2-3

100271

WESTON
MANAGERS DESIGNERS/CONSULTANTS

WESTON WAY
WEST CHESTER, PA 19380
PHONE (215) 692-3030
TELEX 83-5348

TRANSMITTAL FORM

To: MS KATE LOSE
U.S. EPA , ROUTING NO. 3-HW-25
841 CHESTNUT STREET BUILDING
PHILADELPHIA PA 19107

Date: 4/30/93
Reference: STANDARD CHLORINE SITE FEASIBILITY STUDY(FS)

W.O. No.: 02267-012-001-0200

Enclosed herewith are the following:

ITEM	REPORT DWG. OR SPEC. NO.	NO. OF COPIES	DESCRIPTION	STATUS
1		5	RESPONSE TO FS COMMENTS	

REMARKS:

Very truly yours,

MICHAEL CORBIN

RFW 04-08-004/B - 5/85

AR307244

Response Summary to DNREC & EPA Comments on the Draft Feasibility Study (FS)
Standard Chlorine of Delaware, Inc. Superfund Site

ATTACHMENT 1 - GENERAL COMMENTS

Remedial Alternatives

1. Comment: Each of the alternatives (with the exception of No Action) must address compliance with ARARS and adequate protectiveness of human health and the environment. In particular, Alternative 2 should be upgraded to comply with this requirement. Please see specific comments in Attachment 2.

   Response: Alternative 2 will be revised to include the installation of additional groundwater extraction to reduce contaminant migration toward Red Lion Creek. Option 2a will be deleted and Option 2b will be revised to become Alternative 2. The additional extraction wells will reduce the contaminant flux from groundwater discharge into Red Lion Creek. A conceptual model will be investigated for use in estimating on a preliminary basis the flux reduction which might be obtained and its resulting effect on surface water quality. The objective of these additional extraction wells is to further address the protection of human health and the environment.

2. Comment: The elevated levels of contaminants in the subsurface soils at the site act as a continuing source of contamination for ground water. Various in situ treatment technologies have been used at numerous other sites as the remedial alternative for subsurface soils. For example, a case study using hot air steam stripping proved to be effective in removing chlorinated benzenes. Based on the information contained in the FS the regulatory agencies do not understand why the technologies that would directly address subsurface soils at the site were eliminated from consideration. Therefore, further explanation as to the reasons for eliminating technologies must be included and if this information does not satisfy the regulatory agencies, at least one of the alternatives discussed in Section 4 and 5 of the Feasibility Study must include one or more of the following technologies:

   - soil vapor extraction
   - soil flushing
   - insitu air/bio sparging
   - insitu steam extraction
   - hot air steam stripping

   This issue should be discussed in more detail at our proposed meeting in April.

   Response: Additional explanation of the reasons for eliminating technologies will be provided. Specifically, the technologies were eliminated during the screening process for the reasons as outlined below:

   - soil vapor extraction - Many of the compounds of concern (trichlorobenzene, tetrachlorobenzene, pentachlorobenzene, hexachlorobenzene) are not volatile enough to be removed by this technology. References will be furnished prior to the May 10 meeting.

AR307245

- soil flushing - The effectiveness of this technology is suspect due to the low water solubility of the contaminants. Solvents that could be employed to increase the fluxing effectiveness would increase the mobility of the chlorobenzenes and could result in migration to other areas of the site or off-site. Recovery of the solvent (water or other) may be problematic. In addition, introduction of solvents may jeopardize the confining unit underlying the Columbia Formation.

- insitu air/bio sparging - This technology is typically applicable to treatment of groundwater. Its applicability to groundwater treatment may be included in Alternative 5 pending the results of the biological treatability study.

- insitu steam extraction - The effectiveness of this technology in removing semivolatile compounds is suspect. The introduction of heat, in the form of steam or hot air, is expected to volatilize these compounds, however, the extraction of these compounds once volatilized has not been consistently demonstrated. As the volatilized compounds move further away from the heat source, they will cool and may condense. These condensed contaminants would travel downward, by gravity, toward the groundwater table and thereby accelerate contamination of groundwater or add to the DNAPL. References will be provided supporting this position prior to the May 10 meeting.

- hot air steam stripping- See above.

3. Comment: On pages ES-3 and 1-23 of the report, a very brief discussion of subsurface soil contamination is presented. It is implied in the FS that because a complete and direct exposure pathway to contaminated subsurface soil does not currently exist at the site, this environmental medium is not considered for remediation. However, while direct contact with subsurface soil may not be a prevailing concern at the site for humans, the following point should be acknowledged:

In the absence of a secure and impermeable cap, subsurface soil will act as a continual source of contamination to underlying ground water. The contaminated groundwater then discharges to the surface water causing potential surface water quality problems as well as ecological impacts in the Red Lion Creek, unnamed tributary, and the wetlands associated with each.

Response: Subsurface soils will be addressed in each of the alternatives. Excavation of subsurface soils involves important considerations with respect to maintaining structural integrity of process units, tanks, building and sewer lines. Excavation of these soils in the rail track area is not feasible due to these structural limitations in addition to the need to maintain on-going rail service which is vital to plant operations. Deep excavation below the bottom of CB-1 would raise significant structural stability concerns. A combination of excavation and capping techniques will be included in the revised alternatives to address the subsurface soils issue and are discussed further in other comment responses in this document.

It should also be noted that contaminants which could migrate from the subsurface soils into groundwater would be address by the groundwater remedial component of each alternative.

Comment: According to page ES-8 of the FS, only those soils containing the "highest" concentrations of contaminants will be removed and treated; any remaining surface soils exceeding response levels will be contained by caps. Please note, however, that typically in the Superfund Program, all soils containing

AR307246

contaminants in excess of health-based, eco-based or ground water protection-based levels, as appropriate, are remediated.

Response: The alternatives, with the exception of the no action alternative, do address those materials above risk-based levels. The alternatives will be revised, part of which will include additional action for subsurface soils including excavation and capping. This action will focus on drainageways and CB-1 where higher concentrations have been found in subsurface soils in some locations.

Comment: Institutional controls such as deed restrictions, fencing, health and safety measures for future excavation activities will be one component of the approach to the remediation of the contaminated soils.

Response: Alternatives 2, 3, 4, and 5 do implement institutional controls as part of their approach. This point will be emphasized.

4. Comment: To assist in the comparative analysis of the alternatives presented in the FS, a table that provides a summary of the various response actions for each of the alternatives should be provided. The mediums under evaluation should include surface soil, sediment, subsurface soil, ground water, and surface water and evaluate human as well as ecological risks. This table should be similar to the attached example from "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive 9355.3-01, October 1988".

   Response: Even though this information is presented in the text of the FS, a table with format similar to that suggested by the referenced guidance document will be prepared for addition to Section 6.

5. Comment: Several (if not all) of the alternatives will cause various degrees of ecological and habitat impacts which have not been addressed in the alternatives discussions. Each of the alternatives should address ramifications to the ecological systems and include ecological restoration efforts. Ecological restoration may be able to be done in such a way as to reduce Operations and Maintenance (O&M) costs.

   Response: The ecological impacts of each alternative have been discussed as part of the alternatives evaluation. Additional discussion will be included when possible in Section 5 of the FS. It should be noted that the estimated costs for ecological restoration are already included in the cost tables for the alternatives. The wetlands have been impacted by the control structure on the Delaware River and any restoration would be to a level comparable to that existing at the present time.

6. Comment: Each of the alternatives should evaluate remedial action for the Catch Basin #1, subsurface soils and DNAPLS. Subsurface soils should be treated as a separate medium in each of the alternatives.

   Response: The alternatives will be modified as appropriate, to further address contamination in CB-1 (Catch Basin 1), subsurface soils, and DNAPLs. Subsurface soils refer to soils found at a depth greater than 3 feet below ground (bgs). Excavation of these soils in the plant area involves important concerns with respect to maintaining structural integrity of nearby buildings, tanks, process units and other improvements. Excavation in the rail track area is not feasible since these lines must remain in service. Subsurface soil remediation must recognize these site limitations. DNAPL recovery and remediation in the environmental field has not been highly successful and is not feasible at most sites. Due to the presence of some DNAPL at the SCD site, attempted recovery of this material is proposed using extraction wells although its success will be very uncertain. The possible use of existing wells equipped with a suitable sump or the design and location of new extraction wells will be determined as part of

AR307247

RD. The alternatives will be revised to include excavation of soils around CB-1 to a depth corresponding to the bottom of the basin followed by backfilling with clean soil and asphalt capping around the basin. Additional excavation to remove higher concentration soils from drainageways followed by infiltration control using a flexible membrane liner (or other comparable material) installed into the ditch will be included to further address subsurface soils. The revisions are as follows:

- Alternative 2 - Option A will be deleted and Option B will be revised to become Alternative 2. The alternative will be revised to include an asphalt cap around CB1 to address the surface and subsurface contamination. Product recovery wells will be added to address DNAPLs. Excavations for soil removal will be closed with a low permeability cover system, including a flexible membrane liner (FML) to minimize infiltration into any remaining contaminated subsurface soils. An enhanced groundwater extraction system will be evaluated to address groundwater discharge to surface water.

- Alternative 3 - Product recovery (DNAPL) wells will be added. Excavation will be closed with a low permeability cover system.

- Alternatives 4 and 5 - No revision will be made.

7. Comment: Each of the alternatives should delineate the amount of waste to be treated, response levels, and time frames for remediation (intermediate as well as final). A table format is suggested.

   Response: The cost tables provided for each of the alternatives identify the amount of materials to be treated. The methodology used to determine the amount of materials requiring treatment will be further explained (i.e., definition of readily accessible, highly contaminated). The time frame for remediation of groundwater will be very lengthy and will not be predicted due to the presence of DNAPLs in groundwater. A tabular format will be added to consolidate and present this information.

8. Comment: Each of the alternatives must provide more detail on the monitoring systems associated with the remedial efforts.

   Response: Monitoring has been included in the O&M portion of the Cost Estimate. This monitoring has been discussed for Alternative 2 (page 5-9) and will be essentially the same for the other alternatives. Additional detail will be provided for this activity, including provision for monitoring for restoration of wetland areas as appropriate.

Groundwater Loadings to Red Lion Creek

1. Comment: The draft FS states that the flux of contaminated groundwater discharging to the unnamed tributary and Red Lion Creek does not result in a significant impact to the surface water quality. This assessment is not substantiated in the Feasibility Study. As we have discussed in the past, modelling of the contaminant loading to the unnamed tributary and the Red Lion Creek should be completed and included in the final report. In our proposed meeting on April 15,1993, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review prior to the meeting.

   Response: We will attempt to estimate the flux of groundwater contaminants into surface water. We will consider using the conceptual estimation method presented by Mike Apgar at a previous meeting, although there may be other approaches we will consider. Since this will be an order of magnitude estimate, we will identify the key assumptions and sensitivities with the selected approach. The primary objective of this analysis is to estimate reductions in contaminant loading to Red Lion Creek and

AR307248

resulting surface water quality. The intent would be to estimate the level of on-site groundwater control needed to achieve acceptable surface water concentrations.

