



ENVIRONMENTAL MANAGEMENT & CONSULTING ENGINEERING

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Alameda County  
Environmental Health

February 6, 2008

001-09567-02

Mr. Jerry Wickham  
Alameda County Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Subject: Work Plan for Additional Site Characterization at AOC #8, Hanson Aggregates Radium Facility, 3000 Busch Road, Pleasanton, California, SLIC Case RO0002952 and Geotracker ID SL0600101555

Dear Mr. Wickham:

LFR Inc. (LFR) is pleased to present this work plan in response to the Alameda County Environmental Health (ACEH) letter dated November 28, 2007, regarding the environmental conditions at the Hanson Aggregates Northern California ("Hanson") Radium Facility located at 3000 Busch Road in Pleasanton, California ("the Site"; Figures 1 and 2). The November 28, 2007 letter presented ACEH technical comments regarding the report prepared by LFR entitled "Site Investigation Report for the Eastern Portion of AOC #2 and AOCs #3 through #9, ACEH Case #RO0002952 and Geotracker Global ID #SL0600101555, Hanson Aggregates Radium Facility, 3000 Busch Road Pleasanton, Alameda County, California," dated October 26, 2007.

### Property Transfer and New Case Number

In anticipation of the property transfer between Hanson and Legacy Partners ("Legacy"), a series of soil and groundwater investigations have been conducted at the Site. As a result of these investigations the approximately 1,000-acre Site has been divided into two primary parcels that have been further subdivided into nine areas of concern (AOCs), as illustrated on Figure 2.

To assist with the property transfer from Hanson to Legacy, Hanson requested that ACEH assign a new SLIC case number to the portion of the property transferred to Legacy. ACEH approved this request, and currently there are two SLIC case numbers for the Site, defined as follows:

- ACEH SLIC case number RO0002941 and Geotracker Global ID SLT19719376 refer to the approximately 15-acre Parcel 1 and a small area south of the Kiewit property, including AOC #1 and the western portion of AOC #2.
- ACEH SLIC case number RO0002952 and Geotracker Global ID SL0600101555 refer to the rest of the former Hanson Radium property, including the eastern portion of AOC #2 and AOCs #3 through #9.



This work plan focuses on the request from ACEH for further assessment of soil and groundwater quality in the vicinity of soil boring SS123 within AOC #8.

### **ACEH Technical Comments**

The following five technical comments provided by ACEH are directly addressed below (using the ACEH's numbering) and further addressed in the enclosed work plan, as appropriate.

#### **1. AOC #2 Truck Maintenance Area**

*ACEH Technical Comment.* This comment indicated that AOC #2 has been sufficiently characterized and that no further investigation is requested for this area.

*Response.* LFR agrees with this comment.

#### **2. Petroleum Hydrocarbons in Shallow Soil in the Vicinity of Boring EB35 in AOC #3**

*ACEH Technical Comment.* ACEH requested either a plan for additional investigation of the extent of petroleum hydrocarbons in shallow soil (i.e., less than 5 feet below ground surface [bgs]) or a description of plans for further soil removal and confirmation sampling.

*Response.* It is our understanding that this portion of the Site has been transferred to Legacy. As a result, Legacy is responsible to respond to this comment.

#### **3. Petroleum Hydrocarbons in Groundwater near Heavy Maintenance Shop in AOC #3**

*ACEH Technical Comment.* For this comment ACEH requested an additional investigation in this area to evaluate whether the results of the samples collected from soil boring B-1A are representative of groundwater quality in this area and whether a significant subsurface source of petroleum hydrocarbons exists in this area.

*Response.* It is our understanding that this portion of the Site has been transferred to Legacy. As a result, Legacy is responsible to respond to this comment.

#### **4. AOC #8**

*ACEH Technical Comment.* ACEH requested a minimum of two deeper soil borings to confirm the presence of perched groundwater in the vicinity of soil boring SS123, and to assess whether the regional aquifer has been affected or is potentially threatened.

*Response.* A scope of work for an investigation to address this comment is provided in the work plan below.



