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LETTER AND COMMENTS REGARDING DRAFT WORK PLAN FOR BIOREMEDIATION OF  
HYDROCARBON CONTAMINATED CONCRETE SURFACES AND SOIL NS MAYPORT FL  
5/22/1995  
ABB ENVIRONMENTAL SERVICES



Naval Station Mayport  
Administrative Record  
19.01.00.0114

8534

May 22, 1995

Commanding Officer  
Southern Division  
Naval Facilities Engineering Command  
ATTN: Mr. Harold McGill, CODE: 1823  
2155 Eagle Drive  
North Charleston SC 29418

**SUBJECT:** Comments on RHS Technical Services Inc.  
Bioremediation of Hydrocarbon Contaminated Concrete Surfaces Draft Workplan  
NELP Innovative Technology Demonstrations  
NAVSTA Mayport  
Navy CLEAN District I CTO #0028  
Contract No. N62467-89-D-03170

Dear Harold:

Enclosed please find a compilation of comments on the undated RHS Technical Services Inc. Draft Workplan for Bioremediation of Hydrocarbon Contaminated Concrete Surfaces and Soil. At the end of each comment in parenthesis the originator of the comment is identified. The commentors are as follows:

Mayport  
Southern Division  
FDEP  
ABB-ES

Cheryl Mitchell  
Cliff Casey  
Jim Cason or Greg Brown P.E.  
Mark Lieberman

Please contact me at 904-656-1293 with any questions or comments.

Very truly yours,  
ABB Environmental Services

  
Peggy Layne, P.E.  
Project Manager

enclosures

cc: Cheryl Mitchell, NAVSTA Mayport  
David Driggers, SouthDiv

ABB Environmental Services, Inc.

**Comments on Bioremediation of Hydrocarbon  
Contaminated Concrete Surfaces  
Submittal Package  
by  
RHS Technical Services Inc.**

General - The proposal is very general and I am unsure of the location(s) that will be investigated at SWMU 14. Where on SWMU 14 is the project proposed to be sited? I previously thought it would be at the sump. (FDEP)

General - Because of the nature of the materials that are (were) burned on the concrete surface (fuels and oils) and since a surface water standard exists for PAHs, they may be the proper analytes to use in assessing the success of the process especially since the residual material on the concrete surface is likely to be the less volatile PAHs. If used oil was utilized in the training, the possibility of high metals concentrations or other contaminants may be in the residuum should also be considered (comment on Section 1.0). In cases where metals are present, bioremediation would probably not be an effective solution and may possibly increase their mobility. (FDEP)

General - The control of temperature may be critical to successful bioremediation. The heat from the Florida sun in the summer may raise the temperature beyond optimum conditions for the microbes. How will RHS dissipate excessive heat on an open concrete pad? (Southern Division)

General - Additionally, it will probably be important for them (RHS) to ensure the microbes are kept in a moist environment or the microbes may become inactive. The procedure indicates that a spray mist will be applied periodically. It is unknown if that means around the clock or what. During the day I would expect evaporation to be rather high. (Southern Division)

Purpose: The RFP stated that the goal of clean-up was to have stormwater runoff meet Florida surface water quality standards. This will require more than just TPH testing and should be in accordance with FAC 62-3. (Mayport)

Scope: What happens to the area after application during periods of rainfall? Will this negate the results or does the application still work under water? Please keep in mind that 60 days is a long time to block off the retention pond. Due to usage requirements NAVSTA may have to reduce this to 30 days - would this be a problem? (Mayport)

Section 1.0 - Testing: It is stated that field TPH analyses will be conducted on the remediated process water prior to release or reuse. TPH may be utilized to judge the success of the process but since a surface water standard for TPH has not been promulgated, it cannot be used to justify direct surface discharge of the remediation effluent. Additionally, I am not aware of available analytical data that characterizes the residual material presently on the concrete. Because of this, the remediation effluent should be characterized prior to any release since it

could contain metals and other residual compounds that were components of the burned materials. The Navy may want to dispose of the treatment water in the Mayport Wastewater Treatment Plant (WWTP) providing it can be shown to meet the criteria for such discharge. Since the WWTP presently accepts oily waste water, this may be a good option for disposal. Nevertheless, until the chemical nature of the material that is removed from the concrete has been determined to meet surface or ground water standards, it should not be discharged to them, including using the recycled bioremediation product in subsequent soil applications. (FDEP)

