

**Sierra County  
Board of Supervisors'  
Agenda Transmittal &  
Record of Proceedings**

<b>MEETING DATE:</b> September 6, 2016	<b>TYPE OF AGENDA ITEM:</b> <input checked="" type="checkbox"/> Regular <input type="checkbox"/> Timed <input type="checkbox"/> Consent
<b>DEPARTMENT:</b> Department of Public Works and Transportation <b>APPROVING PARTY:</b> Tim H. Beals <b>PHONE NUMBER:</b> 530-289-3201	

**AGENDA ITEM:** Presentation of bids and adoption of resolution awarding contract for the Loyaltan Landfill Perimeter Gas Probe Installation Work.

**SUPPORTIVE DOCUMENTS ATTACHED:** Memo Resolution Agreement Other  
Bid Tabulation

**BACKGROUND INFORMATION:** The perimeter LFG probes, in addition to the acquisition of property adjacent to the landfill which has been completed, is the remaining component of an approved compliance plan to bring the site into compliance with enforcement orders due to soil gas methane concentrations in excess of state regulatory standards (2011). Bidding was authorized on August 2, 2016, and bid opening was August 24, 2016. Two bids were received and staff is recommending award of a public works contract for referenced work to Cascade Drilling, L.P. in the amount of \$30,050.

**FUNDING SOURCE: SOLID WASTE**  
**GENERAL FUND IMPACT:** No General Fund Impact  
**OTHER FUND:**  
**AMOUNT:** \$30,050 N/A

<b>ARE ADDITIONAL PERSONNEL REQUIRED?</b>  <input type="checkbox"/> Yes, -- -- <input checked="" type="checkbox"/> No	<b>IS THIS ITEM ALLOCATED IN THE BUDGET?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <b>IS A BUDGET TRANSFER REQUIRED?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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**SPACE BELOW FOR CLERK'S USE**

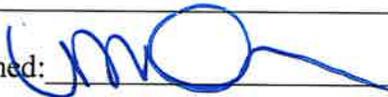
<b>BOARD ACTION:</b> <input type="checkbox"/> Approved <input type="checkbox"/> Approved as amended <input type="checkbox"/> Adopted <input type="checkbox"/> Adopted as amended <input type="checkbox"/> Denied <input type="checkbox"/> Other <input type="checkbox"/> No Action Taken	<input type="checkbox"/> Set public hearing For: _____ <input type="checkbox"/> Direction to: _____ <input type="checkbox"/> Referred to: _____ <input type="checkbox"/> Continued to: _____ <input type="checkbox"/> Authorization given to: _____	Resolution 2016- _____ Agreement 2016- _____ Ordinance _____ Vote: Ayes: Noes: Abstain: Absent: <input type="checkbox"/> By Consensus
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**COMMENTS:**  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CLERK TO THE BOARD \_\_\_\_\_ DATE \_\_\_\_\_

Perimeter Gas Probes - Loyalton Landfill, August 24, 2016 Bid Opening

BIDDER	Bid
ABC Lovin Drilling, Inc.	31,250.00
Cascade Drilling & Tech. Services	30,050.00

Opened: 

Documented: 

Witnessed: 

**BOARD OF SUPERVISORS, COUNTY OF SIERRA, STATE OF CALIFORNIA**

**IN THE MATTER OF AWARD OF CONTRACT TO  
LOWEST QUALIFIED BIDDER FOR  
PERIMETER SOIL GAS PROBE INSTALLATION WORK  
AT LOYALTON LANDFILL**

**RESOLUTION NO. 2016-\_\_\_\_\_**

**WHEREAS**, the County of Sierra has heretofore called for sealed bids for the project referred to as the Perimeter Soil Gas Probe Installation Work at the Loyalton Landfill; and

**WHEREAS**, in response to the formal call for bids, two bids were received; and

**WHEREAS**, the contract shall be awarded to the lowest qualified responsible bidder;  
and

**WHEREAS**, bid opening was held at 3:01 p.m. on Wednesday, August 24, 2016; and,

**WHEREAS**, after analysis of the bid it has been determined that Cascade Drilling, L.P. has submitted the lowest qualified bid.

**NOW THEREFORE, BE IT RESOLVED THAT** the award of contract to Cascade Drilling, L.P. is hereby approved.

**BE IT FURTHER RESOLVED THAT** the Director of Transportation is hereby granted authority to administratively approve construction change orders on the referenced contract as necessary, and within the confines of the funding, cumulative total of which is not to exceed 10% of the construction contract.

**ADOPTED** by the Board of Supervisors of the County of Sierra on the 6th day of September, 2016 by the following vote:

AYES:  
NOES:  
ABSENT:  
ABSTAIN:

COUNTY OF SIERRA

\_\_\_\_\_  
LEE ADAMS, CHAIRMAN  
BOARD OF SUPERVISORS

ATTEST:

APPROVED AS TO FORM:

\_\_\_\_\_  
HEATHER FOSTER  
CLERK OF THE BOARD

\_\_\_\_\_  
DAVID PRENTICE  
COUNTY COUNSEL

**COUNTY OF SIERRA  
PUBLIC WORKS CONTRACT  
SHORT FORM**

**PARTIES**

THIS CONTRACT, made this 6th day of September, 2016, by and between the COUNTY OF SIERRA, a political subdivision of the State of California, hereinafter referred to as “**County**” and **Cascade Drilling, L.P.**, hereinafter referred to as “**Contractor**”.

This contract is for the following project:

**Perimeter Soil Gas Probe Installation Work at the Loyalton Landfill**

**NOW, THEREFORE**, in consideration of the mutual covenants and agreements herein contained, it is hereby agreed as follows:

**TERMS & CONDITIONS**

**1. SCOPE OF WORK:**

Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor and materials necessary to perform and complete in a good and workmanlike manner, and in strict accordance with the Contract Documents as defined in Section 5 hereof, the work of:

- Installation of five nested perimeter soil gas probes to depths of 21 feet, 40 feet, 70 feet, 71 feet, and 48 feet.

**2. CONTRACT TIME:**

**2.1 COMMENCEMENT AND COMPLETION**

The Work shall be commenced on the date specified in the County's “Notice to Proceed” and shall be fully completed no later than thirty (30) working days thereafter, or such additional time as may have been provided by Change Order, pursuant to the Contract Documents.

**2.2 TIME IS OF THE ESSENCE**

Time is of the essence. If the work is not completed in the time specified, including such extensions of time as may have been granted for unavoidable delays, the Contractor will be assessed damages for delay in accordance with the liquidated damages provision herein. A determination of whether delays were avoidable or not shall be made by County.

**3. CONTRACT PRICE:**

County shall pay Contractor for the full and complete performance of this Contract the

sum of thirty thousand fifty dollars (\$30,050.00).

The contract price may be adjusted only as provided in the Contract Documents and only upon the express written approval of the County Board of Supervisors or the County Director of Transportation and in the event of any such adjustment, the Contractor agrees that the maximum adjustment to be attributable to his overhead and profit shall not exceed fifteen percent (15%) of the actual costs to Contractor for any additional work encompassed by any such adjustment, in accordance with the General Conditions.

#### **4. PAYMENTS:**

##### **4.1 PROGRESS PAYMENTS**

Where the work is anticipated to require more than forty-five (45) days to complete, Contractor may apply for progress payments on a monthly basis. Monthly progress payments shall be made in accordance with the General Conditions of these Contract Documents, subject to a ten percent (10%) withhold as specified therein Contractor shall submit a signed application for payment covering the work completed to that date and accompanied by supporting documentation to County's satisfaction. Progress payments will be in an amount equal to ninety percent (90%) of the work completed.

##### **4.2 FINAL PAYMENT**

Payment in full for the completed project will not be due until at least thirty (30) days after filing of the Notice of Completion with the County Clerk. Acceptance of final payment will be deemed a waiver of all claims except those which were timely made pursuant to the claims provisions of this contract. Final payment shall be made in accordance with the General Conditions of these Contract Documents.

##### **4.3 INVOICE CONTENT**

Invoices or applications for payment to the County shall be detailed and shall contain full documentation of all work performed and all reimbursable expenses incurred. Where the scope of work on the contract is divided into various tasks, invoices shall detail the related expenditures accordingly. Labor expenditures need documentation to support time, subsistence, travel and field expenses. No expense will be reimbursed without adequate documentation. This documentation will include, but not be limited to, receipts for material purchases, rental equipment and subcontractor work.

##### **4.4 ACCEPTANCE OF FINAL PAYMENT AS RELEASE**

The acceptance by the Contractor of final payment shall be and shall operate as a release to the County of any and all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and/or neglect of the County or others relating to or arising from the Work, to the full extent authorized by Public Contracts Code Section 7100. No payment, however, final or otherwise, shall operate to release the Contractor of his sureties from any obligations under this Contract or the Performance and Payment Bonds required by this Contract, or the guarantees and warranties required by the Contract Documents, or the bond securing the same.

## **5. CONTRACT DOCUMENTS:**

The contract documents comprise the entire agreement between the parties and may be amended only by writing signed by both parties or by written change order. The contract documents shall include this contract, plans and specifications, bidding documents, addenda thereto, all proposals submitted by Contractor, the general conditions attached hereto and special, and/or supplementary conditions issued by the County. In the case of ambiguity or conflict, the documents shall be given the following priority:

- This Agreement
- Contract Drawings
- Technical Specifications
- Duly issued Addenda
- General and/or Special Conditions
- Supplementary conditions, if any
- Duly issued Clarifications and Field Orders
- Duly issued Work Authorizations
- Duly issued Change Orders
- Supplemental Drawings issued pursuant to Article 4 of the General Conditions
- Initial Submittals approved pursuant to Article 3 and all other submittals approved pursuant to the General Conditions.
- Contractor's Bid Proposal Contractor's Guarantee and Bond
- Designation of Subcontractors
- Performance Bond
- Payment Bond

Such documents, collectively referred to as the "Contract Documents", are hereby incorporated herein by this reference and made a part hereof.

## **6. PERFORMANCE AND LABOR & MATERIAL BONDS:**

Pursuant to the provisions of the California Civil Code Section 9550, for projects in excess of twenty five thousand dollars (\$25,000), the Contractor shall, prior to the performance of any work covered by this Contract, provide to County in such form as may be acceptable to County, a "performance bond" guaranteeing the faithful and timely performance of the work to be performed under this Contract and guaranteeing the work for a period of one full year from the date of the completion of the work (which shall be evidenced by the filing of a notice of completion by County) and a separate "labor and material bond" guaranteeing payment to any laborer, subcontractor and/or material supplier for the work under this Contract. The amount of each of these bonds shall be in accordance with the General Conditions to the Contract.

## **7. REPRESENTATIONS BY CONTRACTOR:**

The Contractor hereby represents that before bidding, he carefully examined the Drawings and Project Manual, visited the Site of the Work and fully informed himself as to all existing conditions at the Site and limitations of information provided by the County regarding the Site.

The Contractor further represents that he has satisfied himself as to the nature and location of the Work, the general and local conditions, conditions of the Site, availability of labor, materials on the Site, the kind of equipment needed, the requirements of various trades or crafts needed to perform the Work and all other matters which in any way affect the Work or cost. The Contractor agrees that his failure to acquaint himself with all available information concerning conditions shall not relieve him from his bid or his responsibility for estimating properly the difficulties or cost of the Work, or the requirements for any trade, craft or portion of the Work.

The Contractor further represents that the Contract Price shall include everything necessary for the completion of Work and of fulfillment of this Agreement for Construction within the time specified hereby, including, but not limited to, furnishing all materials, equipment, tools, plant and other facilities, and all management, superintendence, labor, and services. The Contract Price includes allowance for all Federal, State and local taxes and payment of the prevailing wages required by applicable law and/or the General Conditions.

**8. AMENDMENT:**

This Contract may only be amended by a written amendment which shall require the formal approval of the Board of Supervisors. No County officer, agent or representative shall have the authority to amend this Contract.

**9. DELAY:**

The Contractor specifically acknowledges and agrees that a time extension is his sole remedy for delays caused by the County, and agrees to make no claim for additional damages for such delay. Contractor shall be entitled to a price adjustment with such time extension Change Order, but such price adjustment shall be limited to his direct additional costs to perform the Contract, subject to the General Conditions, and subject to verification by the County.

Processing of Submittals, Clarifications and other information by the County within the time specified in the Contract Documents shall in no event constitute a County-caused delay.

**10. NOTICES:**

Any notice, demand, request, consent, approval or communication that any party desires or is required to give any other party shall be in writing and either served personally or sent by pre-paid first-class mail. Any such writing shall be addressed as follows:

**COUNTY**

Tim H. Beals, Project Director  
Sierra County Department of Public Works  
Post Office Box 98  
Downieville, CA 95936

## **PROJECT ENGINEER**

Craig W. Morgan, Principal Engineer  
Avalex, Inc.  
P.O. Box 550218  
South Lake Tahoe, CA 96155

## **PROJECT CONTRACTOR**

Ralph McGahey, General Manager  
Cascade Drilling, L.P.  
3000 Duluth Street  
West Sacramento, CA 95691

### **11. LIQUIDATED DAMAGES:**

If the Work is not completed by Contractor in the time specified in Section 2 of the Agreement for Construction, or within any period of extension authorized pursuant to a duly issued Change Order, Contractor acknowledges and admits that the County will suffer damage, and that it is impracticable and infeasible to fix the amount of actual damages. Therefore, it is agreed by and between the Contractor and the County that the Contractor shall pay to the County as fixed and liquidated damages, and not as a penalty, a sum equal to one-half of one percent of the contract price, or the sum of **One Hundred Fifty** dollars (**\$150.00**), whichever is greater, for each calendar day of delay until the Work is completed and accepted, and that both Contractor and Contractor's surety shall be liable for the total amount thereof, and that the County may deduct said sums from any monies due or that may become due to Contractor, prior to determining the final amount due to Contractor.

This liquidated damages provision shall apply to all delays of any nature whatsoever, save and except only delays found by the Board of Supervisors to be unavoidable pursuant to the General Conditions, or time extensions granted in writing by the Board of Supervisors.

**IN WITNESS WHEREOF**, the parties hereto executed this Agreement the day and year first above written.

COUNTY OF SIERRA

By \_\_\_\_\_  
LEE ADAMS  
Chairman of the Board of Supervisors

ATTEST:

APPROVED AS TO FORM:

\_\_\_\_\_  
HEATHER FOSTER  
Clerk of the Board

\_\_\_\_\_  
DAVID PRENTICE  
County Counsel

CONTRACTOR

By \_\_\_\_\_  
Official Title

License Number \_\_\_\_\_

(CORPORATE SEAL)

\_\_\_\_\_

CORPORATE CERTIFICATE

I, \_\_\_\_\_, certify that I am the Secretary of the Corporation named as CONTRACTOR in the foregoing Contract; that \_\_\_\_\_, who signed said Contract on behalf of said Corporation is authorized to fully bind the corporation to this Agreement; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

\_\_\_\_\_  
(Secretary)

(CORPORATE SEAL)

# GENERAL CONDITIONS

## 1. CHANGES IN THE WORK:

County may order additions, deletions or revisions in the work which shall be authorized by written change order. Circumstances may occur where Contractor may need to apply for a change in the contract. Such changes must be applied for in writing in advance by Contractor and approved prior to doing of the additional work. Changes in contract price due to change orders shall be established either by (1) unit prices (where bidding was done by unit price), (2) based on the actual cost of the work (including but not limited to all labor and materials) plus an amount not to exceed 15 percent (15%) for overhead and profit together, or (3) by mutual acceptance of a lump sum.

## 2. BONDS:

A. For projects involving more than \$50,000 the contractor shall furnish two bonds each in the amount of 100 percent (100%) of the contract price, one as security for the faithful performance of the work, and the other as security for the faithful payment and satisfaction of all persons furnishing materials and performing labor for the project. The labor and materials bonds shall remain in effect until the recording of a Notice of Completion. The performance bond shall remain in effect until the running of the warranty period. The bonds shall be issued by a corporation duly licensed to transact surety business in California. The bonds must be executed by a duly licensed surety company and accompanied by a certified copy of the authority to act and shall be on the form provided by County.

B. For projects involving less than \$50,000 and more than \$25,000, Contractor shall furnish bonds in the amount of 50 percent (50%) of the contract price, or may post negotiable securities in accordance with the following procedures:

Negotiable securities shall be endorsed over to the County and shall be held by County under a surety deposit agreement until contractor has fully complied with all applicable laws and provisions of the County's public works contract prerequisite to the release thereof. An administrative fee shall be charged by County for the execution of the surety deposit agreement in the amount of \$100.00. The Director of Public Works shall be authorized to execute all security deposit agreements, the form of which shall be as approved by the County Counsel.

C. For projects involving less than \$25,000 no bonds will be required for this contract.

D. In the event of a default by contractor, County shall notify contractor of the specifics of the default and shall extend a reasonable time to contractor to cure same or to pay such damages as County may reasonably assess under the terms of the Public Works Contract. County shall not release the bonds or security until contractor has fully performed under the contract. If contractor fails to promptly cure any breach or to

pay such damages as may have been reasonably assessed after notification of the breach and/or of the assessment of damages, County shall proceed to sell the securities and/or make demand on the bonds.

D. County reserves the right to accept or to reject the tender of any bond or security as being sufficient to protect the interest of the County.

