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U S NAVY RESPONSES TO U S EPA COMMENTS TO DRAFT REMEDIAL INVESTIGATION  
WORK PLAN ADDENDUM BUILDING 81 WITH TRANSMITTAL NAS SOUTH WEYMOUTH MA  
07/22/2009  
TETRA TECH NUS



## TETRA TECH

C-NAVY-07-09-3242W

July 22, 2009

Project Number G00028

Mr. Brian Helland, RPM  
BRAC PMO, Northeast  
4911 South Broad Street  
Philadelphia, Pennsylvania 19112

Reference: CLEAN Contract No. N62472-03-D-0057  
Contract Task Order (CTO) No. 30

Subject: Responses to Comments on Building 81 Draft Remedial Investigation Work Plan  
Addendum, Draft Final Building 81 Remedial Investigation Work Plan Addendum  
Naval Air Station South Weymouth, Weymouth, Massachusetts

Dear Mr. Helland:

Tetra Tech NUS, Inc. (TtNUS) has prepared responses to comments (RTCs) received from the U.S. Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) on the draft Building 81 Remedial Investigation Work Plan Addendum, Naval Air Station South Weymouth, Weymouth, Massachusetts. A draft final version of the Work Plan Addendum has been prepared which reflects the responses to the EPA and MassDEP comments. The schedule for Building 81 anticipates completion of a final Work Plan Addendum followed by commencement of the field program in August 2009.

Through copy of this letter, the RTCs and draft final Building 81 RI Work Plan Addendum are being provided to the recipients listed below. Any questions regarding this document should be directed to your attention at (215) 897-4912. Please contact me at (978) 474-8403 should you have any questions.

Very truly yours,

Phoebe A. Call  
Project Manager

PAC/lh

Enclosure

c:

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**NAVY RESPONSES TO U. S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS  
(DATED JUNE 15, 2009)  
DRAFT REMEDIAL INVESTIGATION WORK PLAN ADDENDUM (RIWPA) – BUILDING 81  
NAVAL AIR STATION SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS**

**EPA Letter Comments**

**Comment 1:** *EPA generally concurs with the locations selected for new monitoring wells and related activities outlined in the Work Plan. However, that data analysis and conceptual site model (CSM) development lags data collection. EPA is concerned that new data, as well as additional analysis of existing data, may necessitate actions beyond those proposed in this work plan. Many of the elements in need of further consideration for an updated CSM for the site are listed in item D on page 1-4, and others were listed in EPA's letter dated March 6, 2009. EPA had expected that much of the new analyses of existing data would be completed and incorporated into an updated CSM before the next phase of field work. EPA recognizes that CSM development is iterative at complex sites such as this one. As such, modifications to this work plan and/or new recommendations as new information and/or analyses become available are possible. EPA looks forward to working with the Navy to integrate new and existing data into an internally-consistent technically-based CSM for the site that will serve as a framework for evaluation of remedial alternatives in an FS. Please provide the electronic data files itemized in our letter of March 6, 2009.*

**Response:** Approximately 100 wells have been installed as part of previous investigation efforts for Building 81. The Navy believes that the CSM presented in the draft RI Report is adequate for completing a supplemental field program that includes the installation of several new wells in each of the groundwater domains. Additional analysis of the draft RI data is underway but will not be completed prior to initiating the supplemental RI field program. In the interest of moving forward, the Navy plans to integrate new and existing data into a revised CSM once the supplemental field program has been completed and the new data evaluated. The revised CSM will be completed concurrently with finalization of the RI. A site walk-over will be planned prior to the start-up of the supplemental field program so that Navy, EPA, and MassDEP can review and approve proposed monitoring well locations.

