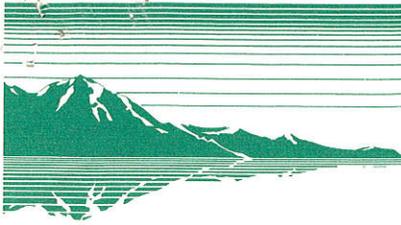


LFP



**AMERICAN GEOLOGICAL SERVICES, INC.**  
Environmental, Geological, and Natural Resource Consultants

September 13, 1996

Mr. Louis F. Pratt  
California Regional Water Quality Control Board  
Central Valley Region  
3443 Routier Road, Suite A  
Sacramento, CA 95827-3098

Dear Mr. Pratt,

Enclosed, please find a copy of our work plan for installation of three ground water monitoring wells at the Tosta Dairy site near Tracy, California. Drilling is tentatively scheduled for Wednesday, September 18, at 8:00 a.m.

If you have questions or comments regarding the work plan or any other aspects of the project, please do not hesitate to call me.

Respectfully submitted,



Ross R. Grunwald, Ph.D., R.G., C.Hg.  
Chief Operating Officer

enclosure

96 SEP 17 PM 1:31

SACRAMENTO  
CVRW009

# **WORK PLAN**

## **INITIAL GROUND WATER INVESTIGATION**

**TOSTA DAIRY  
20662 SAN JOSE ROAD  
TRACY, CA**

By

American Geological Services, Inc.  
P.O. Box 3446  
14847 Mono Way  
Sonora, CA 95370

Tel (209) 532-8021  
FAX (209) 532-3809

September 11, 1996

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## **1.0 INTRODUCTION**

### **1.1 General**

American Geological Services, Inc. (AGS) has prepared this work plan to initiate a ground water investigation at the proposed Tosta Dairy In Tracy, California (Figure 1). This work plan has been developed based on direct field observations made by AGS personnel.

### **1.2 Site Description**

The proposed Tosta Dairy is located on the east side of San Jose Road approximately four miles northwest of Tracy, California. The site is situated in Section 12, T2S., R4E (Figure 1). It is designated by San Joaquin assessor's parcel number APN: 209-290-07.

### **1.3 Background Information**

The proposed site of the new Tosta Dairy was the locale of dairy operations from at least World War I up until about eight years ago. At that time the operation was shut down and the herd slaughtered.

At the present time, new dairy facility is under construction at the site. The plans call for a facility containing a total of 969 animal units. Solid and liquid wastes from the facility will be separated with each component going to a separate collection and storage lagoon.

Wastes from the solid and liquid storage lagoons will be distributed as fertilizer over 216 acres of cropland on which corn and oats will be grown.

### **1.4 Site Geology**

The Tosta Dairy site is situated on the western side of the Central Valley of California and lies within the San Joaquin River drainage. From field inspection, the soils underlying the site are composed of fine grained silts and clays of fluvial origin.

### **1.5 Site Hydrology**

The owner, Henry Tosta stated that the water table is situated approximately 4-5 feet below ground surface. However, the character of the soils exposed at the surface and the fact that several different levels of standing water were observed in lagoons and ditches on the property suggest that the near surface soils have a low transmissivity. This is supported by the fact that the water supply wells on the property, which are located near San Jose Road, have an artesian head. These wells are completed at a depth of approximately 80 feet below the surface,

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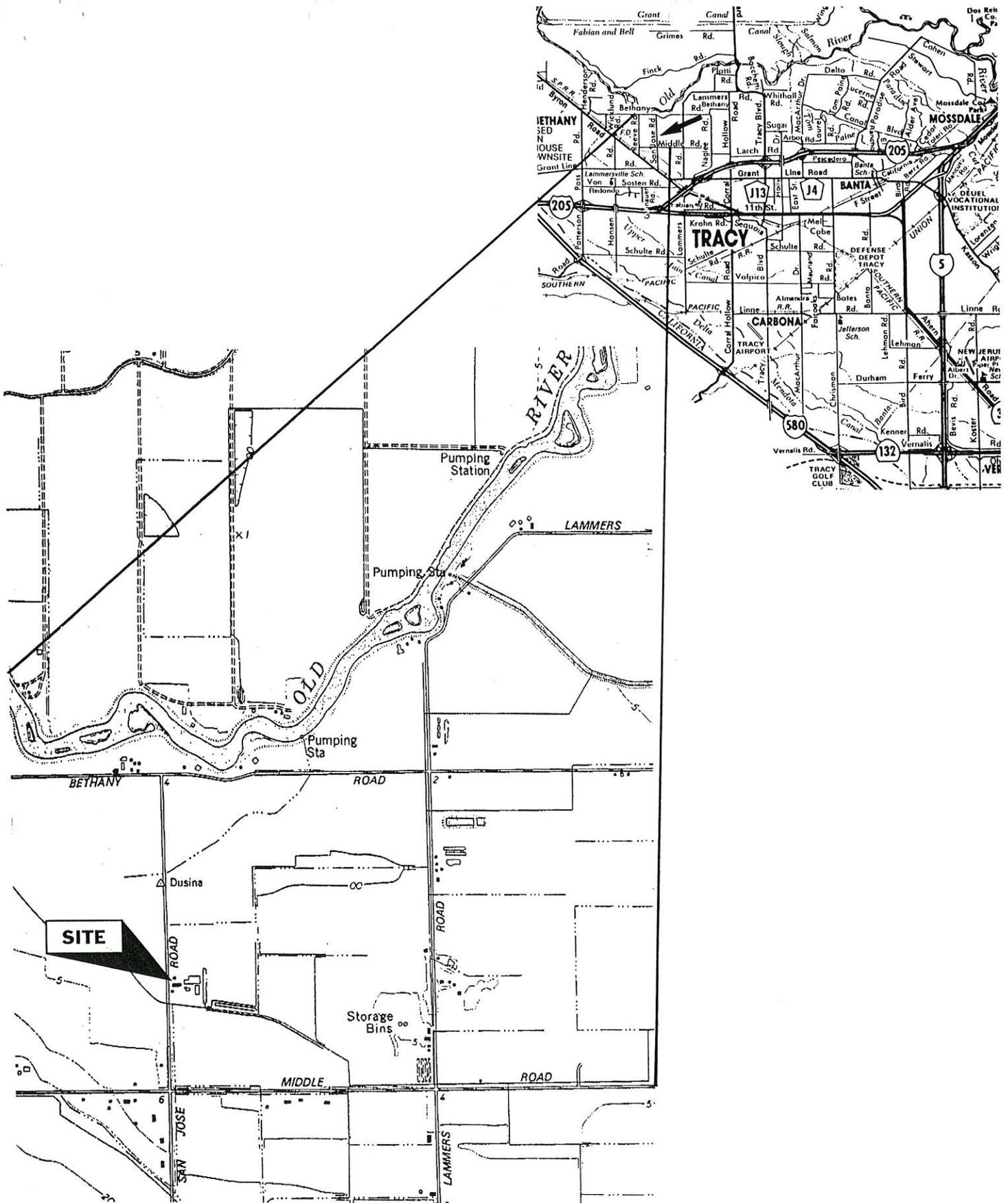


