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ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

January 23, 2014

Mr. Douglas Weimer
Shell Oil Products, United States
Environmental Services Company
20945 S. Wilmington Avenue
Carson, CA 90810

SUBJECT: **REVIEW OF REVISED SITE-SPECIFIC CLEANUP GOAL REPORT AND DIRECTIVE TO SUBMIT REMEDIAL ACTION PLAN, HUMAN HEALTH RISK ANALYSIS, AND ENVIRONMENTAL ANALYSIS FOR CLEANUP OF THE CAROUSEL TRACT PURSUANT TO CALIFORNIA WATER CODE SECTION 13304**

SITE: **FORMER KAST PROPERTY TANK FARM LOCATED SOUTHEAST OF THE INTERSECTION OF MARBELLA AVENUE AND EAST 244TH STREET, CARSON, CALIFORNIA (SCP NO. 1230, SITE ID NO. 2040330, CAO NO. R4-2011-0046)**

Dear Mr. Weimer:

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) is the lead agency overseeing the environmental investigation and cleanup of the Former Kast property (Site) located in Carson, California. The Former Kast property was owned and operated by Shell Oil Company (Shell) as a crude oil storage facility from the 1920s to the 1960s when it was sold to developers and converted into a residential tract with 285 single family homes known as the Carousel Tract. Wastes associated with the tank farm activities, including crude oil in soils, were not fully removed from the site during its development and crude oil wastes remain in soil and groundwater underlying the Site.

The Site was brought to the attention of the Regional Board in 2008 by the California Department of Toxic Substances Control (DTSC). Soon thereafter, the Regional Board issued an investigative order in accordance with California Water Code section 13267 requiring Shell to delineate the nature and extent of wastes throughout the property, including wastes in soil vapor, indoor air within homes, and soil and groundwater beneath the Site. To date, Shell has collected extensive data to define the nature and extent of petroleum hydrocarbons and associated wastes on the Site.

On March 11, 2011, the Regional Board issued Cleanup and Abatement Order No. R4-2011-0046 (CAO), pursuant to California Water Code section 13304. The CAO directed Shell to continue to investigate the Site, continue to conduct groundwater monitoring and reporting, evaluate cleanup methodologies, propose site-specific cleanup goals (SSCGs) for Regional Board approval, submit a proposed remedial action plan (RAP), and upon approval of the RAP conduct remedial actions to cleanup and abate the waste in the soil, soil vapor, and groundwater at the Site. The site investigation under oversight by the Regional Board has been on-going since 2009 and has consisted of horizontal and vertical delineation of wastes beneath the Site, sub-slab and indoor air testing in most of the homes, and pilot remediation tests to determine the efficacy of different remedial technologies.

The CAO directed Shell to SSCGs for residential (i.e., unrestricted) land use for the Executive Officer's approval. The CAO required Shell to apply the following guidelines and policies in proposing SSCGs for wastes in soil and groundwater: (i) various state and federal policies and guidance regarding cleanup levels to address human health risks, including guidance specific to petroleum hydrocarbons; (ii) applicable water quality objectives in the Regional Board's Water Quality Control Plan for the Los Angeles Region (Basin Plan), including California's Maximum Contaminant Levels (MCLs) or Action Levels for drinking water as established by the California Department of Public Health, and the state's "anti-degradation policy" in State Water Resources Control Board (State Water Board) Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality of Waters in California"); and (iii) State Water Board Resolution No. 92-49 ("Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304") (Resolution 92-49). See CAO Paragraph 3.c.II.

On February 22, 2013, Shell submitted a Site-Specific Cleanup Goal Report (Report) to the Regional Board proposing SSCGs. On August 13, 2013, the Regional Board issued a response to the Report notifying Shell that the proposed SSCGs were not approved and directed Shell to revise the SSCGs in accordance with comments and directives contained in the letter. The Regional Board also provided Shell comments from the Expert Panel (convened to provide input to the Regional Board regarding site cleanup) and the State of California Office of Environmental Health Hazard Assessment (OEHHA) and requested that Shell address those comments. As detailed in the August 21, 2013 letter, the Regional Board concluded that the proposed SSCGs did not meet the CAO requirement that the SSCGs must support residential standards for unrestricted use and that the Report had not taken into account State Water Board Resolution 92-49. The Regional Board also commented that the depth intervals proposed by Shell of zero to two feet below grade surface (bgs) and two feet to ten feet were not appropriate for setting cleanup goals in a residential setting, and that the initially proposed SSCGs for total petroleum hydrocarbons (TPH) would result in leaving significant amounts of waste in the soils beneath some portions of the Site.