The Navy understands that as stated in EPA's March 6, 2009 letter, EPA plans to complete additional analyses that will contribute to an improved CSM for the site. To that end, the Navy has provided EPA with requested information pertinent to Building 81. The May 2008 draft RI report for Building 81 contains all of the electronic information, except for surface geophysics data, itemized in the EPA letter dated March 6, 2009. Surface geophysics was only performed for the purpose of utility clearance and was not discussed in the draft RI. The draft RI report provided in electronic format on CD is in searchable PDF format. Cross-sections appear beneath the Figures bookmark in the PDF document. Boring logs, well construction logs, tabulated data, etc. are also provided in electronic format on the report CD. The draft RI report, along with a Bedrock Characterization Report, ISCO information, and an ISCO presentation from a 2002 Monterey conference were also distributed to the USGS for review, at the request of EPA, on April 2, 2009. Please let us know the status of this review.

After new and existing data have been integrated into a revised CSM, the Navy recommends a technical meeting be held with Navy, EPA, and MassDEP to discuss key elements of the revised CSM.

**Comment 2:** *In addition to the specifics described in Section 3.2 of the Work Plan (pages 3-1 to 3-6), drilling, well design, well installation, well development, etc. should adhere to the specifications outlined in the Army Corps of Engineers Engineering Manual EM-1110-1-4000, 1 Nov. 1998, (Engineering and Design), Monitoring Well Design, Installation and Documentation at Hazardous, Toxic, and Radioactive Waste Sites.*

**Response:** Drilling will be conducted using conventional drive and wash and air rotary drilling methods, as described in the Final RI Work Plan for Building 81. Well design, well installation, well development, and groundwater sampling activities will be performed as described in the Final RI Work Plan for Building

81 and, as appropriate, will consider the specifications and recommendations described in the Army Corps of Engineers Engineering Manual EM-1110-1-4000, 1 Nov. 1998, (Engineering and Design), Monitoring Well Design, Installation and Documentation at Hazardous, Toxic, and Radioactive Waste Sites.

**Comment 3:** *In addition to the specifics described in Section 3.3 of the Work Plan (pages 3-6 and 3-7), the sub-slab investigation should adhere to the extent possible to methodologies described in Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site using Basement and Sub-slab Air Samples, EPA 600/R-05/147, March 2006.*

**Response:** The Navy will conduct sub-slab sampling in accordance with methodologies in the recommended guidance, to the extent possible.

**Comment 4:** *The proposed scope and the specific target locations of the proposed investigation generally address the primary data gaps identified by EPA. The proposed wells B81-MW-44S and -45S add shallow head and chemistry control to the east and southeast of the source area. Proposed wells B81-MW-47I, -48I, and -49I add deep overburden control to the north and west of the site, proposed well B81-MW-40B2 adds deep bedrock control to the northwest, proposed wells B81-MW-46S and -48I add overburden control to the southwest, and proposed wells B81-MW-42B2 and -47B2 add deep bedrock control downgradient to the west of existing well MW-21D2 (220 ppb PCE in RI sampling). The proposed locations are generally consistent with comment-resolution discussions held among the Navy, MDEP, and EPA. Proposed analytes for field and laboratory analysis (Table 3-2) are appropriate, and in addition to the VOCs that are the primary target of the investigation, include TAL metals, as well as parameters to review the potential for reductive dechlorination (e.g., nitrate, sulfate, ferrous iron, ethane/methane/ethane).*

**Response:** Comment noted.

**Comment 5:** *However, it should also be noted that many of the items requested in EPA's March 2009 comment letter have not yet been submitted. It is further noted that since many of these requests in large part were directed to a more comprehensive analysis and consideration of previously collected data, EPA reserves the right to suggest modifications and/or additions to the specific monitoring well locations and other proposals in the current work plan once the requested analysis is forthcoming. It remains EPA's expectation that the originally requested information will be completed concurrently with finalization of the work plan, but in any case, finalization of the RI will require a comprehensive integration, synthesis and analysis of both new and existing data leading to a technically-based consensus for an updated CSM for the site which can support a rigorous evaluation of remedial alternatives. Towards this goal, we reiterate our request for the electronic data files listed in our letter of March 6, 2009.*

**Response:** Please see the Response to Letter Comment 1.

### **EPA Attachment A Comments**

**Comment 1,** *Section 1.0, p. 1-2: In Parts A and B, it is presumed that utility or other technical issues that come to the attention of the project team will result in relocation of particular wells rather than eliminating them from the program. With respect to the proposal for MW47I, please indicate more clearly why the water level data collected in April 2009 supports the lack of shallow monitoring well control in this area.*

**Response:** Should utility concerns or other technical issues interfere with proposed locations, wells will be relocated, not eliminated from the supplemental field program. The Navy will notify EPA and MassDEP of the need to change approved well locations. Text in parts A and B will be changed accordingly.

