

CMG ENVIRONMENTAL, INC.

December 8, 2008

Mr. Louis J. Burkhardt III
Raytheon Company
528 Boston Post Road
Mail Stop 1880
Sudbury, MA 01776

**Re: Public Commentary on 11/6/08 Draft Phase IV Completion Report
Former Raytheon Facility, 430 Boston Post Road, Wayland, Massachusetts
Release Tracking Number (RTN) 3-22408; CMG ID 2002-003**

Dear Mr. Burkhardt:

The following is my public commentary on the November 6, 2008 Draft Phase IV Completion for the former Raytheon facility in Wayland, Massachusetts (the Site) regarding Massachusetts Department of Environmental Protection (DEP) RTN 3-22408, prepared by Environmental Resources Management (ERM). For the record, the Wayland Board of Selectmen has retained me to provide technical review of document submittals and other activities at the Site on behalf of the Town of Wayland, especially those that pertain to compliance with DEP requirements.

As in past document reviews, I have prefaced my comments with ERM's heading designations (where applicable) for ease of comparison, and used uppercase roman numerals to identify each comment.

2.2 EXCAVATION ACTIVITIES

2.3.1 Initial Excavation and Construction of Cofferdam

2.3.2 Excavation

I) There seems to be some confusion between the stated geometry of excavation and the reported volume of material stockpiles generated by this excavation. On Pages 6 & 7 of the draft Phase IV Completion Report ERM indicates they excavated the upper 3 feet of material in preparation for beginning the cofferdam excavation, which material they placed in Stockpile A, estimated at 850 cubic yards. They next excavated from 3-6 feet in the same area, and placed this material in Stockpile B (estimated 470 cubic yards) and Stockpile C (estimated 800 cubic yards). One would expect the preparatory excavation to be slightly larger than the cofferdam structure, which according to draft Figure 4 had an 80-foot inside diameter and an 82-foot outside diameter. Simple geometric calculation implies that excavating 3 feet of soil in a circular disc would generate 850 cubic yards if the diameter of the excavation was 98 feet, which seems reasonable (assuming for simplicity no sloping of sidewalls and no 'fluff factor' for the stockpiled soil). However, Stockpile B and Stockpile C were a combined 1,270 cubic yards. That implies that either the excavation of a 98-foot diameter circle extended from 3 to between 9-10 feet below grade (not 6 feet); or that the entire circle was widened to approximately 110 feet in diameter (thereby including additional material from 0-3 feet into Stockpile B or Stockpile C instead of Stockpile A). In any case there is a discrepancy between the described geometry of excavation and the resulting volumes of excavated material.

Pages 7 & 8 of the draft Phase IV Completion Report ERM indicates they excavated soil from between 121-117 feet above sea level within the cofferdam and placed this material in Stockpile D (estimated 190 cubic yards) and Stockpile E (estimated 510 cubic yards). Simple geometric calculation implies that excavating 4 feet within a constrained 80-foot diameter cofferdam should yield approximately 745 cubic yards of material, but Stockpile D and Stockpile E together total only 700 cubic yards. This is a relatively minor difference, possibly due to the soil surface not being completely level within the cofferdam at either the beginning or ending measurement.

On Page 8 ERM indicates they excavated soil from between 117-113 feet above sea level within the cofferdam and placed this material in Stockpile F (750 cubic yards), Stockpile H (150 cubic yards), and Stockpile I (240 cubic yards). [Note: ERM provides this stockpile volume information in draft Table 1, but not in the text of the draft Phase IV Completion Report.] CMG calculates that the volume of material contained in these three stockpiles should be approximately 745 cubic yards, not the total of 1,140 cubic yards indicated in draft Table 1.

Also on Page 8 of the draft Phase IV Completion Report ERM indicates they excavated soil from between 113-107 feet above sea level within the cofferdam and placed this material in Stockpile J (estimated 850 cubic yards). CMG calculates that 6 feet of vertical excavation within the 80-foot cofferdam should yield approximately 1,120 cubic yards of material.

The Town of Wayland requests that Raytheon and ERM either provide more information to explain the excavated soil volume discrepancies noted above, or else revise the depth and volume information presented in the draft Phase IV Completion Report for accuracy.

2.4 MONITORING AND SAMPLING ACTIVITIES

2.4.1 Dust Monitoring

II) On pages 10 & 11 of the draft Phase IV Completion Report, ERM describes the dust monitoring program they conducted as a health and safety precaution during excavation of potentially contaminated soil. ERM states that they did not exceed their action level of 5 mg/m³ of PM10 respirable dust, but does not provide any documentation to support this statement. The Town requests that Raytheon append a table of dust monitoring levels and add an appendix containing the aerosol monitoring data (electronic data on CD-ROM would be appropriate) to their final Phase IV Completion Report.