Figure 1 Location Map for Tosta Dairy.  
Scale: 1" = 2,000 Feet

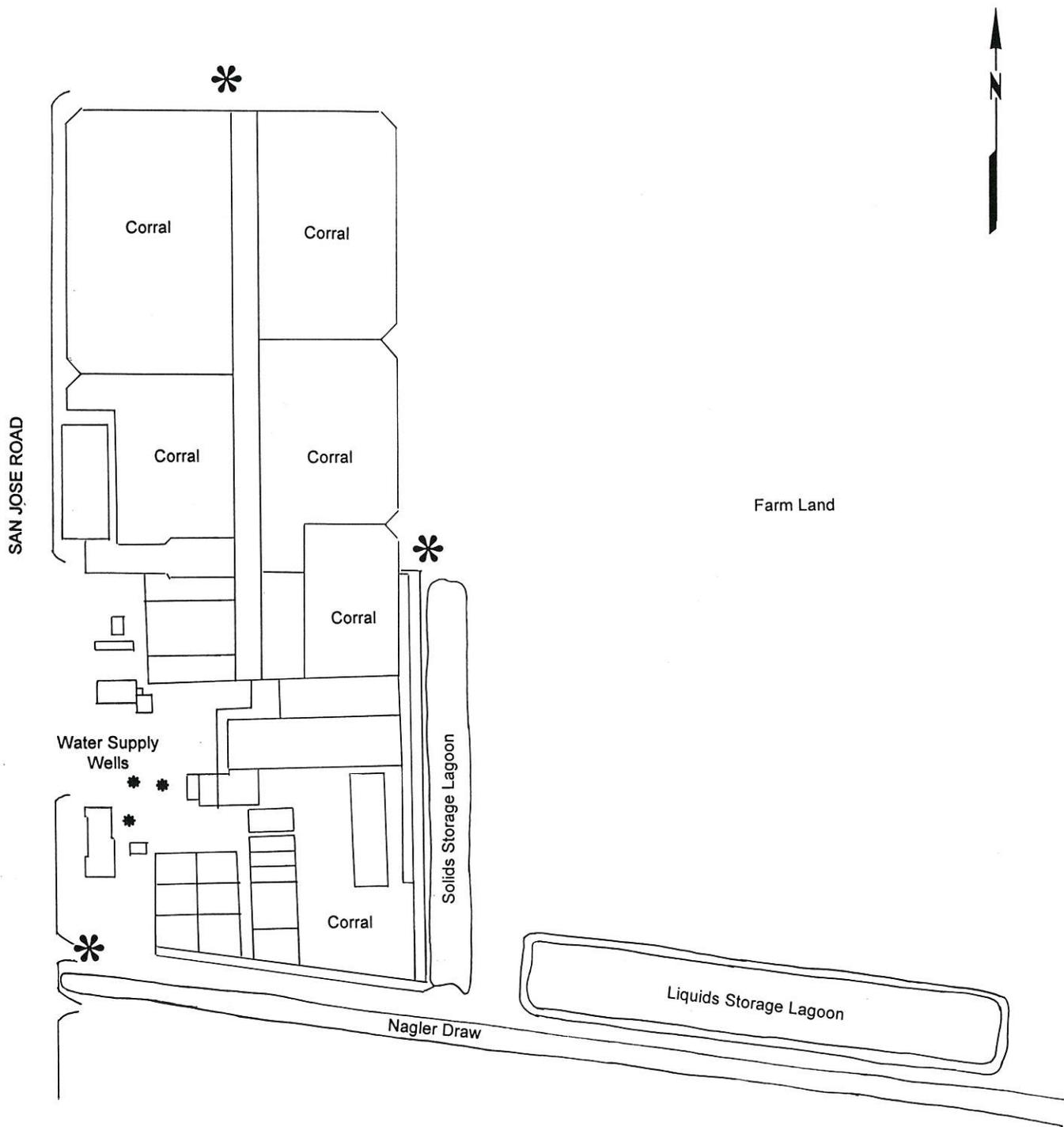


Figure 2. Site Map of Tosta Dairy showing Proposed Location of Monitoring Wells. Scale: 1"=200'

Monitoring Well: \*

## **2.0 OBJECTIVES AND SCOPE OF WORK**

### **2.1 Objectives**

The objective of this phase of the investigation is to determine the possible impact to ground water caused by the previous operation of a dairy at the site and to establish a baseline of Nitrate and Total Dissolved Solids in the ground water at or just below the water table. The second objective is to provide a means of long term monitoring of any possible impacts that the dairy operation will have on ground water in the future. In order to accomplish the above-stated objectives, the following scope of work is proposed.

### **2.2 Scope of Work**

#### **Task 1 - Planning and Permits**

- Conduct a site background investigation.
- Prepare and submit this project work plan to the California Regional Water Quality Control Board (CRWQCB).
- Prepare and submit a site specific Health and Safety Plan (HASP) to the CRWQCB.
- Conduct a local water well survey to locate any domestic or municipal wells that may be impacted by any possible contamination.
- Obtain appropriate drilling permits.

#### **Task 2 - Monitoring Well Installation and Sampling**

- Install, develop, and sample three monitoring wells.
- Submit ground water samples to a California State certified analytical laboratory for analysis of nitrates and total dissolved solids by approved methodologies.

#### **Task 3 - Report Preparation**

- Interpret all laboratory sample analyses and field data.
- Prepare site maps, drill logs, cross-sections and other documentation for the report.
- Investigate and evaluate possible interim remediation alternatives, if necessary.
- Prepare a report utilizing a California Registered Geologist in accordance with California State guidelines that presents all analytical data and interpretations, and recommendations for further work as appropriate.

### **3.0 SITE WORK PLAN**

The following sections describe in detail the tasks to be conducted in the performance of this work plan. The scope of work is designed to meet the objectives for this phase of the project as outlined above.