MW42S and MW21S are located in proximity to the proposed well location for MW47I. The Navy is not proposing to install another shallow overburden well between the existing wells.

The statement "Water levels were measured in both of these wells in April 2009" was included simply to

convey to the regulatory agencies that the Navy was successful in obtaining water levels from each of these wells during the April 2009 synoptic water level round. If either of these wells were damaged or found dry during the recent water level round, installing a shallow overburden well with MW47I for shallow head and chemistry control would have been considered. Since this is not the case, the statement will be removed from the draft RIWPA.

**Comment 2**, Section 1.0, p. 1-3: *The second bullet in Part C states that soil gas samples will be collected over a 2-hour period. This may not be long enough to capture fluctuations in concentrations over time. EPA recommends a 24-hour sampling period unless a reference can be provided for the 2-hour period.*

**Response:** A limited on-line search yielded a few non-citable documents that described sub-slab soil gas sampling periods ranging from 30 minutes to 24 hours, depending on the sampling objective. Two hours is the maximum time allowed when collecting an integrated sample with a 1-liter SUMMA canister. Longer sampling periods require the use of 6-liter SUMMA canisters. A shorter sampling interval was selected to enable the sampler to cover more locations in 1 day (under comparable conditions) than a 24-hour event. 24-hour sampling is quite costly should the sampler have to remain on-site overnight. If the sampler is not required to remain on-site for 24 hours, the sample is out of sight and chain-of-custody becomes a potential issue along with a concern that a person or an animal could access the site and tamper with the sample during the overnight hours. The site is fenced and the gate locked but that does not mean it is impenetrable.

If the regulators can propose a more cost efficient solution to sampling over a longer period, the Navy will plan to collect integrated samples over 24-hours. The Navy understands that data from this effort will be used for risk purposes to estimate future indoor exposures.

**Comment 3**, Section 1.0, p. 1-4: *The first bullet in Part C [sic D] is somewhat unclear. EPA recommends constructing flow-netted hydrogeologic cross sections on alignments that are both parallel and perpendicular to groundwater flow directions. It may be possible to simplify the presentation of these flow nets in a manner that honors the data yet minimizes posting of redundant data. Vertical exaggeration should be minimized to the extent possible.*

**Response:** The text of the bullet will be revised and the last line deleted. The geologic cross-section alignments from the draft RI will be revised to incorporate new data from the Supplemental RI field program. Up to four flow-netted hydrogeologic cross-sections will be constructed on alignments that are both parallel and perpendicular to groundwater flow directions. The RI will also depict primary contaminant concentrations in each of the wells, fracture information from the borehole geophysics, and isocontours of the primary contaminant of concern, if presentable (easy to read) and not redundant. Vertical exaggeration will be minimized to the extent possible.

**Comment 4**, Section 3.2.1, pp. 3-1 & 3-2: *In the first and third bullets, it would be more appropriate to state that August 2009 will most likely not reflect a seasonal water level.*

**Response:** Agreed. Text will be modified on each of these pages.

**Comment 5**, Section 3.2.2 & 3.2.3, p. 3-2: *A continuous/cumulative log of all water gained or lost to the formation during drilling, well development, or other well operations needs to be collected.*

**Response:** Water gains or losses will be reported on boring logs. The volume of water purged during development will be reported on a well development log-sheet. Text will be added to the RIWPA to stipulate this requirement. The use of these standard field forms is specified in the Final RI Work Plan for Building 81. Thus, logging this information on another separate sheet is redundant.

