



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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BOSTON, MA 02114-2023

November 17, 2008

Steve Morrow  
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Suite 200  
Cleveland, TN 37312

Subject: Preliminary Review of the DRAFT Project Operations 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 October 2008.

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 written comments received within the context of this letter. Original comment letters are enclosed.

The Project Operations Plan was prepared under the terms of the AOC, and Section 2.0 and of the RI/FS SOW, to propose the collection of new field data to complete remedial investigations, risk assessments and feasibility studies. The primary objective of the RI/FS Work Plan, and thus this Project Operations Plan, is to collect data necessary to determine the nature and extent of contamination for each of the three operable units.

Given the size and complexity of the Olin Site and this Project Operations Plan, this letter constitutes preliminary broad-base comments only. Detailed review of the Project Operations Plan is ongoing. The goal of this comment letter is to identify broad areas for discussion. Pending the outcome of these discussions, and final review by EPA and the stakeholders, EPA anticipates that Olin will be required to submit a revised Project Operations Plan as an RI/FS Work Plan.

***General Issues***

1. There is no document titled "work plan." It appears that nowhere in the materials provided does this document say Olin plans to write an RI or FS Report, and what

would be included in those reports. The Project Operations Plan discusses remedial objectives and sampling objectives as described in Section 2.0 of the RI/FS SOW, but does not discuss the objectives of the RI itself, as described in Section 3.0 of the RI/FS SOW. The RI is an investigation to identify the horizontal and vertical extent of contamination; therefore, sampling goals and how they will be met should be identified and stated in detail in the Work Plan. Further, the Project Operations Plan does not discuss in any detail the planned risk assessments or expand the information beyond the SOW. As required by the AOC, the RI/FS Work Plan should expand on the SOW. It does state that human health and ecological risk assessments will be done and describes interim deliverables for risk information in the same level of detail provided in the SOW. It does not indicate what guidance would be followed or what receptors, exposure pathways, or exposure areas would be evaluated. At a minimum, a general overview of receptors, potential exposure areas, and data that will be used in the risk assessments should be provided.

2. In addition to comment #1, the Project Operations Plan did not appear to include the following requirements for the RI/FS Work Plan as set forth in the RI/FS SOW:
  - a) Include an evaluation of how completely each objective of the RI has been addressed by any previous investigations. Detail on any further efforts that are necessary to fill remaining data gaps shall also be provided. (Note: since the objectives of the RI are not provided, this must be done and the RI sampling must be conducted to meet the objectives or if the sampling has been conducted and does meet the objectives, this must be clearly shown in the Work Plan).
  - b) Include a method for determining how the field program shall be adjusted according to the initial sampling and chemical testing results. This adjustment must be made once sampling results are known and data gaps (if any) are identified. It is assumed that the initial sampling under an OU may modify subsequent OU sampling.
  - c) Include a Field Sampling Plan (FSP) for the air quality assessment to be implemented during the RI.
  - d) Regarding risk assessment interim deliverables: The exact format of the interim deliverables will be determined in the RI/FS Work Plan.
3. A single figure is needed showing all historic facility features, all historic tanks, disposal locations, drum storage areas, and all historic remedial actions, including MCP actions. This information is somewhat available on a number of figures, but is not comprehensively presented. This information is critical in order to determine where samples need to be collected to identify the nature and extent of Site contamination.