On October 21, 2013, Shell submitted a revised SSCG Report (Revised Report) that included a screening feasibility study (FS) for the proposed SSCGs and provided a technological and economic feasibility analysis of several remediation scenarios for the Site. The screening FS was included in the Revised Report to address Regional Board comments that the SSCGs must address requirements of State Water Board Resolution 92-49 as required by the CAO. State Water Board Resolution 92-49 requires that SSCGs must be, in part, based on technological and economic feasibility, and the screening FS provides some information to address this requirement.[1] The Revised Report also contained four appendices that provide detailed rationale for development of the revised SSCGs, and responses to Regional Board, OEHHA, and Expert Panel comments in the Regional Board August 21, 2013 letter.

The Revised Report addressed many of the comments in the Regional Board August 21, 2013 letter. In particular, the Revised Report included numeric SSCGs for constituents of concern (COCs) in soil vapor; revised the proposed remedial action objective (RAO) for methane such that methane will not exceed two percent of the lower explosive limit and will be removed to less than two percent of the lower explosive

[1] In the Revised Report, Shell commented on the interpretation of Resolution 92-49 in proposing SSCGs. Resolution 92-49 requires the Regional Board to assure that the cleanup promotes attainment of background water quality or the best water quality that is reasonable. In addition, the alternative cleanup level, other than background, must take into account the criteria set forth in Section 2550.4 of Title 23, California Code of Regulations, which includes criteria to protect human health; must address nuisance conditions, and must be consistent with the maximum benefit to the people of the state. In evaluating SSCGs and the remedies to be proposed in the RAP, the Regional Board will consider water quality, human health, and nuisance conditions.

limit and to the greatest extent technologically and economically feasible; revised the RAO for groundwater beneath the Site such that it attains the best quality that is technologically and economically feasible; and developed SSCGs for soil to address COCs leaching to groundwater.

The selected remedy must ensure compliance with the SSCGs for the long term and concludes that a cleanup based on the revised SSCGs proposed in the Revised Report may not fully support unrestricted residential land use, protect human health from exposure to COCs in the long term, and prevent further degradation of groundwater as required by the CAO. As discussed below under "Specific Comments", the Regional Board hereby approves SSCGs as revised to address groundwater and nuisance issues that were not fully addressed in the Revised Report.

SPECIFIC COMMENTS

For the Carousel Tract, SSCGs must result in:

- protecting residents from health risks due to potential exposure to COCs in soil vapors and direct contact with COCs in soil based on appropriate risk-based standards;
- abating nuisance conditions from COCs in soil and soil vapor; and
- restoring and protecting the beneficial uses of groundwater (i.e., attaining applicable water quality objectives in the groundwater).

The methodologies for deriving SSCGs are based on human health risk assessments, COC partitioning and migration analysis, quantification of COC leaching rates into groundwater, and the assessment of the potential for COC-caused nuisance. The Site investigation has provided site specific studies and extensive data[2] that are available for derivation of numeric SSCGs.

SSCGs for COCs in soil vapor must consider human health risks due to exposure through inhalation. SSCGs for COCs for soil must consider health risks and nuisance odor issues due to direct contact and odors and must consider leaching rates and water quality objectives to protect groundwater quality. The proposed SSCGs for COCs in soil are presented in Table 9-2 of the Revised Report. Proposed SSCGs for COCs in soil vapor are presented in Table 9-3 of the Revised Report. Proposed SSCGs for COCs in groundwater are presented in Table 9-4 of the Revised Report. Some of the proposed SSCGs set forth in Tables 9-2, 9-3, and 9-4 of the Revised Report do not meet all applicable criteria for selecting SSCGs, as described below. To address these comments, the Regional Board has developed Tables 1, 2, and 3 which are attached to this letter. Tables 1, 2, and 3 provide SSCGs for COCs in soil, soil vapor and groundwater and supersede Tables 9-2, 9-3, and 9-4 of the Revised Report. The SSCGs in Tables 1, 2, and 3 are protective of human health and groundwater quality, and will address potential nuisance from COCs at the Site. As set forth below under "Conclusions and Directives", Shell shall develop the RAP, the final Human Health Risk Assessment (HHRA) Report, and the environmental analysis using the SSCGs in Tables 1, 2 and 3.

