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U S NAVY RESPONSE TO REGULATOR COMMENTS TO RCRA FACILITY INVESTIGATION  
AREA OF CONCERN 551 AND 552 (AOCS 551 AND 552) CNC CHARLESTON SC  
11/27/2002  
CH2M HILL

AOCs 551 and 552

Response to Comments RFI RA (RO)

# CH2MHILL TRANSMITTAL

**To:** Jerry Stamps  
South Carolina Department of Health  
and Environmental Control  
Bureau of Land and Waste  
Management  
2600 Bull Street  
Columbia, SC 29201

**From:** Dean Williamson/CH2M-Jones

**Date:** November 27, 2002

**Re:** CH2M-Jones' Responses to Comments by SCDHEC regarding the *RFI Report Addendum, Areas of Concern 551 and 552, Zone E, Charleston Naval Complex* (Revision 0)

Quantity	Description
4	CH2M-Jones' Responses to Comments by SCDHEC regarding the <i>RFI Report Addendum, Area of Concern 550, Zone E, Charleston Naval Complex</i> (Revision 0) – Originally Submitted on September 19, 2002

If material received is not as listed, please notify us at once

Remarks:

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Jo Cherie Overcash/SCDHEC, w/att  
BCT Distribution List

*Accomplishing all of these operations in a 10 ft by 15 ft small building does not seem practical, particularly with the type of technology available in 1922 to 1929. The firing or heating unit alone for such an operation would likely have been large enough to occupy all or most of a 10 ft by 15 ft area, leaving little or no room for equipment needed for the metals preparation and galvanizing steps.*

*Our conclusion is that Building 1030 was most likely never used as a galvanizing shop. This building was probably misidentified as a galvanizing shop during the RFA process. Its actual use was most likely as described in the legends from the 1922 through 1929 drawings (a small office and tool shed). No information was located that can confirm the use of this building as a galvanizing operation. Its small size makes the use of this building for galvanizing unlikely.*

2. Data from the soil boring E551SB006 location should be evaluated as relevant to AOC 552 in that the soil boring is directly on the northern boundary of the AOC 552 unit. During this review, data from E551SB006 was considered relevant and pertinent to AOC 552 rather than AOC 551.

**CH2M-Jones Response:**

*Comment noted. No response to this comment appears to be required, since no COCs were identified at the site and the RFI completion requirements, as agreed to by the BCT and discussed in the following comment, have been met. All chemicals in soil at boring E551SB006 are below the industrial RBCs.*

3. According to Appendix A Figure A-1 entitled *Shallow Groundwater Contour Map, May 2002*, shallow groundwater flow in the vicinity of AOC 551 and AOC 552 is complex. Natural groundwater flow to the Cooper River has been interrupted in many areas of the Base by the construction of the quay walls and dry docks. On Figure A-1 a 2.5 foot above mean sea level contour is drawn as a sink in the area of AOC 551. Monitoring well E551GW002 is depicted as inside this sink while monitoring well E551GW001 (closest to the Cooper River) is outside the contours.

In order to establish historical shallow and deep groundwater flow in this area of the Base, the Navy must provide a table of historical groundwater elevation data from the monitoring wells at AOC 551. Groundwater elevation data from grid well locations NBCEGDE17 and GDEGW026 should also be included for perspective.

**CH2M-Jones Response:**

*The requested data, to the extent that they are available, can be provided.*

4. According to Figure A-1 referenced above, the two shallow monitoring wells E551GW001 and E551GW002 and the deep monitoring well E551GW02D are located to monitor groundwater quality at AOC 551. Based on groundwater flow as depicted on this potentiometric map, there are no monitoring wells properly located to monitor a potential release from AOC 552.

This RFI Report Addendum summarizes the surface and subsurface soil data that was generated by EnSafe during the 1995-1998 confirmatory sampling. Review of available data indicates that a release from AOC 552 has occurred. As you may have noted, many of these detections were from the E551SB006 location.

