

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

**ADDENDUM NO. 8 TO
CLEANUP AND ABATEMENT ORDER NO. 92-01**

**KINDER-MORGAN ENERGY PARTNERS, LP O/P; SFPP, LP; POWERINE OIL COMPANY;
SANTA FE PACIFIC PIPELINE PARTNERS, LP; AND EXXONMOBIL OIL
CORPORATION**

**MISSION VALLEY TERMINAL
9950 & 9966 SAN DIEGO MISSION ROAD
SAN DIEGO COUNTY**

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) finds that:

1. Except as contradicted or superseded by the Findings set forth in this Addendum, all of the previous Findings in Cleanup and Abatement Order No. 92-01 and Addenda thereto (CAO) are incorporated into this Addendum.
2. In accordance with CAO No. 92-01, Directive No. 3, the Dischargers submitted a Corrective Action Plan that selected the remedial strategy of groundwater extraction to clean up the light non-aqueous liquid (LNAPL) affected soil and groundwater beneath the on-Terminal Area.¹
3. In accordance with Addendum No. 5, Directive No. 5, the Dischargers submitted a Revised Site Conceptual Model and Corrective Action Plan that expanded the remedial strategy to include soil vapor extraction (SVE) with hydraulic containment at the property boundary to clean up LNAPL affected soil and groundwater beneath the on-Terminal Area.²
4. The Dischargers expanded the network of groundwater extraction wells and SVE wells to expedite the remediation of impacted soil and groundwater beneath the on-Terminal Area.³ The expanded on-Terminal remediation system commenced operation in February 2014.
5. The 2005 Site Conceptual Model and on-Terminal Corrective Action Plan stated that clean up of the “on-Terminal Area will entail reducing the concentration of residual LNAPL such that dissolved-phase hydrocarbons meet primary and secondary MCLs when the property land use changes from an active terminal.” The on-Terminal pollution poses a threat to the newly restored beneficial uses down gradient of the

¹ Camp, Dresser, & McKee, *Mission Valley Terminal, Corrective Action Plan*, October 1999.

² LFR, *Site Conceptual Model and On-Terminal Corrective Action Plan*, Mission Valley Terminal, September 8, 2005.

³ Arcadis, *Work Plan for Installation of On-Terminal Groundwater Extraction Wells, Soil Vapor Extraction Wells, and Soil Vapor Monitoring Probes*, Mission Valley Terminal, September 4, 2009 and *Completion Report, Soil Vapor Extraction Wells*, Kinder Morgan Energy Partners, July 20, 2010.

Terminal. This threat should be eliminated as soon as possible. The threat posed by the on-Terminal pollution is mitigated by the operation of the hydraulic barrier, but this solution requires the discharge of thousands of gallons of groundwater per day to Murphy Canyon Creek. This discharge contributes to the unnaturally high flows in the creek, and should be terminated as soon as possible.

By expanding the remediation system in September 2005, Kinder Morgan cleaned up the off-Terminal pollution in 8 years. Based on Kinder Morgan's achievement in the off-Terminal Area where pollution was more widespread, a reasonable cleanup completion date for the on-Terminal Area is January 31, 2024.

6. Groundwater and remediation monitoring are no longer necessary in the off-Terminal Area because the alternative groundwater cleanup levels have been attained in monitoring wells used for the Monitoring and Reporting Program (MRP). Therefore, the MRP in Addendum No. 7 needs to be revised to eliminate requirements to conduct this monitoring. This Addendum replaces the existing MRP in Addendum No. 7 with an MRP to evaluate the progress of the on-Terminal Area cleanup.
7. In accordance with Addendum No. 5, Directive No. 4, the Dischargers installed a hydraulic containment barrier utilizing extraction wells RW-35, RW-36, and RW-37 to prevent petroleum hydrocarbon waste constituents in groundwater beneath the terminal from migrating beyond the Mission Valley Terminal property limits. Continued monitoring of sentinel wells (T-11, R-10, R-43AS-AD, R-79AS-AM-AD, and R-87AS) is necessary to evaluate hydraulic containment effectiveness near the property boundary.
8. This action is an Order to establish a cleanup compliance date and revise a monitoring and reporting program. Therefore, this action is exempt from the provisions of the California Environmental Quality Act in accordance with section 15061(b)(3) of chapter 3, title 14 of the California Code of Regulations because it can be seen with certainty that there is no possibility that the activity in question will have a significant effect on the environment.