Soil Depth Intervals

Shell provided SSCGs for COCs in soil to a depth of ten feet as required by the CAO. Based on the human health risk exposure scenarios for direct contact with COCs in soil in a residential setting, Shell

[2] See Attached Reference List.

divided the upper ten feet into two intervals of zero to two feet below grade surface (bgs), and from two feet to ten bgs. Shell based the proposed SSCGs on human health risk assessments from direct contact with soil in the upper two feet on an exposure scenario of 350 days per year over a period of 70 years. For the soil interval of two feet to ten feet Shell calculated risk to human health from direct contact with soil on an exposure scenario of four days per year. These exposure scenarios result in different SSCGs in the two soil intervals.

Regulatory guidance that incorporates a soil interval of zero to ten feet as appropriate for addressing risk in residential land use has been published by DTSC and the San Francisco Bay Regional Board. The *Supplemental Guidance For Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities* (CalEPA 1996), Human Health Risk Assessment Note 4 (DTSC, 2011) and the San Francisco Bay Regional Water Quality Control Board – *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Interim Final (December 2013) (ESL) use the exposure scenario of zero to ten feet for 350 days per year as the default. It is reasonable, for the purpose of protecting residents from direct contact with soil and nuisance associated with odors,[3] to assume that residents will have less frequent exposure to soils in a deeper soil interval than to soils in a shallower interval as suggested by Shell. The depth interval proposed by Shell may not, however, support unrestricted residential use as required by the CAO. Residents can readily dig in soil at depths lower than two feet for gardening or other home improvements, at which point they may be exposed to COCs at a greater exposure frequency than that used in developing the proposed SSCGs. Regional Board staff concludes that defining the uppermost soil interval from zero to five feet is supportive of unrestricted residential use because institutional controls are already in place throughout Los Angeles County, including the City of Carson and Carousel Tract for excavations that are deeper than five feet. These controls require a soils investigation as well as grading and shoring permits in order to excavate at depths below five feet. In the Carousel Tract, the Los Angeles County building code is administered by the City of Carson. Because the City must be notified and approve excavations below five feet (Los Angeles County Building Code Sections 3304.1.2, 3307.1, 1803.5.7, J103, J104) the City could readily inform residents and workers of other appropriate precautions necessary for excavations below five feet through existing administrative processes. Consequently, the Regional Board concludes that soil depth intervals of zero to five and five to ten feet bgs provide unrestricted use for gardening and other activities to a depth that coincides with existing institutional measures (i.e. obtaining excavation permits) that are already in place.[4]

It is noted that the Expert Panel has opined on the issue of separating the shallow soil interval of zero to ten feet bgs with different direct contact exposure frequencies. The Expert Panel agrees with the use of separate shallow and deeper soil intervals proposed by Shell. The Expert Panel agrees with Shell's use of a zero to two feet bgs as acceptable, but also agrees with the Regional Board's approach of setting forth a zero to five feet shallow sub-interval based on the precautionary principle. See attached "Soil depth intervals used to calculate the Site Specific Cleanup Goals" (January 14, 2014) from the Expert Panel.

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[3] In the course of conducting cleanup that involves excavation, Shell may encounter soils with detectable odors due to the presence of TPH. To assure protection of residents, the RAP will need to include a method to determine if TPH concentration in soil presents a detectable odor in accordance with the ESL and develop odor-based screening levels for indoor air based on 50 percent odor-recognition thresholds as published in the ATSDR Toxicological Profiles. For soil gas, follow the ESL for odor and other nuisance to calculate a ceiling level for residential land use.

[4] The Regional Board agrees with the proposed risk-based scenario to address exposure of construction or utility workers in non-residential areas of the Site for four days per year. As noted above, the City of Carson implements ordinances to address excavation.

