



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ONE CONGRESS STREET, SUITE 1100
BOSTON, MA 02114-2023

July 16, 2009

Steve Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312

Subject: Conditional Approval
DRAFT FINAL Remedial Investigation/Feasibility Study Work Plan
Olin Chemical Superfund Site, Wilmington, Massachusetts

Dear Mr. Morrow:

In accordance with Paragraph 40 of the Administrative Settlement Agreement and Order on Consent ("AOC"), Region I of the United States Environmental Protection Agency ("EPA") has reviewed the above-referenced document prepared by MACTEC and dated April 30, 2009. This letter serves as a Notice of Approval, subject to the specified conditions. This letter also provides additional questions and comments to be addressed in the Final Work Plan.

Pursuant to Section 1.III.D of the Remedial Investigation/Feasibility Study Statement of Work ("RI/FS SOW"), EPA solicited comments from external state and local stakeholders, and has consolidated certain of these written comments received within the context of this letter. Original comment letters are enclosed.

Although several conditions and comments remain, this Draft Final Remedial Investigation/Feasibility Study Work Plan satisfies a majority of the concerns previously raised by EPA and provides a satisfactory cure to the deficiencies outlined in EPA's letter of March 12, 2009.

CONDITIONS

1. Financial Assurance: Pursuant to Paragraphs 94 to 98 of the AOC, within 30 days from the date of this approval letter, Olin shall submit a cost estimate for completion of the full activities described in the Final RI/FS Work Plan. Based on the amount of this cost estimate, Olin (and the other Respondents) shall establish and maintain financial security for the benefit of EPA using one or more of the forms outlined in the AOC.
2. Well Construction Details: The Draft RI/FS Work Plan states that Olin is currently reviewing several well construction options and will provide an addendum with these details prior to field mobilization. Olin shall submit an addendum to the RI/FS Work Plan that provides well installation and construction details, as well as the criteria to be used to field-identify exact well locations, and well screen intervals, at least two weeks prior to field mobilization for the installation of new monitoring wells.
3. Slurry Wall Testing: Section 6.5 of the Draft RI/FS Work Plan discusses the implementation of Hydraulic Pulse Interference Testing as a non-destructive method

for assessing the structural integrity of the slurry wall. Olin shall submit an addendum to the RI/FS Work Plan that provides the necessary details regarding the implementation and evaluation of this test. This addendum should also include a proposal to effectively monitor the slurry wall/bedrock interface (i.e., additional wells, pump tests, etc.) This addendum should be submitted within 60 days from the date of this approval letter and no later than 30 days prior to field mobilization for this test.

4. North Pond Area: Despite continuous requests by EPA to adequately characterize the North Pond area, the draft Work Plan does not propose any site characterization or analysis. Ariel photographs confirm that North Pond was hydraulically connected to the East Ditch, south of the confluence with the South Ditch, as an upon channel, and remains connected through a culvert. The one sediment sample collected to date from the existing North Pond basin confirms the presence of several site-related compounds. The Final Work Plan must include a reasonable proposal to characterize the current and former extent of the North Pond area (see OU2 comment below), and a proposal to incorporate the results into the BHHRA and ERA for OU2.
5. Right to Request Additional Samples/Analysis: Although the current version of the RI/FS Work Plan provides a significant increase in the overall number of samples and compounds to be analyzed across all media, there are several areas where the proposed approach may not provide sufficient data to characterize the nature and extent of contamination, or quantify the potential human health or ecological exposures. Examples include but are not limited to the approach for characterizing soils deeper than 10 feet bgs; limited analysis for PCBs and pesticides/herbicides; the inability to analyze for several compounds of historic Site use due to a lack of analytical methods; no proposal to characterize subsurface soil within the containment area; no proposal to characterize soil within the Calcium Sulfate Landfill, no proposal to install a bedrock well within the central area of the MMB aquifer; and the collection of limited data from surface water bodies located south of Site property. Although EPA agrees and accepts these limitations based on the current understanding of this Site, EPA reserves the right to request the collection of additional samples and/or analysis based on the results of the approved RI sampling effort.

COMMENTS

Volume I

1. General: There are numerous statements made within the body of this work plan and in various summary tables, and in particular in Volume I, which EPA believes are either premature or unsupported by the current data set. Examples of such statements include: The DAPL pools *are not currently moving* along the bedrock surface in response to gravity; The slurry and temporary cap was constructed to contain residual on-Property DAPL and *overlying contaminated groundwater*, and Currently the DAPL material remains in *isolated* bedrock depressions. Rather than call out and dispute the basis for each and every example, EPA requests that Olin acknowledge in response to this comment that such findings as stated within the work plan will be re-evaluated based on data collected during the RI field work.