### **3. CONTRACTOR LIABILITY AND INSURANCE:**

Contractor shall be liable for all damages and injury which shall be caused to County or any other property on or in the vicinity of the work or which shall occur to any person or persons or property whatsoever arising out of the performance of this contract. Contractor shall purchase and maintain such commercial general liability and other insurance as is appropriate and/or as may be required in the special conditions, for the work being performed and furnished and which will provide complete protection to County. Said policies shall be payable on a "per occurrence" basis unless County specifically consents to a "claims made" basis. At a minimum Contractor shall provide and maintain a policy of commercial general liability insurance in a combined single limit of two million dollars (\$2,000,000.00) and Worker's Compensation Insurance.

Where the services to be provided under this contract involve or require the use of any type of vehicle by Contractor in order to perform said services, Contractor shall also provide comprehensive business or commercial automobile liability coverage including non-owned and hired automobile liability in the amount of one million dollars (\$1,000,000.00).

County shall be a named insured and a certificate of insurance and endorsements shall be provided by Contractor prior to commencement of work. Contractor shall also purchase and maintain property insurance upon the work or equipment and supplies stored at the site, if any, to the full insurable value thereof. All policies of insurance shall contain a provision that the coverage will not be canceled, materially changed, or renewal refused until at least thirty (30) days prior written notice has been given to County. If a loss occurs, the above insurance shall be primary.

### **4. RISK OF LOSS:**

Liability for loss or damage to equipment, materials, work completed or services occurring on or off the site shall be the responsibility of Contractor. Liability for completed work shall not be assumed by County until both the work has been completed and County has accepted the work as complete.

### **5. MATERIALS AND EQUIPMENT:**

All material and equipment shall be of good quality and new unless the contract provides otherwise. Whenever materials or equipment are specified or described in the contract documents by using the name of a proprietary item or a particular supplier, it is intended to establish the type, function and quality required. Any substitutions must be expressly consented to by County in advance of installation or use.

Where applicable, Contractor shall deliver all manufacturer's operating and maintenance instructions to County prior to receipt of final payment.

**6. WARRANTY AND CORRECTION PERIOD:**

If within one year after the date of completion and County's acceptance of the work or such longer period of time as may be prescribed by law or regulations or by the terms of any applicable special guarantee required by the contract documents any work is found to be defective, Contractor shall promptly, without cost to County and in accordance with County's written instruction, either correct such defective work, or, if it has been rejected by County, remove it from the site and replace it with non-defective work. If Contractor is unable to promptly and properly correct any defective work, County may at its option have the work corrected by such other means as County deems appropriate and hold Contractor liable for all direct, indirect and consequential costs caused by such defective work. Said warranty shall apply to all work found to be "defective" which is attributable to the quality or quantity of the materials used, the quality of the workmanship or for lack of proper performance under the contract. The warranty obligation shall not limit the County's right to otherwise seek damages in the event of any failure by Contractor to properly perform under this Agreement.

**7. PERMITS AND TAXES:**

Unless otherwise provided in the special contract provisions, Contractor shall obtain and pay for all construction permits, licenses or other permits necessary to complete the work and shall be liable for all governmental charges, inspection fees, utility connection charges, sales, consumer, use and other taxes.

**8. INDEMNIFICATION:**

Contractor shall fully indemnify, hold harmless and defend County and its consultants, agents, officers and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential arising out of or resulting from the negligent performance of the work herein or willful misconduct by Contractor.

**9. SUSPENSION OF WORK:**

County may, at any time and without cause, suspend the work or any portion thereof for a reasonable period of time by notice in writing to Contractor.

**10. TERMINATION:**

Except as limited by law or regulation, County may terminate this contract upon the occurrence of any one or more of the following events.

- A. If Contractor commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state

law in effect at such time relating to the bankruptcy or insolvency;

B. If a petition is filed against Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against Contractor under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

C. If Contractor makes a general assignment of its obligations and/or compensation under this Agreement;

D. If a trustee, receiver, custodian or agent of Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of property of Contractor is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of Contractor's creditors;

E. If Contractor admits in writing an inability to pay its debts generally as they become due;

F. If Contractor persistently fails to perform the work in accordance with the contract documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the time schedule);

G. If Contractor disregards ordinances, laws or regulations of any public body having jurisdiction;

H. If Contractor disregards the authority of County's supervisory staff, and, in particular, the Contract Administrator;

I. If Contractor otherwise violates in any substantial way any provisions of the contract documents.

County may, after giving Contractor seven days' written notice, terminate the services of Contractor, exclude Contractor from the site and take possession of the work, incorporate in the work all materials and equipment stored at the site or for which County has paid Contractor but which are stored elsewhere, and finish the work as County may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price exceeds the direct, indirect and consequential costs of completing the work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) such excess will be paid to Contractor. If such costs exceed such unpaid balance, Contractor shall pay the difference to County. When exercising any rights or remedies under this paragraph, County shall not be required to obtain the lowest price for the work performed. Where Contractor's services have been so terminated by County, the termination will not affect any rights or remedies of County against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by County will not release Contractor from liability.

Upon seven days' written notice to Contractor, County may, without cause and without prejudice to any other right or remedy, elect to abandon the work and terminate the Contract. In such case, Contractor shall be paid for all work executed and any actual expense sustained.

## **11. SUPERVISION AND CLAIMS DETERMINATIONS:**

### **11.1 CONTRACT ADMINISTRATOR**

County may appoint staff or hire professional services for supervision and administration, at its election. Said person is hereinafter referred to as "Contract Administrator". Upon the appointment of any such Contract Administrator the County shall promptly notify Contractor of such action. The Contract Administrator is delegated authority to determine the amount, quality, acceptability and fitness of the work, materials and equipment to be paid for under this contract, to decide for County all questions relative to contract interpretation, to reject or condemn all work or material which does not conform to the terms of this contract and to review and make a final determination on all claims submitted to County. In the absence of an appointment of a Contract Administrator, the County Director of Public Works shall perform these functions.

### **11.2 WRITTEN CLARIFICATION**

If there is an ambiguity in the contract documents, Contractor shall request an interpretation from the Contract Administrator. Contractor Administrator shall issue a written clarification or interpretation. If Contractor believes that a written clarification or interpretation justifies an increase in the contract price or an extension of the contract time and the parties are unable to agree on the amount or extent thereof, Contractor may make a claim therefore.

### **11.3 CHANGE ORDER**

The Contract Administrator may authorize or require variations in the work from the requirements of the contract documents so long as it is in writing. Contractor shall perform the work involved promptly. If Contractor believes that such a change order justifies an increase in the contract price or an extension of the contract time and the County and Contractor are unable to agree as to the amount or extent thereof, Contractor may make a claim therefore.

### **11.4 UNIT PRICING**

If the contract was based on unit pricing, the Contract Administrator will determine the actual quantities and classifications of unit price work. The Contract Administrator's written decisions thereon will be final and binding upon Contractor unless Contractor delivers to Contract Administrator written notice that Contractor disputes said decision and the reasons therefore as required below.

### **11.5 CLAIM PROCEDURE**

For purposes of this paragraph, "claim" shall be defined as set forth in Public Contracts Code Section 20104(b)(2). Claims shall be presented in writing and include the documents necessary to substantiate the claim. Claims must be filed with the Contract Administrator no later than thirty (30) days after the occurrence of the event giving rise thereto or denial of the change order, whichever occurs last. The form of said claims shall be the same as is required by Government Code Sections 910 and 910.2.

#### **11.6 CLAIMS UNDER \$50,000**

If the claim is under \$50,000, County shall respond in writing to Contractor within forty-five (45) days of receipt of Contractor's claim or may request, in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the County may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to Public Contracts Code Section 20104.2, upon mutual agreement of the County and the Contractor. The County's written response to the claim, as further documented, shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

#### **11.7 CLAIMS OVER \$50,000**

For claims over \$50,000 and less than or equal to \$375,000, County shall respond in writing to all written claims within sixty (60) days of receipt of the claim, or may request, in writing within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the County may have against Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to Public Contracts Code Section 20104.2, upon mutual agreement of County and Contractor. The County's written response to the claim, as further documented, shall be submitted to Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by Contractor in producing the additional information or requested documentation, whichever is greater.

#### **11.8 MEET AND CONFER**

If Contractor disputes County's written response, or County fails to respond within the time prescribed above, Contractor may so notify County, in writing, either within 15 days of receipt of County's response or within fifteen (15) days of County's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer with such County representatives as the Board of Supervisors directs for settlement of the issues in dispute. Upon such demand, County shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

#### **11.9 APPEAL TO BOARD OF SUPERVISORS**

If following the meet and confer conference the claim or any portion remains in dispute, if Contractor desires to pursue Contractor's claim/demand for further compensation, Contractor shall be required to file a claim with the Board of Supervisors pursuant to procedures set out in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. , All claims filed with the Board of Supervisors pursuant to the Government Code shall be filed within ninety (90) days of the denial of the original claim by the County representative. The running of the period of time within which a claim under the Government Code must be filed shall be tolled by any period of time utilized by the meet and confer conference. Any lawsuit which Contractor intends to bring with respect to any claim filed pursuant to the Government Code which claim has been denied by County must be commenced not later than six months after the recording of the notice of completion or not later than six months after the date final payment is deposited in the mail or personally delivered, whichever date comes first.

#### **11.10 DOCUMENTATION**

For every claim that Contractor makes, it shall provide the following documentation upon request of County as a condition precedent to consideration of the claim: Contractor's bidding calculations forms, cost estimates, time sheets, trend reports, job cost analysis records, labor records, as-built documents, any other records used by Contractor in arriving at its bid price, and any other documents or records kept by Contractor during the course of construction. In the event that claims are made, Contractor agrees that County shall have the right to conduct a complete audit of the books and records of Contractor relating to this project and any books and records relating to overhead, profit or general office expenses charged to this project.

#### **11.11 CONTRACT ADMINISTRATOR NOT RESPONSIBLE**

Notwithstanding the above, Contract Administrator shall not be responsible for Contractor's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto and will not be responsible for Contractor's failure to perform or furnish the work in accordance with the contract documents. Contract Administrator shall also not be responsible for the acts or omissions of Contractor or of any subcontractor, any supplier, or any other person or organization performing or furnishing any of the work.

## 12. PAYMENTS:

### 12.1 SCHEDULE OF VALUES

The schedule of values established for the work will serve as the basis for progress payments and will be incorporated into a form of application for payment acceptable to County. Progress payments on account of unit price work will be based on the number of units completed.

### 12.2 PROGRESS PAYMENT

Once each month County shall cause an estimate to be made covering the work completed as of the date of the estimate. No materials shall be paid for until incorporated into the work. The amount of retention with respect to progress payments will be ten percent (10%).

### 12.3 AMOUNTS OF PROGRESS PAYMENTS

Prior to completion, progress payments will be in an amount equal to:

**12.3.1 NINETY PERCENT (90%) OF COMPLETED WORK.** Ninety percent (90%) of the work completed, and

**12.3.2 NINETY PERCENT (90%) OF STORED MATERIALS.** Where applicable pursuant to the above, ninety percent (90%) of materials and equipment not incorporated in the work but delivered and suitably stored, less in each case the aggregate of payments previously made.

**12.3.3 CONTRACT BALANCE.** Thirty (30) days after recordation of a notice of completion by the County, County will pay an amount sufficient to increase total payments to Contractor to one hundred percent (100%) of the contract price, less such amounts as County shall determine in accordance with this contract. County reserves the right to retain such funds as it shall determine in accordance with the contract documents to complete the work.

**12.3.4 ESCROWED SECURITY ALTERNATION.** The Contractor may elect to receive one hundred percent 100% of payments due under this contract from time to time, without retention of any portion of the payment by the public agency, by depositing securities of equivalent value with County in accordance with the provisions of Section 4590 of the *California Government Code*. Securities eligible for investment shall include those listed in Section 16430 of the *California Government Code*, or bank or savings and loan certificates of deposits. Such securities, if deposited by the bidder, shall be valued by County whose decision on the valuation of the securities shall be final. The bidder shall be the beneficial owner of any securities substituted for money withheld and shall receive any interest

thereon. Said deposited funds shall be covered by an escrow agreement in a form approved by the County.

#### **12.4 CONTRACTOR'S WARRANTY OF TITLE**

Contractor warrants and guarantees that title to all work, materials and equipment covered by any application for payment, whether incorporated in the project or not, will pass to County no later than the time of payment free and clear of all liens.

#### **12.5 PAYMENT OF PROGRESS PAYMENT**

County will submit each progress pay estimate to Contractor. Upon receipt back from Contractor of a signed copy of the pay estimate, County shall process the pay estimate for payment. The amount approved by County will become due thirty (30) days after receipt of the signed progress pay estimate. Said payment shall be made by County to Contractor unless County has knowledge of claims or liens filed in connection with the work.

#### **12.6 COUNTY'S RECOMMENDATION OF PAYMENT**

By recommending any payment, Contractor cannot conclude that County represents that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the work in the contract documents or that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by County or County to withhold payment to Contractor.

#### **12.7 COUNTY MAY REFUSE TO MAKE PAYMENT**

County may refuse to make payment of the full amount or any part if, in County's opinion, it would be incorrect to make such payment. County may also refuse to make any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in County's opinion to protect County from loss because:

**12.7.1 DEFECTIVE WORK.** The work is defective, or completed work has been damaged requiring correction or replacement,

**12.7.2 REDUCTION IN PRICE.** The contract price has been reduced by written amendment or change order,

**12.7.3 REQUIRED CORRECTIONS.** Contractor has been required to correct defective work or complete work, or

**12.7.4 SUSPENSION OR TERMINATION.** Of County's actual knowledge of the occurrence of any of the events enumerated in paragraphs relating to suspension of work and termination.

**12.7.5 LIENS OR CLAIMS.** County may refuse to make payment of the full amount because claims have been made against County on account of Contractor's performance or furnishing of the work or liens have been filed in connection with the work or there are other items entitling County to a set-off against the amount recommended, but County must give Contractor immediate written notice stating the reasons for such action.

## **12.8 COMPLETION AND FINAL INSPECTION**

When Contractor considers the entire work ready for its intended use, Contractor shall notify County in writing that the entire work is completed. Within a reasonable time thereafter, County and Contractor shall make an inspection of the work to determine the status of completion. If County does not consider the work complete, County will notify Contractor in writing giving the reasons therefor. If County considers the work incomplete, County will prepare and deliver a list of items to be completed or corrected before final payment. Contractor shall immediately take such measures as are necessary to complete or correct the listed items.

## **12.9 ACCEPTANCE AND FINAL APPLICATION FOR PAYMENT**

After Contractor has completed all such measures to remedy deficiencies to the satisfaction of County and delivered all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, marked-up record documents, property owner's releases and other documents, all as required by the contract documents, and after County has indicated that the work is acceptable, Contractor may make application for final payment. The final application for payment shall be accompanied by all documentation called for in the contract documents, together with complete and legally effective releases or waivers (satisfactory to County) of all liens and stop notices arising out of or filed in connection with the work. In lieu thereof and as approved by County, Contractor may furnish receipts or releases in full; an affidavit of Contractor that the releases and receipts include all labor, services, material and equipment for which a lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the work for which County or County's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any subcontractor or supplier fails to furnish a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to County to indemnify County against any lien.

## **12.10 FINAL PAYMENT**

If, on the basis of County's review of the final application for payment and accompanying documentation, all as required by the contract documents, County is satisfied that Contractor's obligations under the contract documents have been fulfilled, County will, within ten days after receipt of the final application for payment, process the application for payment. Otherwise, County will return the application to Contractor, indicating in writing the reasons for refusing to make final payment, in which case Contractor shall make the necessary corrections and resubmit the application. Thirty (30) days after presentation to

County of the application and accompanying documentation, in appropriate form and substance, or thirty (30) days after recording of a Notice of Completion, whichever date is later, the amount will become due and will be paid by County to Contractor.

### **12.11 CONTRACTOR'S CONTINUING OBLIGATION**

Contractor's obligation to perform and complete the work in accordance with the contract documents shall be absolute. Neither the issuance of a certificate of substantial completion, nor any payment by County to Contractor under the contract documents, nor any use or occupancy of the work or any part thereof by County, nor any act of acceptance by County nor any failure to do so, nor any review and approval of a shop drawing or sample submission, nor the issuance of a notice of acceptability, nor any correction of defective work by County will constitute an acceptance of work not in accordance with the contract documents or a release of Contractor's obligation to perform the work in accordance with the contract documents.

### **13. ARBITRATION:**

For claims under \$375,000, County shall have the option of electing arbitration pursuant to Public Contracts Code Sections 10240, et seq. If County does not so elect, the provisions of Public Contracts Code Section 20104 shall apply. For claims which are above \$375,000, the arbitration provisions of this contract are voluntary. Neither County nor Contractor shall be required to enter into arbitration for amounts above \$375,000. Written consent of both parties to arbitrate such claims shall be a prerequisite to such arbitration. If the parties agree to arbitrate claims above \$375,000, the provisions of Public Contracts Code Sections 10240, et seq. shall be utilized.

### **14. WORKER'S COMPENSATION CERTIFICATION:**

Contractor hereby certifies that Contractor is aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code, and will comply with such provisions before commencing the performance of the work of this contract.

### **15. PREVAILING WAGE RATES:**

In accordance with the provisions of Section 1770 and 1773 of the Labor Code, the County of Sierra has determined the general prevailing rate of wages applicable to the work to be done. These rates are on file in the Department of Transportation. The Contractor shall post a copy of the wage rates on the job site. Pursuant to California Labor Code Section 1775, Contractor shall forfeit twenty-five dollars (\$25.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates for such work or craft, and said amounts shall be distributed pursuant to the requirements of said Section 1775. Any employee whose type of work is not covered by any of the classified wage rates shall be paid not less than the rate of wage listed for the classification which most nearly corresponds to the type of work to be performed.