Table 9-2, Site Specific Cleanup Goals, Soil

Shell provided SSCGs for COCs in soil in Table 9-2 of the Revised Report. In response to the Regional Board's August 21, 2013 letter, Shell considered both risk to human health and restoration and protection of groundwater. To derive the most appropriate SSCGs for COCs in soil, the more stringent of the human health-based and groundwater-based SSCGs needs to be selected for each COC in both soil depth intervals to meet both goals of protecting human health and groundwater. As described above, Shell provided SSCGs based on two soil intervals (zero to two feet and from two feet to ten bgs). However, Table 9-2 omits consideration of the groundwater leaching SSCGs in the deeper soil interval. The Revised Report does not provide explanation for omitting the leaching potential analysis from the deeper soil interval. The COCs can leach from any soil depth above the groundwater table and at some Site locations, the groundwater already exceeds applicable water quality objectives. Waste present at deeper intervals is most likely contributing to continuing degradation of groundwater. The SSCGs for COCs in soil must consider leaching to groundwater for both depth intervals. Table 1 includes SSCGs for COCs in soil that protect both human health and groundwater in the entire soil interval of zero to ten feet and identifies the more stringent of the health risk based and leaching potential based SSCGs.

The Regional Board also finds an error in the Revised Report's calculations of the SSCGs for COCs in soil based on leaching potential. Shell calculated the SSCGs to address COC leaching to groundwater based on the *May 1996 Regional Board Interim Site Assessment & Cleanup Guidebook.* The proposed SSCGs in the Revised Report based on COCs leaching to groundwater used a Dilution Attenuation Factor (DAF) of 6.24. This DAF is not appropriate for the Site because groundwater beneath the Site is already polluted by COCs. See attached Regional Board Staff Internal Memorandum dated December 10, 2013.

Table 9-2 does not include two COCs – xylenes and toluene – that have been detected at the Site. The Expert Panel commented in the attached memorandum that the Revised Report describes the COC list as preliminary. With respect to Table 9-2, the Regional Board considers the list of COCs complete with the addition of xylenes and toluene. Table 1 includes xylenes and toluene as COCs in soil.

Finally, the clarity of Table 9-2 is compromised by referring to the shallow soil horizon as "Excavated Area" and the deeper soil horizon as the "Non-Excavated Area." Table 1 defines the soil intervals to be used based on soil depth. The Regional Board stated in the August 21, 2013 letter that the Regional Board does not distinguish between excavated and non-excavated areas in setting SSCGs and directed Shell to develop protective SSCGs for all site soils.

To address these comments, Table 1, attached to this letter, sets forth SSCGs that take into account leaching potential for both soil intervals, and adds xylenes and toluene to the list of COCs with appropriate SSCGs. Table 1 also includes soil intervals for zero to five feet below grade as discussed above under "Soil Depth Intervals."

Table 9-3, Site Specific Cleanup Goals, Soil Vapor

The proposed SSCGs for COCs in soil vapor are presented in Table 9-3 of the Revised Report. The SSCGs for COCs are intended to protect human health from inhalation of COCs and are based on DTSC guidance for protective concentrations in indoor air. The Revised Report uses an attenuation factor of 0.001 that ties indoor air standards to soil gas COC concentrations in soil vapor. Recent guidance entitled *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance), California Environmental Protection Agency, Department of Toxic Substances Control,* (DTSC. 2011) and *U.S. EPA's Vapor Intrusion Database: Preliminary Evaluation of*

Attenuation Factors, Office of Solid Waste (U.S. EPA. 2008.) recommend use of an attenuation factor of 0.002 (see also Section B.3. of the Expert Panel Memorandum dated December 18, 2013). The Regional Board hereby approves the SSCGs for COC in soil vapor based on the attenuation factor of 0.002. The approved SSCGs for COC in soil vapor are provided in Table 2, attached to this letter.