#### **3.1 Planning and Permits**

The work plan and HASP will be submitted to the CRWQCB for their review and approval. Upon their approval, monitoring well installation permits will be obtained from the San Joaquin County Public Health Services, (PHS). Notification will be made to Underground Service Alert (USA) to mark out all underground utilities in the vicinity of anticipated drilling locations if required.

#### **3.2 Monitoring Well Installation and Sampling**

AGS proposes to install three ground water monitoring wells to determine the possible impacts to ground water caused by former dairy at the site.

The following sections describe the installation, sampling and analysis to be performed for each monitoring well installed.

##### **3.2.1 Monitoring Well Installation**

Monitoring well installation permits will be obtained, as necessary, for the monitoring wells before drilling begins. Underground Service Alert (USA) will be notified at least 48 hours in advance of the drilling to mark all underground utilities in the vicinity of anticipated boring locations. All overhead utilities or other obstructions will be noted and referred to the driller prior to rig setup on any boring location.

Each monitoring well boring will be advanced using a hollow stem auger drill rig with a minimum outside hole diameter of eight inches. Each boring will be advanced to a depth of approximately fifteen feet below the ground surface. Chip samples will be collected at five foot intervals for logging purposes and retained for future reference.

After completion of the boreholes, they will be completed as ground water monitoring wells. The ground water monitoring wells will be constructed of 2-inch inside diameter (ID), flush threaded schedule 40 PVC casing and 0.02-inch factory perforated screen. A filter pack of clean #3 silica sand will be installed in the annulus of the well boring from the base of the well boring to approximately one foot above the screened interval. A one foot thick seal of bentonite chips will be installed in the boring annulus above the sand filter pack and hydrated with potable water.

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A cement/bentonite slurry grout will be used to seal the borings from the top of the bentonite seal to the surface. All wells will be completed above the existing grade using 8 to 10 inch diameter steel well monuments set in concrete. Each well monument will extend approximately 30 inches above the ground surface and be secured with a padlock. Each well head will be secured with a water-tight well cap. A schematic diagram of the proposed monitoring well construction is included in Appendix C.

All monitoring wells will be drilled by a California State licensed drilling contractor with experience in environmental projects. Soil drill cuttings generated during soil boring and monitoring well installation will be stored on-site.

Prior to drilling each well boring, all drilling and sampling equipment will be thoroughly decontaminated as specified in the SOP (Appendix A). Monitoring well locations and elevations to the point of measurement (POM) scribed in the well casing will be surveyed by a licensed California surveyor to 0.01 foot accuracy and locations and elevations will be plotted on a site plan map for inclusion in the report.

### **3.2.2 Development and Sampling of Monitoring Wells**

All ground water monitoring wells will be allowed to set for at least 24 hours following their completion. Each well will be developed by alternately surging and pumping using a manual surge block and submersible pump. Well development will continue for at least one hour or until the field geologist determines that the water is reasonably clear and free of silt and sediment. The SOP and QA/QC Plan contain information on these procedures (Appendix A).

Sampling of monitoring wells will proceed after well development. AGS will collect ground water samples from each monitoring well after purging between three and five well volumes of ground water from each well. During purging, ground water quality parameters will be monitored and recorded on the appropriate well sampling forms. Wells will be purged until water quality stabilization has occurred. Stabilization will have been reached when two consecutive temperature, pH, and conductivity readings do not vary by more than 10%. Purged well water will be containerized and stored on-site in metal 55 gallon drums pending analytical results. The SOP and QA/QC Plan contain information on these procedures (Appendix A).

After well purging has been completed, a ground water sample will be collected from each well. Samples will be collected by lowering a clean disposable polyethylene bailer attached to new poly twine into the well. Alternatively, the samples may be collected using a decontaminated PVC bailer. Ground water sampled from each well will be transferred into one laboratory provided clean glass amber liter bottles. Properly collected samples will be labeled with the location, date and time of collection, and immediately placed into a cooler chilled to 4° Celsius. All samples will be handled under chain of custody procedures and delivered to the analytical laboratory within 48 hours. The samples will be analyzed in Modesto, California by GeoAnalytical Laboratories, a California State certified analytical laboratory. Section 3.2.3 listed below describes the analytical procedures in greater detail.

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### **3.2.3 Laboratory Analysis of Ground Water Samples**

All ground water samples collected for analysis will be stored in a cooler chilled to 4° Celsius and shipped under strict chain of custody protocol to the analytical laboratory. The samples will be analyzed in Modesto, California by GeoAnalytical Laboratories, a California State certified analytical laboratory for the following constituents:

- Nitrate, as N, Method 300  
detection limit, 1.0 mg/L.
- Total Dissolved Solids (TDS), Method 160.1  
detection limit 10 mg/L.

### **3.3 Preparation of Investigation Report**

At the conclusion of the collection of all pertinent field data and laboratory analyses an investigation report will be prepared. The report will be prepared under the direction of, and signed and sealed by a California Registered Geologist, pursuant to the State of California Business and Professional Code (Sections 6735, 7835, and 7835.1). This report will meet the reporting requirements of the Central Valley Regional Water Quality Control Board.

The report will contain appendices of all data and analyses, field notes, observations, tables, photos, drawings, cross-sections, boring logs, figures, charts or graphs, and other graphical representations produced during the investigation that are necessary to clarify conclusions. The findings with regard to the existing conditions on the site will be discussed. In addition to the on-site conditions, observations and potential impacts of adjacent facilities/sites will be discussed, if warranted. The report will include an executive summary of the investigation activities and results, a tabulation of all soil and ground water data, laboratory data sheets, and recommendations for future work as required.

## **4.0 TIME SCHEDULE**

Upon approval of this work plan and procurement of the necessary well drilling permits, AGS is prepared to begin field work, as described in Section 3.0, within 10 working days. The borehole drilling, and the installation, development and sampling of the monitoring wells is anticipated to take no more than 5 working days. Within 30 working days after completion of the field activities and receipt of all analytical data, AGS will prepare and submit for review the investigation report. This schedule is given as an estimate only. Weather and site conditions, regulatory requirements or changes in equipment availability may affect the schedule. AGS will make every effort to complete all tasks on schedule and will make appropriate notification of significant changes to the work schedule.

**American Geological Services, Inc.**

## 5.0 REMARKS AND SIGNATURES

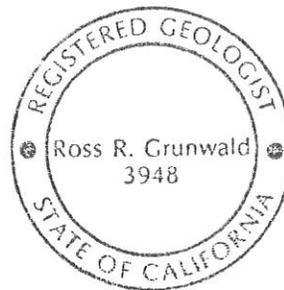
This work plan has been prepared by American Geological Services, Inc. for the Tosta Dairy site. The data and information used in the preparation of this work plan was believed to be complete and accurate at the time of writing, however, AGS makes no warranty as to the completeness or accuracy of the data obtained from outside sources. As such, any recommendations or conclusions based upon such data are subject to revision as deemed necessary.