**Comment 6**, Section 3.2.2, p. 3-2: *The third sentence in the first paragraph states, "Four new shallow and five new deep overburden monitoring wells are proposed ...." Figure 3-2 and Table 1-1 indicate that four deep overburden wells are proposed. Please edit as necessary.*

**Response:** Comment noted. The text on page 3-2 will be modified to indicate that four new shallow overburden and four new deep overburden monitoring wells are proposed.

**Comment 7,** Section 3.2.2, p. 3-2: *EPA endorses the proposal to collect and log continuous soil samples for the deep boring at each cluster. This will help to refine knowledge of the hydrostratigraphy, and allow for greater precision in screen placement.*

**Response:** Comment noted and appreciated. The text will be revised to state “Split-barrel soil samples will be collected and logged from the deepest boring at each well cluster. This will help to refine the knowledge of the hydrostratigraphy, and allow for greater precision in screen placement.”

**Comment 8,** Section 3.2.3.2, p. 3-3: *Please case off more than two feet of the uppermost bedrock to ensure a good casing seal. Accurate records for the thickness of the uppermost bedrock interval that is not accessible during geophysical logging should be collected. Reasonable efforts (e.g., split spoon samples, coring, etc.) should be made to characterize the uppermost bedrock interval.*

**Response:** At deep bedrock locations, the Navy will core the bedrock for characterization so that a data gap does not exist when geophysical logging takes place. Cores will also provide information as to the depth of competent bedrock so that 6-inch casing can be adequately set to ensure a good seal. Text in the RIWPA will be modified to reflect these changes.

**Comment 9,** Section 3.2.4, p. 3-4: *EPA disagrees about the usefulness of temperature and resistivity data. These logs should be considered, particularly if running them does not involve an additional trip into the hole. Also, it should be noted that the HPFM logs are only representative within a somewhat narrow range of flows. For example, flows much greater than 5 gallons per minute may not be detected by this method, and extremely low flows are also problematic. What steps will be taken to ensure that any zones with high flow rates will be properly identified and evaluated?*

**Response:** Comment noted. Navy agrees that temperature and fluid resistivity can sometimes provide indications of transmissive fractures and therefore will add these measurements to the RIWPA. Heatpulse flowmeter (HPFM) does measure a relatively narrow range (~0.1 to 1.0 gallon per minute (gpm)) of flow. Measurements are collected under ambient conditions and then measurements are repeated while pumping the borehole at a low rate (0.5 to 1 gpm). The HPFM measurements under pumping conditions will identify the most transmissive fractures in the borehole. Based on previous geophysical logging results at Building 81, the Navy does not anticipate encountering zones with high flow rates under ambient conditions. More often, there is no measurable flow in the borehole under ambient conditions. Without a head difference between fractures in the borehole there will be no vertical flow in the borehole.

If water in the borehole is flowing greater than 1 gpm under ambient conditions there is another probe (spinner flowmeter) that can measure high flow rates. Should this be the case at Building 81, the Navy will determine the next best step to identify zones with high flow rates according to sound and current scientific and industry practice.

**Comment 10,** Section 3.2.5, p. 3-4: *What screen length is anticipated for the overburden wells? Is this pre-determined or is it to be determined upon inspection of the soil samples? Screened-interval lengths should be ten feet or less.*

**Response:** Screen lengths will be determined in the field based upon encountered conditions. The well's objective, stratigraphy, overburden thickness, temporal function, visual observations, jar headspace readings, analytes of concern, etc. will be considered prior to selecting the screen length. A single well installation is proposed at several overburden locations. At cluster locations, overburden thickness will play a significant role. As in past field efforts, the Navy may have to use shorter screens to avoid communication between shallow and deep overburden wells at cluster locations. If there are no concerns, 10-foot screens will likely be installed. In bedrock wells, screen lengths will be based on the geophysical logging results. The Navy's contractor (TtNUS) will ensure that their drilling subcontractor

will mobilize both 5-foot and 10-foot screen lengths to the site. If an in-between length, such as 7 feet, is warranted, then both TtNUS and their subcontractor will work toward achieving the ideal length required.