The galvanizing process is used in industry to coat iron with zinc as a protection against rust. Inorganic parameters are associated with the galvanizing process. The data indicates that there are elevated concentrations of metals in surface and subsurface soil at AOC 552. See the table below for inorganic constituents detected at AOC 552:

Surface Soil	> Maximum Zone E Background	> Zone E Background Mean + Std. Deviation
	Antimony, Cadmium, Lead and Mercury	Antimony, Cadmium, Cobalt, Copper, Lead, Nickel, Mercury, and Zinc (J)
Subsurface Soil	> Maximum Zone E Background	> Zone E Background Mean + Std. Deviation
	Antimony, Cadmium, Lead, and Zinc	Antimony, Barium, Cadmium, Cobalt, Copper, Lead, Mercury, Silver, Thallium, and Zinc

The Navy must propose to install permanent monitoring wells at AOC 552. Groundwater samples should be analyzed for VOCs, semi-volatile organic compounds (SVOCs) and a full suite of R.61-79.264 Appendix IX metals.

**CH2M-Jones Response:**

*Monitoring wells E551GW002 and the deep monitoring well E551GW02D are located approximately 75 feet downgradient from AOC 552 and are therefore appropriately located to assess whether any groundwater contamination is migrating from the AOC 552 area. Since Building 1030 was demolished over 70 years ago, there has been extensive and adequate time for any contamination that might have been released at AOC 552 to migrate to these wells, if any such contaminant migration in groundwater was ever going to occur. The fact that no contamination attributable to AOC 552 has been detected in these wells after this time indicates that contamination is not migrating from this area and that no further investigation of groundwater at this site is needed. Therefore, no additional wells are required to assess groundwater quality at AOC 552. Also, as noted above, no hard data or records (such as historic engineering drawings) were identified that indicate that any industrial operations were ever conducted at Building 1030. The available records suggest AOC 552 was not used for a galvanizing shop or for other industrial purposes.*

*The BCT has agreed that sites in Zone E need to be delineated only to EPA Region III industrial risk criteria. The following sentence is taken from page 4-4 of the CNC Project Team Notebook." It should be noted that the CNC BCT has agreed that the delineation of contamination related to potential human health impacts for the RFI at sites in Zone E and the industrialized portion of Zone F (generally, the part of Zone F east of Hobson Avenue), is considered complete when surface soil has been delineated to the EPA Region III industrial risk-based concentrations (RBCs)."*

*The RFI for this site has met this criteria. Because no chemicals in the soil samples collected at AOC 552, including sample 551SB006, exceed industrial RBCs, requesting additional samples is contrary to previous BCT agreements and is not necessary. Because the Navy/CH2M-Jones team is not requesting an NFA determination for this site, delineation of chemicals to residential RBCs is not required.*

*The reviewer has provided a table with metals results that exceed the Zone E maximum and Zone E average plus one standard deviation, along with a statement that these metals are "elevated." The term "elevated" is highly relative and whether a concentration is elevated or not depends on the comparison criteria used. Certainly, compared to the industrial RBCs, which is what the BCT has agreed to use for Zone E delineation, none of these chemicals is "elevated."*

*We are somewhat confused as to the apparent introduction of the Zone E maximum and Zone E average plus one standard deviation as new COPC screening or RFI delineation criteria for soil. Since the purpose of RFI investigations are to assess risk, it is not clear how the comparison of the metals to these criteria in the table above, in the absence of relevant risk based concentrations, can be used to assess whether the concentrations pose an unacceptable risk. Please note that the comments from the SCDHEC risk assessor did not indicate any remaining unresolved risk issues at these sites.*

#### 5. Section 5.1.2 Lead

There is a discrepancy with regard to the reported values for lead. The values reported in the facility's GIS and on Table 5-1 for surface soil sample E551SB002 and E551SB006 do not reflect the values presented on the Appendix A table entitled *Chemicals Detected in Zone E Soil Samples AOC 551*. The remaining values are identical. Please clarify this discrepancy.