All aspects of this investigation will be performed by AGS in accordance with applicable laws, regulations, geologic and hydrologic standards in effect at the time of this writing. At no time is any warranty, either express or implied, made with respect to the geologic or hydrologic conditions beneath the Tosta Dairy site.

This work plan was prepared by:



Ross R. Grunwald, Ph.D.  
California Registered Geologist #3948  
California Certified Hydrogeologist #269



9/12/96

Date



Glen T. White  
Registered Geologist #6563



American Geological Services, Inc.

# **Appendix A**

## Quality Assurance/Quality Control Plan

**STANDARD OPERATING PROCEDURES**

**AND**

**QUALITY ASSURANCE AND  
QUALITY CONTROL PLAN**

For

**TOSTA DAIRY  
20662 SAN JOSE ROAD  
TRACY, CA 9533895376**

**BY**

**AMERICAN GEOLOGICAL SERVICES, INC.**

P.O. Box 3446  
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FAX: (209) 532-3809

September 6, 1996

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## 1.0 INTRODUCTION

American Geological Services, Inc. (AGS) has developed these Standard Operating Procedures (SOPs) and stringent Quality Assurance and Quality Control (QA/QC) procedures for all project activity. These QA/QC procedures insure that a high level of confidence is maintained on all collected data, and the conclusions and recommendations derived from this data. American Geological Services, Inc. believes that it is extremely important to collect as representative a sample as possible and to describe that sample thoroughly at the time and place of collection.

This document summarizes the SOPs and QA/QC procedures proposed by AGS for work at the Tosta Dairy site. These procedures contained in this document and the attached forms should be considered *proprietary* and *confidential*.

Prior to the beginning of field data collection the Quality Level of the project investigation must be determined. The importance of the field and analytical data relative to the risks of the study determine the Quality Level required. General descriptions of the Quality Levels are listed below:

**Quality Level 1:** Projects with relatively low risk involving a simple scope, narrow focus, and low budget, such as preliminary assessments.

**Quality Level 2:** Projects related to hazardous waste sites, waste supply development, permit applications, Remedial Investigations and Feasibility Studies, and enforcement cases.

**Quality Level 3:** Projects with high risk which will be intensely scrutinized such as waste management facilities, power plants, and enforcement cases.

Stringent steps are taken to ensure that all field and analytical data are complete and accurate. The following procedures are utilized with all data:

**Verification:** All field and analytical data entered into data bases or various software applications are verified with the original field and analytical sheets, and that these entries fall within the range of valid values.

**Validation:** Comparison of data to nearby sample intervals, sample duplicates, or sample replicates to ensure that highly skewed data are noted and qualified during interpretation. For projects involving the collection of a large number of samples from the same media, such as a soil grid, an Analysis of Variance will be conducted.

**Documentation:** Standardized procedures are followed to ensure that only verified and validated data are utilized for interpretation and final documentation.

**Revision Procedures:** Due to the subjective nature of field data, such as geologic descriptions and observations, revision procedures have been developed. These procedures insure that the original observations and the revisions are included so that subsequent users can evaluate all information.

## **2.0 PROJECT MANAGEMENT**

Dr. Ross R. Grunwald will be assigned as Principal in Charge, Project Manager, and Health and Safety Officer. Mr. Glen T. White will be assigned as Project Geologist and QA/QC Officer.

## **3.0 FIELD PROCEDURES**

### **3.1 General Sampling Procedures**

The following general sampling procedures will apply to all sampling, regardless of media type, for all environmental projects:

- All sampling and monitoring will be conducted by professional geologists or engineers under the direction of a Registered Geologist or Engineer. All daily field activities will be recorded on a Daily Field Log form.
- Each sample will be labeled with the sample number, sample type, sample location, well or boring number, project number, date and time of collection, and sample collector's initials. Sample numbers will also be hand written on the PVC caps or glass surface of the sample vial.
- All samples will be received by a certified and client approved laboratory within 48 hours of the time of collection.
- All water, soil, and product samples will be sealed in plastic ziplock bags, and chilled to approximately 4°C in an insulated ice chest to retard sample degradation. Samples will remain refrigerated until received by the analytical laboratory.
- All samples collected will be listed on Chain-of-Custody forms. These forms will contain all the sample information from the sample label, in addition, information on sample preservation, analysis requested, and the signatures of the sample collector and any other

person involved in the chain of custody, including the times and dates of possession. American Geological Services, Inc. will retain a copy of the Chain-of-Custody form when the samples are delivered or shipped to the laboratory.

- Projects requiring a Quality Level of 2 or 3 may have select duplicate samples collected in the field or replicate analysis conducted to validate the reliability of the samples.
- For projects involving the collection of a large number of samples from the same media, such as a soil grid, an Analysis of Variance will be conducted. An Analysis of Variance may be one-way or two-way, hierarchical analysis, with or without within-cell replications. The hierarchical design including the number of site duplicates and laboratory replicates is designed before sampling begins.
- All field procedures and activities will be conducted in accordance with the Health and Safety Plan which will be prepared and approved for this project.

### **3.2 Soil Sampling Procedures**

- All soil borings will be drilled by a state-licensed drilling contractor.
- All sampling equipment; hand auger, hollow-stem auger flights, drilling rods and bits, and split spoon will be thoroughly cleaned., and brass and stainless tubes will be cleaned in tap water, scrubbed in a laboratory grade, non-phosphate detergent solution, rinsed with tap and deionized water before and between uses to prevent cross contamination.
- Surface soil samples are collected as undisturbed samples encased in removable brass or stainless steel liners. The liners are removed from the sampling device, covered with aluminum foil or Teflon tape and vinyl end caps and sealed with adhesive tape, if aluminum foil is used.
- Split spoon samples are collected in brass or stainless steel sampling tubes which are covered with aluminum foil or Teflon tape and PVC or vinyl caps. The caps are sealed with adhesive tape, if aluminum foil is used, to inhibit the escape of volatile compounds.
- Plastic, vinyl or Nitrile gloves will be worn during sampling and changed between samples.
- All soil samples will be labeled, chilled, and processed as described in Section 3.1. All sample information will be recorded on Boring Log Forms or soil/sediment sample forms.
- Soil samples collected for volatile organic compounds will be periodically screened, as determined by the site geologist, in the field by head space analysis. Samples are placed in a

clean glass container and covered with aluminum foil and covered with a screw lid. A photoionization detector (PID) is used to analyze the headspace of the samples. The PID will be calibrated using calibration gas. The results of this screening will be used for selection of representative samples for laboratory analysis, and as data for determining the boring depth.

