

23 December 2008
Reference: 0079387

Massachusetts Department of Environmental Protection
Northeast Region
205B Lowell Street
Wilmington, Massachusetts 01887



Re: Response to Public Comments
Draft Phase IV Completion Report
Former Raytheon Facility
430 Boston Post Road
Wayland, Massachusetts (the "Site")
RTN 3-22408; Tier IB Permit No. W045278

Dear Department Representative:

On behalf of Raytheon Company (Raytheon), Environmental Resources Management (ERM) has prepared this letter providing responses to comments prepared by members of the Public Involvement Plan (PIP) group regarding the Draft Phase IV Completion Report, dated 6 November 2008 for the Former Raytheon Facility located at 430 Boston Post Road in Wayland, Massachusetts (Site). CMG Environmental, Inc. (CMG), consultant to the Town of Wayland, provided nine comments in a letter dated 8 December 2008. This response letter includes each comment in italics and responses in plain text.

The Following are CMG's Comments:

2.2 EXCAVATION ACTIVITIES

2.3.1 Initial Excavation and Cofferdam Construction

2.3.2 Excavation

1) 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.

Based on this comment an error has been identified on draft Table 1. The stockpile volumes on that table are estimated based on an assumed truckload volume and the number of truckloads that contributed to a particular stockpile. The assumed truckload volume is stated as 15 cubic yards (cy) for Stockpiles B and C, however, similar dump trucks were used throughout the project and were estimated to carry 8 to 10 cy per load for other stockpiles. The estimated truckload volume has been changed to 9 cy on Table 1 and the text has been updated. This correction results in a final estimated volumes for Stockpiles B and C of 280 and 480 cy, respectively.

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.

The volumetric difference cited in this comment amounts to an error of approximately 6 percent. The source of this error could be solely attributed to unlevel excavation surfaces within the work area, but is also likely a function of the variability of material volumes from one truckload to the next. Nonetheless, references to material volumes and elevations in the text, tables and figures of the report are prefaced with either "approximate", "estimated", or "roughly" to ensure no more confidence is put in these measurements than is deserved.

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.

As noted in the text of Draft Phase IV Completion Report, the material excavated from this depth interval was split into three separate stockpiles because of its high water content. It is likely that more than the typical 9 cy was placed in each truckload based on the ability of this wetter material to fill void spaces within the truck. The text has been updated to include the estimated volumes listed in 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.

The paragraph on Page 8 which describes excavation of the material from 113 to 107 feet above sea level continues as follows: "In this interval the historical data showed that material along the sheet piling to the northeast and southeast of the cofferdam was not impacted above the cleanup goals and thus would not need to be removed. This material was left in place as two 'steps' as shown on Figure 4." The difference between the estimated volume in the text (850 cy) and the volume calculated by CMG (1,120 cy) is largely due to the volume of the "steps" left in place, but not accounted for in CMG's calculation.

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.

Dust monitoring was conducted as described in the Draft Phase IV Completion Report. The data loggers on each monitoring unit were downloaded at the end of each monitoring day and the data was analyzed accordingly. However, the text incorrectly states the PM₁₀ action level was 5 micrograms per cubic meter (µg/m³). The Health & Safety Plan (ERM, 26 April 2006), attached as Appendix E to the Phase IV Remedy Implementation Plan, defined the dust monitoring action level as, "An increase in dust concentration, measured in mg dust/cubic meter, of approximately 25% above background levels, for a period of 15 minutes...".

The background dust level was established on 11 July 2007 as 7.7 µg/m³. Therefore, based on the Health & Safety Plan, the PM₁₀ action level was set at 9.6 µg/m³. (This background level was likely suppressed by the excess surface moisture created by rain events on 4, 5, 6, 8, and 9 July 2007.) Throughout the duration of project activities, rain, high humidity, and malfunctioning dust monitors contributed to highly variable dust measurements which frequently exceeded 7.8 µg/m³. ERM does not believe this data set is reliable based on observations made in the field during daily oversight activities. Potential sources of dust, such as the work areas surrounding the cofferdam and the stockpile area were monitored daily. The stockpile area was proactively cleaned via mechanical sweeper as needed to prevent dried soil from accumulating and becoming airborne. Additionally, the stockpiles were covered with tarps and inspected daily to maintain proper containment and covering. No records of visual airborne dust were made during project activities.