Table 9-4, Site Specific Cleanup Goals, Groundwater

The proposed SSCGs for groundwater are presented in Table 9-4 of the Revised Report. The groundwater beneath the Site is designated in the Regional Board's Basin Plan as municipal supply[5], and, therefore, water quality objectives to protect that beneficial use are the appropriate standards. The water quality objectives set forth in the Basin Plan, include primary and secondary MCLs (i.e., drinking water standards) adopted by the California Department of Public Health and incorporated into the Basin Plan and the narrative water quality objective for Chemical Constituents. The proposed SSCGs for groundwater are based on the primary MCLs, the Notification Level, a health based environmental screening level, or zero to represent natural background. Generally, the proposed SSCGs are acceptable with the exception of the SSCGs for TPH. The proposed SSCGs for TPH as gasoline, diesel, and motor oil are based on the ESL. To comply with the Basin Plan water quality objectives, the SSCGs for TPH as gasoline, diesel, and motor oil should be based on the secondary taste and odor threshold of 100 micrograms per liter for TPH as diesel. See State Water Board's "A Compilation of Water Quality Goals", 16th Edition (April 2011).[6] The approved SSCGs for COCs in groundwater are provided in Table 3 attached to this letter.

Methane

In the Revised Report, the revised RAOs proposes prevention of fire/explosion risks in indoor air and/or enclosed spaces due to generation of methane by eliminating methane to the extent technologically and economically feasible. The proposed SSCG for methane is consistent with the DTSC guidance for addressing methane detected at school sites (CalEPA DTSC, 2005) and is applicable to concentrations measured in soil vapor, in vaults, or above ground. The SSCG for methane should be the more stringent of the lower explosive limit or the level that is technically and economically feasible. The "Response" on pages 16 and 78 of the Revised Report include response actions when the SSCG is exceeded. The Regional Board does not approve the response action at this time and will review the response actions that will be contained in the RAP.

The Screening Feasibility Study

The screening FS presented in the Revised Report sets forth several different cleanup alternatives that are based on excavation to different depths and implementation of soil vapor extraction. Shell developed a screening FS to address comments in the Regional Board's August 21, 2013 letter that information regarding the technological and economic feasibility of remedial alternatives was required in accordance with State Water Board Resolution 92-49 in order to approve SSCGs that are greater (i.e. less stringent) than necessary to attain background water quality.

[5] It is important to note that the groundwater at the Site is not currently used for municipal supply. The residents of the Carousel Tract obtain their drinking water from municipal supply provided by California Water Service Company.

[6] http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/

State Water Board Resolution 92-49 defines economic feasibility as follows:

> "Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions. The evaluation of economic feasibility will include consideration of current, planned, or future land use, social, and economic impacts to the surrounding community including property owners other than the discharger.
>
> Economic feasibility, in this Policy, does not refer to the discharger's ability to finance cleanup. Availability of financial resources should be considered in the establishment of reasonable compliance schedules."

The underlying basis for estimating remedial alternative costs is not provided in the Revised Report and cleanup metrics such as mass of wastes removed or risks abated is not provided. As discussed in further detail in the attached Regional Board staff memorandum titled *Comments on the Revised Site-Specific Cleanup Goal Report*, dated December 23, 2013, the range of accuracy is overly broad such that the economic differences between different alternatives may not be discernible. Additionally, the screening FS included statements that certain remedial scenarios might affect the tax basis of the City of Carson but did not provide a basis for this statement.

Resolution No. 92-49 defines technological feasibility as follows:

> "Technological feasibility is determined by assessing available technologies, which have shown to be effective under similar hydrogeologic conditions in reducing the concentration of the constituents of concern. Bench scale or pilot-scale studies may be necessary to make this feasibility assessment."[7]

Regional Board notes that Shell undertook bench-scale and pilot scale studies of a number of technologies, including in-situ bioremediation. These technologies have been documented in the pilot test (*Final Pilot Test Summary Report – Part 1*, [URS, May 30, 2013]). The pilot test indicated bioremediation is a potential technology to remediate residual petroleum hydrocarbons. However, the technology was not included in the remediation alternatives set forth in the Revised Report. In developing the RAP, Shell must consider all technologies that have demonstrated effectiveness in bench and pilot studies, including bioremediation as a potential remedial alternative.

Chlorinated Solvents

The Regional Board staff disagree with the Revised Report which suggested that the tetrachloroethylene (PCE) and trichloroethylene (TCE) detected in both on-site soils and soil vapor is from off-site sources exclusively. Although there may be off-site sources of PCE and TCE at the Site, those COCs are often associated with the petroleum industry and on-site sources should not be discounted. The USEPA Toxic Release Inventory for the Petroleum Industry includes the use of chlorinated solvents in large industrial process description. Therefore, the Regional Board cannot exclude PCE and TCE from the list of COCs for the Site. The Expert Panel also recommends that PCE and TCE should not be excluded from the list of COCs. See Expert Panel memorandum dated December 18, 2013.