- All soil samples will be described in the field. Field observations noting sediment type, color, grain size, sorting, hardness, texture, clay content, moisture content, visible evidence of contamination, odor, and any other information important to the investigation.

These soil sampling procedures are designed to:

- ensure that representative soil samples are collected and accurately described in the field.
- ensure that all boring logs, sample descriptions, and field observations are consistent and accurate.
- minimize the risk of cross-contamination between samples.

### **3.3 Well Water Sampling Procedures**

Prior to sampling of monitoring or other wells, the water level will be measured and the wells will be purged of three to five casing volumes or until well is dry. Bailers or submersible pumps used for purging will be thoroughly cleaned before and between samples, or disposable bailers may be used. The amount of casing volume of water in the well can be calculated with the formula:

$$r^2 \times (h_1 - h_2) \times 7.48 \text{ gallons/ft}^3 = \text{gallons/casing volume, where:}$$

$r$  = inner radius of casing (ft)

$h_1$  = depth of well (ft) from top point measurement (normally from reference mark in casing)

$h_2$  = depth to water (ft) from top of point of measurement (POM).

For most wells Table 1 can be used to calculate the casing volume of water in the well.

$$\text{Casing Volume} = \text{Water Depth (ft)} \times \text{Volume Factor}$$

**TABLE 1**

<b>CASING I.D.</b>	<b>VOLUME FACTOR</b> gal./liner foot
2 inch	0.16
3 inch	0.37
3.5 inch	0.50
4 inch	0.65
4.25 inch	0.74
4.5 inch	0.83
6 inch	1.47
8 inch	2.61
10 inch	4.08

- The purged water will be periodically tested for pH, temperature, turbidity, conductivity, or other parameters as deemed necessary by the site geologist/hydrologist. All testing instruments will be calibrated prior to use. All instrument probes/sensors will be thoroughly cleaned and rinsed with deionized water before and between samples. All data will be recorded on well sampling forms.
- Purged wells will be immediately sampled, once the wells have been purged as described above and the field water parameter tests have stabilized. Stabilization will be considered reached when two consecutive pH, temperature, and conductivity readings do not vary more than 10%, indicating that formation water has been reached. Wells that are purged dry will be sampled after they are approximately 80% recovered, or after 24 hours, whichever comes first.
- Plastic, vinyl or Nitrile gloves will be worn during sampling and changed between samples.
- Water samples will normally be collected with disposable bailers. Normally, two samples will be collected from each well, in case additional analytical work is required later. The samples will be carefully handled to prevent agitation and subsequent aeration. The samples will be immediately transferred to EPA-approved VOA bottles/vials of appropriate size, and

filled completely without headspace. Samples for organic analysis are not filtered or chemically preserved.

- All water samples will be labeled, chilled and processed as described in Section 3.1.
- Projects requiring a Quality Level of 2 or 3 may have select duplicate samples collected in the field or replicate analysis conducted to validate the reliability of the sample. A trip blank and equipment blank may also be submitted. Blanks and duplicate samples will be labeled, stored, and handled identically to all other samples.
- Water samples for heavy metal or inorganic constituents will be collected in clean, acid-rinsed EPA-approved vials or bottles. Before sampling, the bottle will be rinsed several times with the water to be sampled. The water will be filtered using a 0.45  $\mu\text{m}$  membrane filter. Filtering removes the large colloids and sediments. At least 500 ml of water will be collected from each site. Samples will be acidified with  $\text{HNO}_3$  to a pH of approximately 2. This will insure that the cations will remain in solution. Samples for anions and other constituents will be collected in raw state, unfiltered and untreated.

These well sampling procedures are designed to:

- ensure that well water samples are representative of formation waters.
- ensure that all sample descriptions and field observations are consistent and accurate.
- minimize the risk of cross-contamination between samples.

### **3.4 Surface Water Sampling Procedures**

- Plastic, vinyl or Nitrile gloves will be worn during sampling and changed between samples.
- Normally two samples will be collected from each site, in case additional analytical work is required later. The samples will be carefully handled to prevent agitation and subsequent aeration. The samples will be immediately transferred to EPA-approved VOA bottles/vials of appropriate size, and filled completely without headspace.
- All water samples will be labeled, chilled and processed as described in Section 3.1.
- Projects requiring a Quality Level of 2 or 3 may have select duplicate samples collected in the field or replicate analysis conducted to validate the reliability of the sample. A trip blank may be submitted to ensure sample integrity. Blanks and duplicate samples will be labeled, stored, and handled identically to all other samples.

- Water samples for heavy metal or inorganic constituents will be sampled as described above in Section 3.3.
- On-site determinations for pH, conductivity, temperature, and dissolved oxygen will be conducted at each site. Field observations will be recorded for sample source, width and depth, turbulence and aeration, suspended or organic material, precipitates or algae, bedrock geology, vegetation, and possible contaminants.

These surface sampling procedures are designed to:

- ensure that surface water samples are representative.
- ensure that all sample descriptions and field observations are consistent and accurate.
- minimize the risk of cross-contamination between samples.

### **3.5 Free Product Monitoring and Sampling**

- When present, the free product thickness will be monitored using a clear PVC bailer. The free product thickness and ground water level will be recorded on Well Monitoring forms.
- Any equipment used in wells containing free product will not be used in other wells to prevent cross-contamination.
- All free product removals will be described on Free Product Removal forms.

These procedures are designed to:

- ensure that all free product thicknesses, descriptions, and field observations are consistent and accurate.
- minimize the risk of cross-contamination to wells without free product.

### **3.6 Analytical Procedures**

American Geological Services, Inc. will subcontract all analytical work to GeoAnalytical Laboratories, Inc. in Modesto, California, a state certified analytical laboratory. All analytical work is monitored to insure that the correct EPA approved methodology is utilized for the

substance(s) being investigated. Chain-of-Custody and QA/QC procedures are followed and monitored at all times.

