



September 29, 1993

LF 2968

Mr. Doug Humphrey  
Director of Engineering and  
Mr. Mike Cortez  
Assistant Civil Engineer  
Oro Loma Sanitation District  
2600 Grant Avenue  
San Lorenzo, California 94580

Subject: Alternatives for Excavation of Petroleum-  
Affected Soil at the Oro Loma Sanitation  
District Water Pollution Control Plant, 2600  
Grant Avenue, San Lorenzo, California, Fuel  
Station Closure Project Number 45-64-12

Dear Mr. Humphrey and Mr. Cortez:

This letter, as per your request of September 28, 1993, outlines alternatives available to Oro Loma Sanitation District ("Oro Loma") for the removal of petroleum-affected soils encountered by Levine-Fricke, Inc., ("Levine-Fricke") during the performance of a Preliminary Site Assessment (PSA) at the subject site. Each alternative is described and advantages and disadvantages of each alternative provided. For all alternatives, Levine-Fricke recommends removal of soils, to the extent accessible and feasible, above the concentration 10 ppm as total petroleum hydrocarbons (TPHg) or the concentration 1 ppm as the fuel constituents benzene, toluene, ethylbenzene, or total xylenes (BTEX).

Alternative 1: Perform Additional Soil Borings  
and Soil Testing

Perform additional soil borings and collect additional soil samples using a drill rig to supplement analytical data generated in the PSA. Soil would be screened with an organic vapor meter and select samples submitted for analysis for TPHg and BTEX compounds. Soil samples would be submitted on a 24-hour turn around time to minimize the potential impact on start date of the UST removal. Soil borings will be grouted. Soil borings would take approximately one day to perform. We estimate that this alternative would cost approximately \$3,000 to \$3,500, based on the number of borings advanced.

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## Advantages

- Determine with reliability the lateral and vertical extent of the petroleum-affected soil.
- Determine in advance of UST removal the approximate volume and associated costs of soil to be excavated.
- Soil borings will have the least impact on the parking lot surface.

## Disadvantages

- Highest cost soil investigation alternative.
- Could delay start date of UST removal while mobilizing drilling contractor and waiting for analytical test results.

## Alternative 2: Perform Potholing and Soil Testing

Using a subcontracted backhoe, dig potholes to determine the lateral extent of petroleum-affected soils. Screen soils with an organic vapor meter. Submit select soil samples for analytical testing on a 24-hour basis. Immediately replace soils from clean potholes using the backhoe bucket; stockpile petroleum-affected soils on plastic for transportation to aeration area. Performing potholing would take approximately one day. We estimate that this alternative would cost approximately \$2,000 to \$2,500.

## Advantages

- Determine with reliability the lateral and vertical extent of the petroleum-affected soil.
- Could be performed just prior to UST removal, so as not to impact UST removal start date.
- Determine in advance of UST removal the approximate volume and associated costs of soil to be excavated.
- Lower cost than performing soil borings.

## Disadvantages

- Will leave rough areas and/or uneven surfaces where potholes are backfilled.

- If some pothole areas are not excavated, they should be re-compacted

Alternative 3: Excavate Petroleum-Affected  
Soils Without Further Soil-  
Quality Investigation

Excavate petroleum-affected soils without additional soil quality data. After removal of UST is complete, excavate petroleum-affected soils until all affected soils are removed to the extent reasonably possible.

Advantages

- No impact on UST removal start date.
- Lowest cost alternative
- No impact on parking lot surface other than those associated with removal of actual petroleum-affected soil.

Disadvantages

- Do not know lateral or vertical extent of petroleum-affected soil prior to excavation activities.
- Can not determine with reliability the total volume or associated costs of soil to be excavated.
- Least predictability of total costs.

Alternative 4: Perform Soil Excavation After  
UST Removal

Postpone excavation of petroleum-affected soil until after UST removal complete. UST would be removed according to existing work plan. The excavation pit would be backfilled with import fill. Alternative 1, 2, or 3 would be selected to address excavation of petroleum-affected soils at a later date.

Advantages

- Would allow Oro Loma to remove affected-soils at its convenience.
- Start date of UST removal would not be impacted.

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## Disadvantages

- Higher long-term cost than other alternatives because of mobilizing equipment twice, digging placed backfill out, repaving, etc.
- Excavation of petroleum-affected soil would still need to be performed.
- Being a less aggressive approach to leak cleanup, it likely will be more scrutinized by regulatory agencies

## Recommendation

In order to expedite the removal of the UST and excavation of petroleum-affected soils at the lowest cost to Oro Loma, Levine·Fricke recommends Alternative 3: Performing Soil Excavation Without Further Soil Quality Investigation. However, it should be understood by Oro Loma that with alternative 3 only an approximate cost will be provided for construction activities, based upon information available from the PSA. The final costs will depend upon the final volume of soil excavated. If this alternative is chosen, Levine·Fricke will provide a rough estimate of soil volume and associated cost and will also provide a cost not to be exceeded.

If either alternative 1, 2, or 3, is selected by Oro Loma for the excavation of petroleum-affected soil, Levine·Fricke will further discuss project details with Oro Loma and will prepare a work plan for the soil excavation activities.

If you have any questions regarding these alternatives or recommendation, please do not hesitate to contact either me, or John Sturman, Senior Geotechnical Engineer, P.E., R.G.

Sincerely,

*Shellie Fletcher*  
Shellie Fletcher  
Senior Staff Engineer