2. General: The current terms of the AOC (Appendix A SOW) require that electronic access to data be extended only to EPA and EPA's consultant. As a result, Olin has established an FTP link which allows EPA to download digital data. EPA continues to receive concerns from stakeholders over the lack of external data access. Although all existing data has been provided in Adobe format, the effort and expertise necessary to effectively access and review such an expansive data-set is beyond most party's capabilities. While Olin has chosen to restrict non-EPA access to data, it has been our experience that allowing for broader access to data results in fewer questions during the RI/FS process and supports effective consensus-building for the Proposed Plan. For example, at the Nuclear Metals Superfund Site in Concord, Massachusetts (see www.nmisite.org), the PRPs have developed an on-line tool that allows broad community and stakeholder access to data-validation level results. The Nuclear Metals website includes an interactive web-based Geographic Information System (GIS) utility that will graphically display sample locations and results on a map of the site, allowing easy interpretation of the data. Another example is the ARCGIS database. Such tools would aid all interested parties in evaluating the data and should greatly improve consensus-building for the pending Proposed Plan(s) and Record(s) of Decision. EPA strongly recommends that Olin give serious consideration to developing such tools, or at a minimum, expanding access to the existing digital data base. If upon consideration, Olin remains concerned about providing broad access to the overall data set, then EPA would urge Olin to consider providing such access to at least the RI data set.
3. General: Numerous figures and tables in the draft Work Plan are under-scaled for the intended information. Although EPA is not requesting that the scale of the Final Work Plan figures and tables be modified, this is a significant issue that should be addressed in any work plan addendums and the RI Reports. EPA respectfully requests that figures and tables in the work plan addendums and RI reports be scaled appropriately such that oversized drawings and tables (i.e., 11" x 17" or plan-sized) are provided as necessary to effectively convey the intended information. Also, RI figures should include identification of major features appropriate to support the intended information (e.g. Fig. 4.3-1 should identify surface water features and wetland areas, Fig. 4.5-2 should identify all relevant street names and buildings, and so on).
4. P. 7 of 50, Response to EPA Comment No. 2d: Olin's response states that soil samples collected from deeper than 10 feet bgs will be analyzed based on results of 1-10 foot samples, with a minimum of six deep soil samples to be analyzed from areas with the greatest potential for impacts regardless of 0-10 foot soil results. This information is repeated in Volume III-A, Section 4.2.3. However, the details associated with this deep soil sampling program need to be provided in Section 8.1 of Volume III-A. Please incorporate. Note also that EPA is concerned that holding times may be exceeded for some contaminants in the deeper soils while awaiting results from the 1-10 foot samples, and this concern should be addressed in the FSP.
5. P. 9 of 50, Response to EPA Comment No. 7d: Olin's response states that benzonitrile, 2-ethyl hexoic acid, trimethylamine, hexamethylene tetramine, and dinonyl phenol will not be analyzed during the RI because "analytical methods are not available". EPA concurs that standard analytical methods do not currently exist for these compounds. However labs can be instructed to report "tentatively identified compounds (TICs)" which could identify these compounds if present at relatively elevated concentrations. Olin should instruct their labs to include these compounds as

TICs and to continue to include these compounds in the uncertainties section of the appropriate risk assessments.

6. P. 9 of 50, Response to EPA Comment No. 8b: In this comment, EPA noted concern regarding the unusually high background concentration for ammonia. Olin's response is, "Background data sets for surface water and sediment will be recollected." However, according to the proposal for background data as contained in the bullets on p. 3-5 of Volume III-A, it appears that Olin plans to use the existing background data from locations BS021REF and BS012REF in the RI? Historical background soil location BS021REF and sediment location BS012REF cannot be included as background locations in the RI.
7. P. 10 of 50, Response to Comment No. 8f: EPA agrees with the response that Table 2c values will be used, with the condition that the concentrations be adjusted for current toxicity values, as planned by Olin in Section 4.5 of the FSP.
8. P. 12 of 50, Response to EPA Comment No. 9e: In this comment, EPA requests that Olin perform a 42-day sediment toxicity test. Olin's written response is, "Comment noted." Subsequent statements in the work plan appear to be contradictory with regard to Olin's willingness to perform the requested toxicity test. It is EPA's understanding that Olin has agreed to perform the 42-day sediment toxicity test. Please verify in response to this comment, and modify the work plan to eliminate the inconsistent statements and provide the necessary details regarding the scope and methods for this toxicity test in Volume III-A. (EPA observed conflicting statements on pp. 4-1 of Volume I and pp. 15 of 19 of Table 3.2-1 of Volume I.) A complete citation for the test method to be used needs to be provided in addition to the criteria for selecting the sediment location for the toxicity test. Chemical analytical results should be used to identify the sample location for sediment toxicity test.
9. P. 24 of 50, Response to EPA Comment #12: This scenario discusses various hypothetical human exposure pathways. In that context, Olin's response states, "There are no plans to evaluate the use of DAPL material as a drinking water source in the BHHRA." EPA disagrees with this statement. DAPL is groundwater and as such concentrations of site-related constituents, representative of monitoring wells screened within the DAPL zone, should be used in the BHHRA. In support of this position, attached please find a copy of the Groundwater Use and Value Determination for the Olin Site recently prepared by the MassDEP consistent with EPA's 1996 Final Groundwater Use and Value Determination Guidance.
10. P. 4-1, Data Gaps/Needs: For OU1, the last bullet identifies the need to "characterize background conditions in all environmental media for all three OUs"; however, there is very little discussion of specific background sampling after this statement. The brief discussion on pages 3-4 and 3-5 in the FSP is inadequate. EPA notes that in Olin's response letter (dated April 29, 2009), Olin twice mentioned (pages 10 and 12) that they would resample previous background surface water and sediment locations. All proposed sampling activities (and analyses) should be presented in the FSP.
11. P. 4-2, OU2 Data Gaps/Needs: The text on this page includes only one bullet for OU2, when in reality Olin has proposed to collect additional data from the East Ditch and MMB areas. Please add additional bullets to reflect the full proposed scope. In addition, EPA has reviewed the collective information provided by Olin with regard to