Dust monitoring activities continued through 5 October 2007, the day the last of the excavated material was removed from the Site. Regrettably, the laptop computer on which the data was stored during field activities was damaged and the data was lost before it could be backed up. This has resulted in an incomplete data set ranging from 10 July to 20 August 2007. Charts of the analyzed data from days where all four dust monitors were operational are attached to this letter and the text of the Phase IV Completion Report has been revised to correct the action limit error and provide a higher level of detail regarding the data set.

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 ($>670 \mu\text{g}/\text{Kg}$) 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 ($10,000 \mu\text{g}/\text{Kg}$ 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 SW117-102 as a 'critical sample' or else provide additional data validation documentation explaining how they can rely upon this sample.

ERM and Raytheon understand the limitations of the analytical data for sample SW-117-102. At this time sample SW-117-102 is not intended to for use as a "critical point" per DEP Policy WSC-CAM-VII A, however, that decision will be reevaluated when preparing a Response Action Outcome.

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 Phase 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 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:

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

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.

As detailed in the Phase I, Phase II, Phase III, and Phase IV reports submitted in accordance with the MCP, an incidental release is suspected

to have occurred during historical equipment testing activities conducted in this portion of the Site. Under RCRA, it is Raytheon's obligation to determine if the Northern Area excavated soils meet the definition of a characteristic and/or listed hazardous waste.

As part of the due diligence, Raytheon made a "good faith effort" to determine the source of contamination. Per DEP Policy HA 93-01 if the source of hazardous constituents cannot be reasonably determined and "if the soil is not a characteristic hazardous waste as defined in 310 CMR 30.120, the soil shall be managed in accordance with the receiving facility's permit; the requirements of M.G.L.c. 21E and 310 CMR 40.0000; 310 CMR 19.000 and any other applicable federal, state, and local regulations. Similarly, under EPA guidance ("Management of Remediation Waste Under RCRA" EPA530-F-98-026, October 1998, page 5) "if documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not a listed hazardous waste and, therefore, provided the material does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply."

Raytheon was not able to determine a conclusive source of the chlorinated volatile organic compounds in the Northern Area during due diligence efforts. Also, analysis of the stockpile samples (Table 5 in the Draft Phase IV Completion Report) by toxic characteristic leaching procedure (TCLP) showed no exceedance of the limits applicable to defining the material as a "characteristic hazardous waste" under RCRA or 310 CMR 30.130. Specifically, those limits are 700 micrograms per liter ($\mu\text{g}/\text{L}$) of tetrachloroethene, 500 $\mu\text{g}/\text{L}$ of trichloroethene, and 200 $\mu\text{g}/\text{L}$ of vinyl chloride.

The disposal facility, Waste Management's Turnkey Recycling and Environmental Enterprises of Rochester, New Hampshire (Turnkey), was provided with the analytical results of samples from Stockpile D and the MCP regulatory reports for the Site in order to evaluate the suitability of accepting the material as non-hazardous waste for use as daily cover. The initial waste profile completed by Raytheon and Waste Management has been attached to this letter. Subsequent stockpile analytical data was sent to Turnkey and approved for acceptance under the same waste profile number (100144NH) as documented on the bills of lading in Appendix D of the Draft Phase IV Completion Report.

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).

The three sets of criteria displayed on draft Table 5 and referenced in the text were used to select the most appropriate disposal facility based on the analytical data from the stockpile analyses. Once Turnkey Recycling and Environmental Enterprises of Rochester, New Hampshire was approved to receive the excavated material, the Massachusetts criteria should have been removed from the table. Both the text and table have been revised as requested.

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.

The Phase IV Completion Report text and Table 5 have been revised as requested.

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.

During a vertical profiling program conducted as part of the Phase II site investigation activities, toluene was detected at a concentration of 2,600 micrograms per liter ($\mu\text{g}/\text{L}$) in groundwater. A Release Notification Form was filed for this detection because it exceeded the applicable Reportable Concentration (RCGW-1) of 1,000 $\mu\text{g}/\text{L}$. The intent of the statement on Page 25 was not to suggest that toluene has not been detected in the Northern Area since the vertical profiler sample, but instead, that subsequent detections have been rare and of a much smaller magnitude (and also below RCGW-1). For example, the water treatment samples cited in this comment contained concentrations of 1.6 and 5.3 $\mu\text{g}/\text{L}$.