IT IS HEREBY ORDERED THAT, pursuant to California Water Code section 13304, the Dischargers shall, as soon as practicable and **no later than January 31, 2024**, cleanup and abate the effects of the on-Terminal waste discharge in a manner that attains the alternative groundwater cleanup levels approved by the San Diego Water Board.⁴ The approved alternative cleanup levels are provided in the table below.

Chemical	Alternative Cleanup Level (ug/l)	Basis
MTBE (methyl-tertiary-butyl-ether)	5	Secondary MCL
TBA (tertiary-butyl alcohol)	12	Notification Level
Benzene	1	Primary MCL
Toluene	40	Taste and Odor
Ethylbenzene	30	Taste and Odor
Xylenes	20	Taste and Odor

⁴San Diego Water Board, *Approval of Alternative Cleanup Levels and Completion of Corrective Actions for the Off-Terminal Area*.

IT IS FURTHER ORDERED THAT, the MRP in Addendum No. 7 is replaced by the following MRP.

1. **AUTHORITY AND PURPOSE.** The Dischargers are directed to submit the technical reports required by this Addendum pursuant to California Water Code sections 13267 and 13304. This Addendum is intended to document compliance with Cleanup and Abatement Order No. 92-01 and addenda thereto.
2. **OFF-TERMINAL WELL DESTRUCTION.** With the exception of sentinel wells (T-11, R-10, R-43AS-AD, R-79AS-AM-AD, and R-87AS), all off-Terminal wells and borings installed for the purpose of investigating, remediating, and monitoring the unauthorized off-Terminal pollution must be properly destroyed or transferred in accordance with applicable local and State requirements. All waste (i.e. debris and other investigation or remediation derived materials) must be removed from the off-Terminal area and properly managed in accordance with regulatory agency requirements. A Well Destruction Report documenting this activity must be submitted to the San Diego Water Board no later than 60 days after completion.
3. **GROUNDWATER MONITORING.** The Dischargers must gauge groundwater elevations, and collect and analyze groundwater samples from monitoring wells according to the following:
 - a. All sample collection, storage, and analyses must be performed according to protocols in the U.S. Environmental Protection Agency (USEPA), "SW-846: Test Methods for Evaluating Solid Wastes Physical/Chemical Methods" (Revision 8, dated July 2014). All analyses must be performed in a laboratory certified to perform such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board. Specific methods of analysis must be identified. The director of the laboratory whose name appears on the certification must supervise all analytical work and must sign all reports submitted to the San Diego Water Board. Analytical protocols other than USEPA approved methods or Standard Methods are allowed; the exact methodology must be approved by the San Diego Water Board prior to use.

Samples must be analyzed using USEPA Method 8015 for total petroleum hydrocarbons (TPH) quantifying gasoline and diesel fuel fractions (USEPA Method 8260b may be used as an alternative to Method 8015 for quantifying the gasoline fuel fraction) and USEPA Method 8260b for volatile organic compounds including benzene, toluene, ethylbenzene, xylenes, methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), and all other fuel oxygenates.

- b. Quarterly groundwater monitoring must consist of the following:

Wells Gauged and Sampled for Analysis of TPHg, TPHd, BTEX, and Oxygenates						
R-10	R-43AS	R-43AD	R-58AD	R-79AS	R-79AM	R-79AD
R-87AS	T-1	T-2	T-3	T-4	T-5	T-11
T-18						
Wells Gauged Only						
LF-3	LF-4	LF-5	LF-6	M-1	M-2	M-3
M-4	R-2	R-3	R-5	R-6	R-7	R-13
R-14	R-49AS	R-50AS	R-51AS	R-52AS	R-53AS	R-54AS
R-55AS	R-56AS	R-57AD	R-59AS	R-71AS	R-72AS	R-74AS
R-77AS	R-78AS	RW-1	S-1	S-4	S-7	S-10
S-12	SFPP-7	SFPP-8	T-6	T-7	T-8	T-9
T-10	T-12	T-15	T-16	T-17	T-19	T-21

- c. Semi-annually groundwater monitoring must be conducted in the second and fourth quarters and consist of the following:

Wells Gauged and Sampled for Analysis of TPHg, TPHd, BTEX, and Oxygenates					
LF-3	LF-4	M-4	M-5	R-1	R-13
R-53AS	R-54AS	R-55AS	R-56AS	R-77AS	S-1
SFPP-8	T-6	T-7	T-8	T-19	T-20
T-21	R-49AS	R-50AS	R-51AS	R-52AS	R-57AD
Wells Gauged and Sampled for Analysis of TPHd					
M-6	R-73AS	S-3	S-7	S-10	

- d. Annual groundwater monitoring must be conducted in the fourth quarter and consist of the following:

Wells Gauged and Sampled for Analysis of TPHg, TPHd, BTEX, and Oxygenates					
LF-2	LF-5	LF-6	M-1	M-2	M-3
M-6	R-2	R-3	R-5	R-6	R-7
R-59AS	R-71AS	R-72AS	R-73AS	R-74AS	R-75AS
R-76AS	R-78AS	S-3	S-4	S-5	S-7
S-10	S-12	S-13	S-14	S-16	SFPP-7
T-9	T-16				
Wells Sampled for Analysis of Aerobic and Anaerobic Biodegradation Indicators Including pH, Dissolved Oxygen, Alkalinity, Methane, Ferrous Iron, Sulfate, and Nitrate.					
R-10	R-43AS	R-43AD	R-58AD	R-79AS	R-79AM
R-79AD	R-87AS	T-1	T-2	T-3	T-4
T-5	T-11	T-18	R-49AS	R-50AS	R-51AS
R-52AS	R-53AS	R-54AS	R-55AS	R-56AS	R-57AD
R-71AS	R-74AS	S-12	T-21		

- e. If no petroleum constituents are detected at a monitoring well for four consecutive monitoring events, the monitoring frequency for that well may be changed to annual.
- f. The Dischargers must sample any new monitoring well(s) quarterly and analyze groundwater samples for the petroleum constituents as required above. The Dischargers may propose changes in the above groundwater monitoring requirements. All proposed changes to this MRP must be provided in writing and may not be implemented prior to approval by the San Diego Water Board.
4. **REMEDIATION MONITORING.** The Dischargers must monitor the remediation systems and soil vapor in areas under active remediation to track the effectiveness and progress of the on-Terminal cleanup. Analytical data must be collected quarterly from soil vapor extraction (SVE) wells and soil vapor monitoring (SVM) probes, unless two consecutive laboratory samples demonstrate that benzene is below 50 parts per billion by volume (ppbv), the C4-C6 hydrocarbon fraction is below 500 ppbv, the C6-C8 hydrocarbon fraction is below 500 ppbv, and TPH is below 20 parts per million by volume (ppmv).

Additionally, demonstrate monthly that each SVM probe in areas under active remediation is 1) under vacuum and 2) sufficiently aerated by the vapor flow such that O₂ concentrations exceed 5 percent volume per volume (v/v).

5. **REMEDICATION SYSTEM LABORATORY ANALYSIS.** All analysis must be conducted by Gas Chromatography-Flame Ionization Detector (GC/FID) to determine the total concentration and composition in terms of carbon number ranges (e.g., percent TPH less than C4, C4-C6, etc. ranges) and concentrations of benzene, toluene, ethylbenzene, xylenes, and MTBE. Gas Chromatography-Mass Spectrometry (GC-MS) analyses can be used in place of GC-FID whenever this monitoring program calls for GC-FID vapor or soil analysis, as long as GC-MS is used consistently for all analyses.
6. **GROUNDWATER MONITORING AND REMEDIAL PROGRESS REPORTS.** The Dischargers must submit the Groundwater Monitoring and Remedial Progress Reports (Reports) quarterly to the San Diego Water Board no later than 30 days following the end of the quarter according to the following schedule:

Quarter	Monitoring Period	Report Due Date
First Quarter	January -March	April 30
Second Quarter	April-June	July 30
Third Quarter	July-September	October 30
Fourth Quarter	October -December	January 30

The Reports must be received by the San Diego Water Board no later than 5:00 PM on the Report due date and must include:

- a. **Transmittal Letter.** The transmittal letter must discuss any violations and/or petroleum releases during the reporting period and actions taken or planned to correct the problem(s). The letter must be signed by the Dischargers' principal executive officer or his/her duly authorized representative, and must include the following certification statement:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

In order to assist the San Diego Water Board in processing correspondence and Reports submitted in compliance with this cleanup and abatement order, the Dischargers must include the code "SL607392800" in the heading or subject line portion of all correspondence and Reports submitted to the San Diego Water Board.