2. Comment: Contamination of ground water should not be dismissed on the basis of protection of human health through the supply of alternative potable health to human receptors. Ground water contamination (i.e., the Columbia aquifer) still carries a serious potential for ecological impacts through groundwater contamination of surface water and wetlands.

   Response: The impacts of groundwater discharge to surface water have not been overlooked. Groundwater inception or extraction to control this discharge is already provided in Alternatives 3, 4, and 5, and is being added to Alterative 2. This point will be further stated.

Soil and Groundwater Cleanup Levels

Comment: Since RI data shows that subsurface soils are contaminated in areas up to 32 feet below ground surface (see page 1-16 of FS), evaluation and consideration of subsurface soils should be performed when evaluating the soil remedial alternatives. Soil clean-up levels for subsurface soils should be estimated to be protective of ground water quality (i.e. eliminate subsurface soil sources). Modelling (such as MULTIMED or Summers Method) must be conducted to develop clean-up levels for the subsurface soils that are protective of ground water as part of the Feasibility Study. EPA's hydrogeologist will work with Standard Chlorine during the process to insure that the modelling satisfies EPA's criteria. In our proposed April 15, 1993, meeting, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review before the meeting.

Response: Additional remedial action to address subsurface soils will be added to the alternatives. The current exposure pathway for subsurface soils is ultimately through surface water; infiltration of precipitation could mobilize contaminants from subsurface soils into groundwater and ground water will migrate to surface water discharge. This exposure pathway is being addressed in all alternatives. Additional remedial action for subsurface soils will be included in the alternatives. Please refer to responses to previous comments 2 and 6.

Archaeological Issues

SCD received a copy of the March 12, 1993, memo from Faye L. Stocum of the Historic Preservation Office regarding the draft Feasibility Study and the Phase 1A Archaeology Survey conducted for the site. DNREC requests that revisions of the Phase IA report in accordance with the comments in the memo be completed, parallel with revisions of the draft FS, and at the same time arrangements for conducting the Phase 1B site work begin. A workplan for the Phase 1B work must be submitted to the Department and EPA for review by April 30, 1993. As we discussed on March 26, 1993, conference calls between representatives of SCD, your archaeological contractor, DNREC and the Office of Historic Preservation to discuss issues may be a way to expedite this activity.

The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

Response: A revised Phase 1A and a Work Plan for Phase 1B will be submitted on or before June 1. Compliance costs cannot be provided as the need or extent of any further archeological evaluation beyond the Phase 1B has not been determined. Costs associated with the Phase 1B will be incurred prior to commencing remedial activities.

AR307249

Bioremediation Treatability Study

The results of the ongoing treatability study should be included in the final FS document if possible, or if not possible as the already agreed upon addendum. Since finalization of the FS is running approximately two weeks behind schedule, it may be possible to incorporate the results of the treatability study directly into the document instead of creating a separate addendum to address the results.

Response: The treatability study is ongoing and the data is expected to be available by early July. The results of the study will be incorporated as an addendum to the FS as they become available and after they are evaluated.

The results will be initially prepared in tabular form for review. If they are favorable and this technology appears viable, then an addendum in report format will be prepared to more fully evaluate this technology.

Textual Comments

Please review the document for typographical errors and incorrect or awkward phrasing. A number of instances were found where small words were apparently missing from the text.

Response: Any of these minor editorial or typographical revisions will be made.

AR307250

Response Summary to DNREC & EPA Comments on the Draft Feasibility Study
Standard Chlorine of Delaware, Inc. Superfund Site

ATTACHMENT 2 - SPECIFIC COMMENTS

EXECUTIVE SUMMARY

1. Comment: Pg. ES-2, paragraph 1. The opening statement should be modified to reflect the intent of the National Contingency Plan regarding remedial alternative selection: The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste (NCP Section 300.430(a)(i)).

   Response: The requested revision will be made.

3. Comment: Pg. ES-3, paragraphs 3 and 4. These paragraphs should be modified to reflect that the soil contamination present at the site is a possible source of groundwater contamination and then surface water contamination, especially the deeper soils at the site in the vicinity of the catch basin no. 1.

   Response: The requested revision will be made.

4. Comment: Pg. ES-3, paragraph 5. Please indicate that the silt fence was installed after the 1986 spill occurred and did not limit the migration of contamination into the Red Lion Creek during the spill.

   Response: The comment will be addressed, although it will be noted that the silt fence did work quite effectively and that majority of the spill was contained in the area of the Unnamed Tributary.

5. Comment: Pg. ES-4, paragraph 4. This paragraph should be amended to include subsurface contamination along the effluent pipeline. In addition a statement concerning the impact of subsurface soils on ground water contamination should be provided.

   Response: The paragraph will be amended to include the conclusions of the effluent pipeline investigation, as stated in the Remedial Investigation Addendum.

6. Comment: Pg. ES-4, paragraph 4. The statement on page ES-4 concerning 'minimal impact of ...to surface water quality...' must be eliminated through out the report. It should be replaced by a discussion of the results of the loading modelling discussed in the General Comments section.

   Response: As noted, we will evaluate the feasibility of preparing a conceptual groundwater flux estimate and review the approach used at a previous meeting by Mike Apgar. The accuracy, limitations, and applicability of this approach must be considered.

7. Comment: Pg. ES-4, paragraph 3. Please note in the paragraph that air exposure from volatilization of soil contamination has been reduced but not eliminated by the installation of the soil pile covers.

   Response: The requested revision will be made.

8. Comment: Pg. ES-4, paragraph 4. Please note in this paragraph that the groundwater samples from the Potomac Formation aquifer were collected from wells located outside the site boundaries.

AR307251

Response: The requested addition will be made.

9. Comment: Pg. ES-5. Alternative 2 - Containment as discussed on page ES-5 is misleading since the alternative does not contain the contamination.

Response: Alternative 2 will be revised as previously noted. The inclusion of additional groundwater extraction wells and additional soil measures are consistent with containment.

10. Comment: Pg. ES-6. Please revise the statement regarding the effectiveness of Alternative 3 in protecting the environment in light of comments in Attachment 2, Section 5, Alternative 3.

Response: See responses for comments in Attachment 2, Section 5, Alternative 3.

11. Comment: Pg. ES-8. "Highest concentration" and "natural attenuation" should be defined.

Response: These terms will be further explained.

12. Comment: Pg. ES-8. Please discuss the time frame needed for the natural attenuation process to degrade the contaminants.

Response: Results of the biological treatability study will be incorporated as an addendum to the FS when available. These results may provide some insight as to the time frame of biological attenuation processes. Other natural attenuation processes (e.g., photolytic degradation, chemical adsorption, etc.) would require extensive experimental research for the appropriate media in order to estimate any further and this could not be completed before submission of the FS.

SECTION 1

1. Comment: Site operational history should include a description of the current and potential markets for the products produced at Standard Chlorine of Delaware. Section 1 should also include an analysis of the contaminants at the site to address the chemical reactions and breakdown products during degradation under anaerobic and aerobic conditions.

Response: SCD will provide additional information for inclusion in the final FS.

2. Comment: Neither in the Remedial Investigation (RI) nor the FS is there information which indicates that actual Dense Non Aqueous Phase Liquid (DNAPL) was measured in any on-site monitoring or extraction well, and yet in the quarterly monitoring reports, several wells are reported with DNAPL. Information should be included in the FS as to which wells have historically contained DNAPL, thickness, and chemical and physical characteristics, if known. The location, thickness, and chemical analysis should be included in a Table and the narrative should discuss their occurrence in Sections 1.4 or 1.5 of the FS. The narrative should in turn cite the Table.

Response: Additional information regarding the known characteristics and location of the DNAPL will be provided using information from the project records to the extent it is available. Unknown characteristics potentially requiring additional definition will be identified and addressed during Remedial Design.

3. Comment: Pg. 1-5, paragraphs 3 and 4. This paragraph should be accompanied with a figure showing the relationship of the Merchantville Formation to the Potomac Formation in the area of the site for clarification.

AR307252

Response: A figure will be provided using information from the RI.

4. Comment: Pg. 1-7, paragraph 3. Please describe the depth to the water table using current monitoring information.

Response: The requested additional information will be provided from the RI.

5. Comment: Pg. 1-10, paragraph 2. This paragraph should be expanded to identify the results of the annual inspections of the new CB1. Are the underground lines discharging to CB1 tested and inspected?

Response: SCD empties and cleans CB1 annually for removal and disposal of accumulated solids. At this time the structural integrity is visually checked. Although past inspections have not been documented. A written record of future inspections will be maintained.

6. Comment: Pg. 1-14. Section 1.5 should include a discussion of the findings of the Effluent Pipeline Investigation.

Response: The requested additional information will be provided.

7. Comment: Pg. 1-15, paragraph 2. Please state to what depth below the seven foot sampling interval samples were obtained.

Response: The additional sampling depth interval information will be provided from RI data.

8. Comment: Pg. 1-17, paragraph 1. Please include the range of contamination values found in the wetland area of the unnamed tributary and south of the diked area.

Response: This additional information on concentration ranges will be provided from the RI.

9. Comment: Pg. 1-17, paragraph. 2. In summarizing the nature and extent of the contamination found at the Red Lion Creek sediments, it is more relevant to the purpose of this narrative to describe the distribution of the contamination (e.g., the furthest downstream extent and detected concentration) in Red Lion Creek. Description of the location of highest contamination of sediment in Red Lion Creek should be discussed as well.

Response: The requested additional information from the RI will be provided.

10. Comment: Pg. 1-17, para 3. Please rewrite the first sentence to explain that interstitial water was sampled in the sedimentation basin monitoring zone, not surface water. the wording of this sentence has caused some confusion during review.

Response: The requested revision will be made.

11. Comment: Pg. 1-18, paragraph 2. Please state that the explanation of DNAPL migration direction is based on current knowledge of the structural surface of the top of the confining unit.

Response: This additional explanation will be provided.

AR307253

12. Comment: Pg. 1-19, paragraph 3. Please describe briefly the locations of the wells in the site vicinity used to monitor the Potomac Formation aquifer.

Response: An additional figure from the RI will be provided.

13. Comment: Please include site maps defining the areas delineated by the response levels in this section.

Response: Response levels are presented in Section 2. Inclusion of site maps in this Section 1 would confuse the reader.

14. Comment: Pg. 1-19 and 1-20. Non-carcinogenic and carcinogenic risks, as determined by the Baseline Risk Assessment (BLRA) are discussed in this section. While it is recognized that future potential use of ground water as a potable source at the site is not probable, the risks associated with this pathway (as calculated in the BLRA) should be provided (quantitatively) in the FS.

Response: Additional discussion from the BLRA will be included here.

15. Comment: Pg. 1-23, paragraph. 2. No discussion is provided in this report as to the important part that these contaminated subsurface soils would play as a continual source to ground water contamination.

Response: Additional discussion of this potential migration pathway will be provided.

16. Comment: Pg. 1-23, paragraph 6. The integrity of the cover over the soil piles and its ability to reduce the migration of contaminants due to volatilization and the durability of the cover should be discussed. Please state also that the soil pile covers were approved by DNREC as a temporary measure, not a final measure.

Response: Additional discussion of the soil pile covers will be provided.