Toluene has not been previously identified in Northern Area soil above the applicable Reportable Concentration (RCS-1) of 30,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$). The three detections of toluene in soil samples cited in this comment (note: stockpile sample SP-H2 did not contain toluene at or above the reported detection limit) account for a range of 1.2 to 4.0 $\mu\text{g}/\text{kg}$, well below the RCS-1 standard.

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.

Degradation of vinyl chloride (VC) through simple aerobic oxidation is stated on Page 25 as quoted above, however, the preceding sentence is as follows: "In addition to reductive dechlorination, the daughter products (cDCE and VC), are biodegraded through a second anaerobic biological process, cometabolic reductive oxidation, in the presence of other organic compounds and through aerobic cometabolic oxidation in the presence of methane." Thus, with respect to VC, the intent of the first paragraph of Section 3.2 was to list the three possible degradation pathways (two dependent on anaerobic conditions and one dependent on aerobic conditions) possible in the subsurface. This paragraph has been rewritten to reduce confusion.

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).

The Massachusetts Contingency Plan (MCP) defines Phase IV Comprehensive Response Actions as "...Implementation of the Selected Remedial Action Alternative..." at 310 CMR 40.0810(1)(c). Therefore, the goal of the Phase IV activities with respect to groundwater was to implement the bioremediation program described in the Phase IV Remedy Implementation Plan (ERM, 18 August 2006) and the subsequent addendum to that report (ERM, 18 July 2008). This goal was met as described in the Draft Phase IV Completion Report through the installation of the infiltration gallery and injection wells, the completion of the first injection of carbon substrate to the subsurface, and the commencement of the performance monitoring program.

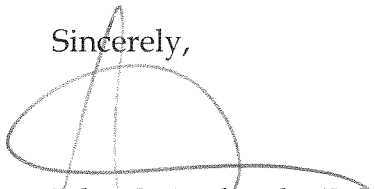
IX) In the most recent previous public commentary regarding RTN 3-22408 (CMG's June 9, 2008 letter), we noted that Raytheon had not yet had sufficient time to fully assess whether carbon substrate (sodium lactate) addition meets the objective of a 'Permanent Solution' in accordance with the MCP. Raytheon's 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.

ERM and Raytheon remain confident that the selected approach will achieve a Permanent Solution for those reasons cited in the response to CMG's 9 June 2008 letter (i.e., the microcosm study, and the evidence of active reductive dechlorination occurring naturally prior to Phase IV activities). Additionally, successful completion of the initial injection program suggests that the design for future substrate injections is sound, and the results of the first two rounds of the monthly performance monitoring program suggest that the injected substrate is moving through the subsurface as expected.

Thank you for these comments. If you have any questions or further comments, please contact Louis Burkhardt of Raytheon at (978) 436-8238.

Sincerely,


John C. Drobinski, P.G., LSP
Principal-in-Charge


Jason D. Flattery
Project Manager

encl: Generator's Waste Profile Sheet - 100144NH
Dust Monitoring Data Analysis

cc: Louis Burkhardt, Raytheon Company
Ben Gould, CMG
Linda Segal
Public Repositories

Generator's Nonhazardous Waste Profile Sheet



Requested Disposal Facility TREE Profile Number
 Renewal for Profile Number n/a Waste Approval Expiration Date

100144NH
 03-31-08

A. Waste Generator Facility Information (must reflect location of waste generation/origin)

- 1. Generator Name: Raytheon
- 2. Site Address: 430 Boston Post Road
- 3. City/ZIP: Wayland, 01778
- 4. State: MA
- 5. County: Middlesex
- 6. Contact Name/Title: Jason Flattery, Consultant
- 7. Email Address: Jason.Flattery@erm.com
- 8. Phone: 6176467816
- 9. FAX: 6712676447
- 10. NAICS Code: _____
- 11. Generator USEPA ID #: NA
- 12. State ID# (if applicable): NA

B. Customer Information same as above

P. O. Number: _____

- 1. Customer Name: Maxymillian Technologies, Inc
- 2. Billing Address: 1801 East Street
- 3. City, State and ZIP: Pittsfield, MA 01201
- 4. Contact Name: Regina Simmons
- 5. Contact Email: rsimmons@maxymillian.com
- 6. Phone: 4134993050
- 7. Transporter Name: AmeriTech Environmental
- 8. Transporter ID # (if appl.): _____
- 9. Transporter Address: 393 Harold Dow Hwy.
- 10. City, State and ZIP: Elliot, ME 03903

