RESPONSE TO COMMENTS
DRAFT WORK PLAN SIX-PHASE HEATING PILOT TEST (September 13, 1999)
NON-TIME-CRITICAL REMOVAL ACTION
AT INSTALLATION RESTORATION SITE 14
FORMER NAVAL STATION LONG BEACH
LONG BEACH, CALIFORNIA

DCN: FWSD-RAC-00-0079

October 27, 1999

Mr. Chris Leadon Naval Facilities Engineering Command Southwest Division 1220 Pacific Highway San Diego, CA 92132-5190 Comments: October 14, 1999	From: Mr. Michael Toy Foster Wheeler Environmental Corporation 611 Anton Boulevard, Suite 800 Costa Mesa, CA 92626 Response: October 25,1999
Comments from SWDIV:	
Comment 1. The three soil sample boring locations proposed for post-operation checking of the pilot test in Sections 6.4 and 1.0 of the Work Plan doesn't look like enough. Please consider adding more soil boring locations to the post operation sampling.	Response 1. Comment noted. Section 1.2, page 1-2, paragraph three and Section 6.4, page 6-4, paragraph one will be revised for five soil borings instead of three. Also, Figure 3 will be revised with the locations of two additional soil borings.
Comment 2. In the third paragraph of Section 1.2 and in Section 4.4 of the Work Plan, please explain what the specific purpose of the three temperature monitoring points in the pilot test. In the third paragraph of Section 1.2, the points are called temperature/pressure monitoring points, but in Section 4.4 there is no mention of pressure monitoring.	Response 2. Comment noted. Section 1.2, page 1-2, paragraph three will be revised with the following text: "The twelve soil borings, after drilling and sampling as described in Task A, will be constructed into 7 heating electrodes, 2 vapor recovery wells, and 3 temperature/pressure monitoring points for monitoring the effectiveness of the SPH heating. Effective remediation by SPH technology requires uniform heating throughout the target soil matrix. Non-uniform heating may leave residual contamination in those areas of insufficient heating. Typical SPH heating distributions show the highest soil temperatures in the immediate vicinity of the energized electrodes and the lowest soil temperatures in areas located medially between two adjacent energized electrodes. The temperature monitoring probes have been positioned to provide temperature profiles at these areas of temperature lows and will be used to verify that sufficient heating has been achieved throughout the target soil matrix."

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	Section 4.4, page 4-3, paragraph one will be revised with the following text at the end of the paragraph: "Each TMP will also be installed with a ¼-inch thick-walled Teflon™ tube attached to the outside of the pipe in order to allow connection of a manometer for pressure monitoring at the TMP. Refer to Section 4.12 for details of the subsurface pressure sensor installation."
Comment 3. In the second paragraph of Section 2.6 of the Work Plan, please explain the basis of the remedial action objectives in more detail. It's stated in the section that the RAO's for carcinogenic contaminants were calculated on a total excess lifetime cancer risk (ELCR) level of 10-5, rather than 10-4. This may be misstated. Usually, RAO's are calculated on a 10-6 basis, but the risk scenario is tailored to a realistic situation at a site, such as an office worker scenario.	Response 3. Comment noted. 10^{-4} is a common standard for a receptor at an industrial site. 10^{-5} was selected as the basis of the RAOs for conservativeness. Section 2.6, page 2-3, paragraph two will be revised with the following text: "The RAOs for carcinogenic contaminants (PCE, TCE, 1,1-DCE and VC) were calculated based on a total excess lifetime cancer risk (ELCR) level of 10^{-5}, rather than 10^{-4} (standard for human health protection at industrial sites), to maintain protection of human health for on-site workers. The RAOs for noncarcinogenic contaminants (c-1,2-DCE and t-1,2-DCE) were calculated based on a hazard index of 1.0."
Comment 4. In the sixth paragraph of Section 3.0 in the Work Plan, please describe the purpose of the condenser in more detail. Refer to Section 4.6 and Figures 7 and 8.	Response 4. Comment noted. Section 3.0, page 3-2, paragraph six will be updated with the following text: "High-temperature chlorinated poly-vinyl chloride (CPVC) piping is used to convey the vapor from the wells to the steam condenser where steam is separated from the recovered air and VOCs by condensing into liquid water. This separation isolates only those compounds that are contaminated and require treatment. In addition, water vapor, if not removed by the condenser, will condense in the carbon vessels of the vapor treatment system and flood the vessel with water, and hence, disrupt system operations."

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Comment 5. In third paragraph of Section 4.2 of the Work Plan, please explain how soil contaminants will be remediated in the pilot test when the SPH electrodes will be insulated to 8 feet bgs? A conductive interval for power application is described from 8 to 16 feet bgs. It seems like this may not be effective in removing soil contaminants.	Response 5. Comment noted. Section 4.2, page 4-1, will be revised to include the following text: "During power application, current will flow in a three-dimensional pattern not only out horizontally from the conductive portion of the electrode, but also vertically. In essence, it will flow in a form that would appear as a "ball" shape. This 3-dimensional current flow will provide a heating pattern that will raise the subsurface to the boiling point of water approximately 3 feet above and 3 feet below the "conductive interval." This will result in active heating between 5 and 19 feet bgs. Once this region starts to actively boil, steam will rise through the region into the shallow soils (less than 5 feet bgs), resulting in conductive heating of this zone. The positive buoyancy of the steam bubbles, in conjunction with the negative pressure influence from the vacuum system will help ensure thorough heating of this region."
Comment 6. In Sections 4.6, 4.7, 4.8, or 4.9 of the Work Plan, please explain where the volatile organic carbon (VOC) contaminant vapors conveyed to the vacuum blower go for disposal after being in the vacuum blower.	Response 6. Comment noted. The VOCs are removed from the process upstream of the vacuum blower. Section 4.6, page 4-4, paragraph two will be revised with the following text: "The recovered air and VOC vapor exit the condenser and are conveyed to the vapor treatment system by the vacuum blower." Section 4.7, page 4-5, paragraph one will be revised with the following text:" A vacuum blower will provide the motive force for extraction of vapors from the subsurface to the condenser and vapor treatment system followed by discharge to the atmosphere of the treated vapors."

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	Section 4.8, page 4-5, paragraph one will be revised with the following text: "The vapor treatment system consists of six (6) granular activated carbon (GAC) vessels and a potassium permanganate ($KMnO_4$) impregnated silica polish bed. The GAC in the carbon vessels remove VOCs from the vapor stream by adsorbing it onto the carbon. The GAC is periodically replaced as carbon is spent and adsorption efficiency decreases. VC is removed by the $KMnO_4$ bed and the exiting vapor stream is below regulatory emission standards. The vapor is conveyed through the blower and discharged to atmosphere."

FOSTER WHEELER

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TRANSMITTAL/DELIVERABLE RECEIPT

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Naval Facilities Engineering Command
Southwest Division
Mr. Richard Lovering, 02R.RL
1220 Pacific Highway
San Diego, CA 92132-5190

DATE: 11/01/99
CTO: 0012
LOCATION: NAVSTA Long Beach

FROM: Kris Fabian, D.P.M. for
Neil Hart, Program Manager

DESCRIPTION: Response to Comments Draft Work Plan Six-Phase Heating Pilot Test (9/13/99) Non-Time Critical Removal Action At Installation Restoration Site 14, 11/01/99

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