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LETTER AND U S NAVY RESPONSE TO AGENCIES COMMENTS REGARDING REVISED APPROACH FOR THE FEASIBILITY STUDY AT SOLVENT RELEASE AREA NAS SOUTH WEYMOUTH MA

08/25/2011

BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE NORTHEAST

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BPMO NE/DB
Ser 11-123
August 25, 2011

Ms. Carol Keating
Remedial Project Manager
U.S. Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Mr. David Chaffin
Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

Dear Ms. Keating and Mr. Chaffin:

Enclosed are responses to U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection comments received on the June 6, 2011 Revised Approach for the Feasibility Study (FS) for the Solvent Release Area (SRA) at the former Naval Air Station South Weymouth, Weymouth, Massachusetts. The responses to the comments reflect the discussions at the July 27, 2011 BRAC Cleanup Team (BCT) meeting and further consideration of the Navy's approach for the SRA site. The accompanying attachment summarizes the approach for the FS, including the remedial action objectives, preliminary remediation goals and remedial alternatives.

Navy hopes to achieve concurrence on the approach at the BCT meeting schedule for September 1, 2011 and proceed with completion of the draft final FS. Consistent with the IR site schedule in the Site Management Plan, Revision 11, Navy anticipates completion of the SRA ROD next year. Please feel free to contact me with any questions.

Sincerely,

David A. Barney
BRAC Environmental Coordinator
By direction of BRAC PMO

Enclosures:
1. Responses to EPA and MassDEP Comments
2. Attachment 1

Copy to:
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Chief Executive Officer, SSTTDC
P. Call, Tetra Tech
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NAVY RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) COMMENTS (DATED JUNE 30, 2011)
REVISED APPROACH FEASIBILITY STUDY, SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the EPA comments on the Revised Approach for the Feasibility Study, Solvent Release Area (SRA) (dated June 6, 2011) are presented below. The EPA comments are presented first (in italics) followed by Navy's responses. A summary of the approach to the SRA FS is attached to these responses.

General Comments

Comment 1. *The revised approach relies on a belief that the boundaries of the plume have been established, and are not expanding, and therefore there is no potential for "down-gradient receptors". This is a critical issue in that redevelopment plans are somewhat fluid, and proposals have already been forwarded for new structures immediately down-gradient of the site, e.g., the recreational complex proposed for the East Mat area. An important consideration is that the technical basis and adequacy of the information that supports these assertions is somewhat limited. EPA does not believe that the current "plume delineation" is sufficiently robust to designate fixed LUC boundaries given uncertainties with respect to the robustness of the underlying monitoring network and temporal variability of the plume. EPA has previously offered a number of comments which are germane to this issue, many of which have not yet been fully resolved (e.g., see monitoring-related comments included in EPA's letters dated December 6, 2010 and February 16, 2011). The additional monitoring requested in these comments, which included both requests for new monitoring locations and additional time-series ground water quality data, sought to better establish not only the limits of the plume, but also its temporal stability, particularly at the leading edge of the high-concentration plume core as well as at the periphery of the dissolved-phase plume. EPA reiterates these comments (which are not repeated here in the interest of brevity).*

In view of the importance of accurate plume delineation, it is essential that all remedial approaches and alternatives include provisions for augmented monitoring at the currently understood plume boundaries so that they may be more firmly established (i.e., verified or revised as necessary). While a number of the alternatives outlined in the document describe supplemental monitoring – which is appropriate – the challenges of characterization and monitoring in the fractured bedrock setting warrant a greater than normal level of effort in order to insure that monitoring points are adequately located laterally and vertically. Given this situation, and in consideration of the significant efforts the Navy has made to date, EPA intends to interject supplemental resources to the project targeted to the monitoring issue. If the Navy agrees, under an existing IAG with USGS, we intend to contract USGS experts to conduct additional geophysical surveys over specific areas of the site where supplemental monitoring is most critical. A concise work plan will be expedited and made available for Navy review over the coming weeks, with a goal of performing the field work in the August time frame. Key objectives for this work, which are focused to the most critical monitoring issues articulated in the document entitled Revised Attachment 1, Summary of Revised Approach, Solvent Release Area Feasibility Study, Naval Air Station South Weymouth, June 6, 2011, are discussed in subsequent comments.