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[7] Note that Shell has conducted numerous pilot studies and those can be used to evaluate technical feasibility. The Regional Board is not suggesting that additional pilot studies are necessary.

CONCLUSIONS AND DIRECTIVES

Upon review of the Revised Report and other relevant documents, the Regional Board approves the following SSCGs as set forth in the attached Tables 1, 2, and 3 with the understanding that the SSCGs may be further revised as necessary to address cumulative risks identified in the forthcoming HHRA that exceed the RAOs.

1. SSCGs for COCs in Soil: The approved revised SSCGs for COCs in soil are provided in Table 1. As described above, to address direct contact with soils, Table 1 provides SSCGs that consider a 350-day per year exposure scenario to soil zero to five feet bgs to be appropriate for unrestricted residential land use and a four- day per year exposure scenario to soil five to ten feet bgs to be appropriate for limited direct contact. To address potential leaching to groundwater, Table 1 provides SSCGs for a soil interval of zero to ten feet bgs. The more stringent of the SSCGs for each soil interval are the approved SSCGs. In addition, SSCGs for toluene and xylenes shall be developed in accordance with the comments above and added to the list of COCs .

2. SSCGs for COCs in Soil Vapor: The approved revised SSCGs for protection of human health are provided in Table 2. As described above, they have been adjusted to take into account recent guidance. In addition, SSCGs shall be revised if necessary to take into account cumulative risks and the final HHRA Report.

3. SSCGs for COCs in Groundwater: The approved revised SSCGs for groundwater are provided in Table 3. As described above, the SSCGs for TPH have been adjusted to address applicable water quality objectives.

The CAO required Shell to submit the RAP to the Executive Officer no later than 60 days after the Executive Officer's approval of the Pilot Test Report. In a letter dated April 25, 2013, the Regional Board revised the due date for the RAP to 45 days following approval of the SSCGs. Therefore, in accordance with the revised due date, Shell is now directed to submit the RAP on March 10, 2014 to the Executive Officer for review and approval. The RAP shall take into account the requirements set forth in the CAO under Paragraph 3, including an evaluation of all available options for remediation, and is based on the comments in this letter and the revised approved SSCGs set forth in Tables 1, 2, and 3 attached to this letter.

To be consistent with the CAO, the RAP shall include, at a minimum:

A. Remedial Alternatives: The RAP shall consider all technologies that were pilot tested, including bioventing, as alternatives. The RAP shall be developed to address COCs in soils in the soil intervals consistent with these comments. The screening FS alternatives in the Revised Report that address this requirement include Alternatives 3B and 4B. Although other alternatives set forth in the screening FS may also be addressed in the RAP, the RAP and environmental analysis must address Alternatives 3B or 4B to take into account the revised SSCGs set forth in Tables 1, 2, and 3. Consistent with State Water Board Resolution 92-49, the RAP shall evaluate the alternatives with respect to effectiveness, feasibility, and cost and propose a remedy or remedies that have a substantial likelihood to achieve compliance, within a reasonable time frame, with the cleanup goals and objectives.

B. Relocation Plan: The RAP shall provide a preliminary relocation plan for residents of the Carousel Tract during remedial activities. The relocation plan shall be based on the

environmental analysis to be submitted in the RAP such that residents are not exposed to COCs or other environmental impacts during the cleanup. A final relocation plan shall be submitted following approval of the RAP.

C. Soil Remediation Boundaries: Shell developed site-wide shallow soil concentration contours for discrete depths of 2, 5, and 10 feet below ground surface in the Site Delineation Report. Shell shall consider the results in the Site Delineation Report, soil concentrations contours and the results of the property-by-property investigations in developing the RAP.

D. Residual Slabs: The RAP shall consider the removal of residual slabs as discussed in the Regional Board's response to the Assessment of Environmental Impact and Feasibility of Removal of Residual Concrete Reservoir Slabs in a letter dated, January 13, 2014 where necessary to protect human health and water quality and address nuisance concerns.