C. Waste Stream Information

1. DESCRIPTION

a. Common Waste Name: Non-hazardous VOC and solvent contaminated soil
 State Waste Code(s): None

b. Describe Process Generating Waste or Source of Contamination:

Excavation of contaminated soil at a former engineering facility. The Former Raytheon Facility operated from 1955 through 1995 as an engineering facility to support other Raytheon manufacturing facilities. Raytheon decommissioned the facility in 1996. During facility operation, Raytheon conducted research and development activities for products including: prototype electronic equipment, antennae and transmitters, and printed circuit boards

c. Typical Color(s): Brown

d. Strong Odor? Yes No Describe: _____

e. Physical State at 70°F: Solid Liquid Powder Semi-Solid or Sludge Other: _____

f. Layers? Single layer Multi-layer NA

g. Water Reactive? Yes No If Yes, Describe: _____

h. Free Liquid Range (%): _____ to _____ NA(solid)

i. pH Range: <2 2.1-12.4 >12.5 NA(solid) Actual: _____

j. Liquid Flash Point: < 140°F ≥ 140°F NA(solid) Actual: _____

k. Flammable Solid: Yes No

l. Physical Constituents: List all constituents of waste stream - (e.g. Soil 0-80%, Wood 0-20%): (See Attached)

Constituents (Total Composition Must be > 100%)	Lower Range	Unit of Measure	Upper Range	Unit of Measure
1. <u>Soil</u>	<u>100</u>	<u>%</u>		
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				

2. ESTIMATED QUANTITY OF WASTE AND SHIPPING INFORMATION

a. Event Base/Ongoing (Check One)

b. Estimated Annual Quantity: 7050 Tons Cubic Yards Drums Gallons Other (specify): _____

c. Shipping Frequency: 7050 Units per Month Quarter Year One Time Other

d. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If yes, answer e.) Yes No

e. USDOT Shipping Description (if applicable): _____

3. SAFETY REQUIREMENTS (Handling, PPE, etc.): None



Generator's Nonhazardous Waste Profile Sheet

D. Regulatory Status (Please check appropriate responses)

- 1. Is this a USEPA (40 CFR Part 261)/State Hazardous waste? If yes, contact your sales representative. Yes No
- 2. Is this waste included in one or more of categories below (Check all that apply)? If yes, attach supporting documentation. Yes No
 - Delisted Hazardous Waste Excluded Wastes Under 40 CFR 261.4
 - Treated Hazardous Waste Debris Treated Characteristic Hazardous Waste
- 3. Is the waste from a Federal (40 CFR 300, Appendix B) or state mandated clean-up? If yes, see instructions. Yes No
- 4. Does the waste represented by this waste profile sheet contain radioactive material? Yes No
 - a. If yes, is disposal regulated by the Nuclear Regulatory Commission? Yes No
 - b. If yes, is disposal regulated by a State Agency for radioactive waste/NORM? Yes No
- 5. Does the waste represented by this waste profile sheet contain concentrations of regulated Polychlorinated Biphenyls (PCBs)? Yes No
 - a. If yes, is disposal regulated under TSCA? Yes No
- 6. Does the waste contain untreated, regulated, medical or infectious waste? Yes No
- 7. Does the waste contain asbestos? Yes No If Yes, Friable Non Friable
- 8. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? Yes No
 - If yes, does the waste contain <500 ppmw VOHAPs at the point of determination? Yes No

E. Generator Certification (Please read and certify by signature below)

By signing this Generator's Waste Profile Sheet, I hereby certify that all:

- 1. Information submitted in this profile and all attached documents contain true and accurate descriptions of the waste material;
- 2. Relevant information within the possession of the Generator regarding known or suspected hazards pertaining to this waste has been disclosed to WM/the Contractor;
- 3. Analytical data attached pertaining to the profiled waste was derived from testing a representative sample in accordance with 40 CFR 261.20(c) or equivalent rules; and
- 4. Changes that occur in the character of the waste (i.e. changes in the process or new analytical) will be identified by the Generator and disclosed to WM (and the Contractor if applicable) prior to providing the waste to WM (and the Contractor if applicable).
- 5. Check all that apply:

- Attached analytical pertains to the waste. Identify laboratory & sample ID #'s and parameters tested: _____ # Pages: _____
- Only the analyses identified on the attachment pertain to the waste (identify by laboratory & sample ID #'s and parameters tested). Attachment #: _____
- Additional information necessary to characterize the profiled waste has been attached (other than analytical). Indicate the number of attached pages: _____
- I am an agent signing on behalf of the Generator, and the delegation of authority to me from the Generator for this signature is available upon request.
- By Generator process knowledge, the following waste is not a listed waste and is below all TCLP regulatory limits.