Response: Comment noted. The Navy is collecting additional time series groundwater data, as described in correspondence dated December 22, 2010 and March 21, 2011. The spring event was completed in April and the fall event is scheduled for September. The design for long-term monitoring in the downgradient portion of the site will take into account the results of the USGS investigation, as appropriate. The FS will include an estimate of the number of wells and sampling frequency for the purpose of estimating the costs, but final long-term monitoring well locations and LUC boundaries will be determined during the remedial design.

Comment 2. *Supplemental monitoring of groundwater immediately north of the EMD as well as ground water south of the EMD are essential to all alternatives (excepting the "no action" alternative) provided in Revised Attachment 1, Summary of Revised Approach, Solvent Release Area Feasibility Study, Naval Air*

Station South Weymouth, June 6, 2011. Given the shallow water table and shallow bedrock in this area, the degree of contamination in the overburden and shallow bedrock are at issue as well as the nature and extent of contaminated discharge to the EMD. As stated in EPA's previously offered comments (EPA's letters dated December 6, 2010 and February 16, 2011), we believe that there is evidence of a N-S striking structure in shallow bedrock/deep overburden which may account for the pronounced N-S orientation of the CVOC plume in this part of the site. As discussed in general comment 1, above, we propose focusing additional geophysical surveys towards verifying the existence and nature of this interpreted feature so that essential monitoring north and south of the EMD may be appropriately located.

Response: Comment noted. As noted in the response above, Navy is collecting supplemental time series data. The long-term monitoring program will include monitoring wells upgradient and downgradient of the EMD and PRBs, for the alternatives that include PRBs. The FS will include an estimate of the number of wells and sampling frequency for the purpose of estimating the costs; detailed information on long-term monitoring will be determined during the remedial design phase.

Previous Navy discussions with EPA have addressed EPA's concern regarding an "N-S striking structure in shallow bedrock/deep overburden." Geophysical data incorporated into the RI indicate that this feature exists but is not a preferred pathway for groundwater. The Navy believes that this feature is a low permeability lens within the overburden. The information provided by the work outlined in the USGS SAP could provide information regarding the extent of the feature. However, field verification by characterization of soil in the feature is the only way to determine the composition of the feature. In other words, geophysics alone cannot resolve this issue, rather integration of the geophysical data with soil characterization data is needed to resolve this issue. The Navy looks forward to the results of the USGS geophysical investigation.

Comment 3. *Alternatives G-C and G-D both include a PRB north of the EMD. In addition, Alternative G-D includes a second PRB approximately 200 feet north of the EMD directed to treating "source area" overburden groundwater. The plan calls for additional monitoring wells upgradient of each PRB to monitor "groundwater entering each PRB". Given the shallow nature of bedrock, this upgradient monitoring should include bedrock and overburden screened intervals. Similar monitoring intervals are also needed a short distance down-gradient of the PRBs in order to facilitate evaluation of PRB performance. Clearly, the locations of the proposed PRBs in relation to the existing well network will dictate the number and location of additional screens which may be needed. Specific discussions are premature until specific PRB locations and dimensions are proposed. The proposed geophysical surveys may also contribute important information with respect to optimal PRB siting locations. The monitoring considerations offered in EPA's letters dated December 6, 2010 and February 16, 2011 will be applicable to these discussions.*

Response: Comment noted. The PRB is a relatively long structure and would span a large portion of the plume where the overburden groundwater concentrations are highest. Detailed information on the selected remedy for the SRA site will be determined during the remedial design phase.

Comment 4. *Surface water monitoring plans for the EMD need additional discussion. EPA expects surface water sampling to coincide with loci of maximum plume discharge/contaminant flux to surface water. While these areas are generally known, a focused ground water – surface water study may be needed to refine optimum surface water sampling locations. EPA's previous comments have highlighted various technical issues with respect to previously completed passive sampling efforts in the EMD which have not yet been addressed.*

Response: Comment noted. Previous Navy responses to EPA's comments have addressed EPA's concerns regarding "various technical issues" with respect to the EMD surface water/groundwater interaction. The Navy believes the surface water/groundwater interaction investigation completed during the RI has adequately characterized the nature of this interaction. The surface water monitoring component of the alternatives will consist of sample locations in the mid-plume section of the EMD and downstream of the plume. The level of detail in the FS will be for the purpose of estimating costs; detailed information on monitoring in the EMD will be determined during the remedial design phase.

