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LETTER REGARDING CHM2 RESPONSES TO PUERTO RICO BOARD OF
ENVIRONMENTAL QUALITY COMMENTS ON THE FULL RESOURCE CONSERVATION
AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION REPORT FOR SOLID WASTE
MANAGEMENT UNIT (SWMU) 78 POLE YARD NAVAL ACTIVITY PUERTO RICO

7/27/2016

CH2M

Responses to comments on the Draft Full RCRA Facility Investigation Report, SWMU 78 – Pole Yard, Naval Activity Puerto Rico, Ceiba, Puerto Rico (January 2015)

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DATE: July 27, 2016

The tables below present responses to comments received from the Puerto Rico Board of Environmental Quality (PREQB) and the USEPA on the referenced document, which was submitted for review on January 27, 2015. Comments are presented as they were received from PREQB on April 13, 2015 and from USEPA on July 7, 2015.

Responses to the initial comments on the Draft Full RFI Report were submitted, along with a red-line version of the report, to PREQB and EPA on September 17, 2015. On October 19, 2015 PREQB subsequently requested additional information be provided for Comments 5 and 7h. EPA also submitted responses to the initial comments on June 16, 2016. The additional PREQB and EPA comments and corresponding responses are provided herein.

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No.	PREQB Specific Comments - April 13, 2015		Navy Response	PREQB Evaluation of Response - October 19, 2015 EPA Evaluation of Response - June 16, 2016 ¹	Navy Response
1		<p>Please clarify the path forward for addressing elevated TPH impacts identified at sample locations 78SB01 and 78SB03, where TPH was detected in surface soil (0-1 ft) at 8,000 mg/kg and 820 mg/kg, respectively, and at 78SB01 in shallow subsurface soil (1-3 ft) at 180 mg/kg. Although petroleum constituents were not a concern based on the results of the risk assessments, PREQB requests that the elevated petroleum impacts be addressed.</p>	<p>Although TPH is detected at concentrations that exceed the 100 mg/kg PREQB Land Pollution Control Corrective Action Level in surface and shallow subsurface soil at the two referenced locations, the Navy does not consider the TPH impacts to warrant remediation based on the very limited extent of detections and the results of the quantitative risk assessment. TPH was not directly evaluated in the risk assessments prepared for the RFI because ecological and human health screening criteria were not considered for TPH; however, the likely toxic components of TPH, such as BTEX and PAHs, were evaluated under each exposure scenario and no risk was identified associated with these constituents.</p> <p>Additionally, the PREQB criterion is based on leaching from soil to groundwater. Per conclusions of the RFI, impacts to groundwater are not expected at SWMU 78 given the shallow nature of the detected constituents, deep depth to groundwater (> 80 feet), and the limited mobility of the detected constituents in the environment. Surface soil sampling has shown limited mobility of the TPH constituents and very low likelihood to impact groundwater. Surface soil from boring 78SB01 had a TPH concentration of 8,000 mg/kg and reduced significantly to 180 mg/kg in the sample collected at 1 foot below ground surface. This 98% reduction in TPH concentration within one foot of the ground surface suggests that it is very unlikely that groundwater at 80 foot depth would be impacted.