17. Comment: Pg. 1-23, paragraph 1. Please address subsurface contamination in the vicinity of the effluent underground pipeline. This section should also note that although there may not be direct receptors, the subsurface contamination is a source of ground water contamination.

Response: See response to Attachment II, Executive Summary, Comment 5.

SECTION 2

1. Comment: Pg. 2-2. The remedial action objective of preventing exposure to groundwater/surface water containing organic compounds in excess of the risk-based or ARAR-based action levels should be included in this section.

Response: The requested revision will be made.

2. Comment: Pg. 2-5, Table 2-1. The list of ARARs should include the Coastal Zone Management Act for Location. Please also review the list of ARARs to make sure that necessary ecological ARARs have been included.

Response: The list will be reviewed to identify any additional ecological inclusions.

AR307254

3. Comment: Pg. 2-5, Table 2-1. Please review the Table and correct the names of the appropriate Delaware regulations. Additional regulations that should be included are: Delaware Regulations Governing the Use of Subaqueous Lands, amended 9/92; Delaware Wetlands Act of 1973, revised 6/84; Delaware Regulations Governing Sediment and Stormwater Control; State of Delaware Regulations Governing the Construction of Water Wells; Delaware Coastal Zone Act, amended 9/92; Delaware Executive Order 56 on Freshwater Wetlands; State of Delaware Regulations for licensing Water Well Contractors, Pump Installers, Contractors, Well Drillers, and Well Drivers; Delaware Regulations Governing the Allocation of Water; Delaware Regulations Governing Control of Water Pollution; Delaware Sediment and Stormwater Regulations; Delaware Regulations Governing Hazardous Substance Cleanup; Delaware Environmental Protection Act; 7 Del. Code, Chap. 63.

   Response: The requested revisions will be made. Only promulgated regulations (not acts) will be added. We have requested assistance from DNREC in obtaining copies of several of these cited regulations.

4. Comment: ARARs should not be distinguished as to applicability or appropriateness and relevance.

   Response: This distinction must be provided as part of ARARs analysis in order to perform the alternatives evaluation to inform the reader how the regulation would be applied to remedial actions proposed at the site. or whether the regulation is relevant or appropriate.

5. Comment: Pg. 2-7, paragraph 4. Please revise the third sentence to reflect the uncertainty or apparent nature of the conclusion regarding the limitation of the groundwater contamination to the shallow Columbia Formation aquifer.

   Response: There is no evidence that there is contamination in the upper Potomac Formation aquifer, and therefore, this sentence is appropriate.

6. Comment: Pg. 2-9, Table 2-2. As of December, 1992, 1 ug/l is the final (rather than the proposed) Maximum Contaminant Level (MCL) for hexachlorobenzene. Table 2-5 should also be modified to reflect this point.

   Response: The requested revision will be made.

7. Pg. 2-9, Table 2-2. The MCL for 1,2,4-trichlorobenzene is 70 ug/l.

   Response: The requested revision will be made.

8. Comment: Pg. 2-10, Table 2-3. Please review the table in light of the newly revised Delaware Surface Water Quality Standards (February, 1993).

   Response: The table will be reviewed and revised as appropriate.

9. Comment: Pg. 2-29. According to page 2-29, for carcinogens, response levels equivalent to a cancer risk of 1.0E-05 were established for the site. Please note, however, that EPA's point-of-departure for carcinogenic risk is 1.0E-06, with the potentially acceptable range being from 1.0E-06 to 1.0E-04, depending upon site-specific conditions. In any case, it is EPA's site manager who determines acceptable risk, not the PRP.

   Response: This will be noted.

10. Comment: On page 2-30 of the report, it appears as though a total clean-up level of 625 mg/kg was calculated for soil contaminants at the site. However, this approach for establishing remediation goals is inappropriate, since it assumes that all contaminants are of equal toxicity or carcinogenic potential. Clean-up levels must be derived for each contaminant of concern at the site.

Response: The response levels do take into account the varying toxicities of the different contaminants and are therefore appropriate.

SECTION 3

1. Comment: A more detailed rationale for elimination of technologies should be included in the text discussions. In some instances the reasons given for elimination were not convincing. For example, sufficient rationale for eliminating solvent rinsing/soil washing was not provided on page 3-39 and 3-40.

Response: The discussions will be checked for consistency, and additional discussion will be provided where necessary.

2. Comment: Soil washing, soil flushing, insitu steam/hot air injection with vapor extraction appear to be viable alternatives for soil remediation and must be evaluated more thoroughly (page 3-58, 59).

Response: See response to Attachment I, Remedial Alternatives, Comment 2.

3. Comment: Air sparging and bio sparging for remediation of contaminated groundwater appear to be viable technologies and should be evaluated in the FS.

Response: See response to Attachment I, Remedial Alternatives, Comment 2.

4. Comment: Pg. 3-15, paragraph 1. The practical depth limitation of a slurry wall is stated to be 25 feet. This is incorrect. Slurry walls will be extended up to 150 feet, depending on site conditions.

The greatest recorded depth to the Merchantville/Potomac Clay at the site is over 70 feet. Slurry walls will be constructed to this depth and at even greater depths. Consequently, depth is not a limiting factor as far as engineering feasibility.

5. Comment: Pg. 3-51, Table 3-3. Please revise this table for depth of slurry walls as discussed in the above comment.

Response: Construction of slurry walls to depths greater than ___ feet require specialized equipment and entail a much higher cost. This screening discussion will be expanded in the text.

6. Comment: Pg 3-15 and Table 3-3. For Interceptor Trenches discussed in this Table and on page 3-15: A more detailed description of the depth limitation of 25 feet should be provided in the narrative. The importance of identifying whether the limitation in depth for this technology is associated with current engineering technology and equipment or cost. A specific detailed discussion must be provided as to engineering difficulties that would make it difficult if not impossible to implement.

AR307256

Response: Construction of deep interception trenches involve additional complexity with respect to showing and dewatering and a much greater cost. This discussion will be expanded in the text on screening.

7. Comment: Pg. 3-38, paragraph 1. Please define KPEG.

Response: Direct contact with surface soils is one of the primary human health exposure pathways of concern. The volume and location of soil or sediments to be excavated, consolidate or treated hs be included in the cost estimate tables and shown graphically in figures in Section 5.

8. Comment: Pg. 3-62, Table 3-5. Please include in the FS a figure(s) to accompany this table. Rationale for depth of area must be provided. Subsurface contaminated soils must be included in the volume calculations. It is recommended that a similar table be generated for each of the alternatives discussed in Section 4, to include volume of treatment for ground water, surface soils, subsurface soils, sediments. Area of capping should also be provided where appropriate.

Response: A figure will be provided to delineate these areas. Because the response levels are risk-based, the rationale for defining surface soils to a depth of 3 feet is based on the definition of surface soils used during risk assessment.

SECTION 4

1. Comment: In the development and screening of Remedial Alternatives, each of the alternatives (with the exception of No Action) must satisfy minimum criteria as described below:

a) must provide adequate protection of human health and the environment; and

b) must meet the requirements of all federal and state ARARS.

In addition, each of the alternatives must provide information on the amount of waste/media to be treated, duration of clean-up, time frames for treatment, achievable intermediate and final clean-up levels.

Response: See responses to Attachment I, Remedial Alternatives, Comments 6 and 7.

2. Comment: Each alternative must provide a discussion and address remediation of subsurface soils, CB1, and DNAPL(s).

Response: Alternatives 2 and 3 will be revised to address additional subsurface soils at CB-1 and in drainageways where they have been identified. The DNAPL recovery wells now included in Alternative will also be included in Alternatives 2 and 3. See response to Attachment I, Remedial Alternatives, Comment 6.

3. Comment: Inconsistency of approach in discussing implementability, effectiveness, and cost of the various alternatives makes it very difficult to compare them. Please review these section and make them consistent in approach.

Response: The approach will be examined to make it more consistent.

AR307257

4. Comment: Please describe the difference between "readily accessible, highly contaminated soils" and "sediments and soils exceeding response levels" in the beginning of the section. Some of the discussions are confusing without a clear distinction.

Response: These terms will be defined for each alternative. In short, readily accessible, highly contaminated soils refers to those soils that 1) are accessible without moving plant equipment (does not include the railroad track area), and 2) exhibit a high concentration of contaminants. Readily accessible, highly contaminated sediments refers to those sediments that 1) are accessible for removal to excavation equipment from the shoreline, and 2) exhibit a high concentration of contaminants. Areas containing soils and sediments of high concentration refers to those areas where materials consistently exceed response levels.

5. Comment: Please define the depth used in describing surface soils and reasons for it early in this section. The discussions are unclear until Table 4-5 is reached and even then it is unclear why the depth of 3 feet is used.

Response: See response to Attachment II, Section 3, Comment 8.

6. Comment: Pg. 4-3, Table 4-1. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the soil alternatives? Please include a discussion in the text.

Response: These technologies are factored in to the alternatives. As noted on Tables 4-1 and 4-2, these technologies are represented by similar technologies (thermal desorption and biological treatment, respectively). This is done to allow decision-makers more flexibility when issuing a ROD. For instance, the ROD could identify biological treatment as the preferred technology, but allow for flexibility in the implementation of the technology (solid phase biological treatment or reductive dechlorination could be implemented).

7. Comment: Pg. 4-5, Table 4-2. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the sediment alternatives? Please include a discussion in the text.

Response: See the response to Attachment II, Section 4, Comment 6.

8. Comment: Pg. 4-6. Table 4-3. Why were biological treatment (aerobic/anaerobic) and chemical/physical treatment (adsorption using synthetics) not factored into the groundwater alternatives? Please provide a discussion in the text.

Response: See the response to Attachment II, Section 4, Comment 6.

9. Comment: Pg. 4-17, paragraph 4. Please provide a reference for the thermal description treatability study.

Response: The requested reference will be provided.

SECTION 5

Overall Comments

1. Comment: All alternatives must discuss remediation of subsurface soils, DNAPLS, and CB1. Based on historical data, the Catch Basin appears to be a continuing source of. contamination and each of the alternatives must address a means of remediating/containing the contamination.

   Response: Subsurface soils in drainage ditches and CB-1 will be included in Alternatives 2 and 3. The DNAPL Recovery wells in Alternative 4 will also be included in Alternatives 2 and 3. See response to Attachment I, Remedial Alternatives, Comment 6.

2. Comment: For evaluation purposes Section 5 should include calculations of cubic yards, gallons, etc. of soil to be treated, capped, contained. Use of a table for each of the alternatives is recommended.

   Response: The volumes of material to be treated under each alternative is already presented graphically on the figures, and quantitatively on the cost tables for each alternative.

3. Comment: The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

   Response: See response to Attachment I, Archeological Issues.

4. Comment: Terms such as "readily accessible" and "highly contaminated" must be clearly defined whenever they are used.

   Response: See response to Attachment II, Section 4, Comment 4.

5. Comment: Pg. 5-2, paragraph 1. Please define ROD.

   Response: The requested definition will be provided

Alternative 1

Comment: Pg. 5-7 The rate of the passive biodegradation mechanism should be incorporated in the text.

Response: The bench scale treatability study currently underway should provide information on bioremediation rates and mechanisms. The results of this testing will be available as an addendum to the FS. See response to Attachment II, Executive Summary, Comment 12.