### **3.7 Well Installation Procedures**

- All wells will be installed by state-licensed drilling companies. All Federal, State, and Local regulations will be followed, including obtaining all required permits.
- Monitoring well construction detail will be recorded on a boring/well log form.
- Bentonite seals/grout will be used for surface seals to prevent surface water/product infiltration.
- Wells will be installed with locking caps with padlocks, and wells will be completed in well monuments approximately three feet above grade to prevent surface runoff from entering the well box.
- Permanent reference marks will be cut in the casing tops to provide consistent reference points for fluid level measurements.
- All well locations and elevations will be surveyed by a state registered Land Surveyor. All well locations and elevations will be plotted on the site map and entered into the project data base.
- Monitoring wells, piezometers, vapor extraction, injection, observation wells, and air sparging wells will be constructed of threaded PVC or stainless steel casing and screens.
- Screen, casing, filter pack for monitoring or remediation wells will be installed through the hollow stem auger flights under unstable borehole wall conditions. When borehole wall conditions are stable screen, casing, and filter pack may be installed immediately after removal of auger flights or drill tooling.
- Unconsolidated soils and sediments will be drilled with a hollow stem auger, consolidated and cemented sediments, and bedrock will be drilled with rock bit, tricone, air rotary or other method depending upon the situation.

### **3.8 Well Development and Monitoring Procedures**

- Newly installed monitoring or extraction wells are allowed to set at least 24 hours after completion. Wells are developed by alternately pumping and surging. Well development

will continue for at least one hour or until the site geologist determines that the discharge is free and clear of silts and sediments.

- Wells will be purged as described in Section 3.3.
- The depth to water and total depth of all wells will be measured prior to sampling. Depth measurements will be made from the permanent mark described in Section 3.7. Depth to water measurements shall be accurate to within 0.01 foot.

### **3.9 Soil and Waste Water Management Procedures**

- All soil cuttings and ground water generated during drilling, well development, purging, and sampling will be stored on site in bins, drums, or tanks pending analysis, transport, and disposal as may be required.
- Uniform Hazardous Waste Manifests or Non-Hazardous Waste Data Forms, if required, will accompany any soil or water transported off site.

### **4.0 REPORTING PROCEDURES**

Strict QA/QC procedures for data entry and management will be utilized on all projects. All field and analytical data entered into data bases or various software applications are verified with the original field and analytical sheets, and that these entries fall within the range of valid values. Comparison of data to nearby sample intervals, sample duplicates, or sample replicates to ensure that highly skewed data are noted and qualified during interpretation. Standardized procedures are followed to ensure that only verified and validated data are utilized for interpretation and final documentation.

Internal technical peer group reviews of all data and reports are conducted prior to final release of any reports or documents.

## **Appendix B**

Health and Safety Plan

# HEALTH AND SAFETY PLAN

**Tosta Dairy  
20662 San Jose Road  
Tracy, California**

Prepared For:

Henry Tosta  
20662 San Jose Road  
Tracy, CA 95376

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## **1.0 INTRODUCTION**

American Geological Services, Inc. has adopted stringent Health and Safety procedures for all project activity. These procedures ensure that a high level of safety for human health is maintained at all times. This Health and Safety Plan is used as a guide to all site personnel to minimize the risks associated with hazardous substances and working conditions for these projects. OSHA and RCRA consider the following key items as important parts of safe hazardous waste management:

- Recognition and understanding of physical and health risks;
- Knowledge of dangerous physical and chemical properties;
- Understanding the need for protective clothing and equipment, and what to use under varying situations;
- Emergency procedures and contingency plans;
- Decontamination procedures;
- Safe and correct equipment use and maintenance.

This Health and Safety Plan covers the procedures to be used for this project. It is not always possible, or feasible to address all possible hazards associated with ongoing dynamic projects. This plan addresses the fundamental issues of known concern. As additional information is generated during the operation of a given project the Health and Safety Plan may be periodically modified.

The provisions of this project Health and Safety Plan will apply to all American Geological Services, Inc. personnel and its subcontractors. Employees of the client, and of Federal, State, and local regulatory agencies are expected to follow safety guidelines established by their respective organization in addition to this plan.

## **2.0 SITE DESCRIPTION AND HISTORY**

### **2.1 Location and Setting**

### **2.2 Previous Investigations**

## **2.3 Site Geology**

## **2.4 Site Hydrology**

## **3.0 SCOPE OF WORK**

### **Task 1 - Planning and Permits**

- Conduct a site background investigation.
- Prepare and submit this project work plan to the the California Regional Water Quality Control Board (CRWQCB).
- Prepare and submit a site specific Health and Safety Plan (HASP) to the CRWQCB.
- Conduct a local water well survey to locate any domestic or municipal wells that may be impacted by any site contamination.
- Obtain appropriate drilling permits.

### **Task 2 - Monitoring Well Installation and Sampling**

- Install, develop, and sample three monitoring wells.
- Submit ground water samples to a California State certified analytical laboratory for analysis of total nitrates and total dissolved solids by approved methodologies.

### **Task 3 - Report Preparation**

- Interpret all laboratory sample analyses and field data.
- Prepare site maps, drill logs, cross-sections and other documentation for the report.
- Prepare a report utilizing a California Registered Geologist and Certified California Hydrogeologist in accordance with California State guidelines that presents all analytical data and interpretations.

## **4.0 PROJECT MANAGEMENT AND RESPONSIBILITIES**

### **4.1 Project Manager**

Dr. Ross R. Grunwald will be assigned as project manager who will be responsible for the overall performance and compliance with applicable regulations, and the Health and Safety Plan guidelines.

## **4.2 Site Health and Safety Officer**

Dr. Ross R. Grunwald will be assigned as Health and Safety Officer who will be responsible for the on-site Health and Safety procedural guidelines compliance. This individual has the authority to stop on-site work due to safety infractions, and can upgrade the safety requirements based on his judgment. The Health and Safety Officer will fill out and maintain all records, checklists, and logs, and will keep a copy of this plan at the site. Due to the small size of this project the Project Manager will serve as the Health and Safety Officer.

## **5.0 SITE HAZARD ANALYSIS**

### **5.1 Primary Health Hazards**

The proposed scope of work described in the Work Plan and all available analytical information regarding hazardous substances which could be encountered at the site will be used to outline the anticipated health hazards. The known hazardous materials at this site consist of ammonia and associated compounds which may have infiltrated into the soil and ground water from previous use of the site as a dairy.

The primary health hazards associated with exposure are provide below in this project plan. The associated permissible exposure limits (PEL), if available, will also be included. The PEL will be defined by state and federal regulations. The PELs are based on research guidelines from the National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH).

Table 4 lists the PEL's for the hazardous substances which may be encountered during this project, based on California regulations.