No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial

Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

**16. EMPLOYMENT OF APPRENTICE LABOR:**

Reference is hereby made to Section 1777.5 of the Labor Code of the State of California, which regulations shall govern the employment of apprentices on the work. Compliance with said Section shall be the responsibility of the Contractor.

**17. COLLECTIVE BARGAINING AGREEMENTS:**

Pursuant to California Labor Code Section 1773.8, Contractor shall pay travel and subsistence payments to any workers covered by applicable collective bargaining agreements which provide for such payments.

**18. PAYROLL RECORDS:**

Contractor shall be responsible for keeping accurate payroll records as required by California Labor Code Section 1776. Contractor is aware that a penalty of twenty-five dollars (\$25.00) per day or portion thereof for each worker may be assessed for noncompliance with said section. Contractors and subcontractors on all public works projects awarded on or after April 1, 2015, must use the DIR's electronic certified payroll reporting (eCPR) to furnish certified payroll records (CPRs) to the Labor Commissioner of each payroll record within ten days after close of each payroll period. An additional 10% retention may be withheld from any payment due for failure to provide same.

**19. EQUAL EMPLOYMENT OPPORTUNITY AND NONDISCRIMINATION:**

During the performance of this contract, the contractor agrees to abide by all provisions of Section 1735 of the California Labor Code, as amended, regarding nondiscrimination practices.

**20. ASSIGNMENT:**

No assignment by a party hereto of any rights under or interests in the contract documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the contract documents.

**21. CONFLICT OF INTEREST RESTRICTIONS:**

No official of the County who is authorized in such capacity and on behalf of the County to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspecting, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof. No officer, employee, architect, attorney, engineer, or inspector of or for the County who is authorized in such capacity and on behalf of the County who is in any legislative, executive, supervisor, or other similar function in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

**22. WAIVER OF RIGHTS:**

No action or lack of action on the part of County at any time to exercise any right or remedy conferred upon it under this contract shall be deemed to be a waiver on the part of the County of any of County's other rights or remedies.

**23. SUCCESSORS IN INTEREST:**

County and Contractor each bind themselves, their partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements, and obligations contained in the contract documents.

**24. SEVERABILITY:**

If any provision to this contract is declared or found to be illegal, unenforceable or void, then both parties shall be relieved of all obligations arising under such provisions, and the remainder of this contract shall not be affected by such declaration or finding and each provision not so affected shall be enforced to the fullest extent permitted by law.

**25. BOOKS OF RECORD AND AUDIT PROVISION:**

Contractor shall maintain on a current basis complete books and records relating to this contract. Such records shall include, but not be limited to, documents supporting all bids, all income and all expenditures. The books and records shall be original entry books with a general ledger itemizing all debits and credits for the work on this contract. In addition, Contractor shall maintain detailed payroll records including all subsistence, travel and field expenses, and cancelled checks, receipts and invoices for all items. These documents and records shall be retained for at least five years from the completion of this contract. Contractor will permit County to audit all books, accounts or records relating to this contract or all books, accounts or records of any business entities controlled by Contractor who participated in this contract in any way. Any audit may be conducted on Contractor's premises or, at County's option, Contractor shall provide all books and records within a maximum of fifteen (15) days upon receipt of written notice from County. Contractor shall refund any moneys erroneously charged. If County ascertains that it has been billed erroneously by

Contractor for an amount equaling 5% or more of the original bid, Contractor shall be liable for the costs of the audit in addition to any other penalty to be imposed.

**26. NOTICE:**

Notices shall be given to County at the following location:

If to "COUNTY":

Board of Supervisors  
County of Sierra  
Post Office Drawer D  
Downieville, CA 95936

With a copy to:

Director of Public Works  
P.O. Box 98  
Downieville, CA 95936

If to "CONTRACTOR":

Ralph McGahey, General Manager  
Cascade Drilling, L.P.  
3000 Duluth Street  
West Sacramento, CA 95691

**27. JURISDICTION AND VENUE:**

This Contract shall be construed in accordance with the laws of the State of California and the parties hereto agree that venue shall be in Sierra County, California.

# **PART 4 - TECHNICAL SPECIFICATIONS**

## **DIVISION 1 GENERAL REQUIREMENTS**

011000	Summary
012200	Measurement and Payment
013300	Submittals

## **DIVISION 33 UTILITIES**

332413	Soil Gas Probe Installation
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## **SECTION 011000**

### **SUMMARY**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Contract description.
- B. Work by Owner.
- C. Owner supplied products.
- D. Contractor's use of site [and premises].
- E. Specification Conventions.

##### **1.2 CONTRACT DESCRIPTION**

- A. Work of the Project includes:
  - Installation of one 21 foot deep soil gas probe
  - Installation of one 40 foot deep soil gas probe
  - Installation of one 70 foot deep soil gas probe
  - Installation of one 71 foot deep soil gas probe
  - Installation of one 48 foot deep soil gas probe

##### **1.3 WORK BY OWNER**

- A. The Owner will provide for the location of underground utilities at the site.

##### **1.4 OWNER SUPPLIED PRODUCTS**

- A. Products provided by Owner: None

##### **1.5 CONTRACTOR'S USE OF SITE [AND PREMISES]**

- A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period.
- B. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of the Project site.
- C. Time Restrictions for Performing Work: 7:00 am to 7:00 pm

##### **1.6 SPECIFICATION CONVENTIONS**

- A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise.

The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

## **SECTION 012200**

### **MEASUREMENT AND PAYMENT**

#### **PART 1 GENERAL**

##### **1.1 MOBILIZATION AND DEMOBILIZATION.**

- A. Payment for the work will be included as part of the lump sum bid, "Mobilization, Demobilization". This work shall consist of the mobilization and demobilization of the Contractor's forces, equipment, and materials necessary for performing the work required under the Contract.

##### **1.2 SOIL GAS PROBE INSTALLATION**

- A. Payment for this work will be made at the contract unit price for "Soil Gas Probe Installation" for the total depth of soil borings installed. Payment will include, but not be limited to, compensation for soil boring, soil sample collection, decontamination and installation of the casing/riser pipe, soil gas probe screen, soil gas probe casing, caps, tail pieces (if any), end caps and centralizers, furnishing, delivering, storage, decontamination, and installing the filter packs and bentonite seals. It will also include compensation for materials and installation of aboveground gas probe completion including but not limited to: protective covers, and locking caps. No payment will be made for abandoned boreholes not used for soil gas probe construction.

##### **1.3 SITE CLEANUP**

- A. Separate payment will not be made for cleanup of the site. Cleanup will mean restoring the site to its pre-construction condition, in accordance with paragraph 3.4 SITE CLEANUP of Section 332413. Cleanup will be considered part of and incidental to the soil boring and soil gas probe installation.

**PART 2 PRODUCTS (Not Used)**

**PART 3 EXECUTION (Not Used)**

**END OF SECTION 012200**

**SECTION 013300**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Submittal procedures.
- B. Drilling Method
- C. Health and Safety Plan (HASP)
- D. Proposed products list.

**1.2 SUBMITTAL PROCEDURES**

- A. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- B. Schedule submittals to expedite Project, and deliver to Project Engineer. Coordinate submission of related items.
- C. When revised for resubmission, identify changes made since previous submission.

**1.3 DRILLING METHOD**

- A. Contractor shall identify the specific drilling method to be employed to meet the requirements of the contract specifications.

**1.4 HEALTH AND SAFETY PLAN (HASP)**

- A. Within 7 days after date of Notice of Award, submit HASP proposed for use.

**1.5 PROPOSED PRODUCTS LIST**

- A. Within 7 days after date of Notice of Award, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 013300

## **SECTION 332413**

### **SOIL GAS PROBE INSTALLATION**

#### **PART 1 GENERAL**

##### **1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

#### **ASTM INTERNATIONAL (ASTM)**

ASTM C 150(2007) Standard Specification for Portland Cement

ASTM D 1586(1999) Penetration Test and Split-Barrel Sampling of Soils

ASTM D 1785(2006) Standard Specification for Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120

ASTM D 5092(2004e1) Design and Installation of Ground Water Monitoring Wells in Aquifers

ASTM D 5299(1999; R 2005) Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities

ASTM F 480(2006b) Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80

CALIFORNIA WATER WELL STANDARDS (1981) Bulletin 74-81

CALIFORNIA WELL STANDARDS (1991) Bulletin 74-90

#### **NSF INTERNATIONAL (NSF)**

NSF 14(2007) Plastics Piping System Components and Related Materials

#### **U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)**

EPA 600/4-79/020(1983) Methods for Chemical Analysis of Water and Wastes

## 1.2 SYSTEM DESCRIPTION

- A. The probe installations shall be constructed to the approximate depths and dimensions as shown on the project figures and as approved by the Project Engineer to accomplish the following: yield chemically representative soil gas samples for field measurement and chemical analysis at the specified screened depth intervals.

## 1.3 PROBE ACCEPTANCE

- A. It is the responsibility of the Contractor to properly construct, install, develop, and test the probe installation according to the requirements of this specification so that it is suitable for the intended purpose. If the Contractor installs a probe that is not functional or not in accordance with these specifications, the Contracting Officer will disapprove the probe and direct the Contractor to repair or replace it, and to destroy the disapproved probe in accordance with this specification.

## 1.4 NOTIFICATION

- A. The Sierra County Department of Public Works (530) 289-3201 and the Project Engineer, Craig Morgan, P.E., Avalex Inc., P.O. Box 550218, South Lake Tahoe, CA 96155, (530) 543-3200 shall be notified at least five (5) days prior to commencement of work.

## 1.5 PERFORMANCE REQUIREMENTS

- A. All well construction practices shall be in accordance with the California Well Construction and Abandonment

## 1.6 SUBMITTALS

- A. Identification of probe drilling equipment and method of construction.
- B. Health and Safety Plan (HASP). The Contractor shall develop and implement their own HASP consistent with the following requirements:
  1. OSHA Safety and Health Standards 29 CFR 1910 (General Industry), U.S. Department of Labor, Occupational Safety and Health Administration. Hereafter, referred as "29 CFR 1910".
  2. OSHA Safety and Health Standards 29 CFR 1926 (Construction Industry), U.S. Department of Labor, Occupational Safety and Health Administration.
  3. Title 8, California Code of Regulations.
  4. California Labor Code.

The HASP shall include the following components as appropriate: Characterization and Analysis, Safe Work Practices, Engineering Safeguards, Medical Surveillance, Environmental and Personal Monitoring, Personal Protective Equipment, Training, Standard Operating Procedures, Control and Decontamination, Emergency and Contingency Planning, Logs and Reports, Hazard Communication Program, Material Handling, Sanitation, Excavation. The Contractor assumes all liabilities associated with the implementation of the HASP.

- C. Probe Casing Materials. Catalog data for probe screens (to include the screen slot size), casing, and riser pipe.
- D. Filter pack material.
- E. Bentonite.
- F. Cement.
- G. Surface protective covers, probe vaults.
- H. Accessories, locking caps, petcocks.
- I. Qualifications. Personnel qualification documentation.

#### 1.7 QUALITY ASSURANCE

- A. Qualifications. The driller shall be licensed in the state of California, according to the state requirements.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store and maintain probe materials in a clean, uncontaminated condition throughout the course of the project.

#### 1.9 SITE CONDITIONS

- A. Access to each monitoring probe site, including any utility clearance, is the responsibility of the Sierra County Department of Public Works. Visit the proposed probe location to observe any condition that may hamper transporting equipment or personnel to the site. If clearing or relocation is necessary, the Contractor and the Project Engineer shall agree on a suitable clearing, or relocation plan and the location of any required access road.

### PART 2 PRODUCTS

#### 2.1 PROBE CASING

- A. Soil gas probes. Casing/riser pipe, shall be new, (3/4) three quarter inch nominal internal diameter, schedule 40 flush-joint threaded polyvinyl chloride (PVC) pipe. Pipe shall meet the requirements of NSF 14. Pop rivets, or screws shall not be used.

#### 2.2 PROBE SCREEN

- A. Soil gas probes. Probe screens shall consist of new commercially fabricated flush-joint threaded (3/4) three quarter inch nominal internal diameter polyvinyl chloride (PVC) schedule 40 slotted, non-clogging design. Required fittings shall be ASTM F 480 flush thread male by female fittings. The screen slot size shall be 0.020 inch and the screen length shall be 10 feet long. The bottom section of the screen shall be sealed watertight by means of a flush threaded end cap of the same material as the vent screen and shall be within 6 inches of the open portion of the screen.

## 2.3 FILTER PACK

- A. Filter pack shall consist of clean, washed, rounded to sub-rounded siliceous material free from calcareous grains or material. Organic matter, soft, friable, thin, or elongated particles are not permissible. Monterey #3 sand or equivalent shall be used as filter pack.

## 2.4 BENTONITE SEAL

- A. The bentonite seal, intended to keep grout from entering the filter pack, shall consist of hydrated granular, or pelletized, sodium montmorillonite furnished in sacks or buckets from a commercial source and shall be free of impurities which adversely impact the water quality. The seal shall be a minimum (2) two feet thick.

## 2.5 CEMENT AND BENTONITE GROUT

- A. Cement grout shall be a mixture of a maximum of 6.5 gallons of approved water per 94 lb bag of Portland cement, which conforms to ASTM C 150, Type I or Type II. Not more than 5 percent by weight of bentonite powder shall be added to reduce shrinkage and to hold the cement in suspension prior to the grout set. High-solids bentonite grout shall be made from sodium bentonite powder and/or granules. Water from an approved source shall be mixed with these powders or granules to form a thick bentonite slurry. The slurry shall consist of a mixture of bentonite and the manufacturer's recommended volume of water to achieve an optimal seal. The slurry shall contain at least 20 percent solids by weight and have a density of 9.4 lb per gallon of water or greater.

## 2.6 CONCRETE

- A. Pre-blended mixture of cement and aggregates for general structural use conforming to ASTM C387 Standard Specifications for Packaged, Dry, Combined Materials for Mortar and Concrete with an average compressive strength 4000 psi. QUIKRETE® or equivalent.

## 2.7 PROTECTIVE STANDPIPE

- A. Each nested probe installation shall have a 12 inch diameter steel lockable protective standpipe set over the probe casing and extending to a height of 3 feet above the ground. The standpipe shall be set in the concrete pad and surface seal. The standpipe shall be outfitted with a two piece aluminum locking cover (Royer or approved equivalent).

# PART 3 EXECUTION

## 3.1 PROTECTION OF EXISTING CONDITIONS

- A. Maintain existing site structures and fixtures and protect them from damage from equipment and vehicular traffic. Any items damaged by the Contractor shall be repaired by the Contractor. Vents/probes requiring replacement due to Contractor negligence shall be re-installed according to these specifications. The Sierra County Department of Public Works shall provide for the location of all known underground utilities and identify through markings on the ground the approximate location of the utilities.

### 3.2 PREPARATION

- A. Decontamination. The drill rig, drill rods, drill bits, augers, temporary casing, tremie pipes, grout pumping lines, and other associated equipment shall be cleaned with high-pressure hot water/steam prior to drilling at each probe location.
- B. Water Source. If probe drilling/installation requires the use of water, the Contractor is responsible for locating the source, obtaining the water from the source, transporting it to, and storing it at the site.

### 3.3 INSTALLATION

- A. Drilling Method. The drilling method shall prevent the collapse of formation material against the probe screen and casing during installation of the probe. The inside diameter of any temporary casing used shall be sufficient to allow accurate placement of the screen, riser, centralizer(s), filter pack, seal and grout. The use of drilling aids such as bentonite, other clay-based agents, or any other foreign matter capable of affecting the characteristics of the ground water is prohibited. Grease or oil on drill rods, casing, or auger joints is not permitted; however, PTFE tape or vegetable oil (in solid phase form) is acceptable. The drill rig shall be free from leaks of fuel, hydraulic fluid, and oil which may contaminate the borehole, ground surface or drill tools. During construction of the probe, precautions shall be used to prevent tampering with the probe or entrance of foreign material. Runoff shall be prevented from entering the probe during construction. If there is an interruption in work, such as overnight shutdown or inclement weather, the probe opening shall be closed with a watertight uncontaminated cover. The cover shall be secured in place or weighted down so that it cannot be removed except with the aid of the drilling equipment or through the use of drill tools.
- B. Soil Sample Collection for Geotechnical Analysis. The Contractor shall provide for the collection of undisturbed soil samples at each drilled probe/test hole. Soil sampling shall be done with a stainless steel split tube sampler using standard sampling techniques in accordance with ASTM D 1586. Samples shall be extracted from their in-situ environment in as near an intact, minimally disturbed condition as technically practical. Samples shall be retrieved according to ASTM D 1586 at (5) five foot intervals across the entire depth of boring at each probe location. Drive sample tools shall be cleaned between sampling events within the same boring.
- C. Borehole Diameter and Depth. The final boring for probe installation shall be 8 inches. Depths of the borings shall be approximately 21 feet, 40 feet, 70 feet, 71 feet, and 48 feet as approved by the Project Engineer based upon conditions encountered in the field.
- D. Screen, Probe Casing/Riser Pipe Placement. Place the probe screen in the appropriate location in the borehole so that the completed probe functions in accordance with sections 1.2 SYSTEM DESCRIPTION and 1.3 PROBE ACCEPTANCE. The screen and probe casing/riser pipe sections shall be joined by flush threaded watertight joints. The probe casing/riser pipe shall extend upwards from the screen to an elevation appropriate for the surface completion described in paragraph Protective Cover Placement. The probe screen and riser pipe shall not be dropped or allowed to fall uncontrolled into the borehole. Joints and fastenings shall be watertight and flush threaded; solvent glue or set screws shall not be used. The probe shall be plumb, and aligned in the hole. Temporary

casing, hollow stem augers or other measures shall be used, as necessary, to prevent collapse of the boring against the probe screen and probe casing/riser pipe prior to placement of the filter pack and sealing materials. A ¼ inch labcock shall be installed on the top of each riser pipe.