Certification Signature: *Joe Bunn* Title: Sr. Environmental Engineer
 Company Name: Raytheon Name (Print): Louis BURKHARDT
 Date: 08-27-2007

FOR WM USE ONLY

Management Method: Landfill Bioremediation Non-hazardous solidification Other: Re-use as ADG Approval Decision: Approved Not Approved
 Waste Approval Expiration Date: 3-31-08

Management Facility Precautions, Special Handling Procedures or Limitation on approval: See attached Addendum for conditions and signature Shall not contain free liquid
 Shipment must be scheduled into disposal facility
 Approval Number must accompany each shipment
 Waste Manifest must accompany load

WM Authorization Name / Title: _____ Date: _____
 State Authorization (if Required): _____ Date: _____

Addendum to Waste Profile Number 100144NH

Raytheon
430 Boston Post Road
Wayland, Massachusetts 01778

Waste Description: Non-hazardous VOC and solvent contaminated soil.

Management Facility Precautions, Special Handling Procedures or Limitations on Approval:

- (1) Non-hazardous contaminated soil from the above-referenced site is approved for re-use as alternative daily cover at Turnkey, provided it meets the performance objectives of Env-Sw 806.03.
- (2) The volume of soil included in this initial approval is 900 tons, and includes material from Stockpile D only.
- (3) Additional material may be added to this approval, up to the profiled volume of 7,050 tons. These additional soils must be sampled and analyzed at a frequency of 1 representative sample for each 500 tons of soil for full waste characterization parameters. WM review and approval of additional data is required prior to waste shipment. Such approval will be provided by WM to the generator in writing.
- (4) The generator is responsible for ensuring that only approved materials are delivered to WM for secure landfill disposal.
- (5) The waste must be shipped on a Non-Hazardous Waste Manifest, Bill of Lading, or a functionally equivalent shipping document. Each shipping document must clearly identify the waste by description and by its approved waste profile number.
- (6) Service Agreement/Exhibit A must be executed prior to waste acceptance. A copy must be maintained on file with this profile.

WM Authorization Name: Ellen Bellio
WM Authorization Title: Approvals Manager

Signature: Ellen Bellio

Date: 8-27-07

QUALITY CONTROL
 GWPS # 100144NH
 REVIEWED ON 8/27/07
 BY: Ellen Bellio
 GOOD THRU 900 tons
 (Stockpile D)



Summary of Analytical Data
 Raytheon- Wayland MA
 Contaminated Soil
 (Maxymilian Technologies)
 Profile Number 100144NH

Stockpile Identification:
 Sample Numbers:
 Field ID:
 Sample Date:

STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"
L0710795-01	L0710795-02	L0710795-03	L0710795-04
L0710794-01	L0710794-02	L0710794-03	L0710794-04
SP-D-1-20070727-01	SP-D-2-20070727-01	SP-D-3-20070727-01	SP-D-4-20070727-01
7/27/2007	7/27/2007	7/27/2007	7/27/2007

RCRA 8 METALS

TCCLP trigger	Reg limit	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"
>100		Total Arsenic	-	-	-
>2000		Total Barium	-	-	-
>30		Total Cadmium	-	-	-
>100		Total Chromium	-	-	-
>700		Total Lead	-	-	-
>1		Total Mercury	-	-	-
>20		Total Selenium	-	-	-
>100		Total Silver	-	-	-
>5		TCCLP Arsenic	<1.000	<1.000	<1.000
>100		TCCLP Barium	<0.500	<0.500	<0.500
>1		TCCLP Cadmium	<0.100	<0.100	<0.100
>5		TCCLP Chromium	<0.200	<0.200	<0.200
>5		TCCLP Lead	<0.500	<0.500	<0.500
>0.2		TCCLP Mercury	<0.001	<0.001	<0.001
>1		TCCLP Selenium	<0.500	<0.500	<0.500
>5		TCCLP Silver	<0.100	<0.100	<0.100