Note that lead was detected in surface soil at the E551SB006 (AOC 552) location in concentration greater than 400 milligrams per kilogram (mg/kg). Based on the groundwater data from AOC 551, one may conclude that lead is not a constituent of concern at AOC 551; however, that is not the case at AOC 552 in that groundwater quality at AOC 552 has not been evaluated.

#### **CH2M-Jones Response:**

*The values for lead for the two samples in question 551SB002 (36.4 mg/kg) and 551SB006 (934 mg/kg) that appear in the GIS and Table 5-1 or the RFI Report Addendum are the same as the values contained the validated data tables in Appendix H of the Revision 0 Zone E RFI report and appear to be the correct values. The reason why the lead values for these samples in the Appendix A table are slightly different is not apparent, but it is possible that the Appendix A tables were based on preliminary (unvalidated) data.*

*Given that more than 70 years has passed since Building 1030 existed, it is highly likely if any groundwater contamination were going to be detected from operations at this building, that contamination would have migrated downgradient to wells E551GW002 and E551GW02D. Also, as discussed above, there is considerable doubt as to whether any galvanizing or other industrial processes ever occurred at this very small building that apparently was used as an office and for tool storage. Therefore, we do not believe that*

*concerns regarding groundwater at AOC 552 are significant or warrant additional new wells such a short distance upgradient from the existing wells.*

6. Section 2.2 Groundwater Sampling and Analysis

In this Section the Navy states that the three monitoring wells were sampled four times between 1996 and 1998. This Section also provides a list of parameters analyzed. However, the text is misleading in that of the four sampling events recorded on the Appendix A table entitled *Chemicals Detected in Zone E Groundwater Samples AOC 551*, no volatile organic compounds (VOCs) or semi-volatile organic compound (SVOCs) analysis was conducted during the last two sampling events. For sampling events 3 and 4, the Table lists NS, defined as "No Sample Taken/Sample Not Analyzed". Moreover, Table 5-2 entitled *Detected Concentrations of Arsenic, Thallium, PCE, TCE, and Methylene Chloride in Shallow and Deep Groundwater* lists six (6) groundwater sampling events. Clarify the number of groundwater sampling events and the analysis performed during each event. Reference to the number of sampling events and analysis performed should be clarified throughout the document.

Another concern is that the facility's geographic information system (GIS) reports concentrations of VOCs as "J", "SJ", or "S=" while the text states that no VOCs were detected "above laboratory detection limits". The text should be revised to include the reported parameters and to explain the laboratory qualifiers included in the GIS. As discussed with Mr. Sam Naik of CH2M-Hill on October 16, 2002, the laboratory's "S" qualifier indicates that the data can be used for screening purposes and for decision making. It is understood that the "S" qualifier has been added to data that may not have completed the laboratory's full quality assurance/quality control process.

**CH2M-Jones Response:**

*The number of times the wells were sampled and the parameters analyzed for will be clarified. For the discussion regarding shallow ground water results in Section 2.2.1, the sentence regarding VOCs will be revised to indicate that no VOCs were detected above the COPC screening criteria or practical quantitation limits. We will also review the data for blanks analyzed for the Sample Data Group with these detections and assess whether laboratory contamination is an issue for the reported detection of methyloene chloride. The qualifiers used in the GIS will be explained.*

7. Section 5.1.3 Soil VOC Screening Using SSL at DAF=1

In this Section, the Navy states that methylene chloride was detected in the shallow and deep groundwater samples collected during the second quarterly sampling event. Note that methylene chloride is not included as a "detected" parameter on the Appendix A groundwater table referenced above. Moreover, the text in Section 5.1.3 is misleading when stating that "Methylene chloride was not detected in groundwater during the preceding sampling event and subs[e]quent two sampling events." According to the Appendix A table presenting the groundwater data, VOCs and SVOCs were analyzed only during the first and second quarterly sampling events. Additional VOC data is reported on Table 5-2 where methylene chloride is recorded at a concentration of 2 µg/L during the October 1998 groundwater sampling event. There is no indication that

groundwater samples have been collected since October 1998. Therefore, the text should be revised to correctly identify the number of sampling events and the analysis performed during each event.