## **5. Re-Sampling of Existing Monitoring well 3S/1E 10D8**

*ACEH Technical Comment.* ACEH requested the collection of a sample from monitoring well 3S/1E 10D8 for the analysis of dissolved mercury.

*Response.* It is our understanding that the portion of the Site where the well is located has been transferred to Legacy. As a result, Legacy is responsible to respond to this comment.

### **Work Plan for AOC #8: Temporary Soil Boring SS-123**

As described below, LFR will perform a soil and groundwater investigation to further characterize the extent of petroleum hydrocarbons in the subsurface at AOC #8 in response to ACEH Technical Comment 4. The scope of the investigation will include the collection of depth-discrete soil and grab groundwater samples and the installation of two groundwater monitoring wells.

#### **Background**

In preparation for the property transfer between Legacy and Hanson, Legacy retained ENV America (ENV) to assist them with their due diligence study related to the environmental conditions of the Site. As part of its subsurface investigations, ENV advanced temporary soil boring SS-123 in the area between the Vulcan Materials Company property and the former mining operations area (AOC #8; Figure 2). Analytical results of soil samples collected from soil boring SS-123 indicated the presence of petroleum-affected soil between approximately 20 and 40 feet bgs. Petroleum-affected soil and groundwater have also been detected in samples collected from additional boreholes in this area. Further investigation of the lateral and vertical extent of the affected soil and groundwater in this area has included advancement of a total of 13 soil borings (including soil boring SS-123) at AOC #8 (Figure 3).

The potential source(s) of petroleum hydrocarbons that have been detected in groundwater in this area has not been fully characterized. ENV has concluded that the source of contamination in this area is associated with a historical mining pit that was filled in with debris and sediment. In addition, ENV also concluded that the groundwater encountered in the SS-123 area is perched on relatively less permeable fill material or sediment. Investigations conducted in the SS-123 area have shown that groundwater is encountered at significantly shallower depths than in other areas of the Site. However, the presence of a perched groundwater interval has not been confirmed by investigations conducted to date. Additionally, ENV has indicated the potential source of the affected soil in the upper 30 feet of sediments may be associated with asphalt material that was used to backfill the mining pits formerly located in this area.

#### **Results for the Investigations Conducted in the SS-123 Area**

A review of analytical results for the SS-123 area (Figure 3) indicates that the lateral extent of petroleum-affected soil has been adequately characterized to the north, east, and west. These data



also indicate that additional sampling would be needed to more fully characterize the extent of soil affected with petroleum hydrocarbons above Environmental Screening Levels (ESLs) to the south. Analytical results for the grab groundwater sample collected from the southernmost soil boring in this area (SS-123 [F2]), indicate the presence of total petroleum hydrocarbons as diesel (TPHd) and TPH as motor oil (TPHmo) at concentrations that exceed ESLs. Additional step-out grab groundwater sample locations will be necessary to further characterize the extent of petroleum-affected groundwater to the south of former boring SS-123(F2) and are the focus of the scope of work presented in this work plan.

### ***Objectives***

The objectives of the scope of work presented in this work plan include:

- Further assess the lateral extent of TPH-affected soil and first encountered groundwater (i.e., groundwater encountered between approximately 2 to 40 feet bgs).
- Further assess the lateral extent of TPH-affected groundwater encountered between approximately 18 to 30 feet bgs.
- Assess the quality of groundwater in the second groundwater-bearing zone, which is anticipated to be encountered between approximately 50 and 60 feet bgs.
- Assess the leachability of the asphalt material (if encountered) in the upper 25 feet of sediments in this portion of the Site.