2.4.2 Excavation Confirmation Sampling

III) On Page 11 of the draft Phase IV Completion Report (and also in draft Table 2), ERM indicates that sidewall confirmation sample SW-117-102 had a concentration of trichloroethene (TCE) that exceeded its laboratory calibration range (i.e., the analytical laboratory flagged this result with the data qualifier “E”). CMG notes that the cited analytical methodology (EPA Method 8260B) requires that in such cases the laboratory is to dilute the sample and re-analyze it (cf. Section 7.5.11 of Method 8260B, Revision 2, December 1996). However, the laboratory data sheet for Alpha Analytical Laboratories sample ID #L0711219-01 has no indication that the laboratory did this. Therefore, the TCE result for this soil sample (>670 µg/Kg) is technically an invalid result. This should not be a problem so long as Raytheon does not rely on the TCE result from sample SW-117-102 as a ‘critical sample’ per published DEP policy (see WSC-CAM-VII A, “Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Response Action Conducted Under the Massachusetts Contingency Plan”). However, Raytheon may need to rely upon this sample to demonstrate there are no

exceedances of the upper concentration limit (10,000 µg/Kg for TCE) remaining in soil within 15 feet of the ground surface at the Site. Wayland requests that Raytheon either provide a statement in the final Phase IV Completion Report that they will not be relying on sample SW-117-102 as a ‘critical sample’ or else provide additional data validation documentation explaining how they can rely upon this sample.

2.5 WATER AND REMEDIAL WASTE MANAGEMENT

2.5.3 Transportation and Off-Site Disposal

IV) The draft Phase IV Completion Report discusses off-Site disposal of excavated contaminated soil on Pages 21-22, summarizes the results of analytical laboratory characterization in draft Table 5, and provides copies of Bill-of-Lading (BOL) documentation in Appendix D.

The Town questions how Raytheon classified soil as non-hazardous. On Page 23 of their August 16, 2006 Phase IV Remedy Implementation Plan (RIP), ERM and Raytheon stated that “all hazardous material shipped from the Site will be properly manifested or shipped under a bill of lading if the material is non-hazardous.” However, neither the Phase IV RIP nor the draft IV Completion Report provides a waste determination (in accordance with DEP policy HW 93-01) that explains why Raytheon concluded remediation waste soil was non-hazardous.

According to DEP regulations set forth at 310 CMR 30.133:

(1) The following materials or items are hazardous wastes if and when they are, or are intended to be, discarded: ...

(d) Residues or hazardous waste constituents contained in media. Any residue or contaminated soil, water, or other debris resulting from the clean-up of a spill, into or on any land or water, of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in 310 CMR 30.133, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill, into or on any land or water, of any off-specification chemical product or manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in 310 CMR 30.133.

(2) These hazardous wastes and their corresponding EPA Hazardous Waste numbers are:

<u>Haz. Waste Number</u>	<u>Chemical Abstracts Numbers</u>	<u>Substance</u>	<u>...</u>
U228	79-01-6	Trichloroethylene	

Raytheon was a registered large-quantity hazardous waste generation facility, and former Raytheon operations at the Site included generation of spent halogenated solvent waste (EPA hazardous waste codes F001 and F002). According to previous ERM reports on the Site, the source of chlorinated VOC contamination in the Northern Area was an apparent release (spill) of approximately 100 gallons of chlorinated solvent (primarily TCE) to the ground surface sometime between 1955 and the 1970s. Although there is no indication that this release was intentional, this spill was effectively a ‘discarding’ of TCE. Given these facts, in pertinent part 310 CMR 30.133 indicates: ‘*materials are hazardous wastes if discarded,*’ including ‘*contaminated soil resulting from the clean-up of a spill of any off-specification TCE*’ (which would carry EPA hazardous waste code U228).

Wayland requests that Raytheon provide the Town with a copy of the waste determination which they prepared for the Waste Management Turnkey landfill in Rochester, New Hampshire (Turnkey), and also include information in the final Phase IV Completion Report documenting in

full Raytheon's due diligence waste determination that allowed their contractors to transport and dispose of remediation waste material as non-hazardous waste.

V) On Page 21 of the draft Phase IV Completion Report, ERM states that waste characterization sample SP-F2 exhibited an aggregate 10,200 µg/Kg of total volatile organic compounds (VOCs), and further notes that this concentration exceeds the lined landfill limit (10,000 µg/Kg). This is misleading since the referenced limit is from Massachusetts DEP COMM-97-001 and pertains only to soil re-used at Massachusetts landfill; Raytheon had the soil from Stockpile F disposed of at Turnkey (thus the COMM-97 requirements would not pertain).

Draft Table 5 indicates that the Rochester, New Hampshire Turnkey facility criteria for VOCs identified via the Toxicity Characteristic Leaching Procedure (TCLP) as "NS" (no standard). According to their acceptance criteria (as posted online), the Turnkey landfill does not place a numeric limitation on total VOCs, but they do limit hazardous waste characteristic VOCs via TCLP. The federal hazardous waste classification thresholds for leachable tetrachloroethene (PCE) and TCE are 0.7 and 0.5 mg/L, respectively. Thus Table 5 should indicate the 'Turnkey Facility Criteria' for waste characterization soil samples as 700 µg/L for PCE and 500 µg/L for TCE.