4. Extensive historical sampling has occurred at the Site over many years. Some of the data collected remains representative of current conditions; some represents soils or sediments that have been removed or contained beneath caps during remedial activities; some is unusable because detection limits were too high or because of the age of the data; some represents groundwater sampled from residential wells at unknown screening intervals or under unknown conditions. The Work Plan needs to present the datasets of all usable data representative of current conditions, which is expected to be included in the quantitative RI evaluations, in a format that clearly presents what data are in each dataset. It is not clear by the existing tables and figures, what existing data is proposed for quantitative use in the risk assessment and RI evaluations. Please provide revised tables and figures which clearly identify the data proposed for use in the remedial investigation process.
5. Further, a single figure needs to be included that shows the useable historic data and the proposed new sampling data so that the entire sampling program is visible. Historic samples that are from excavated materials do not represent current conditions and will not be used in the RI. Decisions on the density of samples that will be used in the RI are difficult/impossible to determine as the material is currently presented. Presentation of useable historic and new sampling locations should be shown in a grid pattern so the adequacy of the samples can be evaluated.
6. Background samples: Background samples are included in an RI/FS to aid in an understanding of what conditions at the Site would be like in the absence of the disposal site. It is understood that background may include both naturally occurring and anthropogenic data. In the EPA RI/FS process, background is considered in the uncertainty discussions during the RI (in the risk assessment sections) and to establish clean-up levels in the FS. If a contaminant drives risk, it is identified as a contaminant of concern to be addressed in the FS. During the FS, potential clean-up levels are set to protect human health and the environment, but not below background concentrations. Therefore, up front knowledge of background concentrations and appropriate selection of background sampling locations are very important. EPA needs to approve background sample locations. The FSP in Section 3 describes available background samples; however, the following information has not been included:
  - a) Summaries of the background data by media and figures showing background sampling locations should be provided in the Work Plan.
  - b) Among the background samples included in the FSP are background samples used for the Industri-Plex site. The locations of these samples are not provided. Where are these background samples collected from? Are they from locations that are down gradient from the Site? This information should be provided in the Work Plan or the collection of new background samples applicable to the Site should be provided in the Work Plan.

- c) The FSP refers to the 1997 Smith report, Appendix S, Attachment 3 for characterization of background conditions and a figure in the Draft FRI. When this information is examined, the figure of the soil background locations provided in the Draft FRI only shows the 5 samples collected in 1996 to support MCP activities. Smith included 7 samples (these 5 plus 2 earlier ones). Nowhere is the full dataset of proposed background samples (described in section 3 of the FSP) presented in table form or on a figure. This information needs to be provided or a plan to collect new background samples should be included in the Work Plan.
  - d) While historical background sampling locations for surface water/sediment samples may be suitable, new background surface water/sediment data need to be collected. This is particularly important if biota sampling is planned or if toxicity testing will be performed.
7. The RI analyte list is provided (FSP, Table 3.1-1). EPA acknowledges and appreciates the addition of perchlorate and EPH/VPH analyses to the RI analyte list. Table 3.1-1 lists several VOC contaminants twice, either including them under both VOCs and SVOCs or listing them as two synonyms. It is unclear why. The FSP Appendix A, Table 2 provides a list of products made at the Site, the raw materials used to produce them, and the waste materials generated. EPA notes that numerous chemicals listed on this table are not included in the RI analyte list. Generally these chemicals were excluded because they are not sufficiently defined (i.e. processing oils, urea), they are not persistent in the environment (i.e. butyl alcohol), they lack toxicity data (i.e. benzonitrile), or lack approved analytical methods (i.e. chlorosulfonic acid). These unaddressed potential contaminants remain a concern. Olin should be familiar with these chemicals as they were used in Olin's manufacturing process; therefore, it is reasonable to request that Olin seek out an analytical method and/or toxicity information for these chemicals or include them in the uncertainty section in the risk assessment.
8. Proposed analytes: The RI analyte list is provided (FSP, Table 3.1-1). It is EPA's position that all contaminants on the RI analyte list should be analyzed for in a representative number of samples from soils and sediments (OU1), sediments (OU2), and groundwater (OU3), unless spatially and temporally appropriate and usable data already exists to fully characterize the nature and extent soils, sediments, and both overburden and bedrock groundwater contamination. This data may exist for or a number of areas and contaminants; however, it was not presented in a manner EPA found to be clear or usable in both the FRI and this Project Operations Plan. See comments #4 and #5 above.
9. In Section 10.1 (Ecological Assessment) Olin states that the following elements required by the Administrative Order of Consent have been provided in previous work efforts (see list below); leaving the reader to assume that these elements are

appropriate for inclusion in future ecological risk assessments. In order to verify and evaluate the usability of this information for future risk assessments, the following supporting documentation is required: a reference(s) for each element; applicable location information, and data collection dates. Only information that Olin feels is useable for risk assessments should be listed. Any elements required by the Administrative Order of Consent that are not available for use in a risk assessment should be listed as "data gaps" and an approach to satisfy any "data gaps" should be presented.