VOLATILE ORGANIC COMPOUNDS

TCCLP trigger	Reg limit	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"
>10		Total Benzene	<0.0013	<0.0010	<0.0011
>1000		Total Carbon Tetrachloride	<0.0013	<0.0010	<0.0011
>100		Total Chlorobenzene	<0.0013	<0.0010	<0.0011
>10		Total Chloroform	<0.0020	<0.0015	<0.0017
>10		Total 1,2-Dichloroethane	<0.0013	<0.0010	<0.0011
>10		Total 1,1-Dichloroethylene	<0.0013	<0.0010	<0.0011
>1000		Total Methyl Ethyl Ketone	<0.0130	<0.0100	<0.0110
>10		Total Tetrachloroethylene	0.023	0.009	<0.0011
>10		Total Trichloroethylene	0.054	0.024	<0.0011
>4		Total Vinyl Chloride	<0.0026	<0.0020	<0.0022
>0.5		TCCLP Benzene	<0.0050	<0.0050	<0.0050
>0.5		TCCLP Carbon Tetrachloride	<0.0050	<0.0050	<0.0050
>100		TCCLP Chlorobenzene	<0.0050	<0.0050	<0.0050
>0.5		TCCLP Chloroform	<0.0075	<0.0075	<0.0075
>0.5		TCCLP 1,2-Dichloroethane	<0.0050	<0.0050	<0.0050
>0.7		TCCLP 1,1-Dichloroethylene	<0.0050	<0.0050	<0.0050
>200		TCCLP Methyl Ethyl Ketone	<0.0500	<0.0500	<0.0500
>0.7		TCCLP Tetrachloroethylene	<0.0050	<0.0050	<0.0050
>0.5		TCCLP Trichloroethylene	<0.0050	<0.0050	<0.0050
>0.2		TCCLP Vinyl Chloride	<0.0100	<0.0100	<0.0100

SEMI-VOLATILE ORGANIC COMPOUNDS

TCCLP trigger	Reg limit	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"
>4000		Total o-Cresol	-	-	-
>4000		Total m-Cresol	-	-	-
>4000		Total p-Cresol	-	-	-
>2000		Total Pentachlorophenol	-	-	-
>8000		Total 2,4,5-Trichlorophenol	-	-	-
>40		Total 2,4,6-Trichlorophenol	-	-	-
>150		Total 1,4-Dichlorobenzene	-	-	-
>2.0		Total 2,4-Dinitrotoluene	-	-	-
>2.0		Total Hexachlorobenzene	-	-	-
>10		Total Hexachlorobutadiene	-	-	-
>100		Total Hexachloroethane	-	-	-
>100		Total Nitrobenzene	-	-	-
>200		Total Pyridine	-	-	-
>200		TCCLP o-Cresol	<0.030	<0.030	<0.030
>200		TCCLP m-Cresol	<0.030	<0.030	<0.030
>200		TCCLP p-Cresol	<0.030	<0.030	<0.030
>100		TCCLP Pentachlorophenol	<0.050	<0.050	<0.050
>400		TCCLP 2,4,5-Trichlorophenol	<0.025	<0.025	<0.025
>7		TCCLP 2,4,6-Trichlorophenol	<0.025	<0.025	<0.025
>7.5		TCCLP 1,4-Dichlorobenzene	<0.025	<0.025	<0.025
>0.13		TCCLP 2,4-Dinitrotoluene	<0.030	<0.030	<0.030
>0.13		TCCLP Hexachlorobenzene	<0.025	<0.025	<0.025
>0.5		TCCLP Hexachlorobutadiene	<0.050	<0.050	<0.050
>1		TCCLP Hexachloroethane	<0.025	<0.025	<0.025
>2		TCCLP Nitrobenzene	<0.025	<0.025	<0.025
>250		TCCLP Pyridine	<0.250	<0.250	<0.250

PESTICIDES

Summary of Analytical Data

**Raytheon- Wayland MA
Contaminated Soil
(Maxymillian Technologies)
Profile Number 100144NH**



Stockpile Identification:	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"	STOCKPILE "D"
Sample Numbers:	L0710795-01	L0710795-02	L0710795-03	L0710795-04
Field ID:	L0710794-01	L0710794-02	L0710794-03	L0710794-04
Sample Date:	SP-D-1-20070727-01 7/27/2007	SP-D-2-20070727-01 7/27/2007	SP-D-3-20070727-01 7/27/2007	SP-D-4-20070727-01 7/27/2007