Comment 5. *Additional information is needed with respect procedures to be used in selecting appropriate surface water PRGs. When will these PRGs be developed? Also, the approach proposed for using ground water data to evaluate whether levels are "protective of the EMD" needs further specificity.*

Response: Please see the surface water PRGs provided with the agenda for the July 27, 2011 BCT meeting. Because groundwater samples are likely to be more consistent than surface water samples, the groundwater results are expected to more consistently indicate surface water quality in the EMD. Surface water results may be affected by sample location, sample depth, mixing, water level, and precipitation events. However, surface water samples are also needed to evaluate potential recreational exposure and to account for biological effects as the groundwater passes through the sediment, volatilization from exposure to the atmosphere, and dilution from uncontaminated groundwater entering the ditch.

Comment 6. *A comprehensive evaluation is needed in order to determine appropriate locations for monitoring points and "sentinel wells" in the critical leading edge(s) of the plume(s).*

Response: Preliminary sampling locations and well locations will be included in the FS. Detailed information for the selected remedy will be determined during the remedial design phase.

Comment 7. *The down-gradient limits of the plume near its currently defined southwestern edge are complicated by the presence of engineered drainage. The role of these structures in plume migration needs to be better understood and factored into remedial/monitoring approaches for SRA. Depending on the density and characteristics of buried utilities in this part of the site, geophysical methods may or may not be useful in identifying preferential pathways which – if present – may allow for migration of contaminants beyond the site boundaries to the south and west. A combined approach calling for an in-depth review of utility construction details, surface geophysics, and perhaps other methods may be necessary in order to insure adequate ongoing monitoring of plume extent and stability in this part of the site.*

Response: The EMD is the dominant surface or near-surface feature in the area that affects groundwater flow, particularly in the overburden. There is a pipe on the north side of the EMD that discharges surface runoff/shallow groundwater into the EMD. This feature has been characterized and is part of the RI datasets. A stormwater drainage system on the East Mat is the only other engineered structure in the area. This system was investigated as RIA 39 a – h; all components of RIA 39 have been closed out with no action required. The storm drains are connected to the TACAN outfall on the west side of the East Mat and to tributaries of Old Swamp River on the east side. There are no buried gas or electrical utility lines within the site boundary. The drainage system that is downgradient of the EMD will not have an effect on the plume because utilities are constructed in overburden and the overburden plume at SRA ends at the EMD.

Comment 8. *Similar to the uncertainties with respect to the monitoring adequacy in the vicinity of the EMD, the "leading edge" of the "plume", particularly in bedrock to the west of the "source area", has been the subject of numerous previous EPA comments. While it is acknowledged that the installation of MW-502D in 2009 was motivated towards addressing these concerns, the well encountered very little permeability. It is not clear whether this well is representative of bedrock conditions in the region to the west and southwest of the "source area" (i.e., MW-405 area), or whether the location, for whatever reason, was not optimal and missed nearby fracturing. Navy's intentions to establish a "compliance boundary" in the vicinity of the western boundary of "the site" highlight these lingering uncertainties, and necessitate a more careful examination. Rather than continue to debate the issue in the face of limited data, we propose to utilize EPA-funded resources to facilitate additional detailed geophysical studies in the northwest quadrant of the site (e.g., vicinity of MW-412 cluster northward to building 112 area). The goal of this proposed work would again be to: a) verify the presence or absence of significant (unmonitored) fracture pathways having the potential to transport contaminants westward/down-gradient (i.e., to NW, W, or SW) from the suspected source area located near MW-405; and b) determine appropriate locations and depths for supplemental monitoring in this part of the site, if needed.*

Response: Comment noted. However, the existing data provides sufficient information to identify the width of the plume, especially for use in establishing LUC boundaries to restrict groundwater uses. The location and construction of MW-502D was selected and approved by EPA to obtain further information in response to a request by EPA.