the surface water bodies located south and southeast of the Olin property. EPA concludes that data gaps remain which must be evaluated to determine the full nature and extent of contamination in this area. Such activities include the following;

- Install borings to map the previous lateral and vertical extent of the North Pond drainage area. Historic photographs should be used to guide boring locations.
 - Collect soil/sediment samples from strata which appear most representative of the bottom layer of the former North Pond, and preferably from the area which appears nearest to the former inlet.
 - Collect sediment samples from the existing North Pond.
 - Collect sediment and surface water data from Landfill Brook to determine if groundwater recharge has transported site-related constituents.
12. P. 4-2, OU3 Data Gaps/Needs: The bullet currently listed under OU2 for “cessation of pumping” should also be listed as a data gap for OU3.
 13. P. 5-1, Final RI Work Plan: The text states that nine electronic copies of the final work plan will be submitted to USEPA, along with signed cover pages of the document volumes. EPA requests that seven hard copies of the Final RI/FS Work Plan also be submitted.
 14. P. 5-2, Spatial Analysis: The Procedures for evaluating surface and subsurface soil data to be collected during the RI should include a discussion on spatial analysis and its use in determining if contaminants are evenly or unevenly distributed across the former facility property. Such analysis will aid in the decision on exposure areas for the HHRA.
 15. P. 5-4, Analytical Data Results: In addition to the procedures described on this page for the release and evaluation of RI data, validated results should be reported in Semi-Annual Status Reports on a rolling basis.
 16. P. 6-5, Ecological Risk Assessment (ERA) Deliverables: Olin states that the ERA, “shall be completed in accordance with current guidance, procedures, assumptions, methods and formats...”, and then lists 4 references. The following reports should also be considered, in addition to the 4 references presented, during the ERA process:
 - a. EPA (U.S. Environmental Protection Agency). 1993a. *Wildlife Exposure Factors Handbook*. Volumes I and II. Office of Research and Development. EPA/600/R-93/187a, EPA/600/R-93/187b.
 - b. EPA (U.S. Environmental Protection Agency). 1998. *Guidelines for Ecological Risk Assessment*. Risk Assessment Forum. U.S. EPA, Washington DC. EPA/630/R-95/002F.
 - c. EPA (U.S. Environmental Protection Agency). 2007. *Framework for Metals Risk Assessment*. Risk Assessment Forum. U.S. EPA, Washington DC. EPA 120/R-07/001.

- d. EPA (U.S. Environmental Protection Agency). 2003. *Generic Ecological Assessment Endpoints for Ecological Risk Assessment*. Risk Assessment Forum. U.S. EPA, Washington DC. EPA/630/P-02/004F.
 - e. EPA (U.S. Environmental Protection Agency). 2000. *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*. Office of Information. EPA/600/R-96/084.
17. P. 6-6, BERAs: The text states that a Draft BERA for each OU will be submitted to USEPA. To clarify, a baseline ecological risk assessment is not required for OU3. Any impacts resulting from groundwater to surface water discharge should be evaluated in the BERA for OU2.
18. Table 2.0-1, Human Health Conceptual Site Model: EPA is in general agreement with the receptors and exposure pathways in this table; however, EPA is not familiar with several of the receptor types listed in this table. It is also unclear which receptors are included for current exposures, future exposures or both? The exposure parameters associated with the listed receptors will need to be discussed in the first interim deliverable for the BHHRA (e.g. Visitor verses Area C Visitor. Community Resident verses Resident). The final work plan should also clarify that deed restrictions will be placed on the property to ensure that future property use remains commercial/industrial. EPA reiterates that there may be multiple exposure point concentrations for the on-Site, non Area C receptors, depending on the results of the proposed soil sampling and other analysis of historical data. EPA agrees that some of the exposure routes can remain "TBD" until future discussions can occur. Depending on the results of the RI field work, additional surface water exposure areas for OU2 may need to be considered (e.g. Maple Meadow Brook, Sawmill Brook, North Pond, and/or Landfill Brook).
19. Table 2.0-2, Ecological Conceptual Site Model: Depending on the results of the RI field work, additional Ecological Exposure Areas for OU2 may need to be considered (e.g. Maple Meadow Brook, Sawmill Brook, North Pond, and/or Landfill Brook).
20. Table 4.2-1, RAOs: The Potential Remedial Action Objectives listed in column 2 should also include the risk management criteria of the Massachusetts Contingency Plan (MCP).
21. Table 7.0-1, 2 and 3, ARARs: For the purpose of the RI/FS Work Plan, the "Actions to be Taken to Attain Requirement" are sufficient. However, for the Feasibility Study Report, the actions provided are too generic and will need to be written specific to the site conditions. For now, please insert the following ARARs:

Table 7.01 – Action-specific ARARs:

- 1. State surface water discharge permit program, 314 CMR 3, and NPDES, which may be applicable in the event the remedy requires discharges to surface waters.
- 2. State groundwater discharge permit program, 314 CMR 5, which may be applicable in the event the remedy requires discharges of pollutants to groundwater.

3. Federal general pretreatment regulations for existing and new sources of pollution, which would be applicable in the event of a discharge to a POTW, 40 CFR 403.
4. NESHAPs, 40 CFR 61, which would apply in the event of emissions of hazardous air pollutants, and the state air pollution rules, 310 CMR 7.00, e.g. 7.09 (dust) and 7.18 (VOCs). Please also add a cite to 310 CMR 40.0049, which applies to air emissions from remedial activities.
5. Underground injection control program, 40 CFR 141.148, which forbids injections that would cause a drinking water regulation violation; also include the state program, 310 CMR 27. The substantive part of these regulations would be applicable in the event of a remedy involving underground injections.

Table 7.0-2 – Chemical specific ARARs:

1. EPA's guidelines for carcinogen risk assessment and EPA's supplemental guidance for assessing early life exposure to carcinogens, both published in March 2005. Both are TBCs.
2. AWQCs are relevant and appropriate, rather than applicable.
3. State surface water quality standards, 314 CMR 4.00 (generally the same as AWQCs).
4. State drinking water standards 310 CMR 22.00 and the state drinking water guidelines.
5. Broaden the reference to the MCP, to include the Method 1 and Method 2 standards as TBCs.
6. EPA health advisories.

Table 7.0-3 -- Location-specific ARARs:

1. Delete the references to the CFR for the executive orders on wetlands and floodplains. Executive orders are no longer appended to the CFR.
2. The vapor intrusion citations should include a citation to the MCP GW-2 regulation, 310 CFR 40.0983.

Volume II

1. P. 3-3, Site Security: The text states that access to off-Property areas will be allowed only to authorized representatives of Olin and USEPA. To clarify, EPA considers the Town of Wilmington, The Wilmington Environmental Restoration Committee (WERC), MassDEP, and Nobis Engineering (and their sub-contractors) to be authorized representatives of USEPA for activities related to the RI/FS.

Volume III-A

1. P. 2-2, Site History: In addition to Plant B and the containment area, construction of the South Ditch weir and West Ditch culvert should also be discussed in this section as significant historic actions. The impact of these structures on area hydrology will need to be discussed in the pending remedial investigation reports.
2. P. 2-4, Source Areas: Please add the following former site features to the list of "Additional potential sources;"
 - non-contact cooling water outfall;
 - urea silo;
 - "gypsum" sludge layer;
 - former or existing sumps, floor drains, and utilities below buildings; and
 - disposal pit/central pond (unlined)
3. P. 2-8, Current Migration Pathways: Please add the following bullets (in no particular order);
 - Determine if migration of constituents within the Calcium Sulfate Landfill is occurring to surrounding groundwater.
 - Migration of impacted groundwater to active area supply wells.
 - Potential migration of impacted groundwater discharge to Landfill Brook and the surrounding wetland area.

This section of the Conceptual Site Model should also include a brief discussion of potential regional flow changes as a result of the cessation of pumping from the municipal supply wells located within MMB.
4. Pp. 2-5 to 2-9, Migration Pathways: When the FSP discusses Migration Pathways, it is almost the same discussion as presented in the Fate and Transport section; however, the following information is not included:
 - vertical and horizontal gradients and how these gradients play a role on COC transport across the disposal site and within the DAPL containment area;
 - existing and former utilities and drain lines from process areas; and
 - the varying location of the ground water divide (i.e., is there enough monitoring data to evaluate the effect of the varying location of the ground water divide on COC distribution and transport?).

Please insert these statements consistent with the Fate and Transport section.