</p> <p>Since the time that the RFI was submitted to PREQB, the Navy submitted to EPA and PREQB the draft Baseline Risk Assessment Protocol for NAPR (June 2015), which proposes ecological screening values (ESVs) for TPH. The proposed TPH ESVs are promulgated by the Canadian Council of Ministers of the Environment (CCME) and are based on toxicity to plants and soil invertebrates. CCME developed ecological values for four TPH fractions (identified as F1 through F4). Gasoline falls within F1 and the criterion is 210 mg/kg for agriculture/residential/parkland land use and 320 mg/kg for commercial/industrial land uses. At SWMU 78, TPH-GRO is detected below these levels in both surface and shallow subsurface soils. Fresh diesel fuel falls within the F2/F3 fractions. Criteria for F2 are 150 mg/kg for agriculture/residential/parkland land use and 260 mg/kg for commercial/industrial land use. For F3 (assuming the soils are fine grained), the criteria are 1,300 mg/kg for agriculture/residential/parkland land use and 2,500 mg/kg for commercial/industrial land use. Since natural weathering in the environment tends to move the fractions into the higher ranges (maybe even into F4, where the criteria are even higher), the F3 values are applicable to SWMU 78. There are no exceedances in shallow subsurface soils based on the F3 value (1,300 mg/kg). In surface soil, only SS-01 exceeds this value but only in the parent sample (8,000 mg/kg); the field duplicate concentration (12 mg/kg) did not exceed the criteria.</p> <p>For the final RFI, the Navy will address the elevated TPH concentrations by comparing the TPH concentrations to the CCME criteria as documented in this response and reiterating the data evaluations and statements made herein. After doing this it is anticipated that the conclusions of the RFI will remain unchanged and that the Navy will be able to transfer SWMU 78 as corrective action complete without controls.</p>	<p>No additional comment/response.</p>	<p>No additional comment/response.</p>
	<p>Section 2.2.3, Regional Hydrogeology, Last Paragraph</p>	<p>Please also add text to this section acknowledging that as stated in the Groundwater Usability Assessment, Section 1302.3(A) of PRWQS regulation (PREQB, 2010) classifies all groundwater in Puerto Rico as SG, which is defined under Section 1303.2(F) as groundwater intended for use as source of drinking water supply. Therefore, site-specific investigations and subsequent corrective action determinations involving groundwater will determine groundwater characteristics relative to potable use suitability.</p>	<p>The following text will be added to Section 2.2.3: <i>The Groundwater Usability Assessment, Section 1302.3(A) of PRWQS regulation (PREQB, 2010) classifies all groundwater in Puerto Rico as SG, which is defined under Section 1303.2(F) as groundwater intended for use as source of drinking water supply. Therefore, site-specific investigations will consider potential impacts to groundwater and, if warranted, characterize site-specific groundwater characteristics and evaluate them relative to suitability for potable use.</i></p>	<p>No additional comment/response.</p>	<p>No additional comment/response.</p>