Specific Comments

Comment 1. Page 1, 5th paragraph - *Given the situation, it is incumbent on the Navy, through ICs and other means, to insure that no structures will be built in the wetland portions of the site. The text here reads as if this is somewhat up to chance.*

Response: Comment noted. LUCs would be used to control construction of buildings. The text was provided to indicate that construction of buildings in this area would be difficult even without consideration to contamination. Note that the portion of the Site north of the EMD is zoned as open space and also designated for public benefit conveyance (PBC).

Comment 2. Pages 1 & 2, COC Table – *There is a footnote to this table indicating that PCE is the only COC for vapor intrusion risk; however, the table shows that the maximum concentration of cis-1, 2-DCE, TCE, and vinyl chloride exceed the GW-2 standard. Please remove this footnote or explain why the other chemicals are not COCs for vapor intrusion.*

Response: The footnote refers to the results of the RI. The GW-2 criteria are listed in the approach document for all COCs for completeness. These criteria are also needed to account for changes in concentrations of degradation products.

Comment 3. Page 2, PRGs, 1st bullet - *The process/logic for determining PRGs may need additional discussion. It is stated here that, "where no groundwater receptors have been identified (e.g., in the bedrock aquifer), MCP Method 1 (GW-3) standards will be applied, as there are no complete exposure pathways that allow for calculation of risk-based values." This thinking is overly simplistic as the potential for exchange of bedrock groundwater with overlying strata is not acknowledged. Overburden is thin at this site, and high levels of contamination are found in shallow bedrock. Shallow bedrock contamination may therefore have the potential to affect overburden groundwater. This may have implications for various plausible risk scenarios under consideration such as construction worker exposure, exposure to irrigation water, and vapor intrusion. In this context, it must be acknowledged that the bedrock ground water characterization is subject to some uncertainty, and the potential for off-site transport of contaminants via bedrock fractures exists.*

Response: Additional information will be included in the FS. If bedrock contamination is discharging into overburden then the resulting groundwater concentrations have been monitored and are accounted for in the RI data. Without pumping of overburden groundwater, which would change the groundwater flow patterns, it is highly unlikely that these conditions will change. Please also see the Response to MassDEP Comment #3c and the referenced text from the *DoD Vapor Intrusion Handbook*.

Comment 4. Page 2, PRGs, 1st bullet – *It is uncertain whether the MCP allows both MCP Method 1 and Method 3 procedures to be used at the same site, as proposed in this bullet. If MCP Method 1 (GW 3) standards are to be applied to the bedrock aquifer on the basis of no completed exposure pathway, this incomplete pathway must be assured in the future by a LUC that prevents the use of the bedrock aquifer for any purpose, including irrigation.*

Response: Comment noted. As previously discussed, since there are no downgradient receptors of the bedrock aquifer, risk-based PRGs cannot be developed. However, risk-based PRGs will be calculated for potential overburden receptors, as shown in the attached Summary of Approach to SRA FS. The LUCs would prevent the use of the contaminated groundwater as a potable water source. Similarly, LUCs can be used to control the locations for irrigation wells.

Comment 5. Page 2, PRGs, 2nd bullet – *PRGs for surface water (in the East Mat Ditch) should be calculated to protect ecological receptors (wildlife, benthic macro invertebrates), as well as recreational receptors, unless justified otherwise.*

Response: As discussed in the ecological risk assessment (ERA) portion of the RI, no CVOCs were identified as COPCs for aquatic organisms or wildlife. The ERA concluded that for both receptors, "risks were not great enough for any chemicals to warrant further evaluation at this site and/or the concentrations in site samples were similar to the concentration in background samples."