5. Section 3.1, Hexavalent Chromium: In development of the target analyte list for the RI, analysis for hexavalent chromium is included for soil and sediment. In review of the proposed soil sample locations in Figs. 4.1-1 and 4.2-1, the extent and locations for proposed analysis of hexavalent chromium appears adequate, particularly in consideration of the historic total versus hexavalent chromium results as presented in Table 4.1-5 of the FRI Report. However, EPA does not believe it is appropriate to

extend this comparison to other media. Conditions may be favorable for the formation of hexavalent chromium in other media. According to Table 5.2-1, hexavalent chromium was detected at sample location NPSED-1 at a concentration well above background. Total chromium at this same location was elevated, yet much lower than on-property total chromium results from the lower South Ditch. Elevated total chromium has also been observed in the adjacent and down stream sediment in East Ditch and in the Off-Property West Ditch. According to Table 4.3-2, sediment analysis for hexavalent chromium is proposed only in samples from South Ditch. Hexavalent chromium analysis should also be performed in a sub-set of the sediment samples from the East Ditch, the Off-Property West Ditch and North Pond. Co-located hexavalent chromium analysis should also be performed from surface water samples in these areas (a minimum of one surface water sample for hex analysis should be proposed for each surface water body with the understanding that if hexavalent chromium is confirmed at concentrations above screening levels, additional hex chromium analysis for surface water may be needed. Hexavalent chromium analysis is currently not proposed for groundwater, yet according to Table 6.2-2, hexavalent chromium has been detected in 7 of 28 historic samples at concentrations well above Mass GW-1 and GW-3 standards. Additional hexavalent chromium analysis should be proposed to ensure sufficient data exists for the OU3 RI. Please add the requested hexavalent analysis to the appropriate samples for sediment, surface water and groundwater, and provide a brief discussion of hexavalent chromium in Section 3.1.

6. P. 3-2, Top Para: Appears to be a typographic error in the following sentence, "An analytical method is not available for water matrices." Please delete the word "not."
7. Pp. 3-4 to 3-5 Background:
 - a. Even though the FSP mentions use of Industri-plex background soil samples on pages 3-4 and 3-5, these background samples are not shown on the soil background figure (Figure 3.2.1), nor on any previously submitted data tables. These samples should **not** be included in the background dataset for the Site.
 - b. Although listed as background soil locations, soil background samples collected during the installation of monitoring wells GW-83-D and GW-85-D are not shown on the background soil figure. Note that groundwater from GW-83-D is contaminated; therefore, soil data from this location may also be impacted and is suspect as a suitable background sample location.
 - c. See Volume I comment above regarding historical background soil location BS021REF and sediment location BS012REF.
8. P. 3-7, Groundwater Sampling Objectives: In addition to the listed objectives, please add the following bullets;
 - Assessment of groundwater quality in residential and commercial supply wells in areas potentially located within the downgradient extent.
 - Assessment of surface water and groundwater interaction in Landfill Brook by measuring the gradient between groundwater and surface water at specific locations.

- Evaluation of the rate of diffusion and other transport mechanisms controlling the migration of contaminants between the DAPL zone, the diffuse zone, overlying groundwater and bedrock groundwater.
9. Sections 4.1 and 4.2, Soil Samples: The surface and subsurface (1-10 foot) sampling program appears to be generally consistent with EPA recommendations, however, the following changes are required:
 - a. For the location designated as A7-Prop7 on Figure 4.1.1, surface soil analysis should include: VOCs, SVOCs, metals, and inorganics.
 - b. For the location designated as A8-Prop6 on Figure 4.1.1, surface soil analysis should include: VOCs, SVOCs, metals, inorganics, NDMA, DMF, phthalic anhydride, hydrazine, and diphenylamine.
 10. P. 4-6, Section 4.2.3: In the second paragraph, please replace the Region 3 RBC table with the current EPA Regional Screening Level tables Levels (http://www.epa.gov/reg3hscd/risk/human/rb-concentration-table/Generic-Tables/pdf/master_sl_table_run-APRIL2009.pdf).
 11. P. 4-8, Section 4.3.3: The text states that “additional Site-related analytes” are identified in Table 4.3-2, but the specific list of inorganics that are included is unclear. Please clarify the analytes included in the category “inorganic” in this table by listing them in a footnote to Table 4.3-2. It is important to measure conductivity, and analyze surface water for ammonia as well as the inorganics that are elevated in DAPL.
 12. P. 4-8, Sediment Program for OU1: This section makes no reference to the 42-day toxicity test. As noted in the Volume I comment above, there are conflicting statements throughout the work plan regarding this text. Please clarify that the 42-day toxicity test will be performed in the Upper South Ditch area and insert the appropriate information into Section 4.4.
 13. P. 4-13, Section 4.5.3: The text of this section does not contain some of the details in Figure 4.5-1, specifically the criterion that groundwater and/or soil concentrations must be 50 times higher than the Table 2c values in the 2002 EPA draft vapor intrusion guidance before indoor air data are collected (unless semi-site specific evaluation of Figure 3a or Figure 3b attenuation factors indicates that Table 3c screening values are likely to be exceeded). EPA does not concur with this approach because it is unaware of the basis for this criterion and the location of the attenuation factors. Please provide an explanation of the basis for such a 50-fold criterion and the location of Figure 3a and 3b attenuation factors. In addition, Figure 4.5-1 indicates that Tier 1 consists in part of screening for occupied buildings, but the text indicates that vapor intrusion will be evaluated for potential future occupied buildings in the area that may be redeveloped. Vapor intrusion should be evaluated in all currently or potentially occupied buildings located within the study area.
 14. P. 5-1, OU2: The opening paragraph states that, “The OU2 sampling and analytical program will consist of *one* sampling event to collect surface water, sediment and stream gauging data from off-Property locations.” However, according to other statements in the work plan including Section 5.1.3, *two* sampling events are planned. Please clarify and correct the text as appropriate.

