BALCO
PROPERTIES

25 January 2010
Project No. 2543.05

Mr. Paresh Khatri
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Subject: Summary of Feasibility Study
2855 Mandela Parkway
Oakland, California

Dear Mr. Khatri:

As a legally authorized representative of BALCO properties, LLC, and on behalf of BALCO properties, LLC, I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document *Summary of Feasibility Study, 2855 Mandela Parkway, Oakland, California*, are true and correct to the best of my knowledge.

Sincerely yours,

Reed Westphal
Property manager
BALCO Properties, LLC

Treadwell&Rollo
A LANGAN COMPANY

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Alameda County Environmental Health
1131 Harbor Bay Parkway
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Dear Mr. Khatri:

On behalf of BALCO properties, LLC, Treadwell and Rollo, A Langan Company(Treadwell & Rollo) has prepared this letter summarizing the Feasibility Study (FS) conducted for the property located at 2855 Mandela Parkway in Oakland, California (Site). Based on the FS results we have outlined our proposed approach for remedial action at the Site.

BACKGROUND

The existing building at the Site is a 143,000 square-foot, single-story industrial building underlain by a reinforced concrete slab. The subsurface beneath the property at 2855 Mandela Parkway is impacted with petroleum hydrocarbon constituents as a result of a former gasoline underground storage tank (UST) leak. The majority of the hydrocarbon impact is bound within Bay Mud that extends from 8 to at least 24 feet below ground surface (bgs). Measurable light non-aqueous-phase liquid (LNAPL) continues to be detected at monitoring points, however LNAPL removal from previous skimming operations reached low, asymptotic levels. This result indicates that much of the LNAPL is residual and that this technology was limited in its effectiveness to further remediate the Site. Shallow soil vapor sampling resulted in no detections that would present an indoor air concern. At present, there is no complete pathway between groundwater which may impact human or environmental receptors. In addition, the LNAPL and dissolved petroleum hydrocarbons are being naturally attenuated.

FEASIBILITY STUDY AND TECHNOLOGY SCREENING

The goal of the Feasibility Study (FS) was to evaluate available remedial technologies and assess the potential effectiveness of those technologies in remediating the Site to acceptable residual levels (LNAPL will not be entirely removed with any method other than excavation).

To accomplish this, Treadwell & Rollo, Inc. evaluated eleven technologies for LNAPL removal, eight technologies for groundwater remediation, and four technologies for vadose zone remediation. Remediation technologies that were deemed to be potentially effective and implementable were compiled for more detailed evaluation. Due to the challenges of remediation beneath an existing building and within a Bay Mud formation, we found that, at present, Thermal Remediation is the only remediation technology for the Site with a reasonable chance of success. We also found that, if needed; petroleum impacts could be effectively contained until the eventual demolition of the existing building, other favorable remediation technologies would become available. For example, after the eventual demolition of the building, improvements in technologies such as In Situ Soil Mixing with Chemical Oxidation may offer an improved prospect for successful cleanup.

Although based on our evaluation, we generally preferred thermal remediation for its ability to remediate the site at the present time, a number of environmental, social, and economic issues tip the scales to the containment alternative. First, thermal remediation is extremely energy intensive (approximately 3 million kilowatt-hours of electricity), this raises the concern of health impacts on occupants of the overlying building, potential compromise of building structural integrity, and environmental risks associated with power generation and climate change. These concerns outweigh the low environmental risk at the site. Second, implementation of thermal remediation would significantly disrupt the tenant business operations in the existing building and likely would require them to relocate for a period of 6-9 months. Lastly, the cost of Thermal Remediation, estimated at $3 to 5.5 million, is unjustified given that there is no current environmental risk present at the site.

For the reasons outlined above, we propose long-term Containment (with potential future remediation after demolition of the building) as the best course of action for this Site. Elements of this alternative include prevention of exposure pathways to human or environmental receptors, prevention of LNAPL and impacted groundwater migration, and continued monitoring until such time that the building is demolished. Following the future removal of the building and slab, a remedial action such as in situ soil mixing with chemical oxidation would be evaluated and implemented, if needed, to remediate remaining petroleum constituents.

CORRECTIVE ACTION IMPLEMENTATION

We propose the following phased-approach to implementation of the selected alternative.

1) Confirm LNAPL and impacted groundwater boundary: In order to properly contain the petroleum hydrocarbons, we propose to confirm the boundary of LNAPL along the downgradient boundary of the site. We propose a limited investigation, primarily focused on the eastern boundary of the property, to perform this task.

2) Confirm presence and direction of groundwater flow: Historical groundwater elevation measurement at the site have indicated variations in the direction of groundwater flow. We propose additional groundwater elevation measurements to more accurately estimate the direction of groundwater flow relative to potential receptors. This information will be important to evaluate whether impacts at the Site are currently migrating, and if so, whether additional containment measures may be needed.

3) Installation of sentry wells to evaluate containment: As mentioned in Item 2, historical groundwater elevation measurements do not indicate a predominant direction of groundwater flow. Nor do they indicate whether any migration of LNAPL or dissolved petroleum hydrocarbons is occurring. If no migration is occurring and potential receptors are not likely affected, additional containment may not be required because the site is, in effect, naturally contained. We propose placement and monitoring of “sentry wells” along the downgradient boundary of the Site relative to potential receptors. Detections of LNAPL and/or elevated petroleum concentrations in these wells may trigger consideration of additional containment measures. If additional containment measures are needed, these may potentially include placement of an impermeable liner across the water table for prevent LNAPL migration and the placement of an aerobic “biobarrier” remediate dissolved petroleum from groundwater as it flows through the containment area.

4) Continued groundwater monitoring. Groundwater sampling and analysis will be performed to track petroleum hydrocarbon concentrations in groundwater Monitoring would be performed on a quarterly basis with a review at the end of the fourth event to evaluate attenuation of the contamination and a possible reduction in sampling frequency

5) Free Product Removal

- Free Product Recovery System: Although previous skimming operations using the installed free product recovery system reached low and asymptotic removal of free-product, it is possible that this technology could continue to remove free-product at this site. A review of previous operations points toward the possibility that skimming may be effective if performed during portions of the year when higher groundwater elevations reach a more permeable zone within the Bay Mud. This will be assessed during groundwater monitoring by determining the volume of free product present as a function of seasonal variation in groundwater elevation. The free product recovery system may be utilized if practical to remove additional free product based on this assessment.

- Groundwater Monitoring: Well sampling will require the bailing of the monitoring wells prior to sample collection. Subsequently, free product may be encountered and removed during bailing.

Free product removed by either the free product recovery system or during bailing for groundwater sample collection will be stored in the existing on-site Above-ground Storage Tank (AST) pending removal and disposal at a disposal and recycling facility

CONCLUSION

As described in the opening, this letter presents our proposed remediation approach for this Site. We would be happy to discuss the proposal outlined here in more detail. If our proposed approach meets with your concurrence, we will prepare a Corrective Action Plan for your approval.

If you have any questions please call Mr Greg Johnson at (510) 874-7039.

Sincerely yours,
TREADWELL & ROLLO, A LANGAN COMPANY

Christopher Glenn, PE, LEED GA
Project Engineer III

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