Comment 6. Page 2, PRGs, last bullet - *The approach for assessing potential risk with respect to use of groundwater for irrigation needs additional discussion. As stated above, the shallowness of bedrock groundwater, high levels of bedrock groundwater contamination, and potential for down-gradient transport via bedrock fractures, perhaps to significant distances down-gradient from "the site", present a number of troubling possibilities if irrigation is not carefully monitored and controlled. Will irrigation water be analyzed for contaminants? If irrigation wells are over-pumped in the certain locations, will contaminants be drawn into them? What process will be followed to insure proposed irrigation wells are sited most favorably with respect to minimizing potential for drawing-in or re-directing ground water from known or suspected areas of contamination? It is worth noting in this discussion that the Navy's current explanation for "upgradient" contamination discovered at the MW-408 area was the result of the de facto "pumping" of the bedrock in this area as an unintended consequence of drilling operations. If this is true, the situation holds serious implications for proposals of sustained and presumably larger scale pumping for irrigation. Further discussions are needed.*

Response: Based on the current reuse plan and the FEIR, a single on-site irrigation well is planned. This on-site irrigation well is approximately 4,000 feet from the SRA. The SRA is located in a low-yield aquifer, and part of the Site is located in a different watershed from the on-site irrigation well. Please see the Response to MassDEP Comment #1 for additional details on the FEIR's preferred irrigation water supply alternative. A LUC will also be included to control placement of any irrigation wells, should there be a future change in the preferred irrigation water supply alternative. Please also see the Response to MassDEP Comment #3.

Comment 7. Page 3, Remedial Alternative G-B – *This alternative indicates that one of the other alternatives (i.e., PRB in Alternative G-C or G-D) would be implemented if surface water concentrations exceed surface water PRGs. If PRGs are exceeded, would implementation of the PRB require a ROD amendment or ESD? Perhaps, it would be preferable to determine whether surface water PRGs are exceeded during the design phase and proceed as appropriate. Nevertheless, the contingency should be retained because concentrations might increase in the future.*

Response: Comment noted. Based on the RI surface water data, there are no exceedances of the calculated PRGs provided with the agenda for the July 27, 2011 BCT meeting. As suggested, during the design phase additional surface water data could be collected to compare to the calculated PRGs. The determination of ROD amendment or ESD would be determined in conjunction with the regulatory agencies. The need to include a contingency PRB can be determined in the design phase.

NAVY RESPONSES TO MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) COMMENTS (DATED JUNE 13, 2011)
REVISED APPROACH FEASIBILITY STUDY, SOLVENT RELEASE AREA
FORMER NAVAL AIR STATION (NAS) SOUTH WEYMOUTH, MASSACHUSETTS

The Navy's responses to the MassDEP comments on the Revised Approach for the Feasibility Study, Solvent Release Area (SRA) (dated June 6, 2011) are presented below. The MassDEP's comments are presented first (in italics) followed by Navy's responses. (MassDEP bulleted comments have been designated with "(a)", "(b)", "(c)", etc for reference.) A summary of the approach to the SRA FS is attached to these responses.

Comment 1. Preliminary Remediation Goals: *Groundwater PRGs should not be based on the presumption that LUCs will be used to address unacceptable risks posed via groundwater, because while PRGs will be used to determine where risk is unacceptable, LUCs are not the only means of addressing unacceptable risk. Consequently, discussion of LUCs should be removed from this section and text should be revised to simply indicate that risk-based groundwater cleanup goals will be developed for each potential groundwater exposure pathway (construction worker, indoor air, and irrigation) and applied to those areas where the potential exposures of concern are allowed under the Reuse Plan to determine where remediation is necessary. Regarding the irrigation pathway, the presumption that the bedrock aquifer will not be used as a source of irrigation water must be justified; such use does not appear to be inconsistent with the Reuse Plan.*

Response: Agree. The LUCs will be excluded from the PRG discussion when presented in the FS. Based on the current reuse plan and the Final Environmental Impact Report (FEIR), the preferred irrigation water supply alternative is an on-site well with a new irrigation water pond "to supply site landscaping irrigation water" (FEIR pg. 10-9). The FEIR notes that the irrigation well is located "at the western end of the east-west runway, approximately 700 feet east of the western boundary of the Base in a grassy area west of the west branch of French Stream and between two wetland areas…" (FEIR pg. 10-9). This on-site irrigation well is approximately 4,000 feet from the SRA. The SRA is located in a low-yield aquifer, and part of the Site is located in a different watershed from the on-site irrigation well. An irrigation well in the high- or medium-yield aquifer, as currently planned, is likely needed to adequately and cost-effectively supply any irrigation needs for the development project. However, a LUC will also be included to control placement of any irrigation wells, should there be a future change in the preferred irrigation water supply alternative.