Section 1.1 - This section states that the site supervisor will develop a treatment program for adjusting the pH of the supply water if the pH is determined to be unacceptable. Please list the pH criteria for the supply water and possible treatment options to be employed by the site supervisor. Include items such as expected responsibilities for providing space, equipment, raw materials, and any waste disposal associated with the treatment. (ABB-ES)

Section 1.2 - TPH is not adequate to determine surface water standards. Also the effluent can not be discharged to the OWTP. The contractor must remove it after the technology implementation. This being the case, where will RHS dispose of this water? (Mayport)

Section 2.1 - The loose debris removed prior to work may be contaminated with the same hydrocarbons that are found on the concrete, why won't this debris be treated and who is responsible for disposal of this material? (ABB-ES)

Section 2.3 - RHS will have to specify how much space is required for their equipment. The space may not be available in the immediate vicinity of the pond area. (Mayport)

Section 2.4 - It may not be possible to "secure" a water faucet only for contractor use, but RHS can have use of it while they are at the site unless operations require it for some unforeseen reason. (Mayport)

Section 2.5 - The pond will somehow be separated from the fire fighting field overflow although it may not be by blank flange. This method will be determined by FTC, Staff Civil and the Base Operating and Support Services Contractor (Colejon/Jones). (Mayport)

Section 2.5 - This section requires that a blank flange be placed over the drain pipe located in the sump of the area to be bioremediated. If this area is to be plugged what happens when the area is filled with rainwater and needs to be drained, but the bioremediation is not complete. Will the water in the basin be drummed, discharged without treatment, or recycled to the mist sprayer? (ABB-ES)

Section 3.2 - What criteria will be used to determine the areas to be sprayed and the quantity of microbial solution to be sprayed? (ABB-ES)

Section 3.2 - What prevents the expansion of the treated area to larger than 10 SF? This seems small and will only take longer to complete. (Mayport)

Section 3.3 - What, if any, surfactant will be added to the microbe and nitrogen catalyst mixture? (ABB-ES)

Section 3.3.1 - What criteria will be used by the site supervisor to determine the time interval between agitations? (ABB-ES)

Section 3.4.1 - What site conditions will be monitored to determine the additional water mist application? What instruments will be used? Will the readings be logged? (ABB-ES)

Section 3.5.1 - TPH is not sufficient. If recycled water is used in soil applications it should also meet surface quality standards prior to discharge to the ground. (Mayport)

Section 3.5 - What criteria will be used to determine that the process has been completed? (ABB-ES)

Section 3.5.1 - How many aerated 55-gallon drums does RHS expect to have on site at any one time? The area to be remediated is large and I would expect the runoff from this area to fill several 55-gallon drums. (ABB-ES)

**Comments on In Situ Hydrocarbon Soil  
Bioremediation  
Submittal Package  
by  
RHS Technical Services Inc.**

General - What potential impacts could the bioremediation have on groundwater? If metals contamination exists in the soil, could bioremediation make the metals more mobile? (ABB-ES)

Scope - Is the microbe and nitrogen biocatalyst mixture used in the soil remediation different from the mixture used in the remediation of hydrocarbon contaminated concrete? If yes, how? (ABB-ES)

Scope - What is the expected time duration of the soils remediation? Will the soils and concrete bioremediation be executed at the same time? (ABB-ES)

Utility Location - NAVSTA will provide RHS with utility drawings of the proposed remediation area, however, we do not have the means to locate and mark utilities except for phone lines. Due to this problem with locating utilities, the contractor must take all precautions to minimize disruption of any service. Hand augering to a the 3' depth may be required in certain areas. NAVSTA will arrange for the phone line location, if any, upon a 2 week notice to proceed from RHS. (Mayport)

Soil Profile - The RFP stated that only 2 wells had been installed at this SWMU. These wells and the samples taken weren't enough to characterize the site and the recommendation was for further investigation and performance of a risk assessment. It also states that the soils and run-off water had to be "clean" in accordance with Florida rules. If there was not sufficient analytical information provided in the RFP for bidding purposes of this technology proposal then this additional cost should have been incorporated into the contractor's bid to implement his technology. Therefore, NAVSTA believes that if soil sampling is required prior to RHS's treatment technology implementation then it is the responsibility of the contractor to perform this at his own cost. (Mayport)

Soil Test - A reference to "Total Parts Hydrocarbon" should be "Total Petroleum Hydrocarbon". Are the tests to be performed prior to application of the remediation technology? Three samples out of 100 seems minimal; would recommend at least 10% of the borings be sampled. (Mayport)