- E. **Filter Pack Placement.** After the screen and probe casing have been aligned in the hole, the approved filter pack shall be constructed around the screen by filling the entire space between the screen and the wall of the hole over the selected screened interval. The lowermost 1 foot of filter pack shall be placed in the boring prior to installation of the probe screen and shall serve as a base on which to place the screen. The filter pack shall be installed continuously and without interruption until the filter pack has been placed to a minimum of 2 feet above the top of the screen section. The depth to the top of the filter pack shall be directly measured, and recorded. Filter pack material shall be protected from contamination prior to placement by either storing it in plastic lined bags, or in a location protected from the weather and contamination on plastic sheeting. Filter pack material shall be transported to the project site in a manner which prevents contamination by other soils, oils, grease, and other chemicals. Temporary drill casing, if installed, or auger shall be removed simultaneously with the above operation. Lifting of the riser pipe shall be minimized when withdrawing the temporary casing/auger. Filter pack material shall be placed in no greater than 3 foot lifts prior to retraction of the temporary casing/auger. A minimum of 6 inches of filter pack shall remain in the temporary casing/auger at all times during filter pack installation. Frequent measurements shall be made inside the annulus during retraction to ensure that the filter pack is properly placed.
- F. **Bentonite Seal.** A minimum 2 foot thick hydrated bentonite seal shall be placed on top of the filter pack in a manner which prevents bridging of the bentonite in the annulus. Bentonite shall be placed in 6 inch lifts and hydrated with water. The depth to the top of the bentonite seal shall be directly measured and recorded following placement after allowance for swelling.
- G. **Grout Placement.** A non-shrinking cement or high-solids bentonite grout shall be used to fill abandoned boreholes. Grout injection shall be in accordance with ASTM D 5092. If the interval to be grouted is less than 15 feet and without fluids after any drill casing is removed, the grout may be placed either by pouring or pumping. The tremie pipe shall be thoroughly cleaned with high pressure hot water/steam before use in each probe. The bottom of the tremie pipe shall be constructed to direct the discharge to the sides rather than downward. The discharge end of the tremie pipe shall be submerged at all times. Additional grout shall be added from the surface to maintain the level of the grout at the land surface as settlement occurs.
- H. **Protective Steel Standpipe.** A protective steel standpipe shall be installed around the probe casing/riser pipe. The standpipe shall be cleaned with high-pressure hot water/steam prior to installation to ensure that it is free of any contamination. The standpipe shall be fitted with a locking cap and installed so that there is a maximum 0.2 foot clearance between the top of the in-place inner probe casing cap and the bottom of the protective casing locking cap when in the locked position. The protective casing shall be positioned and maintained in a plumb position. The bottom of the protective casing shall extend a minimum of 2.5 feet below the top of the ground surface and shall extend 3.0 feet above the surface of the ground. The protective casing shall be sealed and immobilized in concrete placed around the outside of the protective casing. The

protective casing shall have a 1/4 inch diameter drain hole installed just above the top of the concrete pad. Pea gravel shall be placed in the annular space between the protective casing and the riser pipes, above the drain hole, to within 3 inches from the top of the riser pipes.

- I. Probe Pad. Concrete pads shall be constructed around each steel protective standpipe. The concrete pad shall be at least 6-inches thick, at least 2.5 feet in diameter, and be sloped away from the protective steel standpipe to facilitate runoff. The pad shall be contoured flush to the existing ground surface.
- J. Drilling Waste Disposal. Drill cuttings, rock core, and other solid material otherwise removed from the borehole during drilling, installation, and completion shall be stockpiled at the probe site for subsequent disposal by the Sierra County Department of Public Works.

### 3.4 SITE CLEANUP

- A. After completion of the work, tools, appliances, surplus materials, temporary drainage, rubbish, and debris incidental to work shall be removed. Excavation and vehicular ruts shall be backfilled and dressed to conform with the existing landscape. Utilities, structures, roads, fences, or any other pre-existing item which must be repaired or replaced due to the Contractor's negligence shall be the Contractor's responsibility; repair or replacement shall be accomplished prior to completion of this contract.

## **PART 5 - FIGURES**

Figure 1	Site Location
Figure 2	Site Vicinity
Figure 3	Site Plan
Figure 4	Perimeter Gas Probe Construction Details

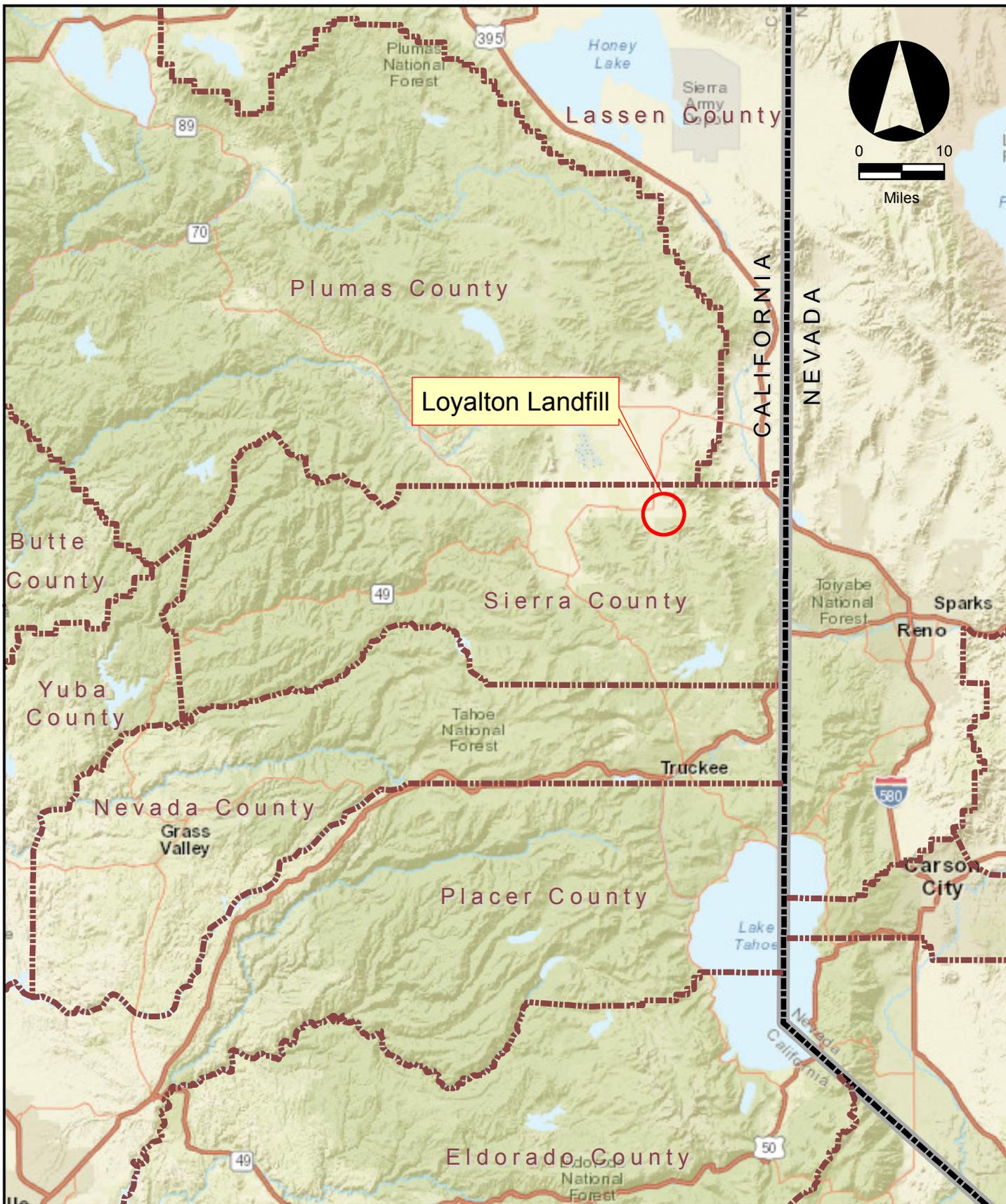


FIGURE 1 - SITE LOCATION



**AVALEX INC.**

Civil Engineering and Environmental Services  
 P.O. Box 550218 South Lake Tahoe, CA 96155  
 Phone (530) 543-3200      www.avaalex.info

LOYALTON LANDFILL

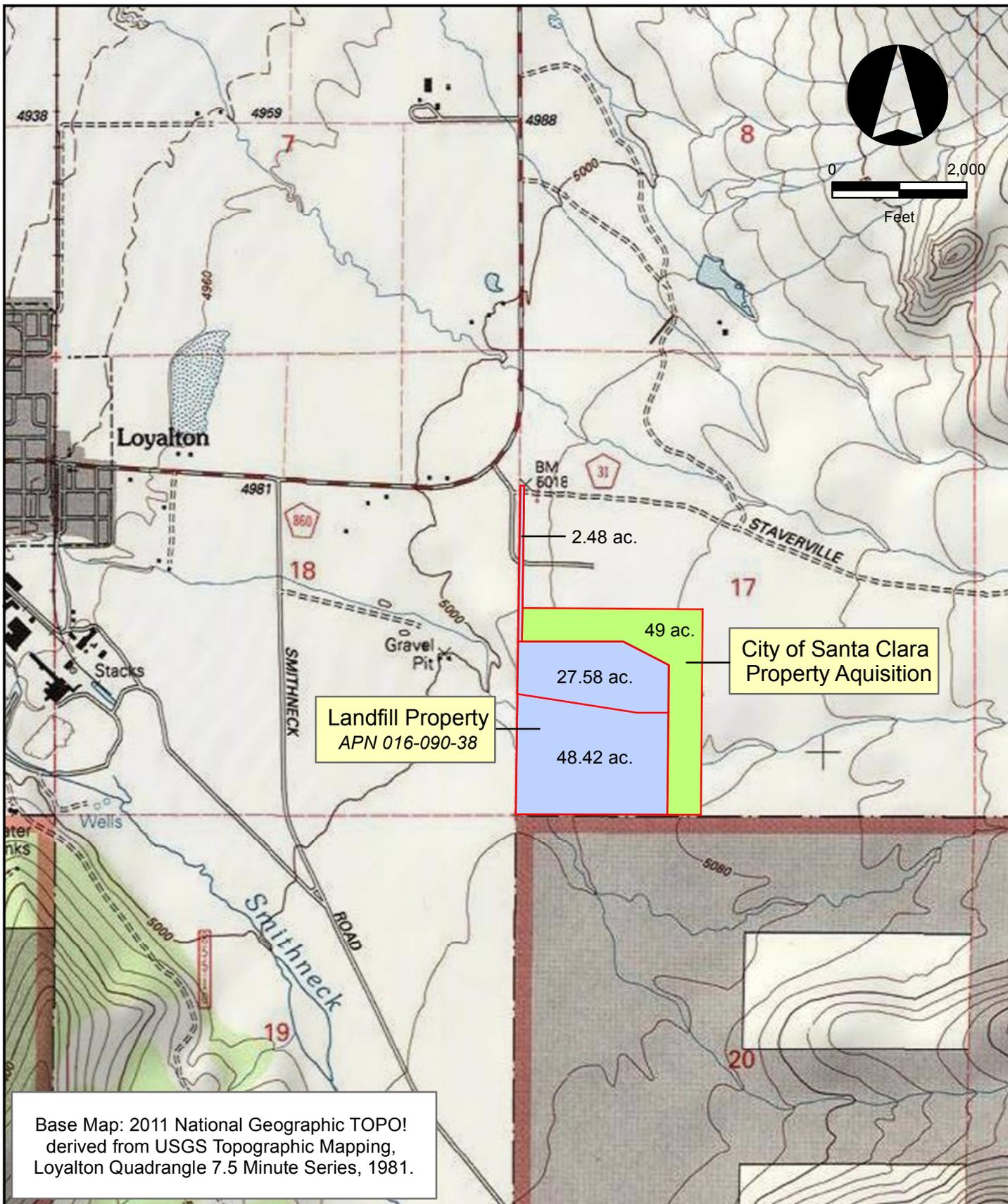
SIERRA COUNTY, CALIFORNIA

97-005.56

8-1-2016

CWM

FIG1.MXD



Base Map: 2011 National Geographic TOPO!  
 derived from USGS Topographic Mapping,  
 Loyalton Quadrangle 7.5 Minute Series, 1981.

FIGURE 2 - SITE VICINITY



**AVALEX INC.**

Civil Engineering and Environmental Services  
 P.O. Box 550218 South Lake Tahoe, CA 96155  
 Phone (530) 543-3200 www.avaalex.info

LOYALTON LANDFILL			
SIERRA COUNTY, CALIFORNIA			
97-005.56	8-1-2016	CWM	FIG2.MXD

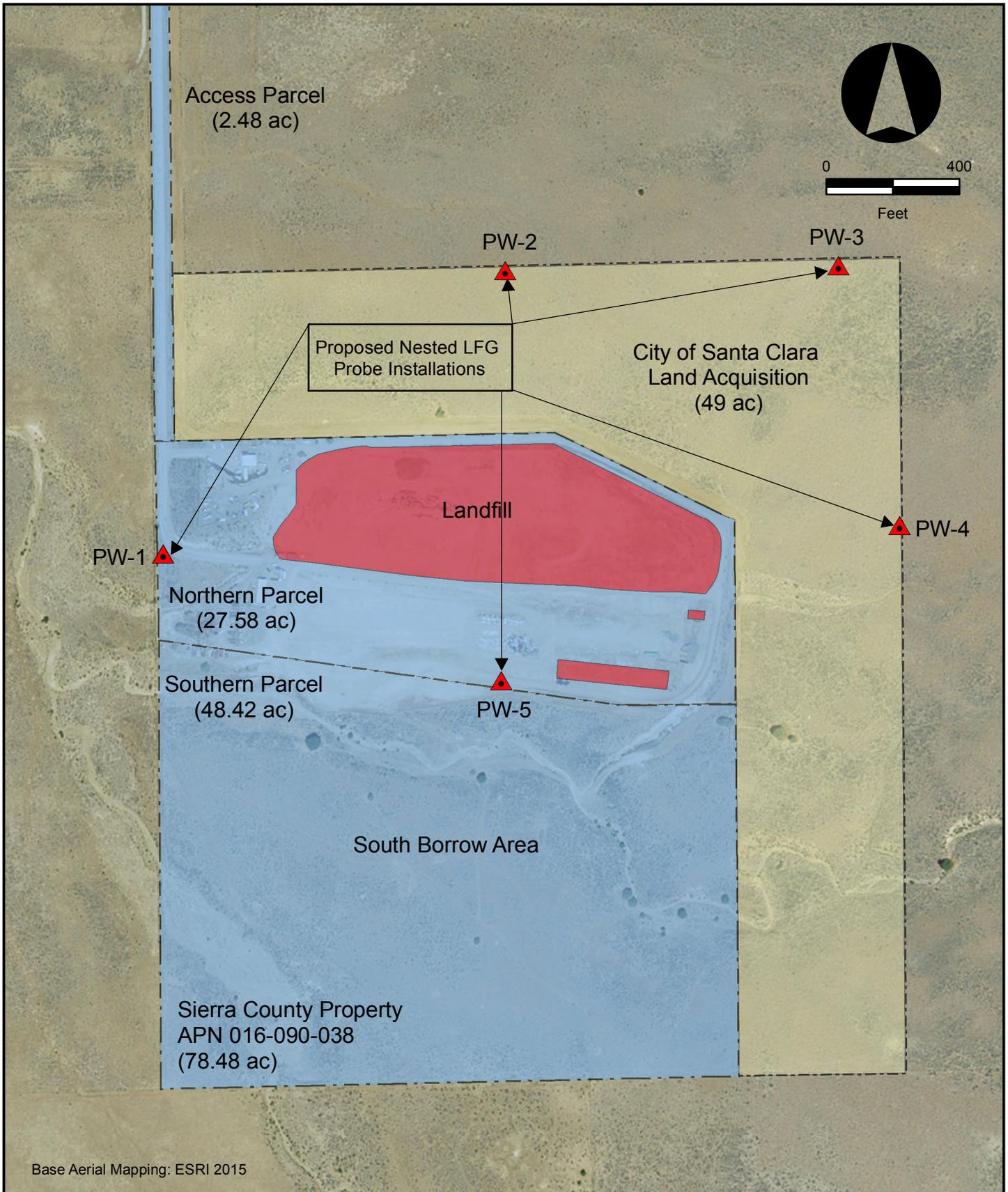


FIGURE 3 - SITE PLAN



**AVALEX INC.**

Civil Engineering and Environmental Services  
P.O. Box 550218 South Lake Tahoe, CA 96155  
Phone (530) 543-3200 www.avaalex.info

