufacturer shall provide a product supplying a minimum hydrostatic design basis (HDB) of 1,600 psi, as determined in accordance with ASTM D-2837. The manufacturer must warrant the pipe to be free from defects in material and workmanship in accordance with ASTM D-3350 and F-714.

1.3 DAMAGE CONTROL

A. Transportation. Care shall be taken during transportation of the pipe that it is not cut, kinked, or otherwise damaged.

B. Handling Pipe Lengths:

1. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipes.

2. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground.

C. Storage. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe.

1. Stacking of the pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions.

2. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

PART 2. PRODUCTS

2.1 PIPING MATERIALS

A. The polyethylene pipe shall be high performance, HDPE pipe, conforming to ASTM D-1248 (Type III, Class C). Minimum cell classification values shall be PE345434C, as referenced in ASTM D-3350. The SDR for each type of pipe shall be as shown on the PLANS. The pipe shall contain a minimum of 2 percent carbon black.

B. Fittings:

1. Fittings shall be butt fusion type, meeting the requirements of ASTM D-3261. All fittings shall be rated to match the system piping to which they are fused. At the point of fusion, the outside diameter and minimum wall thickness shall meet the

outside diameter and minimum wall thickness specifications of ASTM F-714 for the same size of pipe. Pipe connections between dissimilar materials shall be joined by stub end and backing flange.

2. Flanges, when required, shall be of plate type ANSI B16.5-B1, Class 125 lb. The bolts for the flanges shall be galvanized carbon steel. For above- and below-ground installation, bolts shall conform to the requirements of ASTM A307-92a. Bolts shall be carbon steel, Grade B, heavy hex, hot dip-coated in accordance with the requirements of Class C of ASTM A153. Nuts shall conform to the requirements of ASTM A563. Nuts shall be Grade A, heavy hex, hot dip zinc-coated in accordance with Class C of ASTM A153. Washers shall be Grade A, hot dip zinc-coated in accordance with Class C of ASTM A153. All flanges shall have gaskets. Gaskets are to be HYPALON or approved equal material for the service.

C. The piping and pipe fittings shall be comprised of new, first quality HDPE material.

D. The CONTRACTOR shall submit a certification from the manufacturer of the piping and pipe fittings, stating that the piping meets physical property requirements for the intended application.

E. Each standard and random length of pipe in compliance with this specification shall be clearly marked at a minimum: (1) pipe size, (2) SDR number, and (3) class and profile numbers.

### PART 3. EXECUTION

#### 3.1 PREPARATION

A. COUNTY shall stake out pipe alignment which shall be approved by the ENGINEER before installation can begin. This will allow the ENGINEER to determine if any change in the collection system design is needed. On completion of the lateral piping, the COUNTY shall survey the installation for preparation of As-Built drawings.

B. The Manufacturer shall furnish complete written instructions for the storage, handling, installation, fusion, and repair of the piping in compliance with this Specification and the conditions of this warranty.

C. The interior of all pipe shall be thoroughly cleaned of all foreign material before being lowered in the trench and shall be kept clean during laying operations by means of plugs, or other industry-approved methods.

#### 3.2 TRENCHING

A. Trench Excavation for HDPE Pipes (Outside Waste Area Limits). CONTRACTOR shall excavate an existing backfilled trench to expose the 12-inch diameter HDPE header at location shown on Plans.

1. Trench width shall be minimized to greatest extent practical but shall conform to the following:

a. Sufficient to provide room for installing, jointing, and inspecting piping, but in no case wider at top of pipe than pipe barrel outside diameter plus 18 inches unless otherwise approved by the CQA Engineer.

b. Enlargements at pipe joints may be made if required and approved by the CQA Engineer.

c. Sufficient for sheeting, bracing, sloping, and dewatering.

d. Sufficient to allow thorough compacting of backfill adjacent to bottom half of pipe.