The Town recommends that Raytheon remove the above-mentioned misleading text from Section 2.5.3 of the final Phase IV Completion Report, and requests that Raytheon include the TCLP hazardous waste classification standards for PCE and TCE in the final Table 5.

3.0 GROUNDWATER REMEDIATION

VI) On Page 25 of the draft Phase IV Completion Report (second paragraph), ERM states that "The absence of additional groundwater monitoring data to support the detection of toluene above RCGW-1 leads ERM to conclude this detection is not representative of Site conditions." However, ERM also detected low concentrations of toluene in soil samples from sidewall confirmation sample SW-117-102 and stockpile samples SP-D1, SP-F1, and SP-H2 (see Section 2.4.2 Page 11 and draft Table 2; Section 2.4.3 Pages 13 & 14 and draft Table 5). More importantly, the water treatment system influent samples collected on August 10 and August 15 contained low concentrations of toluene (see Section 2.4.5, Page 17 and draft Table 7a). Therefore, it is evident that toluene was present in Site groundwater prior to site remediation activities, albeit at low concentrations. Wayland requests that the Raytheon revise this paragraph of the final Phase IV Completion Report to indicate that laboratory testing conducted during site remediation activities confirmed the prior identification of toluene at vertical profiler boring location WP-520.

3.2 DESCRIPTION OF REMEDIAL ACTION ALTERNATIVE

3.5 NORTHERN AREA GROUNDWATER MONITORING

3.5.2 Groundwater Quality Monitoring

VII) On Page 27 of the draft Phase IV Completion Report, ERM notes that degradation of vinyl chloride is "through simple aerobic oxidation" but goes on to state that the addition of organic substrate will produce anaerobic conditions. The Town requests that Raytheon provide an explanation of how they expect degradation of vinyl chloride to occur in the subsurface.

The same comment applies to the third paragraph (under the bullets) on page 31. Wayland requests that Raytheon explain how vinyl chloride will degrade if they are optimizing sodium lactate substrate addition to achieve anaerobic conditions in the subsurface.

3.6 FINAL INSPECTION REPORT - GROUNDWATER REMEDIATION

VIII) On Page 32 of the draft Phase IV Completion Report, ERM states that “As a result of the Comprehensive Remedial Action, the remediation goals have thus far been met.” However, in the preceding section of the draft Report (see page 31), ERM notes that measured chlorinated VOC concentrations “were consistent with seasonal and historical trends.” Thus the Town disagrees that Raytheon has met groundwater remediation goals, since the goal of this remediation is to reduce chlorinated VOCs in site groundwater to below drinking water standards. Wayland acknowledges that soil excavation activities met their short-term goal of eliminating an ongoing source of chlorinated VOC contamination (or at least reducing this source to the extent practicable).

IX) In the most recent previous public commentary regarding RTN 3-22408 (CMG’s June 9, 2008 letter), we noted that Raytheon had not yet had sufficient time to fully assess whether carbon substrate (sodium lactate) addition meets the objective of a ‘Permanent Solution’ in accordance with the MCP. Raytheon’s response to this was they were “confident that this approach will achieve a Permanent Solution” based partly on the outcome of a microcosm study that concluded “enhanced anaerobic bioremediation is a viable remedial alternative ... to address the chlorinated VOC plume.” Nonetheless, the Town would like Raytheon to explain how they can conclude that the long-term carbon substrate addition program will achieve the requisite Permanent Solution when they currently do not have any groundwater monitoring data in hand to demonstrate its remedial effectiveness.

✍

As always, I thank you in advance for your timely response to this commentary on behalf of the Town of Wayland.

Sincerely,
CMG ENVIRONMENTAL, INC.

Benson R. Gould, LSP, LEP
Principal

cc: Environmental Resources Management (John C. Drobinski, P.G., LSP)
Mr. J. Andrew Irwin, Wayland
Ms. Anette Lewis, Wayland
Massachusetts DEP (Pat Donahue, Larry Immerman, Karen Stromberg)
National Parks Service (% Jamie Fosberg)
Mr. Lewis Russell, Wayland
Mr. Harvey & Ms. Linda Segal, Wayland
Ms. Kimberly Tisa, U.S. EPA Region I
Wayland Board of Health PIP Repository (% Steve Calichman, Health Director)
Wayland Board of Selectmen (% Town Administrator Frederic Turkington)
Wayland Business Center, LLC (% Paula Phillips, Congress Group Ventures)
Wayland Conservation Commission (% Brian Monahan)
Wayland Fire Chief Robert F. Loomer
Wayland Public Library PIP Repository (% Ann Knight)