No.	PREQB Specific Comments - April 13, 2015	Navy Response	PREQB Evaluation of Response - October 19, 2015 EPA Evaluation of Response - June 16, 2016 ¹	Navy Response	
3	Page 3-1, Section 3.2.1	<p>a. Surface and Subsurface Soil Sampling, First Sentence: It appears that 43 borings were completed during the full RFI instead of the 37 that are indicated. Of these 43 soil borings, samples were collected from 37 for analysis of various parameters. Please clarify.</p> <p>b. The two references to Table 3-2 in this section need to be changed to Table 3-1.</p>	<p>a. The first sentence of Section 3.2.1 will be revised to read: "Forty-three locations were sampled to complete the nature and extent..." and in addition, the word "all" will be deleted from the first sentence in Section 3.2.1.1.</p> <p>b. The references to Table 3-2 will be changed to Table 3-1 as recommended.</p>	<p><u>EPA comment on the response to PREQB Specific Comment 3, Page 3-1, Section 3.2.1:</u> The Navy response partially addresses the comment. References to Table 3-2 have been changed to Table 3-1. Additionally the Draft Final RFI report has been revised to include "forty-three locations." However the subsequent text in the RFI is slightly misleading in that it does not state that only 37 samples were collected for analysis. Please clarify in the RFI that 37 samples were collected from the 43 borings. It is recognized that Section 3.2.1.1 indicates that 37 soil samples were collected but for clarity it would be helpful to either change Section 3.2.1.1 or Section 3.2.1 to indicate that 37 samples were collected from the 43 borings locations.</p>	<p>The first sentence in Section 3.2.1.1 has been revised as follows to clarify the surface soil sampling performed during the Full RFI: <i>Surface soil samples were collected from 37 of the 43 soil boring locations, at a depth of 0 to 1 foot bgs (Figure 3-1).</i></p> <p>Likewise, the first sentence in Section 3.2.1.2 has been revised as follows to clarify the subsurface soil sampling performed during the Full RFI: <i>Subsurface soil samples were collected from 24 of the 43 soil boring locations, at varying depth increments, between 1 to 3 feet bgs, 3 to 5 feet bgs, 5 to 7 feet bgs, 7 to 9 feet bgs, and 9 to 11 feet bgs (Figure 3-1, Table 3-2).</i></p>
4	Page 3-2, Section 3.2.1.2, Paragraph 1	<p>a. Please revise text concerning locations where only one subsurface soil sample was collected to include locations 78SB57 and 78SB59. b. Last Sentence: Please revise the last sentence as follows: These samples were analyzed for Appendix IX Metals. Selected samples were analyzed for LLPAs and TPH- DRO.</p>	<p>a. The word "nine" in the second sentence of Paragraph 1 will be changed to "eleven" and locations 78SB57 and 78SB59 will be added to the list of boring where only one subsurface sample was collected. b. The text will be revised as recommended.</p>	<p><u>EPA comment on the response to PREQB Specific Comment 4, Page 3-2, Section 3.2.1.2 Paragraph 1:</u> The Navy response partially addresses the comment. The statement regarding Appendix IX metals has been added to the text. However the text does not state TPH-DRO. It merely states "TPH-." Revise the text to include "DRO".</p>	<p>'DRO' has been added to the last sentence in the referenced paragraph.</p>
5	Page 4-1, Section 4.1:	<p>a. VOCs: Please revise "2-hexane" to "2-hexanone."</p> <p>b. SVOCs: The text states that TPH-DRO was detected in each of the listed samples below the screening criterion of 100 mg/kg. Please confirm for two of the listed samples: 78SB01 and 78SB03, where it appears that TPH was above the screening criterion.</p>	<p>a. The text will be revised as recommended.</p> <p>b. The clause of this sentence beginning with "and TPH-DRO was also detected..." will be deleted. The relationship between the TPH-DRO concentrations detected in 78SB01 and 78SB03 and the 100 mg/kg screening criteria is explained in the 5th bullet of Section 4.1.</p>	<p>Page 4-2, Section 4.2, SVOCs:</p> <p>a. The text was not revised as noted in the response. In addition, the text was revised to state that RSLs were exceeded in shallow subsurface samples from four locations. However, there were RSL exceedances in shallow subsurface samples from three locations and subsurface soil from 1 location. Please revise the text accordingly.</p> <p>b. This issue was addressed by specifically stating where vertical delineation had occurred instead of generally stating that PAHs above the RSLs had been vertically delineated. However, the lack of vertical delineation in the original comment at 78SB24 and 78SB59 was not addressed. Please address the lack of vertical delineation at 78SB24 and 78SB59 in the text.</p>	<p>a. The second sentence of the second bullet in Section 4.2 will be revised as follows: <i>Residential RSLs for human health were exceeded for three PAH compounds, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, in shallow subsurface soil samples collected from three locations (78SB23, 78SB24 and 78SB59) (Figure 4-1). Benzo(a)pyrene was also detected above the residential soil RSL in the subsurface soil sample collected from 7-9 feet at location 78SB24.</i></p> <p>b. The following sentence will be added to the second bullet in Section 4.2: <i>The benzo(a)pyrene concentrations detected in the deepest samples collected from locations 78SB24 (34.2 mg/kg at 7-9 feet) and 78SB59 (27 mg/kg at 1-3 feet) marginally exceed the residential RSL for this constituent (15 mg/kg).</i></p>
7	Page 7-1, Section 7.1, Paragraph 3	<p>This is the first reference to mercury in this report. Please clarify as the maximum concentrations of mercury were not in the referenced borings (78SB01 and 78SB03).</p>	<p>The reference to mercury in this paragraph is an error. The sentence should only reference total TPH and the PAHs and will be revised accordingly.</p>	<p>No additional comment/response.</p>	<p>No additional comment/response.</p>