### ***Scope of Work***

The scope of work for this work plan is the following:

- Drill a total of three soil borings for the collection of soil and grab groundwater samples. Two of these soil borings will be advanced using the hollow-stem auger (HSA) drilling method to collect soil samples from the uppermost approximately 30 feet and a grab groundwater sample from the first encountered groundwater. One of these soil borings will be advanced using the sonic drilling method to collect soil samples from the uppermost approximately 30 feet and a grab groundwater sample from the shallow and deeper water-bearing sediments (approximately 60 feet bgs).
- Install and develop a total of two groundwater monitoring wells; one well is to be installed into the shallow water-bearing zone using the HSA drilling method and one well will be installed into the deeper water-bearing zone using the sonic drilling method.
- Collect groundwater samples from the wells and submit the samples for the analysis of TPHd and TPHmo.
- Collect and analyze soil samples in the upper 30 feet of sediments if asphalt material is observed in the soil. If present, the asphalt material will be retained and submitted to a state-certified laboratory for waste extraction tests (WETs). The WET will be conducted using



deionized water as the leachate. Data from these leachability tests will be used to assess for the potential for hydrocarbon constituents to leach from the petroleum-affected soil and potentially affect underlying groundwater.

### **Task 1: Pre-Field Activities**

Prior to drilling soil borings or installing wells LFR will obtain drilling permits and pay permit fees to the Zone 7 Water Agency, Alameda County Flood Control and Water Conservation District. Because the water-yielding sediments in some parts of the Site may yield very little or no water, it may not be possible to collect grab groundwater samples at all of the proposed locations.

The existing site-specific Health and Safety Plan previously prepared by LFR for subsurface investigations will be updated to address health and safety concerns specific to the planned field activities. Daily health and safety tailgate meetings will be conducted prior to beginning fieldwork, and fieldwork will be monitored to ensure that appropriate health and safety procedures are followed during the field investigations.

In accordance with Hanson's standard facility operations, LFR and LFR's subcontractors will also attend an on-site health and safety training conducted by a Hanson representative.

### **Task 2: Field Investigation**

The proposed field investigation for this project will include the drilling of soil borings for the collection of depth-discrete soil and grab groundwater samples and the installation of groundwater monitoring wells. Details regarding the collection and analysis of the proposed soil and groundwater samples and the installation of the wells are presented below.

Grab groundwater samples are proposed to be collected from the first and second water-bearing zones using the HSA and the sonic drilling methods, respectively.

A sonic drill rig uses high-frequency, resonant energy to advance a core barrel or casing into subsurface formations. The drill rig uses a combination of the mechanically generated vibrations and limited rotary power to penetrate the soil. Resonance occurs when the frequency of the vibrations equals the natural frequency of the drill pipe. The frequency of vibration (generally between 50 and 120 cycles per second) of the drill bit or core barrel can be varied to attain maximum drilling productivity. The sonic drilling technique has proven an effective technology to advance to depths deeper than approximately 45 feet through coarse-grained, unsaturated sediments.

A dual-string assembly allows advancement of a continuous soil sampler casing within the outer casing drill pipe. Small amounts of air and water can be used to remove the material between the inner and outer casing. When a drill bit is used, most of the cuttings are forced into the borehole wall, reducing the amount of cuttings requiring disposal. The outer casing also serves as a



conductor to minimize cross-contamination and to hold the borehole open for the collection of grab groundwater samples.

### **Lithologic Logging Procedures and Field Documentation**

Conventional visual lithologic logging will be conducted of the continuous cores collected from the soil borings advanced using the HSA and the sonic drilling techniques. An LFR field geologist will classify the soil samples using American Society for Testing and Materials (ASTM) D 2488-93, which is based on the Unified Soil Classification System. Lithologic descriptions will be recorded on field boring logs that will be reviewed, edited, and signed by a California Professional Geologist. Soil samples will be collected during drilling using the continuous-core sampling method with either brass-tube- or plastic-tube-lined split spoons for lithologic evaluation, field screening, and laboratory analyses. Soil cuttings and soil samples will be screened in the field using a photoionization detector (PID) to evaluate the presence of hydrocarbons or other volatile organic compounds, and results will be recorded on the soil boring log.

Relevant field activities will be appropriately documented using field forms, including field logs of soil borings, well development, and groundwater sampling forms, sample labels, chain-of-custody forms, and waste management and hazardous waste labels. Field forms will be kept on file at LFR and will be available upon request. Copies of relevant field forms will be included in the summary report.

