

Shell Oil Company • Shell Chemical Company

A Division of Shell Oil Company

Carson Plant
P O Box 6249
Carson CA 90749-0249

Telephone (310) 816-2000

November 3, 1994

Mr. J. E. Ross, Unit Chief
California Regional Water Quality
Control Board - Los Angeles Region
101 Centre Plaza Drive
Monterey Park, CA 91754

ATTN: Mr. Keith Elliot

SUBJECT: Removal of Oil Storage Reservoir's at the Former
Shell Oil Company Facility Located at 1622/1520
East Sepulveda Boulevard in Carson

Dear Mr. Elliot:

Enclosed is a work plan for the construction activity associated with removal of the oil storage reservoirs located on what is now the Unocal Los Angeles Refinery-Carson Plant.

The enclosed work plan augments the plan submitted to you for this project on August 29, 1994. It indicates the procedures that will be followed to achieve compliance with the Waste Discharge Requirements issued by the Regional Board on October 31, 1994.

If you have any questions, please contact me at (310) 816-2045 or Mike Garcia at (310) 816-2082.

Please accept our thanks for the expeditious manner in which the Board has processed our application for Waste Discharge Requirements for this project. Your prompt response to our request has enabled us to avoid the very significant adverse impact that delay would have caused.

Yours truly,

A handwritten signature in dark ink, appearing to read "T. F. Maher", is written over the typed name.

T. F. Maher, Sr. Engineer
Environmental Conservation

cc: Meg George, Unocal

Shell Development Company

A Division of Shell Oil Company

Westhollow Research Center
P.O. Box 1380
Houston, Texas 77251-1380**WORK PLAN****RESERVOIR REMOVAL PROJECT****SHELL/UNOCAL FACILITY
1520 - 1622 EAST SEPULVEDA BLVD.
CARSON, CALIFORNIA****INTRODUCTION**

This work plan describes activities required to complete the removal and closure of two crude oil reservoirs, known as reservoirs one and two, located at the Wilmington Section of the former Shell Oil Company Wilmington Manufacturing Complex, at 1520 to 1622 East Sepulveda Boulevard in Carson, California. These reservoirs were built in the 1920's and were originally used to store crude oil. Later, these reservoirs were also used to store heavier refinery intermediate streams such as coker feed and vacuum flasher feed. In addition, reservoir two occasionally was used to store marine fuel oil. The reservoirs were in continuous use until December 1991, when they were drained and scheduled for removal and closure.

Work to empty the reservoirs and dismantle the roof structure was completed in March 1994. Assessment of the soils in the berms and underlying the reservoirs has been conducted and reports submitted to the California Regional Water Quality Control Board (RWQCB) describing the results of these investigations. A preliminary work plan for the removal and closure of the reservoirs was submitted to the RWQCB in August 1994. Permission to remove and crush the concrete liner covering the interior berm walls and floor was received from the RWQCB in August 1994.

Waste Discharge Requirements (WDR's) applicable to this project were issued by the RWQCB in October, 1994. Included in the WDR's were requirements for the submittal of an additional work plan which describes the: excavation monitoring, characterization of the berm material to be graded into the reservoirs as backfill, placement of a low permeability cover over the filled reservoirs, precipitation and drainage control, and post-closure maintenance. This work plan describes the activities necessary to complete the closure of the reservoirs and comply with the requirements of the WDR's.

Handwritten initials in a circle, possibly 'RWH'.

SCOPE OF PROJECT

The scope of this project is to complete the closure of the reservoirs and make the area available for future use as refinery property. The reservoirs have been emptied and the roofs dismantled. Currently, the concrete liner is being removed and crushed for use as fill material. The steps necessary to complete the closure of the reservoirs are as follows:

1. Complete the removal of the concrete liner and then remove for offsite disposal any residual liquid hydrocarbons and hydrocarbon saturated soils. Any material transported offsite for disposal will be properly handled and disposed of at an approved facility in compliance with applicable regulations.
2. Establish a sampling grid and obtain representative soil samples at the base of the excavation prior to placement of any fill material. Soil samples will be collected at the frequency and analyzed for the constituents required in the "Excavation Monitoring" section of the WDR's.
3. Make individual cuts of approximately 1000 cubic yards (CY) of the berm material. Each individual cut will be sampled, tested, and characterized as appropriate for incorporation as fill material. The frequency of sampling and the contaminant concentrations acceptable for soils used as fill material will be as specified in the WDR's.
4. Grade the fill material into the reservoirs and compact to a minimum of 90% relative compaction. Using the fill material from the berms, bring grade to levels which will serve as a foundation for the final cover material.
5. Install a low permeability cover which has a maximum relative permeability of 1×10^{-6} cm/sec. Final grading and drainage controls will be as specified in the grading plan approved by the County of Los Angeles, which was submitted with the previous work plan. Post-closure maintenance will be as specified in this work plan.
6. Completion and submittal of a "Petroleum Hydrocarbon Contamination Removal Report" and a "Backfill and Final Project Completion Report" within the time frames specified in the WDR's.

The following sections provide additional details for the activities described above.

(RWH)

EXCAVATION MONITORING

After removal of the concrete liner, any liquid hydrocarbons and any hydrocarbon saturated soil will be removed and transported to an appropriate licensed disposal facility. Following removal of all objectionable material, the base of each reservoir will be sectioned off in a grid pattern with each grid node having an area of approximately 5,000 square feet (sq. ft.).