No.	PREQB Specific Comments - April 13, 2015	Navy Response	PREQB Evaluation of Response - October 19, 2015 EPA Evaluation of Response - June 16, 2016 ¹	Navy Response	
8	Table 3-1	<p>a. Please check off Appendix IX LL PAHs for all 2008 samples.</p> <p>b. Please check off PAHs for sample 78SB18-01.</p> <p>c. As per the field notes of Mark Kimes, the collection date for sample 78SB48-00 is 4/26/2011 (not 4/27/2011).</p> <p>d. As per the field notes of Tristram Madden, the collection date for samples 78SB21-01, 78SB22-01, and 78SB22-03 is 4/27/2011 (not 4/28/2011).</p> <p>e. As per the field notes of Tristram Madden, the collection date for samples 78SB23-01, 78SB23-03, 78SB24-01, 78SB24-04, 78SB25-01, 78SB25-04, 78SB26-01, 78SB26-03, 78SB28-01, 78SB29-01 and 78SB29-02 is 4/26/2011 (not 4/27/2011).</p> <p>f. The sample depth for sample 78SB32-01 is listed as 1-3 ft bgs. However, this boring had refusal at 2' bgs. Please revise the sample depth accordingly on this table as well as Table 4-2.</p> <p>g. As per the field notes of Joe Burawa, the collection date for sample 78SB59-01 is 9/27/11 (not 9/28/11).</p> <p>h. As per the field notes of Tristram Madden on 4/27/11, a surface soil sample was collected at 78SB27. Please clarify why this sample is not included.</p>	<p>Since the COC is already included in the RFI report, no further changes to the report are necessary.</p> <p>b. Sample 78SB18-01 will be checked for analysis of PAHs.</p> <p>c., d., e., f., g., and h. The collection dates and sample depths will be reviewed against the field notes and corrected as recommended.</p>	<p>Table 3-1: It does not appear that this comment was addressed. Please clarify.</p> <p>EPA comment on the response to PREQB Specific Comment 8, Table 3-1: The Navy response partially addresses the comment. The Draft Final RFI report has been revised appropriately for the majority of errors in Table 3-1. However the sample collection date for sample 78SB48 in Table 3-1 is still listed as 4/27/2011 and Table 3-1 does not indicate that a surface soil sample was collected at 78SB27. Revise Table 3-1 accordingly.</p>	<p>The 4/27/11 field notes from Tristram Madden do indicate that a surface soil sample was collected at 78SB27, but the COC on which the sample is listed indicates that the lab did not receive the 2-oz jar required for metals analysis for this location. The COC indicates that the analysis was not needed for this sample and the notation on the COC to this effect was signed by Mark Kimes on 4/29/11. The COC also indicates that the sample was not assigned a laboratory ID.</p> <p>The date of collection for sample 78SB48 has been updated to 4/26/2011. A surface soil sample was collected, but not analyzed at location 78SB27. See additional response to PREQB comment 7h above.</p>
9	Figure 4-2	<p>a. Please revise the units in the data boxes to mg/kg.</p> <p>b. Please add the definition of mg/kg to the figure legend.</p>	<p>a. the units in the data boxes will be revised to 'mg/kg' as recommended.</p> <p>b. the definition of 'mg/kg' will be added to the legend.</p>	No additional comment/response.	No additional comment/response.
10	Appendix A, Soil Boring Logs	<p>a. 78SB47: Please provide Sheet 1 of 2.</p> <p>b. 78SB57: Please correct sample IDs on boring log to reflect 78SB57 (not 78SB47).</p> <p>c. 78SB58: Please correct sample ID on boring log to reflect 78SB58 instead of 78SB48.</p>	<p>a. Sheet 1 of 2 will be provided in the Draft Final RFI as requested.</p> <p>b. and c. The sample IDs on boring logs 78SB57 and 78SB58 will be corrected as recommended.</p>	No additional comment/response.	No additional comment/response.
11	Appendix B, Data Validation Summary Reports	<p>SDG 1104175, Page 5: The SVOC LCS sections states that the LCS exhibited high recoveries for benzo(a)anthracene; however the recovery is listed as 11%. Please clarify.</p> <p>SDG 1104177, Page 4: The SVOC internal standard section should clarify how the PAH results compared between the initial extraction and re-extraction for each sample.</p>	<p>The SWMU 78 RFI is based upon an evaluation of existing data collected by a different contractor, under separate contract and the final data validation reports for that sampling work were provided as Appendix B to the RFI Report. CH2M completed a data usability assessment which is included as Section 3.2.4 of the RFI. The text in Section 3.2.4 will be expanded to address these comments on the data validation reports and the additional text will include a summary of the specific points discussed below. No change to the third party validation report is recommended; however, the noted discrepancies will be addressed through additions to Section 3.2.4 and in this comment and response document, which will both be submitted to the administrative record.</p> <p>With respect to SDG 1104175 Page 5, there is likely a typographical error. It is possible the text should read "low" instead of "high" or the percent recovery should have been reported as "111%" or similar. Either way the final data result would be J-qualified.</p> <p>Regarding SDG 1104177 Page 4, there was low recovery for internal standards in the original extraction, and acceptable recovery for internal standards in the re-extraction. However, the re-extraction was performed outside holding time and so the results were not used; therefore, they are not presented as part of this report. It is routine for the DV to select the "best result" and exclude the others to prevent redundancy.</p>	No additional comment/response.	No additional comment/response.