Alternative 2

1. Comment: Alternative 2 must comply with ARARs and it does not currently appear to do so. Please modify this alternative so that it does comply with ARARS.

   Response: Alternative 2 will be revised to include additional groundwater extraction wells to limit the lateral movement of shallow groundwater and discharge into surface water thereby further addressing the surface water quality ARAR. See response to Attachment I, Remedial Alternatives, Comment 6.

AR307259

2. Comment: Page 5-7 is incorrect when it states that Alternative 2 will provide on-site containment. This alternative does not adequately provide for on-site containment. This alternative would more appropriately be labeled "Limited Action" in that it only provides for limited action above and beyond the existing pump and treat and monitoring system.

   Response: With the addition of control measures for subsurface soil at CB-1 and drainageways in addition of DNAPL recovery and groundwater extraction wells further containment of contaminants will be achieved. See response to Attachment I, Remedial Alternatives, Comment 6.

3. Comment: Pg. 5-13, paragraph 4. The statement is made that " ... final capping and closure will address the RCRA design criteria for surface impoundment closure". This is incorrect (see 40 CFR Ch.1 Section 264.228).

   Response: The final cover for Alternative 2 will consist of a multilayer cap which will address RCRA design criteria. The basin material will be stabilized to provide sufficient bearing strength to support the final cover. This will be clarified in the FS text.

Alternative 3

1. Comment: Alternative 3 does not adequately address remediation of the sediments in the unnamed tributary. Figure 5-6 identifies areas along the sides of the unnamed tributary to be excavated. Analytical results from the RI reveal that most sampling locations downgradient of the soil dike are contaminated. This alternative must provide an option for excavation and treatment of sediments above response levels.

   Response: Removal of these additional wetland sediments will create an adverse ecological impact in these areas due to destruction of habitat, disturbance by heavy construction equipment and sediment transport. Operation of excavation equipment in these soft sediments is also problematic and may require placement of temporary access roads which would cause additional ecological impact.

2. Comment: On page 5-20, a slurry wall should be included as an alternative for containing groundwater. Please discuss briefly possible contingency measures for treatment of off-gases in the event that production processes are curtailed and the discharge will no longer be burned in the boilers. In addition, please reference documentation that the boilers will effectively destroy/remove the volatile and semi-volatile constituents.

   Response: Slurry walls are a method for limiting lateral groundwater migration, and their feasibility is dependent upon site geologic conditions. For the SCD site, a successful slurry wall would have to be combined with groundwater recovery via recovery wells or an interception trench. Otherwise, groundwater movement could occur around the limits of the slurry wall or the additional head could drive groundwater vertically into the deeper aquifer. Slurry walls could be substituted for the interceptor trench as the commentor indicates. As set forth in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", representative process options are selected to represent process options that are sufficiently similar. The ROD, if worded with enough flexibility, will allow the implementation of either process option. During the remedial design, it could then be decided whether to implement an interceptor trench system, or a slurry wall system. This type of flexible wording is recommended.

   Contingency measures for off-gas treatment will be briefly discussed. The boilers are currently destroying the compounds that are expected to result from remedial action. This is evidenced by the fact that there are no air permit violations from the boiler.

AR307260

3. Comment: Pg. 5-23. Please discuss briefly alternative technologies (other that air stripping) if it could be used for treating wastewater, which in turn will treat contaminated ground water. Please let DNREC know if SCD believes that the recent events regarding the NPDES effluent discharge permit will have any effects on the Feasibility Study.

   Response: Other technologies that could be used will be discussed briefly. SCD believes that the recent events regarding the NPDES effluent discharge will not effect the FS.

4. Comment: Pg. 5-23. Details on volume of soil to be excavated and stabilized should be provided. Table 3-5 suggests excavation to a depth of 3 feet, whereas sample location #SS-29 showed contamination to a depth of five feet.

   Response: See response to Attachment II, Section 3, Comment 8.

5. Comment: Pgs. 5-22, 5-24, Figures 5-4 and 5-5. Concern has arisen that care should be taken in choosing the location of the interceptor trench in that it should be located out of the flood plain and at a higher elevation than the expected ground water seasonal high. Please clarity the figures and text.

   Response: The current location of the interceptor trench, as depicted on Figure 5-4, is conceptual in nature. The information required to determine the exact location of the interceptor trench must be collected during remedial design.

6. Comment: Please discuss in more detail the effectiveness of the interceptor trench in controlling the seeps.

   Response: The requested discussion will be incorporated.

7. Comment: Please include a more detailed discussion about the liner proposed for the interceptor trench and the ramifications of either including the liner in the alternative or not.

   Response: The requested discussion will be incorporated.

8. Comment: The new silt fence discussed on page 5-32 will only minimize migration and should only be considered as an interim measure as opposed to a permanent solution.

   Response: The installation of a new silt, and proper maintenance of the fence, will serve as a long term mitigation of the risks associated with these sediments.

9. Comment: Rationale for the extent of the asphalt cap around the catch basin should be included in the description.

   Response: The rationale will be provided. The cap will be installed to an areal extent that joins with other asphalt covered areas in the vicinity.

10. Comment: Justification and rationale for placement of manholes 300 feet apart for the interceptor trench should be included in the description.

    Response: See response to Attachment II, Section 5, Alternative 3, Comment 5.

AR307261

Alternative 4

1. Comment: Pg. 5-39. The technology for treatment of contaminated ground water must be delineated.

   Response: The agencies need to realize that this is an operating manufacturing facility, subject to process changes. Although air stripping is currently employed, the facility must have the ability to evaluate and implement other technologies for effectiveness or economic considerations. In this event, the agencies will be given proper notice, and will evaluate the new treatment scheme with respect to the remedial actions presented in the FS.

2. Comment: Provide more detail on the LTTT, size of unit, flow input, management of contaminated media, etc.

   Response: More information concerning thermal desorption will be provided. However, many of these details would be appropriately during the RD phase. The agencies are reminded that several implementations of thermal desorption exist (LTTT, XTRAX, and others) and therefore only generalizations will be provided.

3. Comment: Please expand the description of free product recovery.

   Response: More detail will be provided.

4. Comment: Pg. 5-40, Figure 5-7. Concern exists that the recovery well locations proposed in Figure 5-7 may not encounter free organics because the distribution of the free organics on this site did not coincide with the contouring of the confining unit (see Fig. 3-6, RI report). Therefore it appears that recovery well locations should be placed near and down-slope of monitoring wells TW-5, TW-28, TW-30 (ones that have shown free organics since 1988). Please indicate uncertainty as to number and location of Product Recovery wells.

   Response: As with the location of the interceptor trench, the location of the product recovery wells is only presented on a conceptual basis. However, the location of these wells will be moved closer to the cited wells.

5. Comment: Pg. 5-40, Figure 5-7. Please depict the existing wells which have historically contained DNAPL directly on this figure.

   Response: A figure, depicting these wells will be presented in Section 1.

Alternative 5

Comment: The results of the Bioremediation Treatability Study must be submitted with the revised FS to demonstrate its application and limitation.

Details on ultimate disposition of soil piles after bioremediation should be included.

Response: Results of the biological treatability study will be incorporated as they are made available. At this time, more details concerning Alternative 5 will be provided.

AR307262

SECTION 6

Comment: Pg. 6-2. it is mentioned that the on-site groundwater is expected to meet MCLs over the long term. An approximate time frame should be furnished for each alternative.

Response: See response to Attachment I, Remedial Alternatives, Comment 7.

AR307263

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
DIVISION OF AIR AND WASTE MANAGEMENT
715 GRANTHAM LANE
NEW CASTLE, DELAWARE 19720-4801

WASTE MANAGEMENT SECTION
SUPERFUND BRANCH

TELEPHONE: (302) 323 - 4540
FAX: (302) 323 - 4561

March 31, 1993

Mr. Paul Johnston
Standard Chlorine of Delaware, Inc.
Governor Lea Road
P.O. Box 319
Delaware City, Delaware 19706

SUBJECT: Comments on the Draft Feasibility Study
Standard Chlorine of Delaware, Inc. Superfund Site
Delaware City, New Castle County, Delaware

Dear Mr. Johnston:

Attached are comments from the Delaware Department of Natural Resources and Environmental Control (DNREC) and the U.S. EPA on the draft Feasibility Study document submitted to the agencies by Standard Chlorine of Delaware, Inc. (SCD). General comments are attached first and specific comments are attached second.

DNREC would like to propose a meeting to discuss any questions about these comments between representatives of the regulatory agencies, SCD and its consultant, Weston, after you have had the opportunity to review this letter. April 15, 1993, is suggested as a possible date. Please contact me at 323-4540 to discuss such a meeting.

The revised version of the Feasibility Study should be submitted to the Department by April 30, 1993.

Sincerely,

Anne V. Hiller
Environmental Scientist III
Superfund Branch

Attachments

AVH:avh/dw
AVH93025.wp

pc: Kate Lose (3HW42)
N.V. Raman
Karl Kalbacher

Delaware's good nature depends on you! AR307264

ATTACHMENT 1
General Comments on the Draft Feasibility Study (FS)
Standard Chlorine of Delaware, Inc. Superfund Site

Remedial Alternatives

1. Each of the alternatives (with the exception of No Action) must address compliance with ARARS and adequate protectiveness of human health and the environment. In particular, Alternative 2 should be upgraded to comply with this requirement. Please see specific comments in Attachment 2.

2. The elevated levels of contaminants in the subsurface soils at the site act as a continuing source of contamination for ground water. Various insitu treatment technologies have been used at numerous other sites as the remedial alternative for subsurface soils. For example, a case study using hot air steam stripping proved to be effective in removing chlorinated benzenes. Based on the information contained in the FS the regulatory agencies do not understand why the technologies that would directly address subsurface soils at the site were eliminated from consideration. Therefore, further explanation as to the reasons for eliminating technologies must be included and if this information does not satisfy the regulatory agencies, at least one of the alternatives discussed in Section 4 and 5 of the Feasibility Study must include one or more of the following technologies:

   - soil vapor extraction
   - soil flushing
   - insitu air/bio sparging
   - insitu steam extraction
   - hot air steam stripping

   This issue should be discussed in more detail at our proposed meeting in April.

3. On pages ES-3 and 1-23 of the report, a very brief discussion of subsurface soil contamination is presented. It is implied in the FS that because a complete and direct exposure pathway to contaminated subsurface soil does not currently exist at the site, this environmental medium is not considered for remediation. However, while direct contact with subsurface soil may not be a prevailing concern at the site for humans, the following point should be acknowledged:

   In the absence of a secure and impermeable cap, subsurface soil will act as a continual source of contamination to underlying ground water. The contaminated groundwater then discharges to the surface water causing potential surface water quality problems as well as ecological impacts in the Red Lion Creek, unnamed tributary, and the wetlands associated with each.

   According to page ES-8 of the FS, only those soils containing the "highest" concentrations of contaminants will be removed and treated; any remaining surface soils exceeding response levels will be contained by caps. Please note, however, that typically in the Superfund Program, *all* soils containing contaminants in excess of health-based, eco-based or ground water protection-based levels, as appropriate, are remediated.

   Institutional controls such as deed restrictions, fencing, health and safety measures for future excavation activities can be one component of the approach to the remediation of the contaminated soils.

