



**SAIC Engineering of NY, PC**  
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International Corporation

June 3, 2008

Mr. Edward Hampston, P. E.  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
Remedial Bureau D – 12<sup>th</sup> Floor  
625 Broadway  
Albany, NY 12233-7013

Re: Former Paragon Oil Terminal  
Texaco Facility #304209  
Greenpoint Section  
Brooklyn, New York  
Recovery System –Phase II Upgrades Design

Dear Mr. Hampston:

SAIC Engineering of NY, PC (SAIC), on behalf of Texaco, Inc. (Texaco), respectfully submits to the New York State Department of Environmental Conservation (NYSDEC) this design for the Phase II Recovery System Upgrades. The attached design drawings represent attainment of the milestone (June 3, 2008) for the submission of a Phase II recovery system engineered design in accordance with Order on Consent #D2-1111-01-05 between Texaco and NYSDEC. The purpose of the Phase II upgrades is to further expand the capture zone in the bulkhead area and to further mitigate the seep into Newtown Creek.

This design drawings and associated notes provide details concerning the following Phase II upgrades:

- Total fluids recovery well field expansion
- Fluid processing equipment upgrades
- Installation of a petroleum vacuum recovery system

The total fluid recovery well field will be expanded from the original 6 wells (Phase I) to 12 wells. Total fluid recovery pumps will operate in the 6 additional wells. The total yield from the 6 additional wells is expected to range from 6 to 10 gallons per minute (gpm). The yields are estimated from slug tests and interim pumping of 3 of the 6 new wells.

The treatment equipment upgrades will include one fractionation tank to be located prior to the existing oil water separator (OWS). All 12 recovery wells will discharge to this tank. The tank will provide for primary separation of the groundwater and phase separated hydrocarbon (PSH). The fractionation tank will be equipped with a floating skimmer to remove floating emulsion and PSH and transfer the fluid to the existing product holding tank. PSH sludge that builds up in the fractionation tank will be removed periodically using a vacuum truck.

The untreated water will be transferred to the existing OWS for secondary separation of PSH. The OWS hydraulic throughput of approximately 15 to 20 gpm is within the 50 gpm hydraulic loading rate of the OWS. From the OWS the untreated water will be treated through the existing 1,000 pound (lb) organoclay unit and two 2,000 lb activated carbon units connected in series.

The Phase II upgrades will also include a vacuum extraction (VE) component. The purpose of this component is to remove residual phase hydrocarbon from the dewatered zone of capture in the vicinity of the bulkhead. The removal of the residual phase during the current operation of the system is necessary to mitigate sheens in future when PSH recovery is no longer deemed necessary. The volatile chemistry of the PSH combined with a sand textural matrix makes vacuum extraction a feasible technology. A VE pilot test will be conducted to determine the site specific design parameters prior to the initiation of Phase II VE upgrades. The attached drawings assume 30 scfm of subsurface air will be extracted from each of 9 VE wells at a wellhead vacuum of 40 inches of water column (WC). All off gas will be treated with a catalytic oxidizer.

If you need additional information or clarifications concerning information presented in this request, please do not hesitate to contact Ms. Gesele Harris of Texaco at (770) 984-4190 or Mr. Peter Cagnetta of SAIC at (717) 901-8841.

Respectfully submitted,

SAIC ENGINEERING OF NY, PC



Mark W. Kindig, P.E.  
SAIC Engineering of NY, PC



Peter J. Cagnetta, CPSSc  
Project Manager/Soil Scientist

MWK:sas

cc: Ms. Gesele Harris (Texaco)  
Mr. Neil Fletcher (Texaco)  
Mr. Stan Luckoski (Texaco)  
Mr. Jerry Ross (PWSP)  
Mr. Sal Geneva (Empire Merchants)  
Mr. Steve Russo (SPR)  
Mr. Steve Malinowski (CA Rich)  
Mr. Alan Michaels (NYSDEC)  
Mr. Joe White (NYSDEC)  
Mr. Alex Castro (NYCDEP)  
Mr. Steve Trifiletti (ExxonMobil)  
Mr. Justin Kennedy (Roux Associates)  
Mr. Kevin Endriss (BP)  
Ms. Olivia Morales (Brooklyn Public Library)