No.	PREQB Specific Comments - April 13, 2015		Navy Response	PREQB Evaluation of Response - October 19, 2015 EPA Evaluation of Response - June 16, 2016 ¹	Navy Response
12	Appendix C, Human Health Risk Assessment, Page 9, Section 5.6.3	Minor editorial comment – please revise the following sentence for clarity, “...The maximum reporting limits of 29 100 percent nondetected chemicals were greater than the adjusted residential soil RSLs...”	The text will be revised to read: “The maximum reporting limits for 29 of the 100 percent nondetected compounds....”	No additional comment/response.	No additional comment/response.

Note:

1) EPA evaluated and provided comment on the Navy's response to PREQB comments 3, 4, and 8 on June 16, 2016.

No. (Date)	EPA Specific Comments - July 7, 2015	Navy Response	EPA Evaluation of Response - June 16, 2016	Navy Response
1	Appendix D of this report states that the ERA process was based on the draft ERA protocol completed for NAPR dated September 2014. A paper copy or an electronic link should be provided to EPA for this document.	Hard copies of the draft Human Health and Ecological Risk Assessment Protocols were sent to EPA for review on June 19, 2015. The reference will be updated accordingly.	No additional comment/response.	No additional comment/response.
2	Tables 4-1 and 4-2 a. Both tables have footnotes indicating that “RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents.” The Regional Screening Level (RSL) Summary Tables consist of two different versions – one based on a Target Risk = 1E-06 and an HQ= 1 and the other based on a Target Risk =1E-06 and an HQ = 0.1. This second table (with an HQ = 0.1) should be used to obtain RSLs for screening purposes. These values already take into account multiple constituents and do not need to be adjusted. b. The units of measurement in these tables should agree with the Regional Screening Levels and the Vieques Protocol. Soil should be reported in mg/kg and water should be reported as ug/L.	a. The second table referenced in the comment (with Target Risk = 1E-06 and HQ = 0.1) was used to obtain the RSL screening values used in the RFI report. The footnote is intended to describe the second table as compared to the first (with HQ = 1) and the footnote text will be adjusted to clarify where the SL values were obtained. b. The units of measurement presented in these tables are consistent with the Vieques Protocol. As such, the preference is to present the units as µg/kg for soil routine organics and mg/kg for soil routine inorganics. The RSLs (and other screening levels) are then converted, as necessary, to be consistent with the data units.	The Navy response partially addresses the comment. The request to convert site data to units consistent with RSLs and other screening criteria was not followed, and instead the units of the RSLs and screening criteria were modified to be consistent with the site data. This selected use of units by the Navy has no impact on the results or conclusions, and no further recommendations are offered.	Comment noted.
3	In order to be consistent with the <u>Baseline Human Health Risk Assessment Protocol for Vieques Environmental Restoration Program</u> , EPA SSLs should be used with a DAF of 1 not 20. Page 6 of the protocol document states that “The leachability potential will be assessed by comparing site-specific concentrations to published EPA SSLs based on a dilution/attenuation factor of 1 or site-specific SSLs, if site-specific data have been collected to permit their calculations.”	As requested the SSL values will be rescreened against risk-based SSLs set at DAF=1. Specifically, the June 2015 EPA SSL values will be used. For additional comparison, the data will also be screened against NAPR surface soil background (as currently presented on Tables 4-3 and 4-4) and the generic EPA SSLs at DAF=20 as presented in Appendix A of the December 2002 OSWER guidance. The DAF=1 screening will provide a very conservative assessment of conditions at SWMU 78 and the DAF=20 and background values provide a potentially more realistic picture of leaching conditions given the nature of the constituents that have been detected at the site, the small size of the source area, and the significant depth to groundwater below the site. Conclusions of the RFI are not expected to change based on the results of the DAF=1 screening.	No additional comment/response.	No additional comment/response.