**TABLE 4**

PRIMARY COMPOUND	CAL/OSHA (1) (PPM)	PATHWAY	PRIMARY SYMPTOMS
Ammonia	25 TWA (2) 18 STEL (3)	Inhalation Ingestion	· Irritation of eyes, nose & throat. ·
Notes: (2) TWA = 8 hour time weighted average (3) STEL = Short term exposure limit - The TWA concentration which workers should not be exposed for longer than 15 minutes, and which should not be repeated more than four times per day, with at least 60 minutes between successive exposures			

## 5.2 Physical Hazards

Table 5 shown below describes potential hazards and their associated required safety measures.

**TABLE 5**

POTENTIAL HAZARDS	REQUIRED SAFETY MEASURES
Fire	Open flame or tobacco smoking will be strictly prohibited in the work area. Fire extinguisher will be readily available. Equipment will be shut down during refueling.
Head Injury	Hard Hats will be worn.
Eye Injury	Safety glasses with side shields will be worn around moving machinery, during sampling operations, and in any eye hazard work areas.
Foot Injury	Safety Shoes with steel toes and shanks will be worn.
Noise	Ear plugs and/or noise mufflers will be worn whenever loud machinery is in use.
Inhalation	Appropriate respiratory protective equipment will be used, as directed by the Health and Safety Officer.
Slips and Falls	Appropriate warning signs will be posted, wherever this danger exists. When possible, hazards will be marked with bright colored flagging or paint.
Utilities	Location of all underground utilities will identified, mapped, and marked. All aerial utilities will be identified and mapped. A site map with all utilities will be provided.
Extremity Injury	Guards will be required, when possible, on all moving parts, belts, and pulleys.

## 5.3 Exposure Hazards

### 5.3.1 Heat and Cold Stress

Heat stress and its associated complications is one of the most prevalent health concerns on hazardous waste sites, especially when protective clothing is being used. When heat stress conditions may exist all workers shall be encouraged to ingest additional fluids, which will be readily available on-site. Under high temperature conditions or where level C or higher protection is required, a work/rest schedule shall be instituted.

Cold stress and associated complications occur during periods of low temperature and/or high wind chill conditions. Under these conditions protective thermal clothing will be provided.

### **5.3.2 Hazardous Materials Exposure**

Air monitoring of the work area will be conducted to measure the levels of airborne ammonia vapors during sampling activities. If strong ammonia vapor odors are noted in the work area, a Draeger air sampling pump and detector tubes. Background readings will be collected upwind from the site.

The Health and Safety Officer shall require all site personnel to utilize the proper level of PPE or leave the site until monitoring confirms a safe working environment. The maximum level of PPE which may be required on this project is anticipated to be Level C. Most likely only level D protection will be necessary.

### **5.3.3 Personal Protective Equipment**

The following are the EPA's recommended Levels of Personal Protective Equipment:

- Level A** Provides the highest available level of respiratory, skin, and eye protection.
- Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;
  - Fully-encapsulated, chemical-resistant suit;
  - Inner chemical-resistant gloves;
  - Chemical-resistant safety boots/shoes;
  - Two-way radio communications.

Optional:

- Cooling Unit;
- Coveralls;
- Long cotton underwear;
- Disposable gloves and boot covers.

**Level B** Provides the same level of respiratory protection, but less skin protection as Level A. It is the minimum level recommended for initial site entries until the hazards have been further identified.

- Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA;
- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-pieced chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical-resistant gloves;
- Chemical-resistant safety boots/shoes;
- Hard Hat;
- Two-way radio communications.

Optional:

- Face Shield;
- Coveralls;
- Long cotton underwear;
- Disposable boot covers.

**Level C** Provides the same level of skin protection as Level B, but a lower level of respiratory protection.

- full-facepiece, air-purifying, canister-equipped respirator;
- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-pieced chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical-resistant gloves;
- Chemical-resistant safety boots/shoes;
- Hard Hat;
- Two-way radio communications.

Optional:

- Face Shield;
- Coveralls;
- Long cotton underwear;
- Disposable boot covers;
- Escape Mask.

**Level D** Provides no respiratory protection and minimal skin protection.

- Coveralls;
- Safety boots/shoes;
- Safety glasses or chemical splash goggles;
- Hard Hat.

Optional:

- Gloves;
- Escape Mask;
- Face shield.

## 6.0 WORK SECURITY ZONES

. During power augering operations areas which may have public access will be identified with brightly colored barrier tape or other demarcation methods. The perimeter of the work zone will normally be approximately 20 feet from the drilling rig or excavation site. The work zone shall include an Exclusive zone (contaminated area), a Contamination Reduction Zone for decontamination, and a Contamination Reduction Corridor and Support Zone non-contaminated area.

The exact locations of all work areas, the decontamination area, equipment storage area, rest area, restroom facilities, and routes of exit will be established in the field. When possible the support areas will be established upwind of the work zone.

All unauthorized personnel will not be allowed within the work zone. All personnel entering the work zone will identify themselves with the Health and Safety Officer.

## 7.0 DECONTAMINATION METHODS

The following procedures will be instituted to prevent or reduce the physical transfer of contaminants by equipment and/or personnel from the Exclusion and Contamination Reduction Zone:

- All authorized personnel shall enter and exit the Exclusive Zone through the Contamination Reduction Zone;
- All personal protective equipment, including respirators (less cartridges), protective clothing and boots shall be removed and placed in marked containers

for decontamination in the Contamination Reduction Zone before passing to the support zone;

- Used respirators, reusable protective clothing and boots shall be decontaminated with mild detergent and warm tap water, and rinsed with clean tap water in the Support Zone. Respirators shall be dismantled when possible, and cleaned as above. All equipment will be allowed to air dry in a clean area. The spent solutions and all cleaning apparatus shall be considered contaminated, until shown otherwise, and so treated;
- All equipment shall be decontaminated using a portable steam generator with a spray nozzle, or other equivalent equipment. A final steam/water rinse will be applied after steam cleaning;
- All wash water and respirator cartridges will be disposed of properly.