Comment 2. Alternative G-B – LUCs, Monitoring, Engineering Controls*: In accordance with USEPA policies, this alternative should include a source control component: "EPA therefore expects that source control measures will be evaluated for all contaminated sites and that source control measures will be taken at most sites where practicable" (Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage tank Sites, OSWER Directive 9200.4-17P, 1999).*

Response: Comment noted. Note that the italicized text in the comment is conditional ("where practicable") in the referenced document. Navy believes that an MNA-only alternative can still be developed and evaluated on its own merits. MNA with source control is essentially addressed in Alternative G-D. While excavation was evaluated in the draft FS screening of technologies for groundwater remediation, the technology was eliminated based on implementability and cost. Source control is not needed to achieve the RAOs presented in the revised approach (see Attachment 1).

Comment 3. Use of LUCs:

a. *The FS should not include remedial alternatives that would prevent uses allowed by the Base Reuse Plan; therefore, LUCs should not be used to prevent a future use that is allowed under the Reuse Plan.*

Response: Land Use Controls are viable and integral components to a successful remedial action strategy. It is incumbent that the reuse plan considers the impacts to development in areas of impacted media. As evidenced by the planned remedial approach to the SRA site and the list of acceptable Land Use Controls provided by LNR and approved by SSTTDC in 2009, the reuse plan does contemplate impacts of environmental remediation through the placement and implementation of appropriate LUCs. The Base Reuse Plan allows for a great deal of flexibility in reuse beyond current uses of the property, and as such, the actual use of any parcel by any future developer is uncertain. Land use controls do not irrevocably prevent a future land use allowed under the Base Reuse Plan. Rather, land use controls provide a mechanism by which a future developer can work with environmental regulators to achieve a reuse consistent with the Reuse Plan while still ensuring protection to human health and the environment. Furthermore, the Navy is executing the conveyance of property to SSTTDC via an EDC under the Base Redevelopment & Realignment Manual (BRRM). As such, Section C8.5.1.2. notes: "Historically, remedy selection based on current or historic use helps speed cleanup and redevelopment, as does reuse planning that incorporates special environmental conditions (e.g., landfills or industrial areas). A new owner or LRA, when planning how to redevelop BRAC properties, may benefit from these concepts. Response actions at levels that support less restricted uses of the property are a business decision to be normally made by the new owner of the property with realization that cleanup costs associated with less restricted property usage may be borne by the new owner as part of the redevelopment of the property for new uses. Therefore, for BRAC properties the Department of Defense prefers that Military Department cleanup decisions be based on current use of the property."

b. *LUCs boundaries should not be defined using groundwater concentrations (e.g., PRGs) because groundwater concentrations are not fixed in time and space; it is impractical to monitor and enforce a non-stationary boundary. Relevant and practical boundaries for defining LUC boundaries at the SRA include Reuse Plan zoning district boundaries and wetland delineation boundaries.*

Response: Although the Reuse Plan zoning district boundaries and wetland boundaries may be useful in defining the LUC boundaries, the groundwater concentrations will be more useful because the LUCs would be based on exposure risks. LUC boundaries would include a buffer zone and consider groundwater flow direction to account for any uncertainty or changes in the plume. The monitoring component of the alternatives will ensure that concentrations outside of the LUC boundary do not exceed the PRGs. Further, concentration-based LUC boundaries would also provide a rationale for lifting LUCs at a later date.

c. *LUCs should not be used to impose building design and construction requirements on future users because such requirements would transfer responsibilty for site control to non-responsible parties and monitoring and enforcing such requirements is impractical; neither the Navy or the regulatory agencies will have sufficient presence at the site to ensure that appropriate design and contruction techniques are incorporated into plans, that plans are built as designed, and that structures are maintained to ensure adequate perfromance. Instead of using LUCs to prevent these exposures, remedial action should be taken to reduce contaminant concentrations exceeding the levels that pose unacceptable risk via the indoor pathway in those areas where building construction is allowed under the Reuse Plan.*

Response: Per DoD guidance, building design and construction controls are a recognized way to address vapor intrusion (*DoD Vapor Intrusion Handbook,* January 2009, Tri-Services Environmental Risk Assessment Workgroup). However, vapor intrusion is not likely to be an issue in the recreation-zoned area south of the EMD, as the higher CVOC concentrations are in the bedrock, not in the overburden. The area north of the EMD is designated as a public benefit conveyance (PBC); since the area is predominately wetlands construction of buildings is unlikely. Please also see the information below extracted from the referenced DoD Vapor Intrusion Handbook. The SRA data will be reviewed in this context to address concerns about vapor intrusion.