E. Soil Management Plan: The RAP shall include a proposed Soil Management Plan for all soils containing COCs. The RAP shall address on-going monitoring requirements and identification of other governmental agencies that may be responsible for implementing the Soil Management Plan.

The Regional Board concurs with the comments provided by OEHHA dated December 16, 2013 and the Expert Panel dated December 18, 2013. The RAP should address the comments by the Expert Panel that are not already addressed in this letter.

In addition, Shell is directed to concurrently submit with the RAP (1) the final HHRA Report and (2) draft environmental documents consistent with the California Environmental Quality Act (CEQA) analyzing the potential environmental impacts associated with remediation alternatives considered in the RAP.

The RAP shall address any areas that the HHRA Report identifies that will not meet the remedial action objectives (RAOs) of a cancer risk of 1×10^{-6} and non-cancer risk of 1. The RAP shall ensure that these areas shall be remediated to meet the RAOs.

In summary, the RAP, HHRA Report, and environmental documents are due to the Regional Board by 5:00 pm on March 10, 2014.

Following receipt of the required documents, the Regional Board will provide an opportunity for Expert Panel, OEHHA, other agencies, and public review and comment. Following its review of the documents and comments, the Regional Board will consider certification of the environmental documents and approval of RAP.

The due date for the above required documents constitutes an amendment to the requirements of Cleanup and Abatement Order No. R4-2011-0046 originally dated March 11, 2011. All other aspects of Order No. R4-2011-0046 originally dated March 11, 2011 and amendments thereto, remain in full force and effect. Pursuant to section 13350 of the California Water Code, failure to comply with the requirements of Order No. R4-2011-0046 by the specified due date, including the due date for the RAP, HHRA Report and CEQA documents set forth in this letter, may result in civil liability administratively imposed by the Regional Board in an amount up to five thousand dollars ($5000) for each day of failure to comply.

The State Water Board adopted regulations requiring the electronic submittals of information over the Internet using the State Water Board GeoTracker database. You are required not only to submit hard

copy reports required in this Order but also to comply by uploading all reports and correspondence prepared to date and additional required data formats to the GeoTracker system. Information about GeoTracker submittals, including links to text of the governing regulations, can be found on the Internet at the following link:

http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal

Please note that, the Regional Board requires you to include a perjury statement in all reports submitted under the CAO. The perjury statement shall be signed by a senior authorized Shell representative (and not by a consultant). The statement shall be in the following format:

" I, [NAME], do hereby declare, under penalty of perjury under the laws of State of California, that I am [JOB TITLE] for Shell Oil Company that I am authorized to attest to the veracity of the information contained in [NAME AND DATE OF REPORT] is true and correct, and that this declaration was executed at [PLACE], [STATE], on DATE]."

If you have any questions, please contact the project manager, Dr. Teklewold Ayalew at (213) 576-6739 (tayalew@waterboards.ca.gov) or Ms. Thizar Tintut-Williams, Site Cleanup Unit III Chief, at (213) 576-6723 (twilliams@waterboards.ca.gov).

Sincerely,

Samuel Unger

Samuel Unger, PE
Executive Officer

Attachments:
Table 1: Site Specific Cleanup Goals, Soil (revised Table 9-2)
Table 2: Site Specific Cleanup Goals, Soil Vapor (revised Table 9-3)
Table 3: Site Specific Cleanup Goals, Groundwater (revised Table 9-4)
SSCGs Development Support Documents References
Comments from the Expert Panel dated January 14, 2014
Regional Board Staff Internal Memorandum 1 dated December 10, 2013
Comments from the Expert Panel dated December 18, 2013
Regional Board Staff Internal Memorandum 2 dated December 23, 2013
OEHHA Memorandum dated November 21, 2013

cc: List

List

Janice Hahn, Honorable Congresswoman, US House of Representatives, California's 44th District
Isadore Hall, III, Assembly member, 64th Assembly District
Mark Ridley-Thomas, Supervisor, Second District County of Los Angeles
Jim Dear, Mayor of Carson
Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Frances McChesney, Office of Chief Counsel, State Water Resources Control Board
James Carlisle, Office of Environmental Health Hazard Assessment
Robert Romero, Department of Toxic Substances Control
Alfonso Medina, Los Angeles County Department of Health
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