2. Excavate trenches to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil or bedding material.

a. For pipes less than 6 inches in nominal size, do not excavate beyond indicated depths. Excavate bottom cut to accurate elevations for support of pipe on undisturbed soil or bedding material.

b. For pipes 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe. Cover depressions greater than 1-inch in depth with 10 oz./square yard non-woven geotextile and fill with materials specified in the PLANS.

3. No more than 200 feet of trench outside the landfill may be opened in advance of pipe laying operations at one time unless approved by the CQA Engineer.

4. All trenches shall be constructed in a uniform grade, and free of standing water. The CONTRACTOR shall be responsible for maintaining these conditions. Subgrade soils that become soft, loose, or unsatisfactory as a result of inadequate dewatering and cannot be stabilized or recompacted shall be removed and replaced by Class II coarse aggregate or approved equal underlain with 10 oz./sq. yd. nonwoven geotextile at the CONTRACTOR'S expense.

5. Excavation for appurtenances shall maintain a minimum clearance of 12 inches between their outer surfaces and the face of the excavation, or sheeting, if used.

6. Document the location, elevation, size, material type and function of all new subsurface installations, and utilities encountered during the course of construction and include this information as part of the Record Drawings.

3.3 INSTALLATION

- A. Trench excavation shall be located as shown on the PLANS, and shall be by open cut from the ground surface.
- B. Trenches shall be excavated to maintain depths as shown on the PLANS.
- C. The CONTRACTOR shall be responsible for maintaining alignment and depth of the pipeline. CONTRACTOR shall survey installed pipe to insure compliance with plans prior to backfilling.
- C. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench or weather conditions are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. All pipe in place shall be inspected by the COUNTY and surveyed before backfilling.
- D. Lowering Pipe into Trench. Care shall be exercised when lowering pipe into the trench to prevent damage to or twisting of the pipe.
- E. Cutting shall be done with approved mechanical cutters in a manner that will not damage the pipe. Pipe shall be firmly and uniformly supported on the bedding material. Pipe interior shall be kept thoroughly clean as the work progresses. Care shall be taken that pipe is not disturbed until joints are cured. Any adapters for joining shall be in accordance with the pipe manufacturer's printed instructions.
- F. Special Precautions. Pipe connected to heavy fittings, manholes, and rigid structures shall be supported in such a manner that no subsequent relative movement between the pipe and the joint with the rigid structures is possible.
- G. Joining (HDPE Pipe). Sections of the HDPE pipe (20-foot spacing between joints) shall be joined into continuous lengths by the butt fusion method above or beside the trench and shall be performed in strict conformance with the pipe manufacturer's recommendations using approved equipment. Butt fusion operation shall only be conducted by the factory trained and certified fusion operator. All valves and transition piping shall be by flange or mechanical joint connections. Joining and installation of pipe shall be accomplished under the direction of an authorized manufacturer's representative.
- H. Handling Pipeline. The handling of the pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects.

I. All taps in the pipe as shown on the PLANS shall be made and necessary plugs shall be inserted by the CONTRACTOR.

J. Pipe and fittings shall be selected so that there will be as small a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight fitting joint will be rejected.

K. All pipe cuts shall be square, perpendicular to center line of pipe.

L. Damaged pipe that results in reduction of the wall thickness by more than approximately 10 percent should be cut out and discarded. Damaged pipe shall be repaired according to manufacturer's recommendations.

M. The CONTRACTOR shall protect the pipe and workers from the build-up of static electricity, which can be generated in the pipe by friction from the handling of pipe in storage, shipping, and installation. The CONTRACTOR shall minimize the hazard of discharge by applying a film of water to the work surface, to drain away the static electricity. Other recommendations by the pipe manufacturer will be acceptable.

### 3.4 TESTING

A. The CONTRACTOR shall conduct a pneumatic pressure test on installed HDPE header. He shall furnish all necessary equipment and materials, and make all taps in the pipe, as required. The COUNTY shall be notified at least 72 hours in advance of testing. The COUNTY and/or Engineer shall witness the test.