Testing to determine if the soil is clean should be in accordance with Florida regulations for clean soil, as stated in the RFP. This means adherence to FAC 62-770 and 62-775. More than just TPH testing will be required to meet guidance for "clean soils". (Mayport)

NOTE - DON provides QA/QC field sampling as part of the contract to verify that the technology is "functioning" as described by the contractor. These tests may be done before

application and after application of the material. These results are forwarded to the contractor upon their receipt. (Mayport)

Section 2.4 - What contingencies are planned if the aeration ports are difficult to keep open to 3 feet? (ABB-ES)

Section 2.4 - NAVSTA is concerned about hot water injection into the ground. This will require FDEP North East District approval. NAVSTA will assist in providing additional information to the District regarding the NELP innovative technologies program, if required, but acquiring approval is the contractor's responsibility. (Mayport)

Section 3.0 - A basic problem with the proposal is the introduction of material into the subsurface by the use of wells. Such actions trigger specific regulatory responses under Chapter 62-528, Underground Injection Control. A project of this nature would most likely require a permit from the Department. The applicant would need to furnish a detailed description of the material to be introduced into the subsurface, specific operation protocols, the expected results (based on calculations and previous experiences) and the ultimate fate of the materials used in the injection process. An example of the lack of specificity is illustrated in Section 2.4 which prescribes the use of pressurized hot water with the notation that the "specific technique will be determined by the site supervisor." This information would have to be furnished in detail in the permit review process. Finally, since the contaminant proposed for remediation is petroleum, a review of the project under Chapter 62-770, Petroleum Contamination Site Cleanup Criteria, may be required if the test site is located outside the SWMU. (FDEP)

In contrast to using injection techniques, the use of spray techniques, mentioned only once in the Scope would not be subject to the level of scrutiny as would the use of injection processes. An assessment of the ultimate fate of the spray material would be required, however. The drilling of aeration ports would not likely pose extensive technical or regulatory problems as long as they are used for observation or passive aeration. Ground water monitoring may be required since the proposed location of the project is within a designated SWMU (existing wells may possibly be utilized for this purpose but new wells may be required). Related to this, since the proposed location within the SWMU is not specified, the research team needs to be sensitive to the location of non-petroleum contamination that exists at the site. (FDEP)

Section 3.1 - Assuming the solution is the microbe and nutrient mixture, what test results does this refer to? Attached to the proposal is a one page chart showing the amount of microbes, biocatalyst and water required; since the plot has been designated previously as 100 cubic yards, only a simple calculation is required. This is an example of the generality of the document that elicits questions rather than comment on the actual process. (FDEP)

Section 3.2 - This section states that the site supervisor will develop a treatment program for adjusting the pH of the supply water if the pH is determined to be unacceptable. Please list the pH criteria for the supply water and possible treatment option to be employed by the site supervisor. Include items such as expected responsibilities for providing space, equipment, raw materials, and any waste associated with the treatment. (ABB-ES)

Section 3.3 - What soil conditions will be considered when determining if the injection process will be high or low pressure, or gravity feed? Will the microbes be injected at one or many levels if gravity feed is not selected? (ABB-ES)

Section 4.2, 4.3, 4.4 - By what means will the pH be maintained between 6.5 and 8.5, nitrogen-ammonia be maintained between 10-20 ppm, and ortho-phosphate be maintained between 2-5 ppm? (ABB-ES)

Section 4.6 - What criteria will be used to determine timing and quantity of reinoculation? (ABB-ES)

Section 4.7 - It seems reasonable that the Navy would expect the consultant to furnish information regarding the expected cleanup efficiencies. Simple predictive rate models incorporating initial pollutant quantities, expected microbial degradation rates and treatment costs per unit of contamination would suffice and should be required as part of the proposal. (FDEP)

**Comments on Site Safety and Health Plan  
Submittal Package  
by  
RHS Technical Services Inc.**

(all comments by Mayport)

8.2 Site Control: SWMU 14 is behind a controlled fence and the area is patrolled by an FTC Command Duty Officer (CDO) as well as NAVSTA Security. It will only be necessary to cordon-off the retention pond and surrounding soil area during technology implementation.

11.7 Equipment Decon: Decon water can be drummed and disposal arranged through the NAVSTA Part B Facility.

14.5 On-Site Emergency Facilities: These may not all be available at the site. NAVSTA will verify that it can provide a Fire Hose, water supply, eye washes, and safety showers. The other requirements will have to be provided by the contractor.