- b. **Groundwater Monitoring Results.** The Reports must include at least the following information:
- 1) A site plot plan which clearly illustrates the locations of remediation and monitoring wells, former and current underground and aboveground storage tank systems, and buildings located on-Terminal and in the area of the pollution.
 - 2) A groundwater elevation map that includes the groundwater flow direction and calculated hydrologic gradients(s) clearly indicated in the figures(s).
 - 3) Isoconcentration maps for benzene, MTBE, and TBA. For well locations that are well clusters, each isoconcentration map must be prepared using the highest concentration observed at each well cluster. Isoconcentration maps must be prepared using log scale (e.g. 1, 10, 100, 1000, etc.).
 - 4) Historical groundwater elevations gauged during the previous three-year period must be tabulated in each Report. Groundwater elevation data must be presented in the fourth quarter Report each year in tabular form with well number, date of measurement, depth to groundwater, groundwater elevation, top of casing elevation, depth to the top and bottom of well screen, length of well screen, and total depth for each well included in the monitoring program. The data for all wells containing LNAPL must also include the measured thickness of LNAPL in the groundwater elevation table.
 - 5) Analytical results for each constituent of concern (COC) required in this Order presented in tabular format including: well number, sample collection date, and time versus concentration plots.
 - 6) Narrative interpretations of the groundwater data. The text must include a description of any significant increase(s) in pollutant concentration(s) since the last Report, any measures proposed to address the increase(s), any changes to the site conceptual model, and any conclusions and recommendations for future action.
 - 7) Analytical methods used, detection limits obtained for each reported constituent, lab analysis results, and QA/QC data. A narrative discussion and explanation of any problematic QA/QC data must also be included in the Report.
 - 8) Sample collection protocols and, when waste is disposed of off-site, documentation of proper off-site disposal of wastes (including but not restricted to contaminated well purge water, soil cuttings, LNAPL, etc.).
- c. **Remediation Progress Results.** The remediation system monitoring must include the following minimum information for all active remediation and any interim remedial actions initiated during the reporting period:

- 1) A table summarizing the analytical and field data collected from SVE wells and SVM probes in areas under active remediation.
 - 2) A table summarizing remediation system operations indicating beginning and end of time periods when the system(s), or components thereof, were either shut down or not able to operate at optimum levels and reasons for the occurrence.
 - 3) Groundwater extraction results in a tabular format for each extraction well and for the site as a whole, expressed in average gallons of groundwater extracted per day during the reporting period.
 - 4) Calculated pollutant removal results from operation of the groundwater extraction wells and from any other cleanup and abatement systems reported in units of chemical mass per day.
 - 5) Evaluation of effectiveness and assessment of performance. The fourth quarter Report must include a complete evaluation of the performance and effectiveness of the remediation system(s) at the site. The evaluation must include a full report of system operations during the reporting period, and an assessment of whether the systems are adequately performing to meet all the cleanup goals. If the remediation is not meeting remedial goals, the Report narrative must clearly indicate that expectation and include recommendations for the necessary modifications/enhancements to the configuration and/or operation of the remediation systems.
7. **REMEDIAL COMPLIANCE EVALUATION WORK PLAN.** The Discharger must submit a Remedial Compliance Evaluation (RCE) Work Plan no later than **5:00PM on August 31, 2023**. The RCE Work Plan must include the following minimum information:
- a. Proposed soil sample locations collected from the on-Terminal LNAPL zone. Soil analysis must include results from laboratory-based leachate tests (using Synthetic Precipitation and Leachate Procedure, USEPA Method 1312).
 - b. A vapor rebound test when the remediation monitoring data (described above) indicate that cleanup goals have been achieved.
8. **REMEDIAL COMPLIANCE EVALUATION REPORT.** The Discharger must submit a RCE Report verifying completion of cleanup and abatement actions taken on-Terminal. The RCE Report must be received by the San Diego Water Board no later than **5:00PM on January 31, 2024**. The RCE Report must provide a demonstration, based on a sound technical analysis, that cleanup levels have been met for all waste constituents throughout the zone affected by the waste constituents. When the San Diego Water Board finds that the Dischargers have complied with Directive No. 1, the Dischargers may stop groundwater and remediation monitoring as described in Directives Nos. 3 and 4 above.