TCLP trigger=0.6	Total Chlordane	-	-	-	-
TCLP trigger=0.4	Total Endrin	-	-	-	-
TCLP trigger=0.10	Total Heptachlor	-	-	-	-
TCLP trigger=0.16	Total Heptachlor Epoxide	-	-	-	-
TCLP trigger=8	Total Lindane	-	-	-	-
TCLP trigger=200	Total Methoxychlor	-	-	-	-
TCLP trigger=10	Total Toxaphene	-	-	-	-
Reg limit=0.01	TCLP Chlordane	<0.0010	<0.0010	<0.0010	<0.0010
Reg limit=0.02	TCLP Endrin	<0.0002	<0.0002	<0.0002	<0.0002
Reg limit=0.008	TCLP Heptachlor	<0.0001	<0.0001	<0.0001	<0.0001
Reg limit=0.008	TCLP Heptachlor Epoxide	<0.0001	<0.0001	<0.0001	<0.0001
Reg limit=0.4	TCLP Lindane	<0.0001	<0.0001	<0.0001	<0.0001
Reg limit=100	TCLP Methoxychlor	<0.0010	<0.0010	<0.0010	<0.0010
Reg limit=0.5	TCLP Toxaphene	<0.0010	<0.0010	<0.0010	<0.0010

HERBICIDES

TCLP trigger=200	Total 2,4-D	-	-	-	-
TCLP trigger=20	Total 2,4,5-TP	-	-	-	-
Reg limit=10	TCLP 2,4-D	<0.030	<0.030	<0.030	<0.030
Reg limit=1	TCLP 2,4,5-TP	<0.003	<0.003	<0.003	<0.003

PCBs & WASTE CHARACTERISTICS

50 and/or approved for Sub D	Total PCBs (all arochlors)	<0.0025 mg/L (see notes)	<0.0025 mg/L (see notes)	<0.0025 mg/L (see notes)	<0.0025 mg/L (see notes)
Acceptable=140	Flashpoint	not ignitable	not ignitable	not ignitable	not ignitable
Acceptable=250	Reactive CN	<9	<9	<10	<10
Acceptable=500	Reactive S	<9	<9	<10	<10
Acceptable =3 and <12.5	pH	5.8	6.1	7.2	7.2
Acceptable =5% if liquid	TPH	NR	NR	NR	NR
Negative for direct LP	Paint Filter Test	NR	NR	NR	NR
No standard	Percent Solids	75	74	75	77

All concentrations expressed in parts per million
NR= not required

NOTES/QUESTIONS

- (1) Pending profile RECEIVED PROFILE 8/27/07- MA99 CODE INCLUDED UNDER C(1)(A). Received revised profile 8/27/07.
- (2) Pending site history / background information RECEIVED PROFILE ON 8/27/07 WITH SOME HISTORICAL INFORMATION INCLUDED UNDER SECTION C(1)(B). NEED ADDITIONAL INFO REGARDING THE SOURCE OF THE VOCs- SEE (3) BELOW. Update: See detailed site history in 8/23/07 email from Jeremy Picard of ERM attached.
- (3) What is the source of the low-level VOCs (PCE, TCE, toluene, acetone, etc.)? Is it a listed source? RESPONSE: "THE SOURCE OF LOW LEVEL VOCs IS UNKNOWN. RAYTHEON HAS CONDUCTED DUE DILIGENCE AND HAS BEEN UNABLE TO DETERMINE A PROCESS OR RELEASE IN THE AREA THE CONTAMINATION WAS LOCATED. BECAUSE OF THIS, THE WASTE IS NOT LISTED AND PROVIDED THE SOIL MATERIAL DOES NOT EXHIBIT A CHARACTERISTIC OF HAZARDOUS WASTE, RCRA REQUIREMENTS ARE NOT APPLICABLE." -Jeremy Picard, ERM 8/27/07
In Jeremy Picard's 8/23/07 email it states: "The soil being excavated under this remedial effort is impacted primarily by PCE, TCE and cDCE, associated with suspected transient release(s) of chlorinated solvents in the source area." Where is the source area in relation to the origin of the subject soils? Is the source area upgradient? Were the referenced transient releases removed? Were soil/groundwater contaminated with VOCs from these transient releases managed as a listed hazardous waste? FOR IN DEPTH DISCUSSION OF THE SUSPECTED RELEASES, SEE ATTACHED PHASE I INITIAL SITE INVESTIGATION REPORT DATED 12/17/03.
- (4) The PCB data is a TCLP extraction. What are the total PCBs on a dry weight basis? RECEIVED TOTAL PCB DATA FOR B-522 10-15 ON 8/27/07. THE RESULT FOR THIS SAMPLE WAS ND<0.0438. PER ERM, THIS SAMPLE WAS COLLECTED DURING THE INITIAL CHARACTERIZATION TO RULE OUT PCBs AS CONTAMINANTS OF CONCERN. TCLP PCBs WAS RUN IN ERROR UPON MISREADING TURNKEYS SAMPLING MATRIX. ANY FUTURE DATA SUBMITTED FOR ADDITIONAL MATERIALS WILL INCLUDE TOTAL PCBs AS REQUIRED.
- (5) The profile quantity is 7,050 tons. What is the volume of Stockpile D? PER JON WAGMAN, THE TOTAL QUANTITY IS LIKELY TO BE APPROX 3500 TONS. THE MATERIAL REPRESENTED BY THE SUMMARIZED DATA ABOVE (STOCKPILE D) IS 900 TONS.