As described in the RI/FS SOW, the following need to be provided:

- a) Include an FSP for surface water and sediment sampling during the scoping of the RI/FS. The FSP shall contain provisions for sampling events and more general assessments of wetlands, streams, and ponds, if this additional work is needed.
- b) Include an FSP for ecological assessment, containing an evaluation of the applicability of the following elements, and a plan to implement those elements determined to be applicable:
  - i. An accurate delineation of the wetland boundary and classification of the wetland types and determination of the functions and values of the wetlands and an accurate description and delineation of the ten year and hundred year floodplains;
  - ii. A description of habitat types including a map of major habitats present at the Site and a list of plant and animal species, both resident and transient;
  - iii. A determination of the status of those species identified in terms of sport or commercial usage, protected status, endangered, threatened, or of special concern;
  - iv. Sampling of environmental receptors for analysis of community composition, abundance, or body burden of contaminants;
  - v. Sampling of chemical and physical parameters for surface water and sediments (e.g., grain size, total organic carbon, dissolved oxygen, etc.);
  - vi. Toxicity testing of indicator species, if required, to determine effects of contaminated Site media on the environment;
  - vii. An evaluation of how the contamination from the Site has affected receptors;

- viii. An evaluation of whether the contamination has affected the health of the wetland and other major habitats present at the Site; and
  - ix. A discussion of how each remedial alternative under consideration would affect the wetland, biota, and their functions and values.
10. Also, in Section 10.1, Ecological Assessment, It is unclear what activities are being proposed. The inclusion of an ecological conceptual site model would provide clarity and should be provided. Currently there is no biota sampling or toxicity testing planned. If toxicity testing and sediment sampling (OU1 and OU2) for chemical analysis should occur simultaneously.
  11. The current database that has been made available to the government reviewers and their consultants through an FTP link is no longer sufficient. It is extremely time consuming to evaluate the existing Site data location by location, and contaminant by contaminant. The data in the database needs to be accessible and reportable such that reviewers can search the database and quickly ascertain where a specific contaminant was evaluated, the results, detection limits, etc. The creation of plume maps, evaluation of multiple locations of a single contaminant, and other data queries can not be made with the current available database. While there are many needs for a database, the initial need to administer the data is critical to determining whether there is adequate sample coverage for a contaminant.
  12. There does not appear to be any sort of DQO or goals statement that provides a premise for this FSP. The assumption with respect to any additional characterization is merely the collection of samples for some analytes as described in a table; otherwise there is an implicit assumption that the previous work was good enough. The document needs a coherent statement of data gaps and objectives and how the proposed sampling will address these gaps for each OU.
  13. The FSP needs to present the datasets of all usable data representative of current conditions, as well as the proposed new sampling locations, which is expected to be included in the quantitative RI evaluations. Data must be in a format that clearly presents what data are in each dataset. See comment #5 above.
  14. Please include only usable historic validated data representative of current conditions. In considering what is usable, please keep detection limits and quality control issues in mind, as well as age of data.
  15. From a human health risk assessment perspective, the FSP does not explain what scenarios are planned for groundwater exposures. The potential pathways that need to be considered are exposures through drinking water consumption, household water use (i.e., showering), gardening, industrial use and vapor intrusion.

16. Vapor intrusion issues are applicable to volatile contaminants in shallow groundwater (water table 30 feet or less from basement or slab floors) beneath current or potential buildings both on-site and in areas off-site that lie over the groundwater plume(s). Shallow groundwater (sampled at the water table) should be evaluated for potential vapor intrusion issues following the EPA's Vapor Intrusion Guidance of 2002. Analyses of these samples must be performed such that detection limits are at or are less than the groundwater concentrations designed to be protective of vapor intrusion presented on Table 2c of the EPA's Vapor Intrusion Guidance of 2002. In addition, for a few VOCs, the Table 2c values are based on MCLs. For these VOCs, detection limits based on the vapor pathway need to be developed and met. Also, detection limits based on Table 2c values based on toxicity values that have been updated since 2002, should be developed based on the updated toxicity values and met.
17. Throughout the FRI and FSP, what could be termed "indicator compounds" or "indicator parameters" are discussed at length. These include but are not limited to: NDMA, sulfate, chloride and specific conductance. It is implied that analyzing various media for these compounds/parameters provide a convenient way to assess impact by Site related compounds without collecting and analyzing samples for detailed and expansive analyte lists. In these documents, there is a lack of discussion as to what levels of these compounds/parameters indicate Site impact. Additionally, there is a lack of discussion of additional sampling and investigative activities for other Site related contaminants once impact is apparent at a particular location or area. Simply confirming previously detected compounds as referenced in Table 6.2-4 is not sufficient.
18. General comments on groundwater figures:
  - a) In several figures, residential well data is presented on the same figure with data from groundwater monitoring wells. While it may be appropriate to display chemical results from private wells along side monitoring well data in a few exceptional scenarios, generally it is inappropriate to use data collected from private wells in a quantitative manner for purposes of delineating groundwater plumes or performing detailed evaluations. A number of uncertainties would need to be evaluated (from well depth and construction, to the location of sample collection (pre/post treatment) and collection method) in order to utilize these data in the manner they are being presented.
  - b) One element missing from almost all of the figures is any kind of reference to the temporal distribution of the data. There is no way to evaluate whether the information presented represents data points collected over a period of 1, 2, 5, or 20 years. The usability of the data to represent current conditions diminishes with time as well as the amount of magnitude of time span between individual sampling points. For example, two monitoring wells could be shown on a figure but the data represented could have been collected 10 years apart. Additionally,