LOYALTON LANDFILL

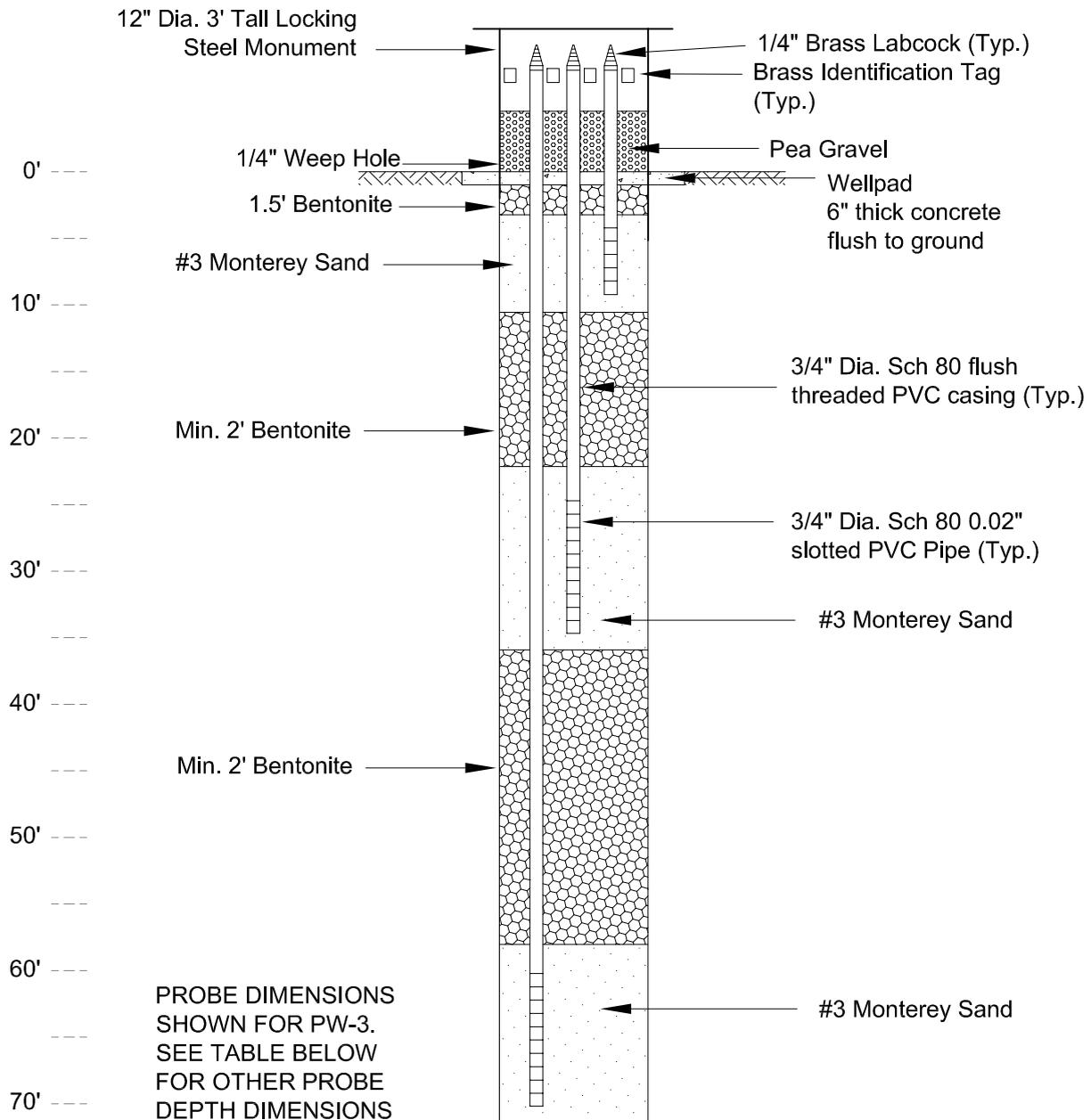
SIERRA COUNTY, CALIFORNIA

97-005.56

8-1-2016

LAO

FIG3.MXD



Well	Depth to Bottom of Well Shallow (ft)	Depth to Bottom of Well Intermediate (ft)	Depth to Bottom of Well Deep (ft)
PW-1	10	-	21
PW-2	10	20	40
PW-3	10	35	70
PW-4	10	35.5	71
PW-5	10	24	48

FIGURE 4 – SOIL GAS PROBE CONSTRUCTION DETAILS



**AVALEX INC.**  
Civil Engineering and Environmental Services  
P.O. Box 550218, S. Lake Tahoe, CA 96155  
Phone (530) 543-3200 www.avalex.info

SOIL GAS PROBE INSTALLATION

LOYALTON LANDFILL, SIERRA COUNTY, CALIFORNIA

97-005.56

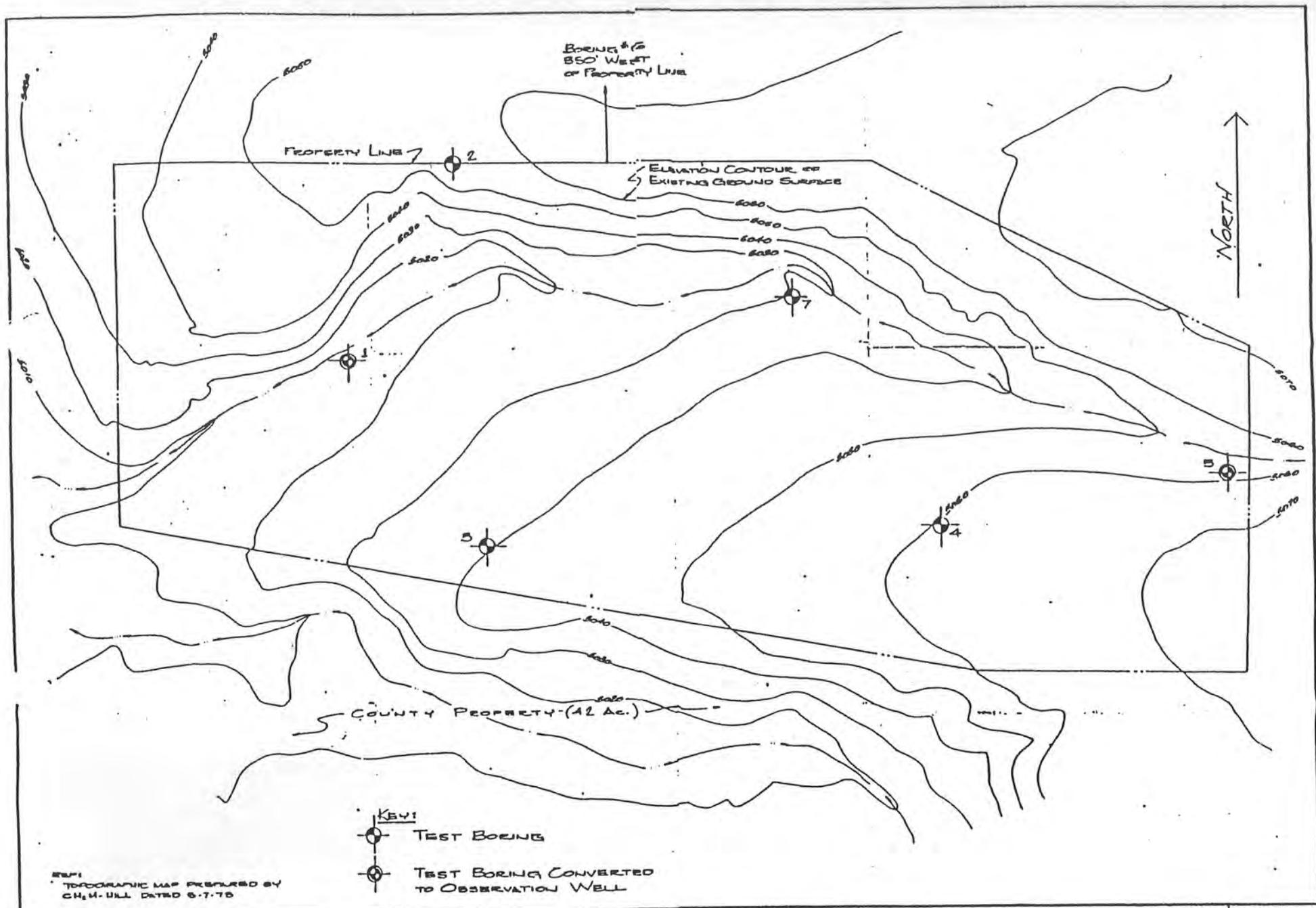
8-1-16

LAO

Fig4.dwg

## **PART 6 - APPENDICES**

Appendix A – Loyalton Landfill Soil Boring Logs



Job No. 4475-0101  
 Designed JCO  
 Drawn REB  
 Checked YB  
 Approved YB  
 Date 12-22-73  
 Scale 1"=100'

**HARDING - LAWSON ASSOCIATES**  
  
 Consulting Engineers  
 and Geologists

SITE PLAN  
 LOYALTON SANITARY LAND FILL  
 SIERRA COUNTY, CALIFORNIA

PLATE  
**1**

**LOG OF BORING 1**

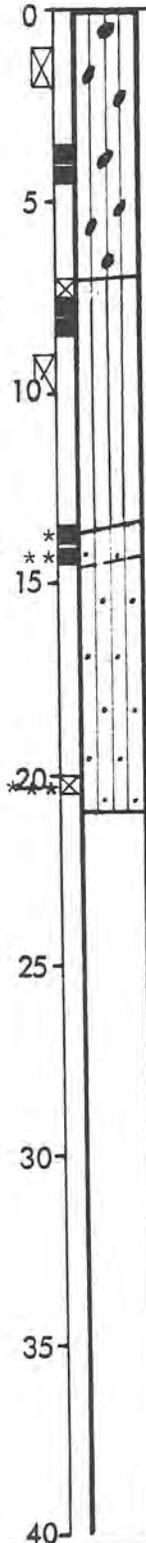
Shear Strength (lbs/sq ft)

Moisture Content (%)  
Dry Density (pcf)  
Depth (ft)  
Sample

Equipment 9" Hollow Stem Auger

Elevation 5015 Date 5/16/73

Percent Passing No. 200 Sieve = 5			
Percent Passing No. 200 Sieve = 76	25.6	95	
Coefficient of Permeability K = 10 <sup>-6</sup> cm/sec			
*Percent Passing No. 200 Sieve = 14	15.9	111	
**Percent Passing No. 200 Sieve = 27			
***Percent Passing No. 200 Sieve = 37			



ORANGE-BROWN SILTY SANDY GRAVEL (GP-GM)  
medium dense, dry  
fine to medium subrounded gravel  
dense, moist at 2.0'  
slight seepage at 6.0'

BROWN SANDY SILT (ML)  
medium stiff, moist

lense of slightly cemented medium coarse sand (SP) at 13.7' to 14.5'

▽ Water level - 5/17/73

Note: No water in hole on 7/30/73

**HARDING - LAWSON ASSOCIATES**



Consulting Engineers and Geologists

**LOG OF BORING 1**

SIERRA COUNTY LANDFILL  
Sierra County, California

PLATE

**4**

Job No 4673,002.05

Appr \_\_\_\_\_ Date 7/31/73

**LOG OF BORING 2**

Shear Strength (lbs/sq ft)

Moisture Content (%)  
Dry Density (pcf)  
Depth (ft)  
Sample

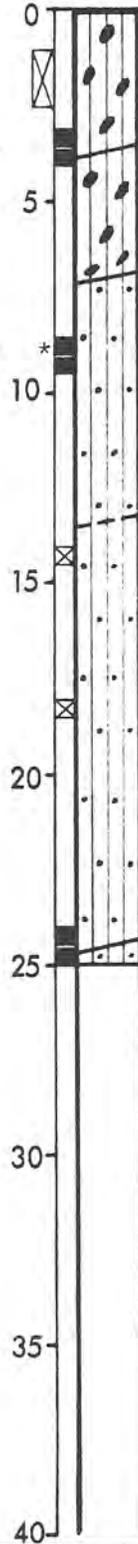
Equipment 9" Hollow Stem Auger

Elevation 5058 Date 5/17/73

*Percent Passing No. 200 Sieve = 38									

12.6 122

23.3 98



BROWN SILTY SANDY GRAVEL (GM)  
loose, dry to moist  
medium dense at 1.0'

YELLOW-BROWN CLAYEY SILTY SANDY GRAVEL (GM-GC)  
dense, moist

BROWN MEDIUM TO FINE SILTY SAND (SM)  
medium dense, moist  
very fine, increase in clay and silt fines below 9.0'

with lense of clay and clayey gravel at 24.0'

No free water encountered

**HARDING - LAWSON ASSOCIATES**



Consulting Engineers and Geologists

Job No. 4673,002.05

Appr + Date 7/31/73

**LOG OF BORING 2**

SIERRA COUNTY LANDFILL  
Sierra County, California

**PLATE**

**5**

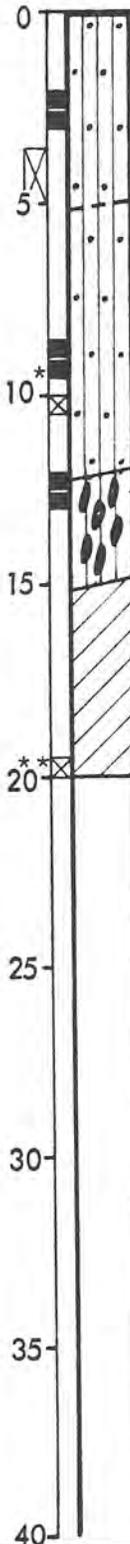
**LOG OF BORING 3**

Shear Strength (lbs/sq ft)

Moisture Content (%)  
 Dry Density (pcf)  
 Depth (ft)  
 Sample

Equipment 9" Hollow Stem Auger  
 Elevation 5039 Date 5/16/73

Percent Passing No. 200 Sieve = 37
*Percent Passing No. 200 Sieve = 36
**Percent Passing No. 200 Sieve = 57



ORANGE-BROWN SILTY SAND (SM)  
 dense, moist, slightly cemented, occasional gravel to 6" diameter

color change to brown, fewer gravels, very fine gravel

slight seepage at 13.0'  
 BROWN SILTY GRAVEL (GM)  
 medium dense, wet

BROWN SANDY CLAY (CL)  
 stiff, moist

no water in hole after removal of auger

**HARDING - LAWSON ASSOCIATES**



*Consulting Engineers and Geologists*

**LOG OF BORING 3**

SIERRA COUNTY LANDFILL  
 Sierra County, California

**PLATE**

**6**

Job No. 4673,002.05

Appr. PL Date 7/31/73

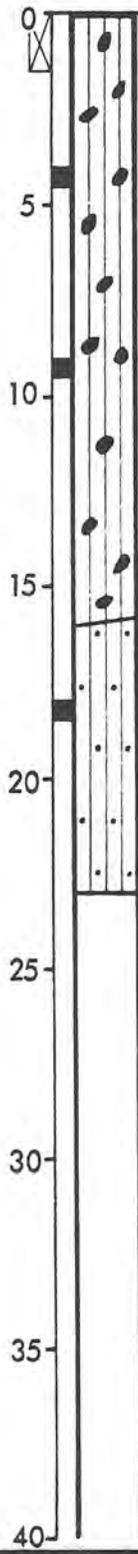
**LOG OF BORING 4**

Shear Strength (lbs/sq ft)

Moisture Content (%)  
 Dry Density (pcf)  
 Depth (ft)  
 Sample

Equipment 9" Hollow Stem Auger  
 Elevation 5060 Date 5/16/73

Percent Passing No. 200 Sieve =	12
Percent Passing No. 200 Sieve =	37
Percent Passing No. 200 Sieve =	46



RED-BROWN SILTY SANDY GRAVEL (GM)  
 medium dense, dry

large gravels at 5.5'

cobbles at 12.0' to 15.0'

LIGHT GREY SILTY FINE SAND (SM)  
 dense, moist, slightly cemented

No free water encountered

**HARDING - LAWSON ASSOCIATES**



Consulting Engineers and Geologists

**LOG OF BORING 4**

SIERRA COUNTY LANDFILL  
 Sierra County, California

**PLATE**

**7**

Job No. 4673,002.05 Apr 11 Date 7/31/73

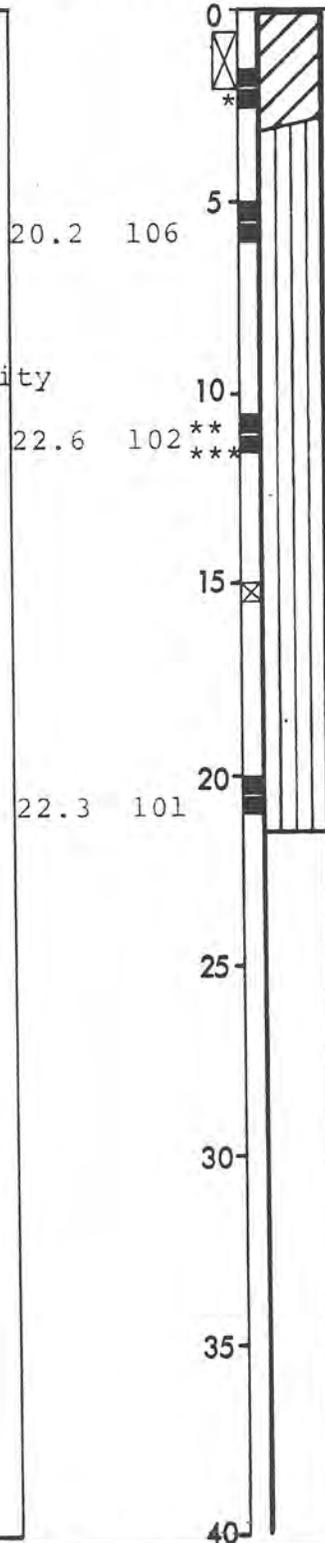
LOG OF BORING 5

Shear Strength (lbs/sq ft)

Moisture Content (%)  
Dry Density (pcf)  
Depth (ft)  
Sample

Equipment 9" Hollow Stem Auger  
Elevation 5057 Date 5/17/73

*Percent Passing No. 200 Sieve = 75
**Coefficient of Permeability K = $2 \times 10^{-7}$ cm/sec
**Percent Passing No. 200 Sieve = 72
***Percent Passing No. 200 Sieve = 59