B. All installed pipes shall be subjected to air test pressure of 100 psi for a period of 1 hour, except for the LFG headers and lateral pipes. The LFG headers and laterals shall be tested at 10 psi for a period of 1 hour. During this period, up to one percent of the testing pressure may be lost over the one hour period.

C. The piping, except at the joints and flanged connections, shall be backfilled prior to air testing. Upon the approval of the COUNTY and/or ENGINEER and after passing the air-testing program, the joints shall be backfilled.

D. Any section of pipe, which fails to meet the stipulated pressure test, shall be checked by the CONTRACTOR and corrective measures taken. The test shall then be repeated, at no additional cost to the County, until test results meet the specified requirements.

E. No pipe installation will be accepted unless and until it meets the pressure test requirements.

F. Equipment. The CONTRACTOR shall provide the following equipment for the pressure test:

1. Pneumatic compressor separator-dryer system capable of providing oil-free dry air and equipped with one or more full capacity safety relief valves set at a pressure of not more than 105 percent of the required test pressure.

2. Pressure gauges of suitable sizes.

G. Procedure:

1. Pneumatic testing shall be performed using accurately calibrated instruments and oil-free, dry air. Tests shall be performed on piping after the piping has been completely installed. All parts of the piping system shall be subjected to the test pressure of 10 psi for 1 hour. During this period, no loss of pressure shall be observed. The CONTRACTOR shall recognize the hazards associated with air testing and shall take all necessary precautions to protect test personnel. All piping to be tested shall be secured to prevent damage to adjacent piping and equipment in the event of a joint failure. Any appurtenant instruments or devices that could be damaged by the test shall be removed from the piping or suitably isolated prior to applying the test.

2. Test Records: Records shall be made of each piping system installation during the test. These records shall include:

a. Date of test.

b. Description and identification of piping tested.

c. Test pressure.

d. Remarks, to include such items as:

1) Leaks (type, location).

2) Repairs made on leaks.

e. Certification by CONTRACTOR and signed acknowledgment by the CQA Engineer and/or County.

### 3.5 BACKFILLING AND COMPACTION

A. No connections, branches, fittings, or any part of a pipe line or other structure that needs to be located for as-builts shall be filled over or around until the COUNTY's surveyor has performed this work and backfilling be approved by the COUNTY. Any such items that are covered without authorization shall be uncovered by the CONTRACTOR at his expense.

B. Backfill around a structure or pipe shall be brought up evenly on all sides so that no unbalanced pressure will be imposed on the structure or pipe.

END OF SECTION

No separate measurement and payment will be made for HDPE Piping. Costs shall be included in Bid Items 3, Connection to Existing LFG System.

PART 4. MEASUREMENT AND PAYMENT

1. The piping system has been constructed in accordance with the approved project plans and specifications.
2. The piping system has been field tested and has passed all of the required tests in the approved project plans and specifications.
3. The piping system has not been damaged during the backfilling operation or construction.

A. Upon completion of the backfilling operation over the piping system, the CONTRACTOR shall certify the following to the COUNTY:

3.6 CERTIFICATION OF COMPLETION

- C. In backfilling of pipelines, backfill material shall be carefully placed about the pipe in uniform layers. Each layer shall be thoroughly compacted with proper tools in such a manner as not to damage the pipe. Backfilling shall be carried on simultaneously on both sides of the pipe so that damaging side pressures do not occur.
- D. After backfill material has been placed and tamped as indicated on the PLANS, the remainder of the trench may be backfilled as shown on the PLANS. Backfill material shall be placed in uniform layers and thoroughly compacted to the specified density for the soil type shown on the PLANS in the appropriate Section of these specifications and to the satisfaction of the COUNTY.
- E. Whenever the trenches have not been properly backfilled or settlement occurs, they shall be refilled, smoothed off and finally made to conform to the surface of the ground. Backfilling shall be carefully performed and the original surface, including pavement or other surfacing above the settled areas, shall be restored to the full satisfaction of the COUNTY, at no additional cost to the COUNTY. Surplus material shall be disposed of as directed by the COUNTY.