15. Section 5.1.2, Groundwater Discharge: The current surface water and sediment analyses proposed for Maple Meadow Brook appears to provide adequate spatial coverage for an initial characterization of contamination and subsequent evaluation of effects. However, there is concern that groundwater discharge may be occurring at localized positions throughout this wetland area and that impact at these groundwater/surface water transition zones may be missed. This concern also exists in the wetland area which extends from the southern portion of the Olin property, in the area between the Lower South Ditch and Landfill Brook. Based on EPA guidance for evaluating this potential scenario, EPA recommends that this potential migration pathway be addressed in the FSP (ECO Update/ Ground Water Forum Issue Paper: *Evaluating Ground-Water/Surface-Water Transition Zones In Ecological Risk Assessments*. Office of Solid Waste and Emergency Response. Publ. 9285.6-17. EPA-540-R-06-072. July 2008. EPA also requests that Olin collect continuous surface water temperature data along Maple Meadow Brook, Sawmill Brook and Landfill Brook to identify areas of potential groundwater discharge in defined channels (particularly in the vicinity of GW 83D to GW 65D). This should be coordinated with the 11 surface and sediment locations listed on Figure 5-1-3. EPA also recommends a minimum of 7 locations; MMB (3 locations), SMB (2 locations) and LFB (2 locations). Surface water temperature profile data should be collected prior to analytical data with the intention to locate sample points in areas where groundwater is discharging to surface water.
16. Section 5.1.3: The text indicates that all OU2 surface water samples will be analyzed for two or more "additional Site-specific analytes" as identified in Table 4.3-2. Please describe how the two or more analytes will be selected?
17. P. 6-1, OU3 (Supply Wells): Section 6.0 discusses the nature and extent of groundwater contamination. There are numerous private supply wells located throughout the study area. These wells include; active residential water supplies, active irrigation wells, active and inactive commercial production wells, and inactive municipal supply wells. Olin has tested many of these wells in an ad hoc manner for more than 15 years now, and results have been used to delineate the extent of groundwater contamination. However, according to Table 6.2-4, testing is not proposed at any of these well locations during the RI field work. Section 6.0 should be revised to provide a complete discussion of the private well characterization effort; including a description of the historic testing, summary of the results in tabular form, a comprehensive private well location figure and a proposal for additional efforts during the RI. Additional efforts should include, at a minimum, continued frequent monitoring of private wells where compounds potentially linked to releases from the Site have been detected, intermittent monitoring of other active private wells, a review of current municipal and other records to verify the locations of all known supply wells located within the OU3 study area, and a proposal to sample supply wells either not previously sampled or not sampled since 2003.
18. Section 6.1.1, Seismic Refraction: An additional seismic refraction line should be completed in the area of the GW-400 quadruplet. This line should be placed to the west of the active rail road bed and extend northward from the intersection of the rail line and Main Street across Maple Meadow Brook, and continue some distance towards Butters Row. This seismic line is an addition to the line planned along Main

Street to the east, and is intended to more accurately determine the placement and depth of the 400 and (if necessary) 404 clusters.

19. Section 6.1.3, GW-405: EPA generally agrees with the proposed location of GW-405BR, but is concerned that the well will not be installed deep enough to achieve the stated objectives. The proposed depth of 250 feet appears arbitrary. Given that the location of GW-405BR is on a knoll, and that the stated (undocumented) depths of private supply wells on Cook Avenue are greater than 300 feet, absent more specific information, EPA requests that GW-405BR be installed to an approximate depth of 350 feet bgs (final depth based on logging). EPA also requests that Olin geophysically log this well and complete as a Solinst installation to isolate what are likely to be several water-bearing fractures, and consider that an overburden well be paired at this location. Given the expected depths of the residential supply wells, installation of a single sample zone is inadequate to determine the nature and extent of Site-related contamination which may be migrating in a southwesterly direction.
20. Section 6.1.3, GW-406: EPA remains concerned about the potential migration of contaminants to the west of Lake Poly. Taking into account the information to be gained from the seismic refraction line, EPA requests that the proposed location of GW-406 and GW-406BR be moved further south to a location just west of Lake Poly.
21. Section 6.1.4, Solinst: The criteria to be used to select the number of ports planned for each Solinst installation should be communicated. After the bedrock wells are drilled, and prior to Solinst well construction and installation, it is unclear how groundwater will be prevented from recirculating in the borehole. EPA has concerns that in areas of strong upward or downward gradients, contaminants associated with the Site may migrate to different aquifer zones from these temporary pathways until the final well installation is grouted in place. The details associated with the Solinst installation should be provided in the required well construction addendum per the condition cited above.
22. P. 6-3, Bedrock Logging: This sections states, "Bedrock boreholes shall be geophysically logged to identify water bearing fracture zones." There is no discussion provided on which wells are to be logged and why. Please insert such discussion or provide a reference to other portions of the work plan that provide this detail. EPA requests that all newly installed bedrock wells be geophysically logged.
23. Table 3.1-1, TALs: The USEPA's National Exposure Research Laboratory previously collected samples from the site and published a study on November 4, 2004 titled, "*Study of Organic Chemical Compounds Present in Water Samples from the Town of Wilmington Maple Meadow Brook Aquifer*". Fluoride and bromide were present at a relatively high rate of detection and one of the recommendations was that fluoride and bromide be added to the list of analytes for the Olin site. EPA Region I requests that fluoride and bromide be added to the list of existing anions as listed in Table 3.1-1.
24. Table 4.3-2, East Ditch sampling: Through review of the IRSWP, Olin has agreed to analyze East Ditch samples for EPH/VPH. These samples were/are to be collected as required during the planned Plant B reduced extraction rate pump test. There is currently no scheduled start date for the pump test. If the Plant B pump test is delayed beyond the RI field effort, Olin should collect the required EPH/VPH samples