BROWN CLAY (CH)  
medium stiff, moist

ORANGE-BROWN SANDY SILT (ML)  
stiff, moist, slightly cemented

with occasional gravels at 20.0'

No free water encountered

**HARDING - LAWSON ASSOCIATES**



Consulting Engineers and Geologists

LOG OF BORING 5

SIERRA COUNTY LANDFILL  
Sierra County, California

PLATE

**8**

Job No 4673,002.05 Appr. ICD Date 7/31/73



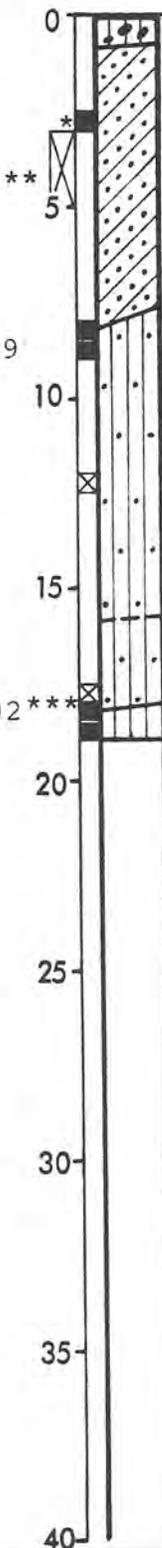
**LOG OF BORING 7**

Shear Strength (lbs/sq ft)

Moisture Content (%)  
 Dry Density (pcf)  
 Depth (ft)  
 Sample

Equipment 9" Hollow Stem Auger  
 Elevation 5031 Date 5/17/73

*Percent Passing No. 200 Sieve = 42				
**Percent Passing No. 200 Sieve = 38				
13.2	119			
21.0	102	***		
***Percent Passing No. 200 Sieve = 83				



BROWN CLAYEY SILTY GRAVEL (GM)

BROWN CLAYEY SAND (SC)  
 medium dense, moist  
 with occasional gravels

BROWN SILTY GRAVELLY SAND (SM)  
 dense, moist  
 slightly cemented

grey at 15.0', increase in  
 silt fines

BROWN SANDY SILT (ML)  
 stiff, dry

No free water encountered

**HARDING - LAWSON ASSOCIATES**



Consulting Engineers and Geologists

**LOG OF BORING 7**

SIERRA COUNTY LANDFILL

Sierra County, California

PLATE

**10**

Job No. 4673,002.05

Appr. [Signature] Date 7/31/73

DRILLING LOG

Project: Sierra County Landfill

Owner: Sierra County

Well Number : MW-1

Location: Loyalton, CA

Project Number: 312E11531

Date Drilled: 4-17-89	Screen Diam.: 2"	Drilling Co: Lynn Drilling  Method: Air Rotary  Driller: John Lynn  Log by: D. King
Total Depth: 60'	Length: 20"	
Diameter: 8"	Slot Size: 0.02"	
Surface Elev.:	Casing Diam: 2"	
Initial Water Level: -35' (24 hours) dry	Length: $\frac{25}{3}$ '      Type: Sch. 40 PVC	

S A D M E P P L T E H	BLOW COUNT	P I D ppm	WELL CONST.	DEPTH (ft)	L O G	DESCRIPTION
						Surface:
				4		Clayey silt (ML): light brown, medium soft, damp.
5				8		Silty gravel (GM): light brown, medium soft, damp, with minor clay, gravels to 1/4" diameter.
10				12		Gravelly clay (CL): brown, very moist to wet, gravels to 1/4" diameter, perched water @ 13'.  No return of cuttings, inject water and drill wet from 18' to total depth.
15				16		
20				20		
25				24		
30				28		Gravelly sand (SP): dark brown, loose, wet, poorly graded, containing silt and clay.
35				32		Gravelly silt (ML): dark brown, loose, wet, gravels to 1/2" diameter, water @ 35'. Hole making water from 35' to total depth.
40				36		
45				40		
50				44		Silty clay (CL): brown, soft, wet.
55				48		Gravel (GP): brown, loose, gravels to 1/2" diam., rounded, wet, poorly graded.
60				52		
				56		Gravelly clay (CL): light brown, soft, wet.
				60		Total Depth: 60 feet.

DRILLING LOG

Project: Sierra County Landfill

Owner: Sierra County

Well Number : MW-2

Location: Loyalton, CA

Project Number: 312E11531

Date Drilled: 4-18-89	Screen Diam.: 2"	Drilling Co: Lynn Drilling  Method: Air Rotary  Driller: John Lynn  Log by: D. King
Total Depth: 55'	Length: 20"	
Diameter: 8"	Slot Size: 0.02"	
Surface Elev.:	Casing Diam: 2"	
Initial Water Level: -42' (24-hours) -35.94' TOC 6"	Length: 35'    Type: Sch. 40 PVC	

S A D M E P P L T E H	BLOW COUNT	P I D ppm	WELL CONST.	DEPTH (ft)	L O G	DESCRIPTION
						Surface:
5				4		Sandy gravel (GW): dark brown, loose, moist, gravel to 1/4" diameter.
10				8		Gravelly silt (ML): brown, loose, damp, with 5-10% gravel.
15				12		Sandy silt (ML): brown, loose, medium grained, dry.
20				16		
25				20		Clayey silt (ML): brown, soft, damp.
30				24		Grading to slightly stiff and moist. ↓
35				28		
40				32		
45				36		
50				40		
55				44		Sandy gravel (GW): dark brown, loose, wet, gravels to 1/2" diameter, water @ 42'.
				48		
				52		Borehole caving-in. Add foam to stabilize.
				56		Total Depth: 55 feet.

DRILLING LOG

Project: Sierra County Landfill

Owner: Sierra County

Well Number : MW-3

Location: Loyalton, CA

Project Number: 312E11531

Date Drilled: 4-18-89	Screen Diam.: 2"	Drilling Co: Lynn Drilling  Method: Air Rotary  Driller: John Lynn  Log by: D. King
Total Depth: 65'	Length: 20"	
Diameter: 8"	Slot Size: 0.02"	
Surface Elev.:	Casing Diam: 2"	
Initial Water Level: -52' (24-hours) -41.23' TOC 6"	Length: 32'    Type: Sch. 40 PVC	

S A D M E P P L T E H	BLOW COUNT	P I D ppm	WELL CONST.	DEPTH (ft)	L O G	DESCRIPTION
						Surface:
5				4		Sandy gravel (GW): brown, loose, dry, gravels to 3/4" diameter.
10				8		
15				12		Gravelly silt (ML): brown, loose, damp, with 20-30% gravel to 1/2" diameter.
				16		
20				20		Sandy silt (ML): brown, loose, damp.
25				24		Silty sand (SM): brown, loose, damp, medium to fine grained sands.
30				28		
35				32		No return of cuttings, inject water and drill wet from 40' to total depth.
				36		
40				40		Gravelly silt (ML): brown, loose, wet, gravels to 1/2" diameter.
45				44		Increase in clay to 5%. ↓
50				48		
55				52		Silty gravel (GM): brown, loose, with 10% silt, gravels to 1/2" dia., water @ 52'.
				56		
60				60		Sandy gravel (GW): dark brown, loose, medium to coarse-grained sands, gravels to 1" diameter.
				64		
65						Total Depth: 65 feet.

DRILLING LOG

Project: Sierra County Landfill Owner: Sierra County Well Number : MW-4  
 Location: Loyalton, CA Project Number: 312E11531 1 of 3

Date Drilled: 5-1-89	Screen Diam.: 3"	Drilling Co: Lynn Drill.
Total Depth: 85'	Length: 20'	
Diameter: 8"	Slot Size: 0.020"	
Surface Elev.:	Casing Diam: 3"	
Initial Water Level: 41' (24 hours) dry	Length: 30' Type: Sch. 40 PVC	

S A D M E P P L T E H	BLOW COUNT	P I D ppm	WELL CONST.	DEPTH (ft)	L O G	DESCRIPTION
						Surface:
				2		Gravelly Silt (ML): light brown, dry, loose with 5% gravel to 1/2" dia.
				4		
5				6		Sandy Silt (ML): light brown, dry, loose with 10% fine to medium-grained sand.
				8		
10				10		Grading to Gravelly Silt (ML): with 2-4% gravel to 1/4" dia.
				12		
15				14		
				16		
20				18		Gravelly Sand (SW): brown, damp, loose, well graded, fine to coarse sand with 2-3% gravel to 1/4" dia.
				20		
25				22		Clayey Gravel (GC): brown, wet, loose, with 5-10% clay. Gravels to 1" dia. Add Water @ 28'. Drill with water to total depth.
				24		
30				26		Silty Gravel (GM): brown, wet, loose, with 15-20% clay. Gravels to 3/4" dia.
				28		
				30		
				32		
				34		

DRILLING LOG

Project: Sierra County Landfill

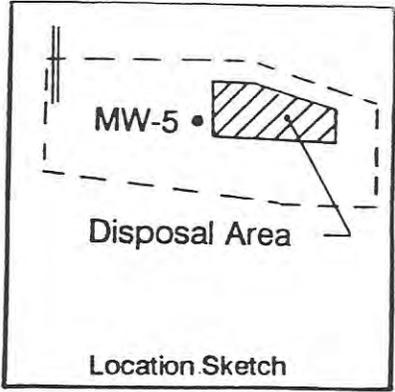
Well Number : MW-4

Page: 2 of 3

S A D M E P P L T E H	BLOW COUNT	P I D ppm	WELL CONST.	DEPTH (ft)	L O G	DESCRIPTION
						Surface:
35				36		Clayey Gravel (GC): brown, wet, stiff, with 15-20% clay. Gravels to 3/4" dia.
				38		
40				40		Sandy Gravel (GW): brown, wet, loose, well graded, fine to coarse sand, with 3-5% clay. Gravels to 1/2" dia. Water at 41'?
				42		
45				44		
				46		
				48		
50				50		Gravelly Clay (CH): brown, wet, stiff, with 5-10% gravel to 1/2" dia.
				52		
				54		
55				56		Decreasing gravel to 2-3%
				58		
				60		
				62		
			64			
65			66		Gravelly Sand (SW): brown, wet, loose, well graded, fine to coarse sand, with 5% gravel to 1/2" dia., and 2-5% clay.	
			68			
			70			
70			72		Clayey Gravel (GC): brown, wet, loose with 3-5% clay. Gravels to 1" dia.	
			74			



Project: Loyalton SWAT      Owner: Sierra County  
 Location: " Loyalton, Calif.      Date of Boring: Jan 16-19, 1990  
 Depth of Boring: 120 ft.      Diameter of Boring: 8 in.  
 Surface Elev.: 5039.74'      Depth to First Water: 87'-90'  
 Drilling Equipment: Air Rotary  
 Well Casing - Type: Sch. 40 PVC Dia.: 3" From: 0' To: 90'  
 Well Screen - Type: Sch. 40 PVC Dia.: 3" From: 90' To: 120'  
 Well Screen Size: 0.020"      Notes: \_\_\_\_\_  
 Drilled By: Lynn Drilling      Logged By: Roy C. Hampson

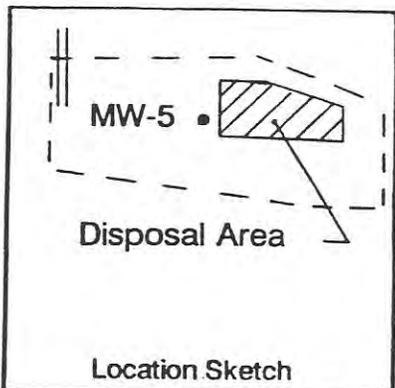


Depth (ft)	Well Construction	Sample		Notes	Geologic Log	DESCRIPTION
		No.	Type			
0 - 10	Diagonal hatching					Silty Sand (SM): brown Sand (SW): brown
10 - 35	Diagonal hatching					Silty, Gravelly, Sand (SM): brown
35 - 40	Diagonal hatching					Gravel (GW):
40 - 45	Diagonal hatching					Silty, Sandy, Gravel (GM): brown
45 - 50	Diagonal hatching					Silty Gravel (GM): brown
50 - 55	Diagonal hatching					Sandy, Silty, Gravel (GM): orange
55 - 60	Diagonal hatching					Silty, Gravelly, Clay (CL): brown
60 - 65	Diagonal hatching					Gravelly Clay (CL): brown

ROY C. HAMPSON & ASSOCIATES  
 Environmental Engineering & Management

Well Log: MONITORING WELL MW-5  
 Loyalton Landfill SWAT Report  
 Sierra County, California

Project: Loyalton SWAT      Owner: Sierra County  
 Location: Loyalton, Calif.      Date of Boring: Jan 16-19, 1990  
 Depth of Boring: 120 ft.      Diameter of Boring: 8 in.  
 Surface Elev.: 5039.74'      Depth to First Water: 87'-90'  
 Drilling Equipment: Air Rotary  
 Well Casing - Type: Sch. 40 PVC      Dia.: 3"      From: 0' To: 90'  
 Well Screen - Type: Sch. 40 PVC      Dia.: 3"      From: 90' To: 120'  
 Well Screen Size: 0.020"      Notes: \_\_\_\_\_  
 Drilled By: Lynn Drilling      Logged By: Roy C. Hampson, PE



Depth (ft)	Well Construction	Sample		Notes	Geologic Log	DESCRIPTION
		No.	Type			
70				- Standing water upon completion 61 feet 1/19/90  First water encounter at 87-90'	[Diagonal Hatching]	Gravelly Clay (CL): brown
					[Dotted]	Gravel (GW): black
80					[Diagonal Hatching with Circles]	Clayey Gravel (GC): brown
					[Diagonal Hatching]	Gravelly Clay (CL): brown
90					[Diagonal Hatching]	Clay (CL): blue
					[Diagonal Hatching]	Gravelly Clay (CL): brown
100					[Diagonal Hatching with Circles]	Clayey Gravel (GC): brown
110					[Diagonal Hatching with Circles]	
120						
Total Depth 120 feet						

**ROY C. HAMPSON & ASSOCIATES**      Well Log: **MONITORING WELL MW-5**  
 Environmental Engineering & Management      Loyalton Landfill SWAT Report  
 Sierra County, California

Drawn By:	Checked By:	Project No.:	Date:	Sheet: 2 / 2
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# AVALEX INC.

Civil Engineering and Environmental Services  
 P.O. Box 550218, S. Lake Tahoe, CA 96155  
 Phone (530) 543-3200 www.avaxex.info

## WELL LOG: MW-5 (NEW)

LOYALTON LANDFILL  
 Sierra County, California

Page  
 1 of 3

DATE DRILLED: Oct. 28-29, 2009

PROJECT: Loyalton Landfill

DRILLING METHOD: Air Rotary

SURFACE ELEVATION: ~5038 feet

DRILLING COMPANY: P.C. Exploration

TOP OF STANDPIPE ELEVATION: 5041.44 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 71 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM	
							3" blank PVC	Cement Grout
0.0-4.0					SW-SM	0.0-4.0 SILTY SAND WITH SILT AND GRAVEL: About 60% fine to coarse sands, about 30% rounded gravels to 1", about 10% fines; Olive Brown (2.5Y 4/3); Damp.		Concrete
4.0-8.0					SW	4.0-8.0 WELL GRADED SAND WITH GRAVEL: About 65% to 75% well graded sands with about 25% to 35% rounded gravels to 1-1/2", trace fines; Olive Brown (2.5Y 4/3); Damp.		
8.0-13.0					SW	8.0-13.0 WELL GRADED SAND WITH GRAVEL: About 55% well graded sands with about 45% rounded gravels to 1-1/2", trace fines; Dark Yellowish Brown (10YR 3/4); Damp.		
13.0-15.0					SW	13.0-15.0 WELL GRADED SAND: About 100% well graded sand, trace fines; Dark Yellowish Brown (10YR 3/4); Damp.		
15.0-17.0					SW	15.0-17.0 WELL GRADED SAND WITH GRAVEL: About 55% TO 60% well graded sand with about 40% to 45% rounded gravels to 1-1/2", trace fines; Dark Yellowish Brown (10YR 3/4); Damp.		
17.0-20.0					SW	17.0-20.0 WELL GRADED SAND WITH GRAVEL: About 70% well graded sand with about 25% rounded gravels to 1-1/2", about 5% plastic fines; Dark Yellowish Brown (10YR 3/4); Damp.		
20.0-25.0					CL/ML	20.0-25.0 SILTY CLAY: About 80% to 85% silty clay with about 15% to 20% rounded gravels to 1"; Dark Yellowish Brown (10YR 3/4); Damp.		
25.0-30.0					SW	25.0-30.0 WELL GRADED SAND: About 100% well graded sand, trace fines; Dark Yellowish Brown (10YR 3/4); Damp.		