4	Tables 4-3 and 4-4 present the screening of soil data against “EPA SSL (May 2014) DAF = 20” values. An explanation should be provided as to how these values were calculated. A review of these values compared to the RSL Summary Table values indicates that the RSL Summary Table values for either the risk-based or MCL-based SSLs were multiplied by 20 to produce the values used in Tables 4-3 and 4-4. For example, the MCL-based SSL value for 1, 4 dichlorobenzene from the Summary Table (TR=1E-06 and HQ=1) is 7.2E-02 mg/kg = 0.072 mg/kg = 72 ug/kg x 20 = 1440 ug/kg (the value used is Tables 4-3 and 4-4). According to EPA hydrogeologists, it is incorrect to multiply an SSL value based on a DAF = 1 by 20 to get an SSL with a DAF = 20. The USEPA document, <u>Supplement Guidance for Developing Soil Screening Levels for Superfund Sites</u> , OSWER 9355.4-24 December 2002 should be consulted for migration to groundwater SSL values with a DAF = 20. This topic should be discussed between USEPA, EQB, and Navy hydrogeologists to ensure that the correct values are used in screening tables to account for the potential for soil contaminants to migrate to groundwater.	The data have been rescreened against the criteria stated in Comment #14 and the results are presented in the revised RFI Report.	The Navy response does not address the comment. The comment stated that the procedure used by the Navy to develop soil screening levels (SSLs) for a DAF of 20 was incorrect, and offered a reference and suggested discussion to correct the procedure. Neither the procedure nor the discussion were followed by the Navy in the Draft Final RFI. Instead, the Navy presented additional SSLs based on DAF of 1 along with those based on a DAF of 20, but conclusions of the RFI continue to be partially based on the SSLs derived using a DAF of 20. The Navy contends that site conditions (as well as the SSLs based on DAF of 20) suggest a lack of potential for leaching of soil COPCs to groundwater. However this information is not well documented. It is recommended that the Navy follow the recommended procedures in the original comment or use only a DAF 1.	Tables 4-3 and 4-4 and the corresponding text in Section 4.3 has been updated to reflect only the screening that was performed against the DAF=1 criteria. These revisions do not materially change the conclusions of the RFI; that the detected constituent concentrations at SWMU 78 are very unlikely to impact groundwater.
5	Appendix C, page 3, Section 2.3 provides a definition of a hot spot as a soil concentration greater than 100 times the RSL. Is this hot spot definition used at Vieques? If so, please provide the reference.	Historically for Vieques HHRAs, detected concentrations have been compared to 100 times RSL values to identify hot spots. The text in this section will be expanded to reference the Vieques Protocol which is also consistent with the Draft NAPR Protocol currently under regulatory review.	No additional comment/response.	No additional comment/response.
6	Page 2-2, Section 2.3.1, 1st sentence This sentence states that the SWMU is located on Gilbert Island Street and does not agree with the 2nd sentence on page 2-3, Section 2.3.3 that states the SWMU is “... located on edge of a steep slope off of Hollandia Street.” Please correct this if it is error.	Based upon a review of survey maps included in Land Transfer Documentation the sentences in the RFI will be rewritten to state that SWMU 78 is located to the north of the intersection of Forrestal Drive and Valley Forge Road. Based on maps provided in the Draft Full RFI (Baker, 2012) it appears that Gilbert Island Street and Hollandia Street are two minor roads that exist just northeast of SWMU 2.	No additional comment/response.	No additional comment/response.
7	Page 4-2, Section 4.2, 4th bullet Correct the spelling of “twelve.”	The spelling will be corrected.	No additional comment/response.	No additional comment/response.

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