from surface water and sediment in East Ditch through the RI field effort. Either way, EPH/VPH data should be included in future RI discussions relevant to the East Ditch.

25. Table 6.2-1: Summary of Analytes Detected indicates that GW-55S & D were not sampled for NDMA. This information corresponds to Figure 4.3-19 in the October, 2007 FRI report. However, Table 6.2-4 indicates that GW-55D was sampled for NDMA, and NDMA was detected. Please clarify. Also, Kempore has not historically been "detected" in wells E-10 and W-10 (installed in the east pit and west pit, respectively). However, based upon a review of Figure 6.2-18, it appears that Kempore was not "analyzed" in these two wells located in the east and west pits. Please clarify.
26. Table 6.2-3, Specific Conductance: GW 55D is not included on this table. Was GW 55D ever tested for specific conductance? If so, please add the relevant information to this table.
27. Table 6.2-4, Calcium Sulfate Landfill: In EPA's opinion, the current monitoring program is not sufficient to determine if the CSL represents an ongoing source area. In lieu of installing borings in the CSL to characterize the nature and extent of contamination which may have been placed, testing for "additional Site-specific analytes" should be performed within the existing monitoring well network. EPA requests that this table be revised to add well locations SL-1S, SL-1D, SL-4, SL-5, SL-7, and SL-8; and that all SL-designated wells include "additional Site-specific analytes."
28. Section 8.1, Surface Soils: Section 8.1 states that *surface soils* are to be collected between zero and two feet bgs. Section 4.1 and Volume I, response to March 12 EPA letter Volume IIA, Comment #5 (page 35 of 50) describe surface soil as 0-1 foot. EPA reiterates that *surface soils* should be collected from 0 to 1 foot bgs during the RI. Existing soil samples collected from 0 to 2 foot bgs may be considered to be representative of surface soil conditions.
29. Section 8.1.2, Sample Interval: Section 8.1.2 describes collection of *subsurface soils* from 1-10 feet bgs as composites from the entire 1 to 10 foot interval. However, a single 2 foot interval within the 1-10 foot range is required at each location rather than a 9 foot composite. The selection of the 2 foot interval to be analyzed should be based on PID readings, visual observation, and/or olfactory observation. If field observations do not lead to a clear choice, depths may be chosen at random and documented in field logbooks. Samples from immediately above the water table should be considered as preferable, however, EPA recommends some variation of depths to ensure spatial coverage across the Site.

Volume III-B

1. The analytical methods were updated appropriately in the QAPP except for Sulfide. This is listed as method 376.1. As this is not an approved method for CWA and SDWA, and sulfide is being tested for surface water, this should be changed to SM4500502.
2. The QAPP cover page and title page should match.