4. To assist in the comparative analysis of the alternatives presented in the FS, a table that provides a summary of the various response actions for each of the alternatives should be provided. The

AR307265

mediums under evaluation should include surface soil, sediment, subsurface soil, ground water, and surface water and evaluate human as well as ecological risks. This table should be similar to the attached example from "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive 9355.3-01, October 1988".

5. Several (if not all) of the alternatives will cause various degrees of ecological and habitat impacts which have not been addressed in the alternatives discussions. Each of the alternatives should address ramifications to the ecological systems and include ecological restoration efforts. Ecological restoration may be able to be done in such a way as to reduce Operations and Maintenance (O&M) costs.

6. Each of the alternatives should evaluate remedial action for the Catch Basin #1, subsurface soils and DNAPLs. Subsurface soils should be treated as a separate medium in each of the alternatives.

7. Each of the alternatives should delineate the amount of waste to be treated, response levels, and time frames for remediation (intermediate as well as final). A table format is suggested.

8. Each of the alternatives must provide more detail on the monitoring systems associated with the remedial efforts.

Groundwater Loadings to Red Lion Creek

1. The draft FS states that the flux of contaminated groundwater discharging to the unnamed tributary and Red Lion Creek does not result in a significant impact to the surface water quality. This assessment is not substantiated in the Feasibility Study. As we have discussed in the past, modelling of the contaminant loading to the unnamed tributary and the Red Lion Creek should be completed and included in the final report. In our proposed meeting on April 15, 1993, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review prior to the meeting.

2. Contamination of ground water should not be dismissed on the basis of protection of human health through the supply of alternative potable health to human receptors. Ground water contamination (i.e., the Columbia aquifer) still carries a serious potential for ecological impacts through groundwater contamination of surface water and wetlands.

Soil and Groundwater Cleanup Levels

Since RI data shows that subsurface soils are contaminated in areas up to 32 feet below ground surface (see page 1-16 of FS), evaluation and consideration of subsurface soils should be performed when evaluating the soil remedial alternatives. Soil clean-up levels for subsurface soils should be estimated to be protective of ground water quality (i.e. eliminate subsurface soil sources). Modelling (such as MULTIMED or Summers Method) must be conducted to develop clean-up levels for the subsurface soils that are protective of ground water as part of the Feasibility Study. EPA's hydrogeologist will work with Standard Chlorine during the process to insure that the modelling satisfies EPA's criteria. In our proposed April 15, 1993, meeting, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review before the meeting.

Archaeology Issues

SCD received a copy of the March 12, 1993, memo from Faye L. Stocum of the Historic Preservation Office regarding the draft Feasibility Study and the Phase IA Archaeology Survey conducted for the site. DNREC requests that revisions of the Phase 1A report in accordance with the comments in the memo be completed, parallel with revisions of the draft FS, and at the same time arrangements for conducting the Phase IB site

AR307266

work begin. A workplan for the Phase IB work must be submitted to the Department and EPA for review by April 30, 1993. As we discussed on March 26, 1993, conference calls between representatives of SCD, your archaeological contractor, DNREC and the Office of Historic Preservation to discuss issues may be a way to expedite this activity.

The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

Bioremediation Treatability Study

The results of the ongoing treatability study should be included in the final FS document if possible, or if not possible as the already agreed upon addendum. Since finalization of the FS is running approximately two weeks behind schedule, it may be possible to incorporate the results of the treatability study directly into the document instead of creating a separate addendum to address the results.

Textual Comments

Please review the document for typographical errors and incorrect or awkward phrasing. A number of instances were found where small words were apparently missing from the text.

AR307267

ATTACHMENT 2
Specific Comments on the Draft Feasibility Study
Standard Chlorine of Delaware, Inc. Superfund Site

EXECUTIVE SUMMARY

1. Pg. ES-2, paragraph 1. The opening statement should be modified to reflect the intent of the National Contingency Plan regarding remedial alternative selection: The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste (NCP Section 300.430(a)(i)).

3. Pg. ES-3, paragraphs 3 and 4. These paragraphs should be modified to reflect that the soil contamination present at the site is a possible source of groundwater contamination and then surface water contamination, especially the deeper soils at the site in the vicinity of the catch basin no. 1.

4. Pg. ES-3, paragraph 5. Please indicate that the silt fence was installed after the 1986 spill occurred and did not limit the migration of contamination into the Red Lion Creek during the spill.

5. Pg. ES-4, paragraph 4. This paragraph should be amended to include subsurface contamination along the effluent pipeline. In addition a statement concerning the impact of subsurface soils on ground water contamination should be provided.

6. Pg. ES-4, paragraph 4. The statement on page ES-4 concerning "minimal impact of ...to surface water quality..." must be eliminated through out the report. It should be replaced by a discussion of the results of the loading modelling discussed in the General Comments section.

7. Pg. ES-4, paragraph 3. Please note in the paragraph that air exposure from volatilization of soil contamination has been reduced but not eliminated by the installation of the soil pile covers.

8. Pg. ES-4, paragraph 4. Please note in this paragraph that the groundwater samples from the Potomac Formation aquifer were collected from wells located outside the site boundaries.

9. Pg. ES-5. Alternative 2 - Containment as discussed on page ES-5 is misleading since the alternative does not contain the contamination.

10. Pg. ES-6. Please revise the statement regarding the effectiveness of Alternative 3 in protecting the environment in light of comments in Attachment 2, Section 5, Alternative 3.

11. Pg. ES-8. "Highest concentration" and "natural attenuation" should be defined.

12. Pg. ES-8. Please discuss the time frame needed for the natural attenuation process to degrade the contaminants.

SECTION 1

1. Site operational history should include a description of the current and potential markets for the products produced at Standard Chlorine of Delaware. Section 1 should also include an analysis of the contaminants at the site to address the chemical reactions and breakdown products during degradation under anaerobic and aerobic conditions.

AR307268

2. Neither in the Remedial Investigation (RI) nor the FS is there information which indicates that actual Dense Non Aqueous Phase Liquid (DNAPL) was measured in any on-site monitoring or extraction well, and yet in the quarterly monitoring reports, several wells are reported with DNAPL. Information should be included in the FS as to which wells have historically contained DNAPL, thickness, and chemical and physical characteristics, if known. The location, thickness, and chemical analysis should be included in a Table and the narrative should discuss their occurrence in Sections 1.4 or 1.5 of the FS. The narrative should in turn cite the Table.

3. Pg. 1-5, paragraphs 3 and 4. This paragraph should be accompanied with a figure showing the relationship of the Merchantville Formation to the Potomac Formation in the area of the site for clarification.

4. Pg. 1-7, paragraph 3. Please describe the depth to the water table using current monitoring information.

5. Pg. 1-10, paragraph 2. This paragraph should be expanded to identify the results of the annual inspections of the new CB1. Are the underground lines discharging to CB1 tested and inspected?

6. Pg. 1-14. Section 1.5 should include a discussion of the findings of the Effluent Pipeline Investigation.

7. Pg. 1-15, paragraph 2. Please state to what depth below the seven foot sampling interval samples were obtained.

8. Pg. 1-17, paragraph 1. Please include the range of contamination values found in the wetland area of the unnamed tributary and south of the diked area.

9. Pg. 1-17, paragraph. 2. In summarizing the nature and extent of the contamination found at the Red Lion Creek sediments, it is more relevant to the purpose of this narrative to describe the distribution of the contamination (e.g., the furthest downstream extent and detected concentration) in Red Lion Creek. Description of the location of highest contamination of sediment in Red Lion Creek should be discussed as well.

10. Pg. 1-17, para 3. Please rewrite the first sentence to explain that interstitial water was sampled in the sedimentation basin monitoring zone, not surface water. the wording of this sentence has caused some confusion during review.

11. Pg. 1-18, paragraph 2. Please state that the explanation of DNAPL migration direction is based on current knowledge of the structural surface of the top of the confining unit.

12. Pg. 1-19, paragraph 3. Please describe briefly the locations of the wells in the site vicinity used to monitor the Potomac Formation aquifer.

13. Please include site maps defining the areas delineated by the response levels in this section.

14. Pg. 1-19 and 1-20. Non-carcinogenic and carcinogenic risks, as determined by the Baseline Risk Assessment (BLRA) are discussed in this section. While it is recognized that future potential use of ground water as a potable source at the site is not probable, the risks associated with this pathway (as calculated in the BLRA) should be provided (quantitatively) in the FS.

15. Pg. 1-23, paragraph. 2. No discussion is provided in this report as to the important part that these contaminated subsurface soils would play as a continual source to ground water contamination.

16. Pg. 1-23, paragraph 6. The integrity of the cover over the soil piles and its ability to reduce the migration of contaminants due to volatilization and the durability of the cover should be discussed. Please state also that the soil pile covers were approved by DNREC as a temporary measure, not a final measure.

17. Pg. 1-23, paragraph 1. Please address subsurface contamination in the vicinity of the effluent underground pipeline. This section should also note that although there may not be direct receptors, the subsurface contamination is a source of ground water contamination.

SECTION 2

1. Pg. 2-2. The remedial action objective of preventing exposure to groundwater/surface water containing organic compounds in excess of the risk-based or ARAR-based action levels should be included in this section.

2. Pg. 2-5, Table 2-1. The list of ARARs should include the Coastal Zone Management Act for Location. Please also review the list of ARARs to make sure that necessary ecological ARARs have been included.

3. Pg. 2-5, Table 2-1. Please review the Table and correct the names of the appropriate Delaware regulations. Additional regulations that should be included are: Delaware Regulations Governing the Use of Subaqueous Lands,amended 9/92; Delaware Wetlands Act of 1973, revised 6/84; Delaware Regulations Governing Sediment and Stormwater Control; State of Delaware Regulations Governing the Construction of Water Wells; Delaware Coastal Zone Act, amended 9/92; Delaware Executive Order 56 on Freshwater Wetlands; State of Delaware Regulations for Licensing Water Well Contractors, Pump Installers, Contractors, Well Drillers, and Well Drivers; Delaware Regulations Governing the Allocation of Water; Delaware Regulations Governing Control of Water Pollution; Delaware Sediment and Stormwater Regulations; Delaware Regulations Governing Hazardous Substance Cleanup; Delaware Environmental Protection Act; 7 Del. Code, Chap. 63.

4. ARARs should not be distinguished as to applicability or appropriateness and relevance.

5. Pg. 2-7, paragraph 4. Please revise the third sentence to reflect the uncertainty or apparent nature of the conclusion regarding the limitation of the groundwater contamination to the shallow Columbia Formation aquifer.

6. Pg. 2-9, Table 2-2. As of December, 1992, 1 μg/l is the *final* (rather than the *proposed*) Maximum Contaminant Level (MCL) for hexachlorobenzene. Table 2-5 should also be modified to reflect this point.

7. Pg. 2-9, Table 2-2. The MCL for 1,2,4-trichlorobenzene is 70 μg/l.

8. Pg. 2-10, Table 2-3. Please review the table in light of the newly revised Delaware Surface Water Quality Standards (February, 1993).