### **Soil Borings**

LFR proposes to retain a state-licensed drilling subcontractor to provide an HSA drilling rig to advance three soil borings to depths of approximately 30 feet bgs at the Site. LFR is also proposing to retain a state-licensed drilling subcontractor to provide a drilling rig equipped with sonic drilling technology to advance two soil borings to the “regional aquifer,” to a maximum depth of approximately 65 feet bgs.

Downhole drilling and sampling equipment will be appropriately cleaned with high-pressure hot water (steam cleaned) before use at each new drilling location. After soil and groundwater samples are collected, each borehole will be abandoned by sealing it with a mixture of cement and bentonite (“grout”) from the bottom up to the ground surface using a tremie pipe if groundwater is present or pouring directly into the borehole if groundwater is not present. Waste soil generated during drilling will be placed on plastic tarps on the ground surface near each temporary soil boring and will be disposed of as necessary during future land development activities.

### **Collection of Soil Samples**

Depth-discrete soil samples will be selected for laboratory analyses from each soil boring based on the potential presence of contaminants, in particular petroleum hydrocarbons or visible asphalt, as apparent from field screening using a PID or from visual/olfactory evaluation of the soil cores. If



there is no evidence of petroleum hydrocarbons, then soil samples will be collected approximately every 5 feet from ground surface to 30 feet bgs. No soil samples collected from within or beneath the water-bearing zones are to be submitted for analysis. Soil samples selected to be submitted for laboratory analyses will be transferred from the core barrel to clean brass tube liners or glass jars, which will be sealed, properly labeled, and stored in ice-chilled coolers for transport to the analytical laboratory under chain-of-custody protocol.

### **Grab Groundwater Sampling**

***First Water-bearing Zone.*** Grab groundwater samples are proposed to be collected from the two soil borings (SS123F2-4 and SS123F2-5) that are to be advanced using the HSA drilling method to the first groundwater-bearing zone that is estimated to be between approximately 15 and 30 feet bgs (see Figure 3). After drilling is completed, a temporary polyvinyl chloride (PVC) well screen and casing will be placed through the HSA and a filter pack of sand will be placed around the PVC well screen prior to raising the HSA approximately 3 to 5 feet to allow groundwater to enter the borehole. The purpose of the filter pack is to decrease the turbidity of the grab samples. In addition, groundwater will be purged from the casing prior to collecting the groundwater sample in an effort to further reduce the turbidity of the grab samples. Grab groundwater samples will be collected using clean, disposable bailers lowered into the PVC casing and by gently pouring the groundwater from the bailer into the appropriate clean, laboratory-supplied water sample containers. Sample containers will be properly labeled and stored in ice-chilled coolers for transport to the analytical laboratory under chain-of-custody protocol.

***Second Water-bearing Zone.*** One grab groundwater sample is proposed to be collected from soil boring SS123F2-1 that is proposed to be advanced using the sonic drilling method into the second groundwater-bearing zone between approximately 50 and 60 feet bgs. The sonic drilling method was selected in this case so that the first water-bearing zone can be isolated from the second water-bearing zone by the outer casing that is advanced ahead of the drill string, thereby sealing off the upper water-bearing zone.

After drilling is completed, the drill string will be removed from the boring and the temporary drive casing will remain in place to seal off the upper water-bearing zone. As with the grab samples to be collected from the first water-bearing zone, temporary PVC well screen and casing will be placed through the drive casing and a filter pack of sand will be placed around the PVC well screen prior raising the drive casing approximately 3 to 5 feet to allow groundwater to enter the borehole. Grab groundwater samples will be collected using clean, disposable bailers lowered into the PVC casing and by gently pouring the groundwater from the bailer into the appropriate clean, laboratory-supplied water sample containers. Sample containers will be properly labeled and stored in ice-chilled coolers for transport to the analytical laboratory under chain-of-custody protocol.



## Groundwater Monitoring Wells

Two groundwater monitoring wells are proposed to be installed during this phase of the investigation. Well MW-SS123F2-2 is proposed to be completed in the first groundwater-bearing zone (between approximately 15 and 30 feet bgs) and well MW-SS123F2-3 is proposed to be completed in the second groundwater-bearing zone (between approximately 50 and 60 feet bgs; see Figure 3). Each monitoring well casing will be equipped with a locking well cap. The surface completions will consist of an aboveground, monument-style well box equipped with locking access lids installed in concrete pads. Three steel bollards will also be installed surrounding each well to protect the well casing and box from damage.