Dust Monitoring Data Analysis
Source Area Excavation
Wayland, Massachusetts

Date	Wind Direction	Precipitation (in)	Average Humidity (%)	Comments	Maximum Dust* (µm/m3)
5-Jul	S	0.57	86	No Data - Rain	-
6-Jul	W	0.09	80	No Data - Rain	-
7-Jul	Saturday				
8-Jul	Sunday				
9-Jul	SE	0.34	91	No Data - Rain	-
10-Jul	E	-	84	Station 3 Malfunction	6.2
11-Jul	SSW	-	84	Data OK - Background Level Set	7.7
12-Jul	W	0.01	70	Station 2 Malfunction	1.6
13-Jul	SW	-	64	Data OK	11.1
14-Jul	Saturday				
15-Jul	Sunday				
16-Jul	W	0.01	69	Battery Failure	-
17-Jul	SSW	-	69	Station 3 Malfunction	14.3
18-Jul	SSE	0.22	92	No Data - Rain	-
19-Jul	SE	0.21	92	No Data - Rain	-
20-Jul	W	0.03	76	No Data - Rain	-
21-Jul	Saturday				
22-Jul	Sunday				
23-Jul	ENE	0.04	91	No Data - Rain	-
24-Jul	W	0.01	80	Data OK	17.4
25-Jul	W	-	70	Data OK	84.6
26-Jul	SSW	-	67	Station 3 Malfunction	42.0
27-Jul	SSW	-	71	No Data Collected	-
28-Jul	Saturday				
29-Jul	Sunday				
30-Jul	S	1.09	93	No Data - Rain	-
31-Jul	N	-	81	Station 3 Malfunction	-5.0
1-Aug	N	-	69	No Data - Humidity	-
2-Aug	SW	-	70	Data OK	68.9
3-Aug	SW	-	68	Data OK	32.3
4-Aug	Saturday				
5-Aug	Sunday				
6-Aug	SSW	0.4	89	No Data - Rain	-
7-Aug	SE	-	83	No Data - Humidity	-
8-Aug	SW	0.19	82	No Data - Humidity	-
9-Aug	S	-	58	Data OK	7.7
10-Aug	S	0.11	88	No Data - Rain	-
11-Aug	Saturday				
12-Aug	Sunday				
13-Aug	W	0.04	82	No Data - Rain	-
14-Aug	W	-	69	Data OK	-2.0
15-Aug	WSW	-	72	Data OK	36.5
16-Aug	SSW	-	72	Data OK	79.0
17-Aug	SSW	-	72	No Data - Rain/Humidity	-
18-Aug	Saturday				
19-Aug	Sunday				
20-Aug	E	-	73	Data OK	28.0
21-Aug				End of Data Set. Data Not Recovered From Field Laptop.	

Notes:

Wind direction, precipitation, and humidity measured at Claypit Hill in Wayland, MA.

* = Maximum recorded difference of downwind and upwind measurements over a 15 minute average.