## **8.0 GENERAL WORK PRACTICES AND STANDARD OPERATING PROCEDURES**

The Project Manager and Health and Safety Officer will ensure that the below listed steps will be followed as the general work practices and standard operating procedures for all projects involving, or suspected of involving hazardous materials:

- Tailgate safety meeting prior to beginning each days activities. Tailgate meetings will include any applicable regulatory warnings, such as CA Proposition 65 warning, information on the various work zones and facilities, the health and safety hazards associated with their assigned activities, care and use of personal protective equipment, emergency procedures, contingency plan, and any other pertinent information;
- All personnel entering the work site must identify themselves with the Health and Safety Officer. If they have not attended the tailgate safety meeting they will be required to do so;
- Eating, drinking, chewing gum or tobacco, smoking or any other activity that could increase the risk of ingesting hazardous materials is prohibited in all areas of the Exclusion and Contamination Reduction Zones. Hands shall be thoroughly washed upon leaving the contaminated area. Restroom and handwashing facilities, and potable water shall be provided in a safe and sanitary manner;
- All personnel within the Exclusion and Contamination Reduction Zones shall use the Buddy System, maintaining communications and visual contact at all times;

- A fire extinguisher shall be available within 50 feet of the work area during all operations. A first-aid kit suitable for hazardous waste sites will be located in the support zone;
  - Contaminated personal protective equipment will not be removed from the site until properly cleaned, packaged, and labeled;
  - All personnel entering the Exclusion zone wear the proper personal protective equipment as designated in the Project Health and Safety Plan. Such individuals shall be trained in the proper use and maintenance, and have been deemed physically fit by a licensed medical physician, to wear such equipment. All equipment shall be inspected prior to donning. For Level C and higher protection, gloves and boots shall be taped to protective clothing to ensure complete closure;
  - If unanticipated hazardous materials are observed, suspected, or personnel exhibit symptoms of distress, the Health and Safety Officer shall conduct an investigation to identify the material. Work may be halted and samples collected at the discretion of the Health and Safety Officer;
  - The Project Manager, Health and Safety Officer, project personnel, and subcontractors shall periodically observe personnel for symptoms of distress. Symptoms of distress shall include the following:
    - Changes in speech patterns;
    - Nervousness or excitability;
    - Changes in complexion, skin discoloration;
    - Changes in disposition or demeanor;
    - Signs of incoordination;
    - Excessive salivation or pupillary response.
- All personnel are required to contact their supervisor, Project Manager, or Health and Safety Officer if they experience any ill effects, such as:
- Headache;
  - Dizziness;
  - Blurred Vision;
  - Heat Stress;
  - Irritation to eyes, mucous membranes, respiratory tract, or skin.
- All mechanical equipment shall be parked or stored in a safe location as designated by the Project Manager at the end of each workday.

· In the event the work is performed contrary to provisions and specifications of the work plan, permits, regulations, inspection, or any manner which is likely to endanger any person or the public, the work shall be stopped by the Project Manager or any other authorized representative.

## **9.0 TRAINING**

All personnel required to wear Level C or higher personal protective equipment shall have successfully completed all training requirements set forth in the Final Rule for Hazardous Waste Operations and Emergency Response, Code of Federal Regulations, Title 29, Part 1910.120, dated March 6, 1989.

American Geological Services, Inc. conducts in house training for all professional and technical personnel to ensure the highest QA/QC and health and safety standards are maintained.

## **10.0 MEDICAL SURVEILLANCE PROGRAM**

All personnel involved with hazardous materials investigations shall participate in a Medical Surveillance Program. This program's objectives are to:

- Establish a baseline physical examination status of health for monitoring and comparison of future medical changes;
- Identify any illness or condition which may be aggravated by exposure to hazardous materials, other stressors, or job activities;
- Allow early recognition of any condition or abnormalities so that corrective measures can be taken.

All medical examinations shall be performed by or under the supervision of a licensed medical physician who is knowledgeable with or has been provided with the following:

- A description of the employee's duties, potential exposure levels, and a description of personal protective equipment which may be used;
- A copy of the U.S. Department of Labor, OSHA, Hazardous Waste Operations and Emergency Response; Notice of Rulemaking and Public Hearings;
- Any information from previous medical examinations which may not be available to the examining physician.

## **11.0 RECORD KEEPING**

Records will be kept shall be kept in accordance with Federal, State, and local requirements. The following records shall be maintained by the project manager at the site:

- Project Health and Safety Plan, and any subsequent changes;
- Project Work Plan, and any subsequent changes;
- Site Entry Log;
- On-site personnel, their affiliation, and purpose;
- Chain-of-Custody Forms
- Daily Field Log, describing activities and conditions;
- Project Safety Inspection Reports;
- Tailgate Safety Meeting attendance record;
- Worker illness and/or injury reports;
- Accident Log.

The following records will be kept at the offices of American Geologic Services, Inc. and its subcontractors:

- Accident Logs, OSHA Form 200 or equivalent;
- Hazards Materials Training Records;
- Medical Surveillance;
- Safety Inspection Reports;
- Personal Monitoring Records;

## **12.0 CONTINGENCY PLAN, EMERGENCY RESPONSE CONTACTS AND TELEPHONE NUMBERS**

In the event of an emergency or accident, the personnel observing the condition shall give three sharp blasts of a vehicle horn, or other prearranged emergency alarm. All nonessential communication shall immediately cease and the team member shall notify the Project Manager and Health and Safety Officer. Actions to be taken will be dictated by the emergency. All injured personnel will be taken to the designated local medical facility by the Health and Safety Officer or local emergency medical personnel.

The project Health and Safety Plan will contain the following specific emergency contacts for the project location, where locally available:

Local Emergency Contacts: Phone Number

Ambulance or Emergency Medical Technician	911
Police Department	911
Fire Department	911

Hospital or 24 Hour Emergency Medical Center:

Location:	Tracy Community Hospital	911
	Eaton Avenue	(209) 835-1500
	Tracy, CA	

Directions:

Figure 1 illustrates the route from the project area to the hospital.

Drive south on San Jose Road to Byron Road, turn left. Follow Byron Road until it merges with 11th Street. Continue east on 11th street to Tracy Boulevard, turn left. Continue on Tracy Boulevard to Eaton Avenue and turn right. Hospital is on the left side of the road.

Hazardous Materials Information Sources:

EPA-INFO	(800) 342-4636
Toxline	(301) 496-1131
CHEMTREC (24-hour, emergency only)	(800) 424-9300
ORNL, Toxicology Information Response Center	(615) 576-1743
Poison Control Center	(800) 682-9211

American Geological Services, Inc. Contacts:

Project Manager and Health and Safety Officer

Dr. Ross R. Grunwald

(209) 532-8021 Office  
(209) 533-0933 Home  
(209) 770-3397 Cellular  
(209) 990-2436 Pager

Emergency Reporting Procedures:

When calling for emergency assistance, the following information must be provided:

- Name of person making call;
- Telephone number and location of person making call;
- Nature of emergency and type of exposure, when appropriate;
- Action and First Aid measures taken;

Always wait for the emergency dispatcher to finish with all questions and instructions before hanging up.

APPROVED



Ross R. Grunwald  
Project Manager and Health and Safety Officer



Date



## **Appendix C**

### **Schematic Diagram of Monitoring Well Construction**