Continued



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## WELL LOG: MW-5 (NEW)

LOYALTON LANDFILL  
 Sierra County, California

Page  
 2 of 3

DATE DRILLED: Oct. 28-29, 2009	PROJECT: Loyalton Landfill
DRILLING METHOD: Air Rotary	SURFACE ELEVATION: ~5038 feet
DRILLING COMPANY: P.C. Exploration	TOP OF STANDPIPE ELEVATION: 5041.44 feet
LOGGED BY: Craig Morgan, P.E.	TOTAL DEPTH OF BORING: 71 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
30.0-35.0					SP	30.0-35.0 POORLY GRADED SAND: About 100 %mostly fine to medium sand; Dark Yellowish Brown (10YR 3/4); Damp.	
35.0-42.0					SP	35.0-42.0 POORLY GRADED SAND: About 90% to 95% fine to medium sand with 5% to 10% well rounded gravels to 1"; Dark Olive Gray (2Y 3/3); Damp.	
42.0-47.0					SW	42.0-47.0 WELL GRADED SAND: About 100% well graded sands; Very Dark Grayish Brown (2.5Y 3/2); Moist.	
47.0-52.0					SW	47.0-52.0 WELL GRADED SAND: About 90% to 95% well graded sands with 5% to 10% well rounded gravels to 3/4", trace plastic fines; Very Dark Grayish Brown (2.5Y 3/2); Moist.	
52.0-57.0					SW	52.0-57.0 WELL GRADED SAND: About 100% well graded sands, trace plastic fines; Very Dark Grayish Brown (2.5Y 3/2); Moist to Wet.	
57.0-60.0					SW	57.0-60.0 WELL GRADED SAND: About 90% to 95% well graded sands with 5% to 10% well rounded gravels to 3/4", trace plastic fines; Very Dark Grayish Brown (2.5Y 3/2); Wet.	

DTW=55'

Continued



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## WELL LOG: MW-5 (NEW)

LOYALTON LANDFILL  
Sierra County, California

Page  
3 of 3

DATE DRILLED: Oct. 28-29, 2009

PROJECT: Loyaltan Landfill

DRILLING METHOD: Air Rotary

SURFACE ELEVATION: ~5038 feet

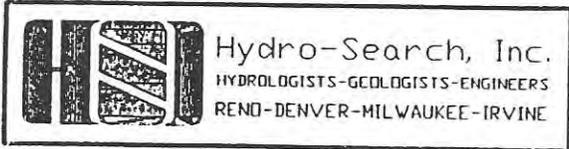
DRILLING COMPANY: P.C. Exploration

TOP OF STANDPIPE ELEVATION: 5041.44 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 71 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
65					SW	60.0-65.0 WELL GRADED SAND: About 80% to 90% well graded sands with 5% to 10% well rounded gravels to 3/4", 5% to 10% plastic fines; Very Dark Grayish Brown (2.5Y 3/2); Wet.	<p>3" slotted PVC (0.02 inch)</p> <p>#2/12 Lapis Lustre Sand</p>
70					GP	65.0-71.0 POORLY GRADED GRAVEL WITH COBBLES: About 30% poorly graded gravel, about 70% cobbles to 4"+; Very Dark Grayish Brown (2.5Y 3/2); Wet.	
75						Bottom of Boring @ 71 feet	
80							
85							
90							



# DRILLING LOG

WELL NUMBER          MW-6 Page 1 of 3

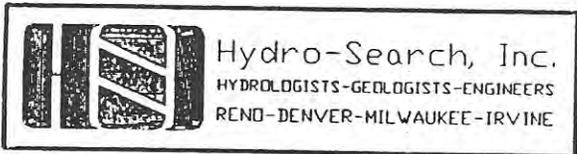
Project Sierra County Landfill Owner Sierra County  
 Location Loyalton, California Project Number 372P12601/10008  
 Date Drilled 9/27/90 Total Depth of Hole 120 ft. Diameter 8"  
 Surface El.          Water Level Initial 99' 24 hrs.           
 Screen: Dia. 4" Length 20' Slot Size 0.040"  
 Casing: Dia. 4" Length 96' Sch.40-threaded Type PVC  
 Drilling Company Lynn Drilling Drilling Method Air Rotary  
 Driller John Lynn Log by R.J.Johnson

Sketch Map

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Notes

Sample Depth (ft.)	Blow Counts (SPT)	H-NU	Well Construction	Depth (ft)	Log	DESCRIPTION
5				2	SW	Gravelly sand (SW): Brown, dry, loose, 50% fine-to coarse-grained sand, 30% subangular gravel up to 1", 20% silt.
				4		
				6		
				8		
10				10	ML	Sandy silt (ML): brown, dry, loose, 80% silt, 20% fine-grained sand.
				12		
				14		
15				16	SW	Gravelly sand (SW): brown, dry, loose, 65% fine-to coarse-grained sand, 20% subangular gravel, 15% clay. Added water during drilling starting at 15'.
				18		
				20		
20				20	CL	Sandy clay (CL): light brown, wet, soft, low plasticity, 70% clay, 20% fine-grained sand, 10% subangular gravel.
				22		
				24		
				26		
25				26	CL	Silty clay (CL): light brown, wet, medium stiff, medium plasticity.  30' - Brown with 5 to 10% fine-grained sand.
				28		
				30		
				32		
35				34	CL	35' - With 5% fine-grained sand and 5% gravel up to 1/2".
				36		
				38		
				40		
40				40		
				42		



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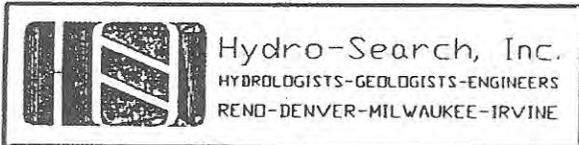
# DRILLING LOG

WELL NUMBER MW-6 Page 2 of 3

Project Sierra County Landfill Owner Sierra County  
 Location Loyalton, California Project Number 372P12601/10008  
 Date Drilled 9/27/90 Total Depth of Hole 120 ft. Diameter 8"  
 Surface El. \_\_\_\_\_ Water Level Initial 99' 24 hrs. \_\_\_\_\_  
 Screen: Dia. 4" Length 20' Slot Size 0.040"  
 Casing: Dia. 4" Length 96' Sch.40-threaded Type PVC  
 Drilling Company Lynn Drilling Drilling Method Air Rotary  
 Driller John Lynn Log by R.J. Johnson

Sketch Map  
  
  
  
  
  
  
  
  
  
Notes

Sample Depth (ft.)	Blow Counts (SPT)	H-NU	Well Construction	Depth (ft)	Log	DESCRIPTION
45				44		
				46	CL	45' - With 10% fine-grained sand and 1 to 2% fine gravel up to 1/4".
				48		
50				50		
				52	CL	Sandy clay (CL): brown, wet, soft, low plasticity, 50% clay, 30% fine-to coarse-grained sand, 20% silt.
55				54		
				56		Sandy gravel (GW): brown, wet, loose, 50% gravel up to 1", 30% fine-to coarse-grained sand, 20% silt.
				58		
60				60		
				62	GW	
65				64		
				66		Silty clay (CL): light brown, wet, very stiff, medium plasticity, 10% fine-grained sand, 5% gravel up to 1/2".
70				70		
				72	CL	
				74		Sandy gravel (GW): light brown, wet, loose, 65% gravel up to 1", 30% fine-to coarse-grained sand, 5% silt.
75				76	GW	
				78		Clayey gravel (GC): light brown, wet, loose, 70% gravel up to 1", 30% sandy clay.
80				80		
				82	GC	
				84		



# DRILLING LOG

WELL NUMBER          MW-6 Page 3 of 3

Project Sierra County Landfill Owner Sierra County  
 Location Loyalton, California Project Number 372P12601/10008  
 Date Drilled 9/27/90 Total Depth of Hole 120 ft. Diameter 8"  
 Surface El.          Water Level Initial 99' 24 hrs.           
 Screen: Dia. 4" Length 20' Slot Size 0.040"  
 Casing: Dia. 4" Length 96' Sch.40-threaded Type PVC  
 Drilling Company Lynn Drilling Drilling Method Air Rotary  
 Driller John Lynn Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Blow Counts (SPT)	H-NU	Well Construction	Depth (ft)	Log	DESCRIPTION
85				84	GC	Clayey gravel (GC): light brown, wet, loose, 70% gravel up to 1", 30% sandy clay.
				86	GW	Sandy gravel (GW): light brown, wet, loose, 65% gravel up to 1 1/4", 30% fine- to coarse-grained sand, 5% silt.
				88		
90				90	CL	Silty clay (CL): brown, wet, soft, medium plasticity, 10% fine-grained sand.
				92		
				94		
95				96	GW	Sandy gravel (GW): brown, wet, loose, 60% gravel, 25% fine- to coarse-grained sand, 15% sandy clay.
				98	CL	Silty clay (CL): as above at 90 - 95'.
100				100	GW	99' - First water.
				102		Sandy gravel (GW): as above at 85 - 90'.
105				104	CL	Silty clay (CL): light brown, wet, medium stiff, medium plasticity, 10% fine-grained sand to 1/2" gravel.
				106		
				108		
110				110	GC	Clayey gravel (GC): light brown, wet, loose, 60% gravel up to 3/4", 40% sandy clay.
			112			
			114			
115			116	CL	Gravelly clay (CL): light brown, wet, soft, medium plasticity, sandy clay with 30% gravel up to 3/4".	
			118			
120			120			
					CL	Total Depth = 120' Airlifted 1 - 3 gallons per minute at 120'.



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Civil Engineering and Environmental Services  
 P.O. Box 11928, Tahoe Paradise, CA 96155  
 (530) 577-8541 Fax (530) 573-0131

## WELL LOG: MW-7

LOYALTON LANDFILL  
 Sierra County, California

DATE DRILLED: March 12, 2003

PROJECT: Loyalton Landfill

DRILLING METHOD: Air Rotary / IR T3M

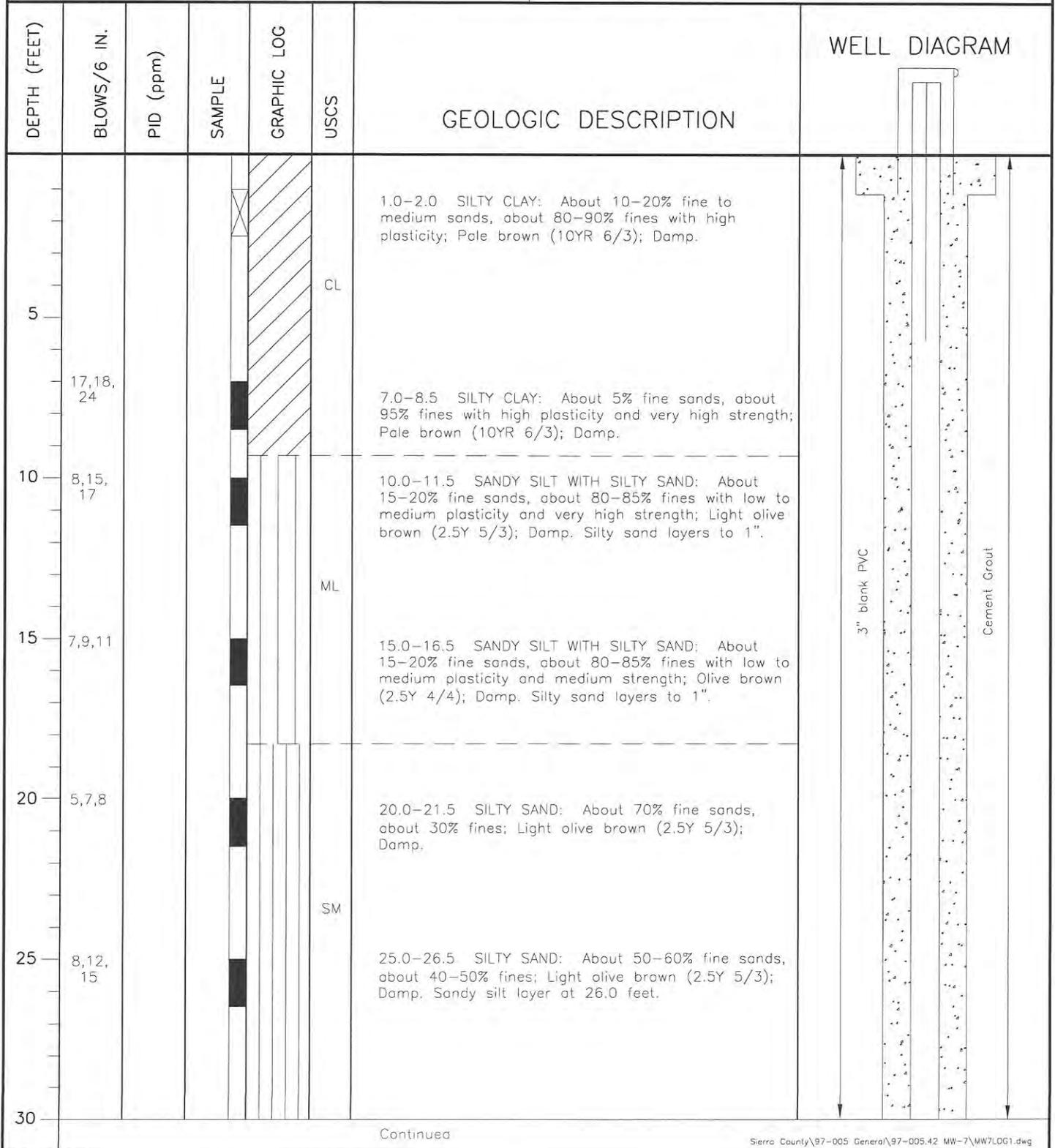
SURFACE ELEVATION: ~ 5060 feet

DRILLING COMPANY: West Hazmat

TOP OF CASING ELEVATION: 5064.81 feet

LOGGED BY: Craig Morgan, P.E./Gordon Seitz, R.G.

TOTAL DEPTH OF BORING: ~ 90 feet





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Civil Engineering and Environmental Services  
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## WELL LOG: MW-7

LOYALTON LANDFILL  
Sierra County, California

Page  
2 of 4

DATE DRILLED: March 12, 2003

PROJECT: Loyalton Landfill

DRILLING METHOD: Air Rotary / IR T3M

SURFACE ELEVATION: ~ 5060 feet

DRILLING COMPANY: West Hazmat

TOP OF CASING ELEVATION: 5064.81 feet

LOGGED BY: Craig Morgan, P.E./Gordon Seitz, R.G.

TOTAL DEPTH OF BORING: ~ 90 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
30.0-31.5	5,10, 12				SM	30.0-31.5 SILTY SAND: About 80% mostly medium sands, about 20% fines; Light olive brown (2.5Y 5/3); Damp.	<p>3" blank PVC</p> <p>Cement Grout</p>
35.0-36.5	12,17, 23				SW	35.0-36.5 SILTY SAND WITH GRAVEL: About 60-70 % fine sands, about 30-40% fines; Light olive brown (2.5Y 5/3), iron oxide staining; Damp. Some rounded clasts to 1/2".	
40.0-41.5	13,17, 50-2"				SW	40.0-41.5 WELL GRADED SAND: About 95% fine to medium sands with a few coarse sands to 1/4", some gravels, about 5% silts; Brown (10YR 5/3), manganese staining; Damp.	
45.0-46.5	17,50-6"				GW	45.0-46.5 SANDY GRAVEL: About 30% well graded sands, about 70% subangular to rounded gravels to 1"+, trace fines; Brown (10YR 4/3); Moist.	
50.0-51.5	14,27, 47				SP	50.0-51.5 POORLY GRADED SAND: About 95% medium to coarse sands, gravel lens to 1-1/2", about 5% fines; Yellowish brown (10YR 5/4); Moist.	
55.0-56.5	14,21, 30				ML	55.0-56.5 SANDY SILT WITH SILTY SAND: About 20-50% fine sands, about 50-80% fines with medium plasticity and very high strength; Brown (10YR 5/3); Moist. Silty sand layers 3"-6" thick.	
60						Continued	



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## WELL LOG: MW-7

LOYALTON LANDFILL  
Sierra County, California

Page  
3 of 4

DATE DRILLED: March 12, 2003

PROJECT: Loyalton Landfill

DRILLING METHOD: Air Rotary / IR T3M

SURFACE ELEVATION: ~ 5060 feet

DRILLING COMPANY: West Hazmat

TOP OF CASING ELEVATION: 5064.81 feet

LOGGED BY: Craig Morgan, P.E./Gordon Seitz, R.G.

TOTAL DEPTH OF BORING: ~ 90 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
60.0-61.5	8,12, 17				SM	60.0-61.5 SILTY SAND: About 70% mostly fine to medium sands, about 30% fines; Brown (7.5YR 5/3); Moist.	
65.0-66.5	7,11, 15				SC	65.0-66.5 CLAYEY SAND: About 75-80% mostly fine to medium sands, about 20-25% clayey fines; Brown (10YR 5/3); Moist.	
70.0-71.5	7,14, 20				SM	70.0-71.5 SILTY SAND: About 80% mostly fine sands with some coarse sand and gravel to 1/4", about 20% fines; Grayish brown (10YR 5/2); Wet. Water encountered at 71.5 feet.	
75.0-76.5	9,17, 24				SM	75.0-76.5 SILTY SAND: About 80% mostly fine sands, about 20% fines; Grayish brown (10YR 5/2); Wet. Five gallons water added to boring by driller at 75 feet.	
80.0-81.0	11,17, 22				GW	80.0-81.0 SILTY SAND: About 80% mostly fine sands, about 20% fines; Light brownish gray (10YR 6/2); Wet.	
81.0-81.5					GW	81.0-81.5 SANDY GRAVEL: About 50% fine to coarse sands, about 50% subangular to subrounded gravels to 1"+, trace fines; Brown (7.5YR 4/3); Wet.	
85.0-86.5	11,18, 30				SC	85.0-86.5 CLAYEY SAND WITH SANDY CLAY: About 50-70% fine sands, about 30-50% fines with high plasticity and very high strength; Brown (10YR 5/3); Wet. Silt layers 2"-6" thick.	
90							

Continued



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WELL LOG: MW-7

LOYALTON LANDFILL  
 Sierra County, California

Page  
 4 of 4

DATE DRILLED: March 12, 2003

PROJECT: Loyalton Landfill

DRILLING METHOD: Air Rotary / IR T3M

SURFACE ELEVATION: ~ 5060 feet

DRILLING COMPANY: West Hazmat

TOP OF CASING ELEVATION: 5064.81 feet

LOGGED BY: Craig Morgan, P.E./Gordon Seitz, R.G.