the cessation of pumping from the Maple Meadow Brook Aquifer by the town of Wilmington may have significantly changed the groundwater flow regime and the usability of data should take this into account, i.e. potential for significant changes to vertical gradients.

- c) Historical data is helpful in a qualitative way and was presented in great detail in the FRI report, however, if historical data is not being presented to help support the sampling plan rationale and only serves to demonstrate the level of historical effort it should be removed from figures and tables.

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### OU1 SPECIFIC COMMENTS

1. Proposed analytes: The RI analyte list is provided (FSP, Table 3.1-1). It is EPA's position that all contaminants on the RI analyte list should be analyzed for in a representative number of samples throughout the property (OU1), taking into account historic activities, and unless adequate usable data already exists to fully characterize the nature and extent of contamination at each potential exposure point.
2. OU1 Exposure Areas: It is not clear from the documents provided, whether or not Olin intends to evaluate the entire 50-acre property (OU1) as one large exposure unit for human health and ecological risk evaluation. EPA recommends that the portion of the Site south of the south ditch with an environmental and open space restriction should be looked at separately from the remainder of the Site; also the temporary cap area should be looked at separately. Attachment A to these comments depicts suggested exposure areas for OU1. These suggested exposure areas are negotiable. Olin may propose alternative exposure areas, but should consider both potential exposure scenarios and potential variations in contamination make-up in different areas of the Site. It is not acceptable for relatively clean areas of the Site to essentially dilute out concentrations from more contaminated areas or areas contaminated with different contaminants. Figures incorporating these exposure areas (or alternative exposure areas), historic samples representative of current conditions, and proposed sample locations are needed for both surface and subsurface soils and should be included in the Work Plan. The existing data need to be summarized for each potential exposure area in order to determine whether there will be adequate data for each exposure area.
3. Summary of usable surface soil data: FSP Table 4.1-1 provides a summary for the entire 50-acre Site of existing surface soil data considered to be representative of current conditions. FSP Figure 4.1-1 shows these samples. There are over 160 samples shown on this figure. Except for chromium, there are at most 89 samples analyzed for any given contaminant and for some contaminants as few as 4-10 samples. It is not clear in looking at the figure versus the table, which samples have been analyzed for what and whether the analyses for any particular contaminant or group of contaminants are concentrated in or missing from certain areas of the Site or whether all the data is usable. The RI/FS Work Plan needs to demonstrate what data are available for use in the RI. Table 4.1-1 needs to be divided up into exposure

areas to help clarify which analyses have been performed in each area and thus what data are available for each exposure area evaluation. FSP Table 4.1-1 presents only detects. If a contaminant was analyzed for, but never detected, the reader does not know this. For example, NDMA does not appear on either Table 4.1-1 or 4.2-1. Have soils been analyzed for this Site contaminant?

- a) The data should be divided into the proposed exposure areas and summaries/ explanations for each exposure area should be provided.
  - b) Only usable validated data representative of current conditions should be included. In considering what is usable, please keep sampling depths, detection limits, sample age, and quality control issues in mind.
  - c) All analyzed contaminants, whether detected or not, should be included. A non detect is as important as a detect during the data gathering stage of the investigation. This comment applies to subsurface soil data summarized on FSP Table 4.2-1 and shown on FSP Figure 4.2-1.
4. Existing surface soil data: Individual sample #'s are shown on FSP Figure 4.1-1, but the individual results for these samples (except the maximum for each contaminant shown on Figure 4.1-5) are not available either in the RI/FS Work Plan documents or in the FRI. This adds to the inability of the reviewer to determine what was sampled for where.
- a) While this information is available in the database, it was not, in the interest of time, reviewed on a sample-by-sample basis. A spreadsheet should be available in the Work Plan showing data for all historic samples considered to be usable in the RI; this would allow for decisions on what additional samples will need to be collected in the upcoming field investigation. It would be helpful if samples were grouped by exposure area or by grid notation. See suggested table format below:

ANALYTE	Exposure Area A		Exposure Area B	
	Sample 1	Sample 2	Sample 3	Sample 4
	date	date	date	date
	depth	depth	depth	depth
Chemical X (mg/kg)	5	7.2	6.6	24

- b) Figures 4.1-2 through 4.1-4 present historical surface soil samples evaluated for metals, SVOCs, and VOCs; however, since they present all historic data (some samples are from excavated soils that are no longer on Site) and not just usable data representative of current conditions, their usefulness is limited.
- c) This comment applies to subsurface soil data shown on FSP Figure 4.2-1. EPA defines surface soil for risk assessment purposes as 0-6 inches below ground surface, and will generally consider data at 0-1 foot to be representative. Soil samples collected from 0-3

foot are not usable for evaluation of surface exposures. Subsurface soils are defined for risk as 6 inches to 10 feet below ground surface. For future exposures following site redevelopment, 0-10 feet may be used for risk evaluation of subsurface soils.

5. Proposed OU1 samples: FSP Table 4.1-2 shows proposed samples in various areas of the Site. This is very helpful in understanding the location and rationale for the proposed samples. FSP Appendix A, Table 2 was also very helpful in understanding what was used or generated or stored where and when. FSP Table 4.1-2 lists proposed sampling and proposed analyses, but does not clarify which specific SVOCs will be included when SVOCs are analyzed. Since some SVOCs included in the RI Analyte List (Table 3.1-1) are listed separately from SVOCs on Table 4.1-2 (nonyl phenol, Kempore, Opex, phthalic anhydride, DMF, and formaldehyde), one must presume they are not included when the SVOC column is checked. Therefore, the relationship between the RI Analyte List and the proposed sampling table is unclear and must be clarified in the Work Plan.
  - a) Please provide a list of what analytes are included when a general category (SVOCs, VOCs, metals, or inorganics) is checked on FSP Table 4.1-2.
  - b) Please further organize the proposed soil samples based on the exposure areas described in OU1 Comment 2 (keeping the information on what plant or disposal area the samples are associated with).
  - c) FSP Table 4.1-2 also lists sampling rationale. Only one of the proposed samples (any media) for OU1 says for risk assessment purposes. Why?
  - d) Please address the following apparent deficiencies in soil sampling both historic and proposed:
    - i. No soils to be analyzed for Opex or Kempore.
    - ii. No media to be analyzed for phthalic anhydride.
    - iii. Formaldehyde analyzed only at 6 select surface soil samples and 6 subsurface soil samples (Plant A and Plant B production and tile field). Previously analyzed in only 8 surface soil samples, and 22 subsurface soil samples.
    - iv. Hydrazine previously analyzed in only 8 surface soil samples, and 20 subsurface soil samples. Unknown number proposed.
    - v. Nonyl phenol analyzed only at 5 select surface soil samples. Unknown number previously analyzed.
    - vi. Hexavalent chromium was analyzed for in only 4 surface soil samples and 6 subsurface soil samples. Are any proposed?
6. Soil sampling locations: FSP Figures 4.1-6 and 4.2-6 provide the proposed surface and subsurface soil sampling locations and historic sampling on a grid.
  - a) EPA contends that because of the many activities on the Site and the potential for disposal, redistribution during past construction activities, and dispersion caused

by wind or flooding, surface soil sampling (0-1 foot) should occur throughout the Site. Subsurface soil sampling at depths of 1 to 10 feet below ground surface should occur throughout the manufacturing area of the property and in any area that has been disturbed by past Site activities. Within the southern area included in the open space restriction, subsurface sampling would be performed for Nature and Extent purposes only in any area that has been disturbed by past Site activities. Note that aerial photographs indicate possible activities in the southern area, which have not previously been discussed as areas of activities.