***First Water-bearing Zone.*** Soil boring MW-SS123(F2-1) will be completed as a groundwater monitoring well in the first water-bearing zone, estimated to be between approximately 15 and 30 feet bgs. The well will be constructed using 2-inch-diameter Schedule 40 PVC well casing and machine-slotted PVC well screens with a 0.02-inch slot size. A well screen filter pack consisting of appropriately graded sand will be placed in the borehole annular space around each well screen interval and extended to approximately 2 feet above the top of the well screen. Bentonite pellets will be placed in the annular space above the filter pack to create an approximately 2- to 3-foot-thick bentonite seal between the filter pack and the grout that will be used to fill the remaining annular space to near ground surface.

***Second Water-bearing Zone.*** Deeper soil boring MW-SS123(F2-3) will be completed as a groundwater monitoring well in the second or “regional aquifer” water-bearing zone, estimated to be between approximately 50 and 60 feet bgs. The well will be constructed using 2-inch-diameter Schedule 40 PVC well casing and machine-slotted PVC well screens with a 0.02-inch slot size. A well screen filter pack consisting of appropriately graded sand will be placed in the borehole annular space around each well screen interval and extended to approximately 2 feet above the top of the well screen. Bentonite pellets will be placed in the annular space above the filter pack to create an approximately 2- to 3-foot-thick bentonite seal between the filter pack and the grout that will be used to fill the remaining annular space to near ground surface. The grout will be placed into the annular space between the PVC well casing as the temporary casing is removed from the soil boring.

## Well Development and Sampling

Following installation, each new monitoring well will be developed to remove fine materials from the well and maximize the hydraulic efficiency. Development will be performed using surge blocks and/or pumping. Water from drilling and development activities will be contained on site in drums or a temporary holding tank for subsequent characterization and appropriate disposal.





### Laboratory Analyses

Each of the groundwater samples will be submitted to Curtis & Tomkins, Ltd., a state-certified laboratory located in Berkeley, California, for the following analyses:

- TPHd and TPHmo using EPA Method 8015B
- benzene, toluene, ethylbenzene, and total xylenes using EPA Method 8021B
- As requested by ENV, if asphalt material is observed in the upper 30 feet of soil, a sample will be submitted for a WET using deionized water as the leachate. Data from these leachability tests will be used to assess for the potential for hydrocarbon constituents to leach from the petroleum-affected soil and potentially affect underlying groundwater.

### Preparation of Summary Report

LFR will prepare a summary report for submittal to ACEH that presents the results of the investigation described above. The report will include lithologic logs, laboratory analytical data, and an interpretation and discussion of those data. The results of the investigation will be used to refine the assessment of the lateral and vertical extent of petroleum-affected soil and groundwater at AOC #8.

The report will be uploaded to the Geotracker system and ACEH file transfer protocol (FTP) site in accordance with Regional Water Quality Control Board and ACEH requirements.

Following your review of this work plan, please do not hesitate to contact either Katrin Schliewen or Ron Goloubow at (510) 652-4500 or Lee Cover of Hanson at (925) 426-4170 if you have questions or comments regarding our responses to your technical comments or the proposed scope of work outlined in the work plan.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Seyfried', written in a cursive style.

J. Scott Seyfried, P.G. #7374, C.H.G  
Principal Hydrogeologist

A handwritten signature in black ink, appearing to read 'R. Goloubow', written in a cursive style.