9. **USE OF REGISTERED PROFESSIONALS.** The Dischargers must provide documentation that plans and reports required under this Order are prepared under the direction of appropriately qualified professionals. California Business and Professions Code sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under the direction of licensed professionals. A statement of qualifications and license numbers of the responsible lead professionals must be included in all plans and Reports submitted by the Dischargers. The lead professional must sign and affix their registration stamp to the Reports.
10. **RELEASE REPORT.** The Groundwater Monitoring and Remedial Progress Reports must include a list of all releases, regardless of volume, from the tanks and/or piping systems for the quarter. This includes all operations, tanks (permanent or temporary), sumps, and pipelines. The Reports must also include a site plot plan indicating the location of each release, the date each release was discovered, the cause of each release, an estimated volume of material/pollutants associated with each release, date the releases were reported to the agencies as required by statute/regulation or this Order, and the mitigation methods employed to repair the problem(s).
11. **STATUS REPORT.** The Groundwater Monitoring and Remedial Progress Reports must describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures, results of implementation of the Corrective Action Plan) and work planned for the following quarter. The Reports must also indicate any problems in completing site related work during the previous reporting period (e.g., equipment malfunctions, site access problems, etc.).
12. **ELECTRONIC REPORTING REQUIREMENTS.** The Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & and Division 3 of Title 27, CCR) require electronic submission of any Report or data required by a regulatory agency from a cleanup site after July 1, 2005. All information submitted to the San Diego Water Board in compliance with this Addendum is required to be submitted electronically via the Internet into the Geotracker database <http://geotracker.waterboards.ca.gov/> (Geotracker Site ID. **SL607392800**). The electronic data shall be uploaded on or prior to the regulatory due dates set forth in the Order or addenda thereto. To comply with these requirements, the Discharger shall upload to the Geotracker database the following minimum information.
 - a. **Laboratory Analytical Data.** Analytical data (including geochemical data) for all soil, vapor, and water samples in Electronic Data File (EDF) format. Water, soil, and vapor data include analytical results of samples collected from: monitoring wells, boreholes, gas and vapor wells or other collection devices, surface water, groundwater, piezometers, stockpiles, and drinking water wells.
 - b. **Locational Data.** The latitude and longitude of any permanent monitoring well for which data is reported in EDF format, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System (CSRS-H), if available.

- c. **Monitoring Well Elevation Data.** Elevation measurements to the top of groundwater well casings for all groundwater monitoring wells. Drinking water wells included in the Report, do not need to have the elevation reported unless they are identified as permanent sampling points.⁵
 - d. **Depth-to-Water Data.** Monitoring wells need to have the depth-to-water information reported whenever water data is collected, even if water samples are not actually collected during the sampling event. Drinking water wells do not need to have the depth-to-water reported unless the wells are surveyed as permanent sampling points and the measurements can be feasibly made in the well.
 - e. **Site Map.** Site map or maps that displays discharge locations,⁶ streets bordering the facility, and sampling locations for all soil, water, and vapor samples. The site map is a stand-alone document that may be submitted in various electronic formats.⁷ A site map must also be uploaded to show the maximum extent of any groundwater pollution. An updated site map may be submitted at any time.
 - f. **Monitoring Well Screen Intervals.** The depth to the top of the screened interval and the length of the screened interval for any permanent monitoring well.
 - g. **Boring Logs.** Boring logs (in searchable PDF format) prepared by an appropriately licensed professional.
 - h. **Electronic Report Submittal Requirements.** A complete copy (in searchable PDF format) of all assessment, cleanup, and monitoring Reports including the signed transmittal letters, professional certifications, and all data presented in the reports.
13. **VIOLATION REPORTS.** If the Dischargers violate requirements in the Cleanup and Abatement Order and/or addenda thereto, the Dischargers must notify the San Diego Water Board office by telephone and facsimile as soon as practicable once the Dischargers have knowledge of the violation. The San Diego Water Board may require the Dischargers to submit a separate technical report on the violation within five working days of telephone notification.
 14. **OTHER REPORTS.** The Dischargers must notify the San Diego Water Board verbally prior to any site activities which have the potential to contribute to, create or exacerbate a condition of pollution or nuisance (e.g., cause or contribute to additional contaminant mass or migration of pollution) or which would provide new need for site investigation.
 15. **RECORD KEEPING.** The Dischargers or his/her agent must retain data generated for the above reports, including laboratory results and QA/QC data, for a minimum of six years after origination and must make them available to the San Diego Water Board upon request.
 16. **MONITORING AND REPORTING PROGRAM REVISIONS.** Revisions to the MRP may be ordered by the San Diego Water Board, or requested by the Dischargers. Prior

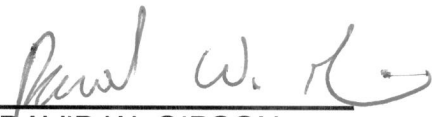
⁵ A permanent sampling point is defined as a point that is sampled for more than a 30-day period.

⁶ Former tank(s), product and vapor piping, dispenser locations, or sump locations, and unauthorized discharge or spill areas.

⁷ Formats include .gif, .jpeg, .jpg, tiff, .tif, .pdf

to making MRP revisions, the San Diego Water Board will consider the burden, including costs, of the groundwater monitoring Reports relative to the benefits to be obtained from these reports.

17. The Dischargers must implement this updated MRP commencing in the Third quarter 2016 with the quarterly Report due on **October 30, 2016**.

Ordered by: 
DAVID W. GIBSON
Executive Officer