**CH2M-Jones Response:**

*The text will be revised to clarify the detections of methylene chloride and when this chemical was analyzed for. It is not clear why the Appendix A table (taken directly from the Revision 0 Zone E RFI report) does not include methylene chloride as a detection but it is likely because it was prepared after the collection of the only the first round of groundwater samples, in which this chemical was not detected.*

8. Section 5.2.3 PCE and Section 5.2.4 TCE in Deep Groundwater

According to Appendix A, both tetrachloroethene (PCE) and trichloroethene (TCE) have been detected in deep groundwater at E551GW02D in concentrations below each parameters respective maximum contaminant level (MCL) of 5 micrograms per liter ( $\mu\text{g}/\text{L}$ ). The data included in Appendix A represents four sampling events during which VOCs were analyzed twice. According to Table 5-2, TCE was detected at 21 micrograms per liter ( $\mu\text{g}/\text{L}$ ) in deep monitoring well E551GW02D during the March 1998 groundwater sampling event and was estimated at 1  $\mu\text{g}/\text{L}$  during the October 1998 sampling event. The Navy states that trichloroethene (TCE) is not considered a constituent of concern in deep groundwater at AOC 551 and 552. The monitoring data indicates that these VOCs are not present in the shallow portion of the aquifer, only the deeper portion. The detection of TCE in a concentration greater than the MCL in the deep aquifer at E551GW02D indicates a possible upgradient source.

Note that both PCE and TCE have been consistently detected at hydraulically upgradient deep grid well GDEGW17D. PCE concentrations have ranged from 4 (SJ)  $\mu\text{g}/\text{L}$  to 270  $\mu\text{g}/\text{L}$  while TCE has ranged from 1 (SJ)  $\mu\text{g}/\text{L}$  to 16  $\mu\text{g}/\text{L}$ . The Navy should identify a possible upgradient source of this contamination. Moreover, additional groundwater samples from deep well E551GW02D should be collected and analyzed for VOC to aid in determining whether there is a migrating plume in this vicinity.

**CH2M-Jones Response:**

*We agree that an upgradient source area is likely responsible for the VOC detections at well E551GW02D. We think that it is reasonable to resample the well deep at this site for VOCs to assess current groundwater quality.*

CONCLUSIONS:

- The Navy should discuss the galvanizing process performed at Building 1030 and provide as built drawings.

**CH2M-Jones Response:**

*No as-built drawings are available for this building. It does not appear that galvanizing operations actually occurred at this site.*

- The Navy should provide historical shallow and deep groundwater elevation data in table format.

**CH2M-Jones Response:**

*Available information on this issue will be provided.*

- The Navy should propose to install an appropriate number of groundwater monitoring wells (shallow and deep) in the vicinity of AOC 552 to monitor groundwater quality in that area of the Base. A monitoring well approval will be granted upon receipt of an approvable request.

**CH2M-Jones Response:**

*We do not believe that additional wells are needed at AOC 552.*

- The Navy should revise the RFI Report Addendum to clarify the discrepancies outlined above, specifically the lead data and the discrepancies regarding the number of monitoring events and the analysis performed.

**CH2M-Jones Response:**

*The requested revisions will be made.*

- The Navy should identify a source of the VOCs detected in deep groundwater at AOC 551 and grid well GDEGW17D.

**CH2M-Jones Response:**

*We will work with the Department to develop an approach to assess potential sources of the VOCs detected in deep wells near this site. Review of the groundwater elevation data requested in a previous comment may assist in targeting potential source areas.*

- The Navy should collect additional groundwater samples from E551GW02D to be analyzed for VOCs. Sampling of this well may coincide with the first sampling event for wells to be installed at AOC 552.

**CH2M-Jones Response:**

*The existing well will be sampled for VOCs to assess current groundwater conditions. As noted above, we believe that Building 1030 was most likely not used for galvanizing operations, based on the historic engineering drawings and that additional assessment of groundwater quality at this location via installation of new wells is not warranted.*