A representative soil sample will be collected from each grid node. Each soil sample will be analyzed by a state certified laboratory for Total Petroleum Hydrocarbons (TPH) using EPA method 8015m. A hydrocarbon scan will be conducted and the concentrations of the following ranges of hydrocarbons will be reported:

C_6 to C_{12} C_{13} to C_{22} C_{23} to C_{28}

These ranges of hydrocarbons are the ranges typically reported in the TPH-G and TPH-D methods.

In addition, each sample will be analyzed for Aromatic Volatile Hydrocarbons by EPA method 8015m and Semi-volatile hydrocarbons by EPA method 8270. Based on the results of the analyses by method 8270, additional analyses may be conducted using the TCLP extraction procedure. If concentrations of Polynuclear Aromatic Hydrocarbons (PNA's), measured in mg/kg, are reported in samples analyzed in excess of 20 times their laboratory established Practical Quantitation Limits (PQL's), measured in mg/l, then additional analyses will be conducted using the TCLP extraction procedure.

PLACEMENT OF BACKFILL

The backfill of the reservoirs with material graded from the berms has two primary activities; soil characterization, and grading and compaction. Soil in the berms will be cut into segments of approximately 1,000 CY. Each segment will be graded, sampled and characterized to insure that the material conforms to the requirements of the WDR's.

Each segment of excavated soil will have two representative samples collected and analyzed for TPH. One additional sample from each segment will be collected and analyzed for Aromatic Volatile Hydrocarbons and Semi-volatile Hydrocarbons. As described in the previous section, samples which contain PNA's in excess of 20 times the PQL's for the TCLP extract will be further analyzed by the TCLP extraction procedure. Results of the analyses will be compared to the following limits established in the WDR's for this project.

PWH

<u>CONSTITUENT</u>	<u>LIMIT</u>
Benzene	0.1 mg/kg
Ethylbenzene	2.9 mg/kg
Toluene	4.2 mg/kg
Xylenes	1.7 mg/kg
TPH	
C ₆ to C ₁₂	1,000 mg/kg
C ₁₃ to C ₂₂	10,000 mg/kg
C ₂₃ to C ₂₈	15,000 mg/kg
PNA's (in TCLP extract)	non detect at the PQL's

Material which is suitable for use as backfill will be graded into the reservoirs. Material which is graded into the reservoirs as backfill will be placed in horizontal lifts and compacted to at least 90% relative density. The specifics of the fill grading and compaction are detailed in the approved grading and drainage plan. The final fill grading and compaction will be such that the fill material will be suitable as foundation material for the low permeability cover for the reservoir areas.

LOW PERMEABILITY COVER INSTALLATION

Once the fill material has been brought to grade and compacted to the required specifications, a low permeability cover will be installed to enclose the soils placed in the reservoirs and prevent the infiltration of water into the underlying soils. The low permeability cover will consist of a clay liner and a protective topsoil layer. The clay liner will have as a minimum the following characteristics:

Material type:	Predominately clay, classified as SC, CL or CH (ASTM D 2487)
Density:	Minimum compaction requirement of 95% of the maximum dry density (ASTM D 1557)
Moisture:	Compacted moisture range of -1 to +3 % of optimum moisture corresponding to the maximum dry density
	Field in-place density will be determined accordance with ASTM D 1556

RWH

Thickness: Minimum compacted thickness of 12 inches, compaction should be performed in lifts which do not exceed the length of the prongs of the compactor. Compaction should be performed using a tamping foot type compactor.

Hydraulic conductivity: Maximum hydraulic conductivity of 1×10^{-6} cm/sec
ASTM D 5084

The protective topsoil layer will have a minimum thickness of 12 inches. The final surface will be to the grades specified in the approved final grading and drainage plan. The surface will be graded and maintained to prevent any ponding of water.

POST-CLOSURE MAINTENANCE

Post-closure maintenance will consist of regular inspection and maintenance of the cover materials. Inspections will be conducted once a quarter for the first year after closure and then annually thereafter. Any damage to the cover materials such as erosion gullies, cracking or settlement of the final cover, or any slumping or sliding of the cover materials will be noted and repaired. Drainage structures will also be inspected and repaired as part of the post-closure maintenance.

REPORTING REQUIREMENTS

The following documentation will be provided to the RWQCB during this project.

A "Petroleum Hydrocarbon Contamination Removal Report" will be submitted within 30 days of the completion of any soil removal activities and to document the condition of soils left in-place at the base of the reservoirs.

A "Backfill and Final Project Completion Report" will be submitted within 30 days of the completion of installation of the low permeability cover. This report will include as-built plans and specifications of any cover materials and drainage features and will include the results of all soils testing, compaction, grading, and permeability tests conducted.

PREPARED BY:



Robert W. Hastings, R.G. # 5452

U-95

Shell - Carson
Reservoir 1 & 2 closure

11/3/94

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Mike	Garcia	Shell Oil Co.	(310) 816-2082

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Westhollow Research Center
P.O. Box 1380
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WORK PLAN

RESERVOIR REMOVAL PROJECT

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RJH

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(RW4)

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Robert W. Hastings, R.G. # 5452

12-95