Ron Goloubow  
Senior Associate Geologist

Enclosures



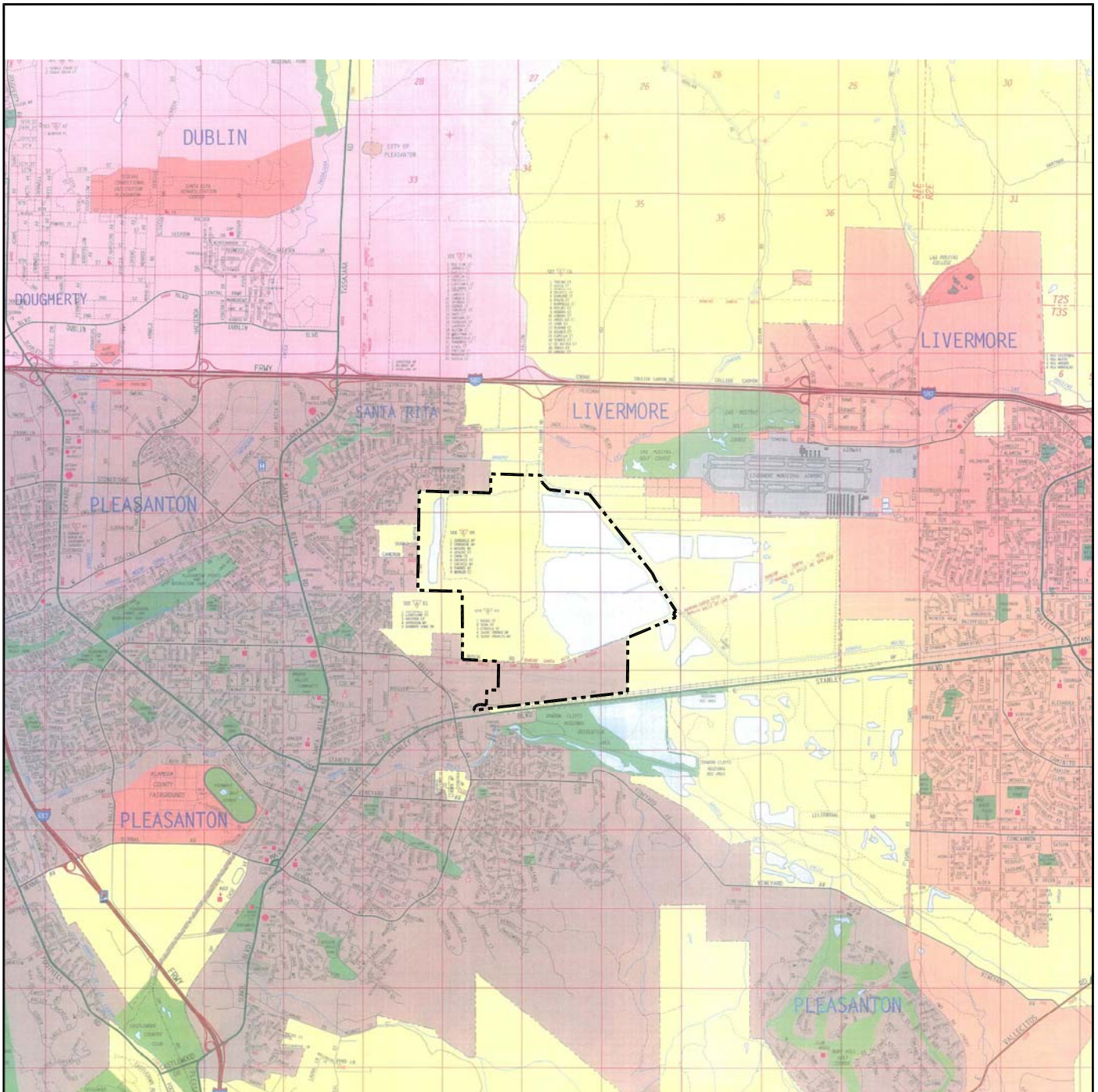
Attachments:

Figure 1. Site Location Map

Figure 2. Site Plan Showing Areas of Concern

Figure 3. Area of Concern #8

cc: Lee Cover, Hanson Aggregates Northern California



Source: Thomas Guide

**EXPLANATION**

----- Approximate Site Boundary



0 5000 FEET  
APPROXIMATE SCALE

**Site Location Map**

Hanson Aggregates, Radum Facility, 3000 Busch Rd, Pleasanton, CA



**Figure 1**