**Comment 11**, Section 3.2.7, p. 3-5: *Following development, a relaxation period on the order of two-weeks should precede groundwater sampling efforts. Well development should adhere to the specifications outlined in Army Corps of Engineers Engineering Manual EM-1110-1-4000, 1 Nov. 1998, (Engineering and Design), Monitoring Well Design, Installation and Documentation at Hazardous, Toxic, and Radioactive Waste Sites.*

**Response:** Please see the Response to EPA Letter Comment 2. The referenced Army Corps of Engineers document (1998) specifies well development should occur within 2 to 7 days following construction. The newly installed wells will be developed within 4 days of construction. The Navy agrees that time should be allowed for re-stabilization of the surrounding environment after drilling, and equilibration of the well with the formation following development prior to initiating groundwater sampling. In the interest of keeping this project on schedule, there will be a minimum of 5 days between well development and groundwater sampling. The RIWPA text will be modified to reflect these changes.

**Comment 12**, Sections 3.3 and 3.3.1, p. 3-6: *If preferential vapor migration pathways are identified, (such as subsurface conduits, utility trenches, footings, barrier walls, etc.), efforts should be made to target these features directly. It is possible that such features are facilitating vapor migration rather than 'interfering' with it. Please explain how preferential pathways will be considered when determining the probable locations.*

**Response:** Building characteristics can play a significant role when planning to collect sub-slab soil gas samples. In general, the presence and location of utility and electrical conduits in proximity to groundwater and soil gas may influence preferential migration pathways. At Building 81, as-built drawings indicate the presence of water, electrical, steam, and sanitary sewer lines; however, they were suspended along walls inside the building and not encased in the concrete slab. The building no longer exists. One of two remaining features, a floor drain, does penetrate the concrete surface and appears to lead toward the former kitchen area. The Navy will inspect the floor drain and likely target it as a probable vapor sample collection point. The other feature, a steam pit, contains accumulated rain water. The Navy will investigate this sump to determine if a sub-slab soil gas sample should be collected in proximity to the feature. The Navy will also target areas of the slab that are cracked because cracks, if in contact with soil, could facilitate vapor migration. Remaining locations will be centrally located on the building footprint, within the boundaries of the groundwater plume.

**Comment 13**, Section 3.2.3, p. 3-7: *Please provide the basis for selecting two hours as an appropriate interval for the time-integrated samples. A 24-hour period is usual.*

**Response:** Please see the Response to EPA Attachment A, Comment 2.

**NAVY RESPONSES TO MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
(MassDEP) COMMENTS (DATED MAY 14, 2009)  
DRAFT REMEDIAL INVESTIGATION WORK PLAN ADDENDUM (RIWPA) – BUILDING 81  
NAVAL AIR STATION SOUTH WEYMOUTH, WEYMOUTH, MASSACHUSETTS**

**Comment 1. Section 1.0, Subsection D:** *As part of the effort to develop a more complete site conceptual model, MassDEP recommends that drawings of the extensive network of underground utilities located in the vicinity of Shea Memorial Drive and underground utilities located in the vicinity of Redfield Road be reviewed to determine if preferential pathways for migration of dissolved phase or vapor phase contamination exist west and north of the former Building 81 slab. In particular, an evaluation of whether or not any of the underground utilities intercept the water table might explain the abrupt decline of groundwater contaminant concentrations and hydraulic gradient observed immediately west of the slab (e.g., southward diversion of groundwater similar to that observed immediately west of Building 82).*

**Response:** Agreed. The Navy will review available utility drawings to determine if preferential migration pathways exist west and north of the Building 81 slab. Text will be added to Section 1, Subsection D in the RIWPA.

**Comment 2. Section 3.3.3:** *Please confirm or correct the statement indicating that the subslab samples are intended to be representative of future indoor air exposures; it appears that the results from the subslab samples are intended to be representative of subslab gas concentrations, which will be used to estimate future indoor exposure concentrations.*

**Response:** The subslab sample results will be used to estimate future indoor exposure concentrations. The text will be revised accordingly.