- b) FSP Figure 4.1-6 should show proposed surface soil samples and **only** those historic samples considered representative of current conditions (those summarized in Table 4.1-1 and shown on Figure 4.1-1) and usable. This would allow the reader to see what samples will be available in the final dataset to evaluate the Site surface soils and to identify potential gaps in coverage. The same applies for FSP Figure 4.2-6, which shows proposed subsurface soil samples and historic samples.
- c) The grid is useful for locating specific proposed samples; however, it was not used to identify areas in need of sampling. Many squares of the grid are without any soil sampling, either proposed or historic. Each grid square (except as noted below) should contain at least some analysis (historic usable or proposed. Each exposure area (Attachment A) should ideally contain a minimum of 20 surface soil and 20 subsurface soil samples.
- d) EPA concurs that soil sample density may be less in the undeveloped areas of the Site (i.e. the larger grid size is acceptable).
- e) EPA concurs that soil sampling is not necessary in the closed Calcium Sulfate Landfill (CSL).
- f) EPA contends that surface soil sampling is required in the area of the temporary cap, unless the cap is made permanent.
- g) EPA contends that the former location of the pilot bioremediation cell needs to be characterized and shown on a figure.
- h) Surface soil samples should be collected along the perimeter of the Site at some frequency to assess the potential of off-site migration (i.e., wind dispersion).
- i) Numerous areas with past activities evident in aerial photographs have limited or no sampling. Based on these historic photographs, soil sampling should be included in the following locations:
  - i. Behind, in front of, and between buildings 1, 2, and 3.

- ii. Along tracks behind/beside building 3 where railroad car sat.
- iii. Northeast corner near unknown structure and apparent outfall to east ditch.
- iv. Disturbed area between Plant B tank farm and east ditch.
- v. Near former formaldehyde tank and ammonia tanks at Plant B leach field  
- SE and SW corners of leach field.
- vi. In trench area east of Boiler house.
- vii. Around urea silo.
- viii. Between east warehouse and Plant D where drums were stored.
- ix. South of Plant D and Plant D tank farm.
- x. Plant B tank farm.
- xi. Southwest and southeast of Plant C-1
- xii. Along edge of the containment area where acid pit and lined lagoon

appear

on figures to have extended beyond the current cap.

- xiii. In west ditch wetland.
  - xiv. Between east and west warehouse.
  - xv. Disturbed area of open space east of the containment area shown in 1981 & 1983 photos.
  - xvi. Access area to CSL
  - xvii. Areas not just under buildings, but alongside buildings used for manufacture, storage, or disposal areas.
  - xviii. South of south ditch.
7. Some surface soil samples should be collected in the "Environmental and Open Space Restriction Area" east of the CSL for ecological assessment purposes as well as for human health assessment purposes since this area is the most ecologically significant terrestrial habitat in OU1.
  8. FSP Figure 4.2-1 shows historic subsurface soil samples considered representative of current conditions, but not all these samples are shown on FSP Figure 4.2-6. Why?
  9. Surface water and sediment samples used in the OU1 risk assessment need to be current. If older sediment samples are proposed for risk assessment inclusion there needs to be justification presented that they are in fact representative of current conditions. In general surface water and sediment data older than 1 to 2 years is considered too old for risk assessment purposes. These older samples could be used qualitatively in the narrative, but not quantitatively in the risk assessment calculations.
  10. Sediment samples need to be collected from 0-2.5 inches.
  11. Justification should be provided for the location of proposed surface water and sediment samples (e.g. sediment samples need to be collected in depositional areas; surface water samples need to be co-located with sediment samples).

12. Analyses for proposed surface water and sediment samples is not clear, will “conventional” analyses like hardness, pH, turbidity, TOC , TSS , DO, grain size, etc., be included? These (and other) parameters were included in previous analyses, but not discussed in the Work Plan.
13. Contaminants to be analyzed in surface water and sediment may be adjusted based on results of soil (OU1) and groundwater (OU3) sampling.

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#### **OU2 SPECIFIC COMMENTS**

1. Surface water and sediment samples used in the OU2 risk assessments need to be current. If older sediment samples are proposed for risk assessment inclusion there needs to be justification presented that they are in fact representative of current conditions. In general, surface water and sediment data older than 1 to 2 years is considered too old for risk assessment purposes.
2. Justification should be provided for the location of proposed surface water and sediment samples (e.g. sediment samples need to be collected in depositional areas; surface water samples need to be co-located with sediment samples).
3. Multiple surface water and sediment samples need to be collected for each area – MMB, Sawmill Brook, south ditch, east ditch, west ditch, North Pond, New Boston Street Drain Way, and Hall’s Brook. Soil samples also need to be collected from the former area of North Pond. Historically, the east ditch and the south ditch drained to North Pond. Much of North Pond has since been filled in, but contaminants originating from the Site may still remain.
4. Analyses for proposed surface water and sediment samples are not clear. Will “conventional” analyses like hardness, pH, turbidity, TOC, TSS, DO, grain size, etc., be included? These (and other) parameters were included in previous analyses, but not discussed in the Work Plan.
5. Contaminants to be analyzed in OU2 may be adjusted based on results of soil/sediment (OU1) and groundwater (OU3) sampling.
6. Sediment samples need to be collected from 0-2.5 inches.