9. Pg. 2-29. According to page 2-29, for carcinogens, response levels equivalent to a cancer risk of 1.0E-05 were established for the site. Please note, however, that EPA's point-of-departure for carcinogenic risk is 1.0E-06, with the potentially acceptable range being from 1.0E-06 to 1.0E-04, depending upon site-specific conditions. In any case, it is EPA's site manager who determines acceptable risk, not the PRP.

10. On page 2-30 of the report, it appears as though a *total* clean-up level of 625 mg/kg was calculated for soil contaminants at the site. However, this approach for establishing remediation goals is inappropriate, since it assumes that all contaminants are of equal toxicity or carcinogenic potential. Clean-up levels must be derived for <u>each</u> contaminant of concern at the site.

SECTION 3

1. A more detailed rationale for elimination of technologies should be included in the text discussions. In some instances the reasons given for elimination were not convincing. For example, sufficient rationale for eliminating solvent rinsing/soil washing was not provided on page 3-39 and 3-40.

2. Soil washing, soil flushing, insitu steam/hot air injection with vapor extraction appear to be viable alternatives for soil remediation and must be evaluated more thoroughly (page 3-58, 59).

4. Air sparging and bio sparging for remediation of contaminated groundwater appear to be viable technologies and should be evaluated in the FS.

5. Pg. 3-15, paragraph 1. The practical depth limitation of a slurry wall is stated to be 25 feet. This is incorrect. Slurry walls can be extended up to 150 feet, depending on site conditions.

   The greatest recorded depth to the Merchantville/Potomac Clay at the site is over 70 feet. Slurry walls can be constructed to this depth and at even greater depths. Consequently, depth is not a limiting factor as far as engineering feasibility.

   Pg. 3-51, Table 3-3. Please revise this table for depth of slurry walls as discussed in the above comment.

6. Pg 3-15 and Table 3-3. For Interceptor Trenches discussed in this Table and on page 3-15: A more detailed description of the depth limitation of 25 feet should be provided in the narrative. The importance of identifying whether the limitation in depth for this technology is associated with current engineering technology and equipment or cost. A specific detailed discussion must be provided as to engineering difficulties that would make it difficult if not impossible to implement.

7. Pg. 3-38, paragraph 1. Please define KPEG.

8. Pg. 3-62, Table 3-5. Please include in the FS a figure(s) to accompany this table. Rationale for depth of area must be provided. Subsurface contaminated soils must be included in the volume calculations. It is recommended that a similar table be generated for each of the alternatives discussed in Section 4, to include volume of treatment for ground water, surface soils, subsurface soils, sediments. Area of capping should also be provided where appropriate.

SECTION 4

1. In the development and screening of Remedial Alternatives, each of the alternatives (with the exception of No Action) must satisfy minimum criteria as described below:

   a) must provide adequate protection of human health and the environment; and

   b) must meet the requirements of all federal and state ARARS.

In addition, each of the alternatives must provide information on the amount of waste/media to be treated, duration of clean-up, time frames for treatment, achievable intermediate and final clean-up levels.

2. Each alternative must provide a discussion and address remediation of subsurface soils, CB1, and DNAPL(s).

3. Inconsistency of approach in discussing implementability, effectiveness, and cost of the various alternatives makes it very difficult to compare them. Please review these section and make them consistent in approach.

4. Please describe the difference between "readily accessible, highly contaminated soils" and "sediments and soils exceeding response levels" in the beginning of the section. Some of the discussions are confusing without a clear distinction.

5. Please define the depth used in describing surface soils and reasons for it early in this section. The discussions are unclear until Table 4-5 is reached and even then it is unclear why the depth of 3 feet is used.

6. Pg. 4-3, Table 4-1. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the soil alternatives? Please include a discussion in the text.

7. Pg. 4-5, Table 4-2. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the sediment alternatives? Please include a discussion in the text.

8. Pg. 4-6, Table 4-3. Why were biological treatment (aerobic/anaerobic) and chemical/physical treatment (adsorption using synthetics) not factored into the groundwater alternatives? Please provide a discussion in the text.

9. Pg. 4-17,paragraph 4. Please provide a reference for the thermal description treatability study.

SECTION 5

Overall Comments

1. All alternatives must discuss remediation of subsurface soils, DNAPLs, and CB1. Based on historical data, the Catch Basin appears to be a continuing source of contamination and each of the alternatives must address a means of remediating/containing the contamination.

2. For evaluation purposes Section 5 should include calculations of cubic yards, gallons, etc. of soil to be treated, capped, contained. Use of a table for each of the alternatives is recommended.

3. The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

4. Terms such as "readily accessible" and "highly contaminated" must be clearly defined whenever they are used.

5. Pg. 5-2, paragraph 1. Please define ROD.

Alternative 1

Pg. 5-7 The rate of the passive biodegradation mechanism should be incorporated in the text.

Alternative 2

1. Alternative 2 must comply with ARARs and it does not currently appear to do so. Please this alternative so that it does comply with ARARs.

2. Page 5-7 is incorrect when it states that Alternative 2 will provide on-site containment alternative does not adequately provide for on-site containment. This alternative woul appropriately be labeled "Limited Action" in that it only provides for limited action abo beyond the existing pump and treat and monitoring system.

3. Pg. 5-13, paragraph 4. The statement is made that "...final capping and closure will add RCRA design criteria for surface impoundment closure". This is incorrect (see 40 CF Section 264.228).

Alternative 3

1. Alternative 3 does not adequately address remediation of the sediments in the unnamed Figure 5-6 identifies areas along the sides of the unnamed tributary to be excavated. results from the RI reveal that most sampling locations downgradient of the soil contaminated. This alternative must provide an option for excavation and treatment of s above response levels.

2. On page 5-20, a slurry wall should be included as an alternative for containing groundwate discuss briefly possible contingency measures for treatment of off-gases in the event that p processes are curtailed and the discharge can no longer be burned in the boilers. Ir please reference documentation that the boilers can effectively destroy/remove the vo semi-volatile constituents.

3. Pg. 5-23. Please discuss briefly alternative technologies (other that air stripping) that cou for treating wastewater, which in turn will treat contaminated ground water. Please let DN if SCD believes that the recent events regarding the NPDES effluent discharge permit wil effects on the Feasibility Study.

4. Pg. 5-23. Details on volume of soil to be excavated and stabilized should be provided. suggests excavation to a depth of 3 feet, whereas sample location #SS-29 showed co to a depth of five feet.

5. Pgs. 5-22, 5-24, Figures 5-4 and 5-5. Concern has arisen that care should be taken in c location of the interceptor trench in that it should be located out of the flood plain anc elevation than the expected ground water seasonal high. Please clarify the figures ar

6. Please discuss in more detail the effectiveness of the interceptor trench in controlling

7. Please include a more detailed discussion about the liner proposed for the intercepto the ramifications of either including the liner in the alternative or not.

8. The new silt fence discussed on page 5-32 will only minimize migration sh considered as an interim measure as opposed to a permanent solution.

9. Rationale for the extent of the asphalt cap around the catch basin should be included in the description.

10. Justification and rationale for placement of manholes 300 feet apart for the interceptor trench should be included in the description.

Alternative 4

1. Pg. 5-39. The technology for treatment of contaminated ground water must be delineated.

2. Provide more detail on the LTTT, size of unit, flow input, management of contaminated media, etc.

3. Please expand the description of free product recovery.

4. Pg. 5-40, Figure 5-7. Concern exists that the recovery well locations proposed in Figure 5-7 may not encounter free organics because the distribution of the free organics on this site did not coincide with the contouring of the confining unit (see Fig. 3-6, RI report). Therefore it appears that recovery well locations should be placed near and down-slope of monitoring wells TW-5, TW-28, TW-30 (ones that have shown free organics since 1988). Please indicate uncertainty as to number and location of Product Recovery wells.

5. Pg. 5-40, Figure 5-7. Please depict the existing wells which have historically contained DNAPL directly on this figure.

Alternative 5

The results of the Bioremediation Treatability Study must be submitted with the revised FS to demonstrate its application and limitation.

Details on ultimate disposition of soil piles after bioremediation should be included.

SECTION 6

Pg. 6-2. It is mentioned that the on-site groundwater is expected to meet MCLs over the long term. An approximate time frame should be furnished for each alternative.

United States
Environmental Protection
Agency

Office of Emergency and
Remedial Response
Washington DC 20460

OSWER Directive 9355.3-01
October 1988

Superfund

EPA

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA

Interim Final

MAR-25-1993 11:40 FROM EPA TO 83022234561 P.002
FCI BY:XEROX TELECOPIER 7010 ; 3-25-93 11:16AM ; 2155972150→ 13022234561;# 2

General Response Action			1 No Action	2 Limited Action	3 Source Containment; No GW Controls	4 Source Containment; GW Collection, Pretreatment, POTW	5 In Situ Stabilization, Cap; GW Collection, Pretreatment, POTW	6 Biodegradation, Cap; GW Collection, Pretreatment, POTW	7 Incineration; GW Collection, Pretreatment, POTW
Medium	Technology Type	Area or Volume							
Soil	Access Restrictions (Fencing)	Entire Site		●					
	Excavation	All Soil Above 10^{-6}							●
		All Soil Above 10^{-4}			●	●			
	Disposal	Onsite RCRA Landfill			●				
		Offsite RCRA Landfill				●			●
	Treatment Onsite	In Situ Stabilization					●		
		Bioremediation To 10^{-4}						●	
	Incineration Offsite								●
	Capping	All (Remaining) Soil Above 10^{-6}			●	●	●	●	
Ground Water[a]	Alternate Water Supply	All Residents in Affected Area		●	●	●	●		
	Monitoring	All Monitoring Wells Twice A Year	●	●	●	●	●	●	●
	Collection With Interceptor Trenches	All Water Above 10^{-4} Within 10 Yrs.				●	●		
		All Water Above 10^{-6} Within 20 yrs						●	●
	Treatment With Precipitation Onsite	Pretreatment				●	●	●	●
	Discharge	Offsite To POTW				●	●	●	●

[a] This is a conceptual example using the example of carcinogenic risk ranges; however, in general, when MCLs are available they will supply.

Figure 4-6. Assembling a range of alternative examples.

4.3 Alternatives Screening Process

4.3.1 *Alternatives Definition*

Before beginning screening, alternatives have been assembled primarily on medium-specific considerations and implementability concerns. Typically, few details of the individual process options have been identified, and the sizing requirements of technologies or remediation timeframes have not been fully characterized (except for timeframes identified to develop ground-water action alternatives). Furthermore, interactions among media, which may influence remediation activities, have usually not been fully determined, nor have sitewide protectiveness requirements been addressed. Therefore, at this point in the process, such aspects of the alternatives may need to be further defined to

AR307276

later phases of the FS when alternatives are refined and evaluated on a sitewide basis.

If modeling of transport processes is undertaken during the alternative development and screening phases of the FS to evaluate removal or collection technologies, and if many contaminants are present at the site, it may be necessary to identify indicator chemicals, as is often done for the baseline risk assessments, to simplify the analysis. Typically, indicator chemicals are selected on the basis of their usefulness in evaluating potential effects on human health and the environment. Commonly selected indicator chemicals include those that are highly mobile and highly toxic.