TOTAL DEPTH OF BORING: ~ 90 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
90.0-91.5	10, 14, 30				CL	<p>90.0-91.5 SILTY CLAY WITH FINE SAND: About 10% fine sands, about 90% fines with high plasticity and very high strength; Yellowish brown (10YR 5/4); Wet. CaCo3 coated fractures.</p> <p>Bottom of boring at 90 feet.</p> <p>Drive samples collected with 1-1/2" Split Spoon Sampler.</p>	<p>#3 Lapis Lustre sand</p>
95							
100							
105							
110							
115							
120							



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 Phone (530) 543-3200 www.avalex.info

## WELL LOG: MW-8

LOYALTON LANDFILL  
 Sierra County, California

DATE DRILLED: Aug. 28, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5057 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5061.87 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 88 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0-5	10, 14, 21				SM	0.0-1.5 SILTY SAND: About 85% fine to coarse sands, about 15% fines with low plasticity; Olive Brown (2.5Y 4/4); Dry to Damp at 1.5 feet.	<p>The well diagram shows a concrete cap at the surface. Below it is a section of bentonite. The main casing is 3" Sch 80 PVC. Inside the casing, there are two smaller pipes: a 3/4" Sch 80 PVC pipe and a #3 Lapis Lustre pipe. The well extends to a depth of 30 feet, with bentonite seals at the top and bottom.</p>
5-10	6, 12, 25				ML	5.0-6.5 SANDY SILT: About 40% fine sand, about 60% non-plastic fines; Dark Olive Gray (5Y 3/2); Moist.	
10-15	7, 12, 24				ML	10.0-11.5 SILT: About 5% fine sand, about 95% fines with low plasticity; Dark Grayish Brown (2.5Y 4/2); Moist. 3" Clay stringer at 10.5 feet.	
15-20	12, 24, 49				CL	15.0-16.5 LEAN CLAY: About 5% fine sand, about 95% fines with high plasticity and strength; Brown (10YR 4/3); Moist.	
20-25	6, 10, 15				CL	20.0-21.5 LEAN CLAY: About 5% fine sand, about 95% fines with high plasticity and strength; Dark Yellowish Brown (10YR 4/4); Moist.	
25-30	10, 16, 50-6"				CL	25.0-26.0 LEAN CLAY: About 5% to 10% fine to medium sand, about 90% to 95% fines with high plasticity and strength; Olive Brown (2.5Y 4/3); Moist. 26.0-26.5 LEAN CLAY WITH SAND: About 15% to 20% fine to coarse sand, about 80% to 85% fines with high plasticity and strength; Olive Brown (2.5Y 4/3); Moist.	
30					SW		

Continued



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## WELL LOG: MW-8

LOYALTON LANDFILL  
 Sierra County, California

DATE DRILLED: Aug. 28, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5057 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5061.87 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 88 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
30.0-31.0	40,40				SW	30.0-31.0 WELL GRADED SAND: About 95% fine to course sands, about 5% fines; Olive Gray (5Y 4/2); Moist.	<p>3" Sch 80 PVC</p> <p>3/4" Sch 80 PVC - 0.020" Slots</p> <p>#3 Lapis Lustre</p> <p>Bentonite</p> <p>#3 Lapis Lustre</p>
31.0-31.5	50-4"				SW-SM	31.0-31.5 WELL GRADED SAND WITH SILT: About 90% fine to course sands, about 10% nonplastic fines; Olive Gray (5Y 4/2); Moist.	
35.0-35.5					SW	35.0-35.5 WELL GRADED SAND: About 95% fine to course sands, about 5% fines; Olive Gray (5Y 4/2); Moist.	
40.0-41.0	25, 50-4"				GW	40.0-41.0 WELL GRADED GRAVEL WITH SAND: About 70% well rounded gravels to 2", about 30% well graded sands, trace fines; Light Olive Brown (2.5Y 5/3); Moist.	
45.0-45.7	10,50-2"				GW	45.0-45.7 WELL GRADED GRAVEL WITH SAND: About 70% well rounded gravels to 1", about 30% well graded sands, trace fines; Light Olive Brown (2.5Y 5/3); Moist.	
50.0-51.5	7,12, 12				SP	50.0-51.5 POORLY GRADED SAND: About 95% fine sand, about 5% fines; Dark Grayish Brown (2.5Y 4/2); Moist.	
55.0-56.5	7,24, 33				ML	55.0-56.5 SILT: About 100% non-plastic fines; Olive Brown (2.5Y 4/4); Moist.	
60.0					SP		

Continued



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## WELL LOG: MW-8

LOYALTON LANDFILL  
Sierra County, California

DATE DRILLED: Aug. 28, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5057 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5061.87 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 88 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
	7,8, 26				SP	60.0-61.5 POORLY GRADED SAND: About 95% fine sand with about 5% fines; Olive Brown (2.5Y 4/4); Moist.	
65	13,24, 50-4"				ML	65.0-66.0 SANDY SILT: About 40% fine sand and about 60% fines with low plasticity and strength; Olive Brown (2.5Y 4/4); Moist. 66.0-66.5 SILTY SAND: About 60% fine sand with about 40% fines with low plasticity and strength; Olive Brown (2.5Y 4/4); Moist.	
70	14,16, 25				CL	70.0-71.5 LEAN CLAY: About 10% fine to medium sand and about 90% fines with medium plasticity and strength; Olive Brown (2.5Y 5/3); Moist.	
75	9,9, 24				ML	75.0-76.5 SANDY SILT: About 40% fine sand and about 60% fines with low plasticity and strength grading to a SILTY SAND with about 60% fine sand and about 40% fines with low plasticity and strength at 76.0 feet; Light Olive Brown (2.5Y 5/3); Moist.	
80	15,36, 50-3"				SW	80.0-81.5 WELL GRADED SAND: About 100% fine to coarse sands with no fines; Very Dark Grayish Brown (2.5Y 3/2); Wet.	
85	6,6,9				SW	85.0-86.5 WELL GRADED SAND: About 100% fine to coarse sands with no fines; Very Dark Grayish Brown (2.5Y 3/2); Wet.	
90						Bottom of Boring at 88 feet	



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## WELL LOG: MW-9

LOYALTON LANDFILL  
 Sierra County, California

Page  
 1 of 4

DATE DRILLED: Aug. 29, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5073 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5076.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 95 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
6,8,8					SM	0.0-1.5 SILTY SAND: About 50% fine sand with about 50% non-plastic fines; Dark Brown (7.5YR 3/3); Dry to Moist at 1.0 feet.	
5	7,8,8				CL	5.0-6.5 LEAN CLAY: About 5% to 10% fine sand and 90% to 95% fines with medium plasticity and strength; Layer of mostly fine sand at 5.5' to 6.0'; Dark Gray (2.5Y 4/1); Moist.	
10	12,46, 50-6"				CL	10.0-11.5 SANDY LEAN CLAY: About 40% fine sand, about 60% fines with medium plasticity and strength; Dark Olive Gray (5Y 3/2); Moist.	
15	14, 50-4"				ML	15.0-15.8 SANDY SILT: About 30% fine to medium sand, about 70% non-plastic fines; Grayish Brown (2.5Y 5/2); Moist.	
20	10,35 50-6"				ML	20.0-21.5 SILT: About 5% fine sand, about 95% non-plastic fines; Olive Brown (2.5Y 4/3); Moist.	
25	50-6"				CL	25.0-25.5 LEAN CLAY: About 5% to 10% fine sand, about 90% to 95% fines with medium plasticity and strength; Olive Brown (2.5Y 4/3); Moist.	
30					ML		

Continued



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## WELL LOG: MW-9

LOYALTON LANDFILL  
 Sierra County, California

DATE DRILLED: Aug. 29, 2013	PROJECT: Loyalton Landfill
DRILLING METHOD: CME 85 - 10" HSA	SURFACE ELEVATION: ~5073 feet
DRILLING COMPANY: Cascade Drilling	TOP OF STANDPIPE ELEVATION: - 5076.10 feet
LOGGED BY: Craig Morgan, P.E.	TOTAL DEPTH OF BORING: 95 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
30.0-31.5	12,38 42				ML	30.0-31.5 SILT: About 5% fine sand, about 95% fines with low plasticity; Dark Grayish Brown (2.5Y 4/2); Moist.	<p>3" Sch 80 PVC</p> <p>3/4" Sch 80 PVC - 0.020" Slots</p> <p>#3 Lapis Lustre</p> <p>Bentonite</p> <p>3/4" Sch 80 PVC - 0.020" Slots</p> <p>#3 Lapis Lustre</p>
35.0-36.5	12,13 17				CH	35.0-36.5 FAT CLAY: Trace fine sand, about 100% fines with high plasticity and strength; Olive Brown (2.5Y 4/4); Moist.	
40.0-41.5	14, 50-5"				SW-SM	40.0-41.5 WELL GRADED SAND WITH SILT AND GRAVEL: About 60% well graded sand, about 30% rounded gravels to 2", about 10% fines; Dark Grayish Brown (10YR 4/2); Moist.	
45.0-45.2	50-2"				GW	45.0-45.2 WELL GRADED GRAVEL WITH SAND: About 40% well graded sand, about 60% rounded gravels to 2"; Brown (10YR 4/3); Moist.	
50.0-51.0	7,11, 50-0"				CL	50.0-51.0 LEAN CLAY: Trace fine sand, about 100% fines with medium plasticity and strength; Grayish Brown (10YR 5/2); Moist. broken Gravel in drive shoe.	
55.0-56.4	14,28, 50-4"				CL	55.0-56.4 LEAN CLAY: Trace fine sand, about 100% fines with medium plasticity and strength; Grayish Brown (10YR 5/2); Moist.	
60.0					ML		

Continued



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## WELL LOG: MW-9

LOYALTON LANDFILL  
 Sierra County, California

Page  
 3 of 4

DATE DRILLED: Aug. 28, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5073 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5076.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 95 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
60.0-61.4	13,14, 50-4"				ML	60.0-61.4 SANDY SILT: About 30% fine to medium sand, about 70% fines with low plasticity and strength; Dark Brown (10YR 3/3); Moist.	
65.0-67.75	26, 50-3"			ML	65.0-67.75 SILT: About 100% fines with low plasticity and strength; Grayish Brown (10YR 5/2) with some Strong Brown (7.5YR 4/6) stains; Moist.		
70.0-70.5	15,36, 50-3"			SW	70.0-70.5 WELL GRADED SAND WITH GRAVEL: About 60% fine to coarse sands, about 40% well rounded gravels to 1/2"; Brown (7.5YR 4/2); Moist.		
70.5-71.25						70.5-71.25 SILT: About 100% fines with low plasticity and strength; Brown (7.5YR 4/2); Moist.	
75.0-75.5	50-6"			ML	75.0-75.5 SILT: About 100% fines with low plasticity and strength; Grayish Brown (10YR 5/2) with many Strong Brown (7.5YR 4/6) stains; Moist.		
80.0-80.9	21,50 -5"			SM	80.0-80.9 SILTY SAND: About 80% fine sand, about 20% fines with low plasticity and strength; Grayish Brown (10YR 5/2) with a few Strong Brown (7.5YR 4/6) stains; Moist.		
85.0-86.5	12,12, 24			ML	85.0-86.5 SANDY SILT: About 20% fine sand, about 80% fines with low plasticity and strength; Grayish Brown (10YR 5/2) with many Strong Brown (7.5YR 4/6) stains; Moist.		
90							

Continued



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## WELL LOG: MW-9

LOYALTON LANDFILL  
Sierra County, California

Page  
4 of 4

DATE DRILLED: Aug. 28, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5073 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5076.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 95 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0	3,3,20				ML	90.5-91.5 SANDY SILT: About 20% fine sand, about 80% fines with low plasticity and strength; Grayish Brown (10YR 5/2); Wet.	
95						Bottom of Boring at 95 feet	
100							
105							
110							
115							
120							



DATE DRILLED: Aug. 30, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5034 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5037.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 70 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
0-5	8,14, 21				SM	0.0-1.5 SILTY SAND: About 85% fine to coarse sands, about 15% fines with low plasticity; Olive Brown (2.5Y 5/4); Dry.	
5-10	50-6"				SW	5.0-6.5 WELL GRADED SAND: About 95% fine to coarse sands, about 5% fines; Yellowish Brown (10YR 5/4); Dry.  - @ 7.5' Well graded sand with gravel to 2 inches.	
10-11					CL	- @ 9.0' Lean Clay.	
10-15	12,21, 28				SP	10.0-10.5 POORLY GRADED SAND: About 100% fine sand; Light Olive Brown (2.5Y 5/3); Moist. 10.5-11.5 SILTY SAND: About 85% fine sand, about 15% non-plastic fines; Light Olive Brown (2.5Y 5/3); Moist.	
15-20	12,20, 50-6"				ML	15.0-16.5 SILT: About 100% fines with low plasticity and strength; Grayish Brown (2.5Y 5/2) with Strong Brown (7.5YR 5/2) stains; Moist.	
20-25	12,21, 32				ML	20.0-20.5 SILT: About 100% fines with low plasticity and strength; Grayish Brown (2.5Y 5/2) with Strong Brown (7.5YR 5/2) stains; Moist. 20.5-21.5 WELL GRADED SAND WITH GRAVEL: About 60% fine to coarse sands, about 35% well rounded gravels, about 5% fines; Olive (5Y 5/3); Moist.	
25-30	50-6"				GW	25.0-25.5 WELL GRADED GRAVEL WITH SAND: About 15% fine to coarse sand, about 80% well rounded gravels, about 5% fines; Dark Yellowish Brown (10YR 3/4); Damp.	
30-35					ML		

Continued



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## WELL LOG: MW-10

LOYALTON LANDFILL  
 Sierra County, California

DATE DRILLED: Aug. 30, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5034 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5037.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 70 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
30.0-30.5	9,21, 50-3"				ML	30.0-30.5 SILT: About 5% fine sand, about 95% fines with low plasticity; Light Olive Brown (2.5Y 5/3); Moist.	<p>3" Sch 80 PVC - 0.020" Slots</p> <p>#3 Lapis Lustre</p> <p>Bentonite</p> <p>#3 Lapis Lustre</p> <p>55.7'</p>
30.5-31.25						30.5-31.25 WELL GRADED SAND WITH GRAVEL: About 60% well graded sand, about 40% rounded gravels to 3/4"; Strong Brown (7.5Y 3/4); Moist.	
35.0-35.5	9, 50-6"				CL	35.0-35.5 LEAN CLAY: About 100% fines with medium plasticity and strength; Light Olive Brown (2.5Y 5/3); Moist.	
35.5-36.0						35.5-36.0 SILT: About 100% fines with low plasticity and strength; Light Olive Brown (2.5Y 5/3); Moist.	
40.0-40.9	26, 50-5"				SW	40.0-40.9 WELL GRADED SAND WITH GRAVEL: About 60% well graded sand, about 40% rounded gravels to 1/2"; Dark Olive Brown (2.5Y 3/3); Moist.	
45.0-46.5	14,24, 33				ML	45.0-46.5 SILT: About 100% fines with low plasticity and strength; Olive Brown (2.5Y 4/3); Moist.	
50.0-50.5	21,35, 46				CL	50.0-50.5 LEAN CLAY: About 100% fines with medium plasticity and strength; Olive Brown (2.5Y 4/3); Moist.	
50.5-51.5						50.5-51.5 SILT: About 100% fines with low plasticity and strength; Olive Brown (2.5Y 4/3) with Strong Brown (7.5YR 3/4) stains; Moist.	
55.0-56.3	30,35, 50-4"				SW	55.0-56.3 WELL GRADED SAND WITH GRAVEL: About 60% well graded sand, about 40% rounded gravels to 3/4"; Dark Grayish Brown (2.5Y 4/2); Wet.	
55.5						- @ 55.5' Thin stringer of silt.	
55.8						- @ 55.8' Well graded sand with no gravel. Dark Grayish Brown (2.5Y 4/2) with a few Strong Brown (7.5YR 3/4) stains; Wet.	
60					CH		

Continued



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## WELL LOG: MW-10

LOYALTON LANDFILL  
Sierra County, California

DATE DRILLED: Aug. 30, 2013

PROJECT: Loyalton Landfill

DRILLING METHOD: CME 85 - 10" HSA

SURFACE ELEVATION: ~5034 feet

DRILLING COMPANY: Cascade Drilling

TOP OF STANDPIPE ELEVATION: - 5037.10 feet

LOGGED BY: Craig Morgan, P.E.

TOTAL DEPTH OF BORING: 70 feet

DEPTH (FEET)	BLOWS/6 IN.	PID (ppm)	SAMPLE	GRAPHIC LOG	USCS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
60.0-61.0	12, 50-6"				CH	60.0-61.0 FAT CLAY: About 100% fines with high plasticity and strength; Brown (10YR 5/3) with Dark Yellow Brown (10YR 3/4) stains; Moist.	<p>3" Sch 80 PVC - 0.020" Slots #3 Lapis Lustre</p>
65.0-65.5	50-6"			GW	65.0-65.5 WELL GRADED GRAVEL WITH SAND: About 40% well graded sand, about 60% rounded gravels to 3/4"; Brown (10YR 4/3); Wet.		
70.0-71.5	12,20, 22			GW	70.0-71.5 WELL GRADED GRAVEL WITH SAND: About 30% well graded sand, about 70% rounded gravels to 1-1/2"; Dark Grayish Brown (10YR 4/2); Wet.		
						Bottom of Boring at 70 Feet	