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#### **OU3 SPECIFIC COMMENTS**

1. FSP Section 2.2 Conceptual Site Model – Environmental Fate and Transport: All discussion in this section focuses on DAPL and NDMA. While these are important, EPA’s request for additional characterization was to determine the nature and extent

of Site contaminants on the agreed RI analyte list. The continual referral to DAPL and NDMA only serve to distract any focus on other chemicals. Understanding DAPL may help in tracing certain contaminants and/or to identify potential source of groundwater contaminants, but it is not the entire story. Likewise, NDMA may serve as a good fingerprint for material originating from the Site, but it is not the sole indicator. The continuing focus on DAPL, NDMA, and associated DAPL indicator compounds such as sulfate and chloride, coupled with the omission of any substantial discussion or data presentation of other Site contaminants, leads to the assumption that the nature and extent, and fate and transport, of Site contaminants outside of those mentioned above, are not fully characterized or understood.

2. FSP Section 6.1 Proposed Groundwater Monitoring Well Installations – On page 6-1 Olin states that “The horizontal extent of groundwater impacts has been well defined in most areas of the Site.” This should be corrected because the RI Work Plan proposes the horizontal extent of only a select few contaminants, and uses only NDMA to delineate the extent of Site impacts to Groundwater. It is assumed that the proposed field investigations will include all RI analyte chemicals shown on the agreed RI analyte list.
3. FSP Section 6.1 Proposed Groundwater Monitoring Well Installations – There is no clearly articulated program for determining the nature and extent of contamination in bedrock. Section 6.1.1 discusses the addition of one bedrock well but there is no discussion of how this well will be integrated into any sort of defined program to evaluate bedrock or the objectives of a bedrock monitoring program. A number of concerns regarding the integrity of bedrock and its ability to provide a conduit for contaminant migration have been raised during previous document reviews. Of particular concern are those areas of bedrock which underlie and those that are adjacent to groundwater contaminant source pools, as well as the bedrock/slurry wall interface. To date, Olin’s response has been that the scope of previously performed investigations have adequately addressed this issue, i.e. the bedrock saddle investigations and ongoing inductive logging programs. These investigations are useful in understanding bedrock in particular areas of the Site and the elevation of groundwater contaminant source pools over time. However, a clearly defined quantitative program is needed to address the concerns regarding bedrock. Sampling points for a bedrock program should in part, center on known groundwater contaminant source pools and radiate outward until the nature and extent of contaminant impact in bedrock is fully defined. Whenever possible, existing bedrock wells should be utilized, however the number of wells included in the program should fully characterize bedrock with respect to Site contaminants. Additional bedrock wells should be included in the field investigation.
4. FSP Section 6.2.1 – Historical Groundwater Sampling and Analysis – On page 6-5 it is stated that drinking water standards and guidance listed in companion tables are not relevant since most of the property is not a drinking water source area. While there is

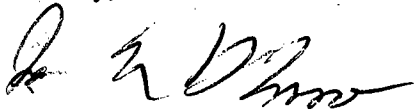
a state established groundwater zone classification which divides the Site into two watersheds (as discussed in OU3 Objectives), there is clear impact from activities originating on the Site to the drinking water aquifer in the Ipswich watershed. Releases from the Site have contaminated the town of Wilmington municipal drinking water wells which are in the Maple Meadow Brook Aquifer in the Ipswich watershed. Active private residential wells are also present in each watershed.