4.2.5.2 Implementability Evaluation

Implementability encompasses both the technical and administrative feasibility of implementing a technology process. As discussed in Section 4.2.4, technical implementability is used as an initial screen of technology types and process options to eliminate those that are clearly ineffective or unworkable at a site. Therefore, this subsequent, more detailed evaluation of process options places greater emphasis on the institutional aspects of implementability, such as the ability to obtain necessary permits for offsite actions, the availability of treatment, storage, and disposal services (including capacity), and the availability of necessary equipment and skilled workers to implement the technology.

4.2.5.3 Cost Evaluation

Cost plays a limited role in the screening of process options. Relative capital and O&M costs are used rather than detailed estimates. At this stage in the process, the cost analysis is made on the basis of engineering judgment, and each process is evaluated as to whether costs are high, low, or medium relative to other process options in the same technology type. As discussed in Section 4.3, the greatest cost consequences in site remediation are usually associated with the degree to which different general technology types (i.e., containment, treatment, excavation, etc.) are used. Using different process options within a technology type usually has a less significant effect on cost than does the use of different technology types.

4.2.6 *Assemble Alternatives*

In assembling alternatives, general response actions and the process options chosen to represent the various technology types for each medium or operable unit are combined to form alternatives for the site as a whole. As discussed in Section 4.1.2.1, appropriate treatment and containment options should be developed. To assemble alternatives, gene response actions should be combined using differe technology types and different volumes of mec and/or areas of the site. Often more than one gener response action is applied to each medi F example, alternatives for remedia sc contamination will depend on the type and d utic of contaminants and may include incineration of sc from some portions of the site and capping of others.

For sites at which interactions among media are nc significant (i.e., source control actions will not affec ground-water or surface-water responses) th combination of medium-specific actions into site wide alternatives can be made later in the FS process, either after alternatives have been screenec or prior to conducting the comparative analysis o alternatives. For example, if media interactions are not of concern, an FS might describe three source control options, three soil remediation options, and four ground-water remediation options, (instead of developing numerous comprehensive sitewide alternatives). Although this approach permits greater flexibility in developing alternatives and simplifies the analyses of sitewide alternatives, it may involve greater effort in developing and analyzing medium-specific options.

Figure 4-6 illustrates how general response actions may be combined to form a range of sitewide alternatives. For this relatively simple example, the two media of interest are soil and ground water. The range of alternatives developed include a no n alternative (alternative 1); a limited action alt e (alternative 2); source containment options with and without ground water treatment (alternatives 3 and 4); and three alternatives that employ various levels of source treatment, with ground-water collection and treatment (alternatives 5, 6, and 7).

Although not shown in this example, a description of each alternative should be included in the FS report. For the alternatives presented in Figure 4-6, such descriptions would include the locations of areas to be excavated or contained, the approximate volumes of soil and/or ground water to be excavated and collected, the approximate locations of interceptor trenches, the locations of potential city water supply hook-ups, the locations of connections to the local publicly owned treatment works (POTW), management options for treatment residuals, and any other information needed to adequately describe the alternative and document the logic behind the assembly of general response actions into specific remedial action alternatives. In describing alternatives, it may be useful to note those process options that were not screened out and that are represented by those described in the alternative.

AR307277

Response Summary to DNREC & EPA Comments on the Draft Feasibility Study (FS)
Standard Chlorine of Delaware, Inc. Superfund Site

ATTACHMENT 1 - GENERAL COMMENTS

Remedial Alternatives

1. Comment: Each of the alternatives (with the exception of No Action) must address compliance with ARARS and adequate protectiveness of human health and the environment. In particular, Alternative 2 should be upgraded to comply with this requirement. Please see specific comments in Attachment 2.

   Response: Alternative 2 will be revised to include the installation of additional groundwater extraction to reduce contaminant migration toward Red Lion Creek. Option 2a will be deleted and Option 2b will be revised to become Alternative 2. The additional extraction wells will reduce the contaminant flux from groundwater discharge into Red Lion Creek. A conceptual model will be investigated for use in estimating on a preliminary basis the flux reduction which might be obtained and its resulting effect on surface water quality. The objective of these additional extraction wells is to further address the protection of human health and the environment.

2. Comment: The elevated levels of contaminants in the subsurface soils at the site act as a continuing source of contamination for ground water. Various in situ treatment technologies have been used at numerous other sites as the remedial alternative for subsurface soils. For example, a case study using hot air steam stripping proved to be effective in removing chlorinated benzenes. Based on the information contained in the FS the regulatory agencies do not understand why the technologies that would directly address subsurface soils at the site were eliminated from consideration. Therefore, further explanation as to the reasons for eliminating technologies must be included and if this information does not satisfy the regulatory agencies, at least one of the alternatives discussed in Section 4 and 5 of the Feasibility Study must include one or more of the following technologies:

   - soil vapor extraction
   - soil flushing
   - insitu air/bio sparging
   - insitu steam extraction
   - hot air steam stripping

   This issue should be discussed in more detail at our proposed meeting in April.

   Response: Additional explanation of the reasons for eliminating technologies will be provided. Specifically, the technologies were eliminated during the screening process for the reasons as outlined below:

   - soil vapor extraction - Many of the compounds of concern (trichlorobenzene, tetrachlorobenzene, pentachlorobenzene, hexachlorobenzene) are not volatile enough to be removed by this technology. References will be furnished prior to the May 10 meeting.

AR307278

- soil flushing - The effectiveness of this technology is suspect due to the low water solubility of the contaminants. Solvents that could be employed to increase the fluxing effectiveness would increase the mobility of the chlorobenzenes and could result in migration to other areas of the site or off-site. Recovery of the solvent (water or other) may be problematic. In addition, introduction of solvents may jeopardize the confining unit underlying the Columbia Formation.

- insitu air/bio sparging - This technology is typically applicable to treatment of groundwater. Its applicability to groundwater treatment may be included in Alternative 5 pending the results of the biological treatability study.

- insitu steam extraction - The effectiveness of this technology in removing semivolatile compounds is suspect. The introduction of heat, in the form of steam or hot air, is expected to volatilize these compounds, however, the extraction of these compounds once volatilized has not been consistently demonstrated. As the volatilized compounds move further away from the heat source, they will cool and may condense. These condensed contaminants would travel downward, by gravity, toward the groundwater table and thereby accelerate contamination of groundwater or add to the DNAPL. References will be provided supporting this position prior to the May 10 meeting.

- hot air steam stripping- See above.

3. Comment: On pages ES-3 and 1-23 of the report, a very brief discussion of subsurface soil contamination is presented. It is implied in the FS that because a complete and direct exposure pathway to contaminated subsurface soil does not currently exist at the site, this environmental medium is not considered for remediation. However, while direct contact with subsurface soil may not be a prevailing concern at the site for humans, the following point should be acknowledged:

In the absence of a secure and impermeable cap, subsurface soil will act as a continual source of contamination to underlying ground water. The contaminated groundwater then discharges to the surface water causing potential surface water quality problems as well as ecological impacts in the Red Lion Creek, unnamed tributary, and the wetlands associated with each.

Response: Subsurface soils will be addressed in each of the alternatives. Excavation of subsurface soils involves important considerations with respect to maintaining structural integrity of process units, tanks, building and sewer lines. Excavation of these soils in the rail track area is not feasible due to these structural limitations in addition to the need to maintain on-going rail service which is vital to plant operations. Deep excavation below the bottom of CB-1 would raise significant structural stability concerns. A combination of excavation and capping techniques will be included in the revised alternatives to address the subsurface soils issue and are discussed further in other comment responses in this document.

It should also be noted that contaminants which could migrate from the subsurface soils into groundwater would be address by the groundwater remedial component of each alternative.

Comment: According to page ES-8 of the FS, only those soils containing the "highest" concentrations of contaminants will be removed and treated; any remaining surface soils exceeding response levels will be contained by caps. Please note, however, that typically in the Superfund Program, all soils containing

AR307279

contaminants in excess of health-based, eco-based or ground water protection-based levels, as appropriate, are remediated.

Response: The alternatives, with the exception of the no action alternative, do address those materials above risk-based levels. The alternatives will be revised, part of which will include additional action for subsurface soils including excavation and capping. This action will focus on drainageways and CB-1 where higher concentrations have been found in subsurface soils in some locations.

Comment: Institutional controls such as deed restrictions, fencing, health and safety measures for future excavation activities will be one component of the approach to the remediation of the contaminated soils.

Response: Alternatives 2, 3, 4, and 5 do implement institutional controls as part of their approach. This point will be emphasized.

4. Comment: To assist in the comparative analysis of the alternatives presented in the FS, a table that provides a summary of the various response actions for each of the alternatives should be provided. The mediums under evaluation should include surface soil, sediment, subsurface soil, ground water, and surface water and evaluate human as well as ecological risks. This table should be similar to the attached example from "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive 9355.3-01, October 1988".

Response: Even though this information is presented in the text of the FS, a table with format similar to that suggested by the referenced guidance document will be prepared for addition to Section 6.

5. Comment: Several (if not all) of the alternatives will cause various degrees of ecological and habitat impacts which have not been addressed in the alternatives discussions. Each of the alternatives should address ramifications to the ecological systems and include ecological restoration efforts. Ecological restoration may be able to be done in such a way as to reduce Operations and Maintenance (O&M) costs.

Response: The ecological impacts of each alternative have been discussed as part of the alternatives evaluation. Additional discussion will be included when possible in Section 5 of the FS. It should be noted that the estimated costs for ecological restoration are already included in the cost tables for the alternatives. The wetlands have been impacted by the control structure on the Delaware River and any restoration would be to a level comparable to that existing at the present time.

6. Comment: Each of the alternatives should evaluate remedial action for the Catch Basin #1, subsurface soils and DNAPLS. Subsurface soils should be treated as a separate medium in each of the alternatives.

Response: The alternatives will be modified as appropriate, to further address contamination in CB-1 (Catch Basin 1), subsurface soils, and DNAPLs. Subsurface soils refer to soils found at a depth greater than 3 feet below ground (bgs). Excavation of these soils in the plant area involves important concerns with respect to maintaining structural integrity of nearby buildings, tanks, process units and other improvements. Excavation in the rail track area is not feasible since these lines must remain in service. Subsurface soil remediation must recognize these site limitations. DNAPL recovery and remediation in the environmental field has not been highly successful and is not feasible at most sites. Due to the presence of some DNAPL at the SCD site, attempted recovery of this material is proposed using extraction wells although its success will be very uncertain. The possible use of existing wells equipped with a suitable sump or the design and location of new extraction wells will be determined as part of

AR307280

RD. The alternatives will be revised to include excavation of soils around CB-1 to a depth corresponding to the bottom of the basin followed by backfilling with clean soil and asphalt capping around the basin. Additional excavation to remove higher concentration soils from drainageways followed by infiltration control using a flexible membrane liner (or other comparable material) installed into the ditch will be included to further address subsurface soils. The revisions are as follows:

- Alternative 2 - Option A will be deleted and Option B will be revised to become Alternative 2. The alternative will be revised to include an asphalt cap around CB1 to address the surface and subsurface contamination. Product recovery wells will be added to address DNAPLs. Excavations for soil removal will be closed with a low permeability cover system, including a flexible membrane liner (FML) to minimize infiltration into any remaining contaminated subsurface soils. An enhanced groundwater extraction system will be evaluated to address groundwater discharge to surface water.