3. On worksheet #9b, the following items need to be changed:
 - a. Please update the Human Health PAL values based on the recent May 19, 2009 update of the EPA Regional Screening Levels ([http://www.epa.gov/reg3hscd/risk/human/rb-concentration table/ Generic Tables/pdf/master_sl_table_run_042009.pdf](http://www.epa.gov/reg3hscd/risk/human/rb-concentration%20table/Generic%20Tables/pdf/master_sl_table_run_042009.pdf)).
 - b. The response indicated that the laboratory SOP was similar to EPA Method 310.1. It is assumed this was an error and the correct reference should be 350.1. The response further indicated that Method 310.1 (read 350.1) would be added to the ammonia worksheets. This has not been done.
 - c. The response indicated that Selenium would be reported to the MDL to meet the PALs. In all cases where the MDLs are going to be used to meet the PALs, a standard at the PALs level should be analyzed by the laboratory to demonstrate that the reported level can be distinguished from zero.
 - d. The response indicated that PALs are met by Method 6010 for soil and sediment and that the reference to method 6020 would be removed. Actually, the PALs are not met for Cadmium, Selenium, or Thallium, as stated in Section 7, because of matrix interferences, only ICP-AES will be used for the soils. However, the reference to method 6020 was not removed from worksheet #9d.
4. The response indicates that sampling method S-2 on worksheet #12b will be added to the worksheet when sediment samples are to be collected. If that is the case, then worksheet #11 should be similarly updated.
5. Worksheet #13: Add preservatives, as appropriate, to the Equipment Identification column for the sample containers.
6. The response indicates that Worksheet #22b will be removed from the QAPP. It was, but the reference to it in the Table of Contents is still in place and should also be removed.
7. Additional Comments to prior QAPP comments not addressed in communications:
 - a. Table 6.1, Summary of Analytical Methods and Media was added to the QAPP. This provides an excellent summary of all methods and media that are covered in the QAPP for potential sampling. Please add NDPA to this table.
 - b. There are several comments related to Section 7.1, where the PALs exceed the Quantitation Limits:
 - i. For groundwater VOCs, Vinyl chloride should be added to the list of analytes that have the Quantitation Limits exceeding the PALs.
 - ii. For groundwater SVOCs, N-Nitroso-di-n-propylamine should be listed, followed by a discussion that NDPA will be tested by an alternate method, 521, to achieve the PALs. Add to Table 7.1 also.

- iii. For surface water Metals, add Lead to the list of metals where the Quantitation Limits exceeds the PALs.
- iv. For sediment SVOCs, add Benzyl alcohol to the list of analytes where the Quantitation Limits exceed the PALs. Add to Table 7.1 also.
- c. Worksheet #11, (p. 7-36). Nitrate and nitrite are not listed on the Analytic Parameter header of the table, even though they are listed in the Analytical Method section.
- d. In Section 16, page 16-2 and 16-3, a discussion of the use of blind PE samples and data validation as technical system audits (TSAs) was included in the Draft QAPP but was omitted in the April 2009 version of the QAPP. Inclusion of blind PE samples and data validation should continue to be a part of the TSAs for this project, where applicable.
- e. The SOP for Analysis of Pesticides references L-29 and L-30, but should only reference L-29 as there is no L-30 reference number in Worksheet #20. The list of SOPs in Appendix B includes a reference for L-31 but this reference number is not included in Worksheet #20 and is not an SOP in Appendix B.

Volume IV

1. The term "Site," as used in this plan, refers to both on-property and off-property areas that are affected by contamination. In most cases, the text appears to be more applicable for on-property areas where the property is secure and access is limited. There does not appear to be inclusion of the potential for the public to be in proximity to off-property investigative operations (such as Task 5 and Task 7). Adequate consideration should be included in this Health and Safety Plan for typical off-property, unrestricted access issues, such as noise impacts, investigation derived waste (IDW), and VOC vapors in off-property areas.
2. Section 1.2.3, Page 1-5: A bullet should be added to address issues of "public safety" for activities which occur in off-property areas of the Site.
3. Section 2.3, Task 8: This Task describes "Observing Handling soil-filled drums." Add a similar note to account for "Observing Handling drilling fluid drums" from development water from off-site wells. Also, for Task 10, insert "See note below this table" in column 1, consistent with the reference in Task 9.
4. Section 3.5.4.1, Page 3-24: The text indicates benzene colorimetric tubes will be used if total VOC levels are sustained at 0.5 parts per million (ppm). Table 3-2 (in the notes), and Sections 3.5.4.1 and 3.5.4.3, indicate tubes will be initially used to screen for benzene if total VOC levels are at or above 1.4 ppm. Please clarify.
5. Section 8.4, Page 8-4: Please confirm that the listed telephone numbers for the police and fire departments are current.

Consistent with Table 1 of Appendix A of the RI/FS SOW, Olin should proceed with field work for the RI within 30 days from the date of this letter. Please submit a schedule for field work

with 15 days. Concurrently, Olin should prepare and submit a Final Remedial Investigation/Feasibility Study Work Plan, which incorporates the specified conditions, and is responsive to the written comments, within 30 days from the date of this letter. I recommend that EPA and Olin meet within the next two weeks to discuss some of the more significant comments to ensure they are appropriately addressed in the final Work Plan.

Please call me if you have any questions or concerns.

Sincerely,



James M. DiLorenzo
Remedial Project Manager
USEPA Region 1 - New England

Enclosures

Stakeholder Comment Letters
EPA Response to Written Stakeholder Comments
Groundwater Use and Value Determination

Cc: Bob Cianciarulo, EPA
Wesley Kelman, EPA
Rick Sugatt, EPA
Heather Ford, Nobis
Joe Coyne, MassDEP
Michael Caira, Town of Wilmington
Michael Webster, GeolInsight
Martha Stevenson, WERC
Rich Lester, Cambridge Environmental