5. FSP Section 6.2.1.1 VOCs – There is a typo when describing Diisobutylene as a mixture of two TMP compounds. The text mentions the same compound twice.
6. FSP Section 6.2.2 Supplemental Conceptual Site Model Information – The additional contour figures display data consistent with the format of the Draft FRI as averages over the last ten years. A specific comment on the Draft FRI was to post actual values or display max and min values, not averages.
7. Summary of groundwater data: FSP Table 6.2-2 provides a summary of existing historical groundwater data. Several Figures throughout the document show historical groundwater data for a select few contaminants of concern or groups of contaminants without comment on whether or not they represent full lists. There are also several figures showing the proposed sample locations for particular groups of contaminants (assumed to be those on the RI analyte list). There is an apparent gap between those presentations of data and the objective of an RI. Figures or tables that show what the proposed data set will consist of at the end of the proposed investigation do not exist in the document and are needed. It is not practical to comment on the adequacy of the proposed sampling plan without an unreasonable amount of labor to dig out this information from the format as presented.
8. Proposed OU3 samples: FSP Table 6.2-4 shows proposed OU3 samples and the rationale for the proposed samples. For many samples, the proposed analyses are limited and the sampling rationale is to confirm prior detections. It is unclear how extensive prior analyses were at each of these wells. Please provide a list of what analytes are included when a general category (SVOCs, VOCs, metals, or inorganics) is checked on FSP Table 6.2-4.
9. FSP Table 6.3-1 - How were the wells for the synoptic water level measurement event selected? There are a large number of wells to choose from and while not every well may need to be measured there should be a logical rationale. Why were some bedrock wells left out?
10. FSP Figure 6.1.1 – Extent of Groundwater impact figure should only show those wells that were used in the delineation along with their respective values.
11. FSP Figure 6.1.2 – Proposed Monitoring well locations appear to be based primarily if not entirely on the interpreted delineation of groundwater impact from Figure 6.1.1. Again, NDMA is only one contaminant of concern, albeit a relatively soluble and mobile contaminant, but should not constitute the sole rationale for proposed monitoring wells as these two figures suggest.

12. FSP Figure 6.1.2 – It is not clear why two very similar monitoring well clusters (GW-400 S/M/D/BR and GW-404 S/M/D) are being located so proximal to each other—approx 150 feet apart in the northeast portion of the Site. Additionally, how was the specific location of these wells selected? The site for these two well clusters appear to have been intentionally located down gradient of the confluence of the Sawmill Brook and Maple Meadow Brook and approximately 1,400 feet away from the current delineated boundary of Site impact. Additional wells should be located in the area between the inferred contour and the residential development to the northwest.
13. FSP Figure 6.2-26 – The concentration of ammonia in GW-45S of 1,240 mg/l and the concentration contour of 10 mg/l appear to conflict.
14. FSP Figure 6.2-26 – The similar concentrations of ammonia in GW-45S (1,240mg/l) and the concentration in GW-62BR (1,244 mg/l) which is possibly screened in DAPL should be explained; it is assumed that the groundwater which GW-45S represents is likely in an advectively controlled environment and presumably originated from a groundwater contaminant source pool. What other analytes was GW-45S sampled for?
15. FSP Figure 6.2-27 – The concentration of 4,086 mg/l of sulfate in GW-62BR seems abnormally high. It is difficult to assume that this does not indicate impact from Site contaminants. What other RI analytes were sampled at this location? This and other data points in bedrock support the need for a comprehensive bedrock investigation program.
16. FSP Figure 6.2-27 – Why were GW-62BR (see previous comment) and GW-65BR not sampled for NDMA?
17. FSP Figure 6.2-32 and 33– Private Drinking water wells are being used to show the limits of the NDMA plume. Are these wells screened within the same formation (deep/shallow overburden)? Specifically on the north side of Maple Meadow Brook, and in the residential area south and west of the Site.
18. FSP Figure 6.2-32 and 33– Areas to the north of the delineation near Main Street, to the North of the delineation in Maple Meadow Brook, to the east of the Site past east ditch and to the south of the delineation near Cook Avenue appear to be overly interpretive.
19. FSP Figure 6.2.34 – Interpreted distribution of Ammonia in deep overburden and shallow overburden groundwater. Locations with detected concentrations of Ammonia (or any compound on any figure) should be shown as green circles and not yellow crosses consistent with other figures. The text regarding EPA “lifetime exposure concentrations” as a justification of this variance should be removed as it is not appropriate and inconsistent with the title of the figure.

Please respond to the written comments contained herein and supply the requested figures and tables by December 19, 2008.

Sincerely,



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

Enclosure

Cc: Wesley Kelman, EPA  
Rick Sugatt, EPA  
Dick Willey, EPA  
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Joe Coyne, MassDEP  
Michael Caira, Town of Wilmington  
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