Comment 4. Engineering Controls for EMD: *A fence should not be used to prevent recreational exposure to the EMD because recreational use is allowed in the EMD under the Reuse Plan and*

monitoring and maintenance of a fence in a recreational area is not practical; neither the Navy not the regulatory agencies will have sufficient presence at the site to ensure the integrity of a fence in an area where high frequency (e.g, daily) recreational use is planned. Instead of using a fence to prevent these exposures, remediation action should be taken to prevent groundwater with contaminant concentrations exceeding the surface water cleanup goals from discharging to the EMD.

Response: PRGs for recreational exposure to surface water in the EMD were provided with the agenda prior to the July 27, 2011 BCT meeting. Based on the RI surface water data, there are no exceedances of the calculated PRGs. A fence is needed for short-term control in Alternatives G-C and G-D. Installation of a fence would not be precluded by the Reuse Plan zoning descriptions. The Navy would be responsible for the inspection and maintenance of the fence, similar to any other LUC inspection requirement.

***DoD Vapor Intrusion Handbook*, January 2009, pg.22**

"It is an accepted component of the CSM for vapor intrusion from groundwater that a clean water lens above VOC contamination can act as a barrier to volatilization of VOCs from deeper ground water and reduce or prevent vapor intrusion into overlying buildings.

Field studies and modeling presented in Rivett (1995) suggest that groundwater concentrations one meter below the water table are unlikely to create significant soil gas signatures in the overlying vadose zone. Other studies indicate that because the rate of diffusion of contaminants through the overlying clean ground water is so slow, the overlying ground water can greatly impede or prevent VOCs in deeper ground water from reaching the unsaturated zone, thus possibly preventing a vapor intrusion situation (Fitzpatrick & Fitzgerald, 2002; McAlary et al., 2004). New Jersey's vapor intrusion guidance states that sites with a groundwater lens at least three feet above contaminated groundwater are not likely to be associated with significant off gassing (NJDEP, 2005)."

ATTACHMENT 1
SUMMARY OF APPROACH TO SRA FS

Remedial Action Objectives

RAO No. 1: Prevent exposure of recreational users to surface water in the EMD that is impacted by groundwater at levels that could pose an unacceptable risk.

RAO No. 2: Prevent exposure of potential building occupants to VOCs resulting from vapor intrusion into any future buildings that could be built in the non-wetland areas of the site at levels that could pose unacceptable risk.

RAO No. 3: Prevent exposure to VOCs in groundwater being used for irrigation at concentrations that could pose unacceptable risk.

RAO No. 4: Prevent exposure of construction workers during excavation activities to VOCs in groundwater that could pose unacceptable risk.

Preliminary Remediation Goals

- PRGs for the overburden groundwater will be calculated to protect potential receptors under the future land use for the site based on risk-based values, using EPA's risk assessment guidance. Where no groundwater receptors have been identified (e.g., in the bedrock aquifer), MCP Method 1 (GW-3) standards will be applied, as there are no complete exposure pathways that would allow for calculation of risk-based values.

- PRGs for surface water will be based on recreational user risk.

- PRGs for the vapor intrusion pathway will be calculated for the shallow groundwater beneath the upland area north of the EMD.

- As an additional measure of safety, risk-based values will be calculated and used to determine LUC boundaries for preventing exposure to future construction workers and use of groundwater for irrigation.

Remedial Alternatives

- Alternative G-A – No Action
- Alternative G-B – Monitoring, Engineering Controls, and LUCs
- Alternative G-C – PRB, Monitoring, Engineering Controls, and LUCs
- Alternative G-D – Multiple PRBs, Monitoring, Engineering Controls, and LUCs