- Alternative 3 - Product recovery (DNAPL) wells will be added. Excavation will be closed with a low permeability cover system.

- Alternatives 4 and 5 - No revision will be made.

7. Comment: Each of the alternatives should delineate the amount of waste to be treated, response levels, and time frames for remediation (intermediate as well as final). A table format is suggested.

   Response: The cost tables provided for each of the alternatives identify the amount of materials to be treated. The methodology used to determine the amount of materials requiring treatment will be further explained (i.e., definition of readily accessible, highly contaminated). The time frame for remediation of groundwater will be very lengthy and will not be predicted due to the presence of DNAPLs in groundwater. A tabular format will be added to consolidate and present this information.

8. Comment: Each of the alternatives must provide more detail on the monitoring systems associated with the remedial efforts.

   Response: Monitoring has been included in the O&M portion of the Cost Estimate. This monitoring has been discussed for Alternative 2 (page 5-9) and will be essentially the same for the other alternatives. Additional detail will be provided for this activity, including provision for monitoring for restoration of wetland areas as appropriate.

Groundwater Loadings to Red Lion Creek

1. Comment: The draft FS states that the flux of contaminated groundwater discharging to the unnamed tributary and Red Lion Creek does not result in a significant impact to the surface water quality. This assessment is not substantiated in the Feasibility Study. As we have discussed in the past, modelling of the contaminant loading to the unnamed tributary and the Red Lion Creek should be completed and included in the final report. In our proposed meeting on April 15,1993, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review prior to the meeting.

   Response: We will attempt to estimate the flux of groundwater contaminants into surface water. We will consider using the conceptual estimation method presented by Mike Apgar at a previous meeting, although there may be other approaches we will consider. Since this will be an order of magnitude estimate, we will identify the key assumptions and sensitivities with the selected approach. The primary objective of this analysis is to estimate reductions in contaminant loading to Red Lion Creek and

AR307281

resulting surface water quality. The intent would be to estimate the level of on-site groundwater control needed to achieve acceptable surface water concentrations.

2. Comment: Contamination of ground water should not be dismissed on the basis of protection of human health through the supply of alternative potable health to human receptors. Ground water contamination (i.e., the Columbia aquifer) still carries a serious potential for ecological impacts through groundwater contamination of surface water and wetlands.

   Response: The impacts of groundwater discharge to surface water have not been overlooked. Groundwater inception or extraction to control this discharge is already provided in Alternatives 3, 4, and 5, and is being added to Alterative 2. This point will be further stated.

Soil and Groundwater Cleanup Levels

Comment: Since RI data shows that subsurface soils are contaminated in areas up to 32 feet below ground surface (see page 1-16 of FS), evaluation and consideration of subsurface soils should be performed when evaluating the soil remedial alternatives. Soil clean-up levels for subsurface soils should be estimated to be protective of ground water quality (i.e. eliminate subsurface soil sources). Modelling (such as MULTIMED or Summers Method) must be conducted to develop clean-up levels for the subsurface soils that are protective of ground water as part of the Feasibility Study. EPA's hydrogeologist will work with Standard Chlorine during the process to insure that the modelling satisfies EPA's criteria. In our proposed April 15, 1993, meeting, a discussion of the approach taken in this modelling effort should occur. Please provide a written proposal for review before the meeting.

Response: Additional remedial action to address subsurface soils will be added to the alternatives. The current exposure pathway for subsurface soils is ultimately through surface water; infiltration of precipitation could mobilize contaminants from subsurface soils into groundwater and ground water will migrate to surface water discharge. This exposure pathway is being addressed in all alternatives. Additional remedial action for subsurface soils will be included in the alternatives. Please refer to responses to previous comments 2 and 6.

Archaeological Issues

SCD received a copy of the March 12, 1993, memo from Faye L. Stocum of the Historic Preservation Office regarding the draft Feasibility Study and the Phase 1A Archaeology Survey conducted for the site. DNREC requests that revisions of the Phase IA report in accordance with the comments in the memo be completed, parallel with revisions of the draft FS, and at the same time arrangements for conducting the Phase 1B site work begin. A workplan for the Phase 1B work must be submitted to the Department and EPA for review by April 30, 1993. As we discussed on March 26, 1993, conference calls between representatives of SCD, your archaeological contractor, DNREC and the Office of Historic Preservation to discuss issues may be a way to expedite this activity.

The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

Response: A revised Phase 1A and a Work Plan for Phase 1B will be submitted on or before June 1. Compliance costs cannot be provided as the need or extent of any further archeological evaluation beyond the Phase 1B has not been determined. Costs associated with the Phase 1B will be incurred prior to commencing remedial activities.

AR307282

Bioremediation Treatability Study

The results of the ongoing treatability study should be included in the final FS document if possible, or if not possible as the already agreed upon addendum. Since finalization of the FS is running approximately two weeks behind schedule, it may be possible to incorporate the results of the treatability study directly into the document instead of creating a separate addendum to address the results.

Response: The treatability study is ongoing and the data is expected to be available by early July. The results of the study will be incorporated as an addendum to the FS as they become available and after they are evaluated.

The results will be initially prepared in tabular form for review. If they are favorable and this technology appears viable, then an addendum in report format will be prepared to more fully evaluate this technology.

Textual Comments

Please review the document for typographical errors and incorrect or awkward phrasing. A number of instances were found where small words were apparently missing from the text.

Response: Any of these minor editorial or typographical revisions will be made.

Response Summary to DNREC & EPA Comments on the Draft Feasibility Study
Standard Chlorine of Delaware, Inc. Superfund Site

ATTACHMENT 2 - SPECIFIC COMMENTS

EXECUTIVE SUMMARY

1. Comment: Pg. ES-2, paragraph 1. The opening statement should be modified to reflect the intent of the National Contingency Plan regarding remedial alternative selection: The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste (NCP Section 300.430(a)(i)).

   Response: The requested revision will be made.

3. Comment: Pg. ES-3, paragraphs 3 and 4. These paragraphs should be modified to reflect that the soil contamination present at the site is a possible source of groundwater contamination and then surface water contamination, especially the deeper soils at the site in the vicinity of the catch basin no. 1.

   Response: The requested revision will be made.

4. Comment: Pg. ES-3, paragraph 5. Please indicate that the silt fence was installed after the 1986 spill occurred and did not limit the migration of contamination into the Red Lion Creek during the spill.

   Response: The comment will be addressed, although it will be noted that the silt fence did work quite effectively and that majority of the spill was contained in the area of the Unnamed Tributary.

5. Comment: Pg. ES-4, paragraph 4. This paragraph should be amended to include subsurface contamination along the effluent pipeline. In addition a statement concerning the impact of subsurface soils on ground water contamination should be provided.

   Response: The paragraph will be amended to include the conclusions of the effluent pipeline investigation, as stated in the Remedial Investigation Addendum.

6. Comment: Pg. ES-4, paragraph 4. The statement on page ES-4 concerning 'minimal impact of ...to surface water quality...' must be eliminated through out the report. It should be replaced by a discussion of the results of the loading modelling discussed in the General Comments section.

   Response: As noted, we will evaluate the feasibility of preparing a conceptual groundwater flux estimate and review the approach used at a previous meeting by Mike Apgar. The accuracy, limitations, and applicability of this approach must be considered.

7. Comment: Pg. ES-4, paragraph 3. Please note in the paragraph that air exposure from volatilization of soil contamination has been reduced but not eliminated by the installation of the soil pile covers.

   Response: The requested revision will be made.

8. Comment: Pg. ES-4, paragraph 4. Please note in this paragraph that the groundwater samples from the Potomac Formation aquifer were collected from wells located outside the site boundaries.

AR307284

Response: The requested addition will be made.

9. Comment: Pg. ES-5. Alternative 2 - Containment as discussed on page ES-5 is misleading since the alternative does not contain the contamination.

Response: Alternative 2 will be revised as previously noted. The inclusion of additional groundwater extraction wells and additional soil measures are consistent with containment.

10. Comment: Pg. ES-6. Please revise the statement regarding the effectiveness of Alternative 3 in protecting the environment in light of comments in Attachment 2, Section 5, Alternative 3.

Response: See responses for comments in Attachment 2, Section 5, Alternative 3.

11. Comment: Pg. ES-8. "Highest concentration" and "natural attenuation" should be defined.

Response: These terms will be further explained.

12. Comment: Pg. ES-8. Please discuss the time frame needed for the natural attenuation process to degrade the contaminants.

Response: Results of the biological treatability study will be incorporated as an addendum to the FS when available. These results may provide some insight as to the time frame of biological attenuation processes. Other natural attenuation processes (e.g., photolytic degradation, chemical adsorption, etc.) would require extensive experimental research for the appropriate media in order to estimate any further and this could not be completed before submission of the FS.

SECTION 1

1. Comment: Site operational history should include a description of the current and potential markets for the products produced at Standard Chlorine of Delaware. Section 1 should also include an analysis of the contaminants at the site to address the chemical reactions and breakdown products during degradation under anaerobic and aerobic conditions.

Response: SCD will provide additional information for inclusion in the final FS.

2. Comment: Neither in the Remedial Investigation (RI) nor the FS is there information which indicates that actual Dense Non Aqueous Phase Liquid (DNAPL) was measured in any on-site monitoring or extraction well, and yet in the quarterly monitoring reports, several wells are reported with DNAPL. Information should be included in the FS as to which wells have historically contained DNAPL, thickness, and chemical and physical characteristics, if known. The location, thickness, and chemical analysis should be included in a Table and the narrative should discuss their occurrence in Sections 1.4 or 1.5 of the FS. The narrative should in turn cite the Table.

Response: Additional information regarding the known characteristics and location of the DNAPL will be provided using information from the project records to the extent it is available. Unknown characteristics potentially requiring additional definition will be identified and addressed during Remedial Design.

3. Comment: Pg. 1-5, paragraphs 3 and 4. This paragraph should be accompanied with a figure showing the relationship of the Merchantville Formation to the Potomac Formation in the area of the site for clarification.

AR307285

Response: A figure will be provided using information from the RI.

4. Comment: Pg. 1-7, paragraph 3. Please describe the depth to the water table using current monitoring information.

Response: The requested additional information will be provided from the RI.

5. Comment: Pg. 1-10, paragraph 2. This paragraph should be expanded to identify the results of the annual inspections of the new CB1. Are the underground lines discharging to CB1 tested and inspected?

Response: SCD empties and cleans CB1 annually for removal and disposal of accumulated solids. At this time the structural integrity is visually checked. Although past inspections have not been documented. A written record of future inspections will be maintained.

6. Comment: Pg. 1-14. Section 1.5 should include a discussion of the findings of the Effluent Pipeline Investigation.

Response: The requested additional information will be provided.

7. Comment: Pg. 1-15, paragraph 2. Please state to what depth below the seven foot sampling interval samples were obtained.

Response: The additional sampling depth interval information will be provided from RI data.

8. Comment: Pg. 1-17, paragraph 1. Please include the range of contamination values found in the wetland area of the unnamed tributary and south of the diked area.

Response: This additional information on concentration ranges will be provided from the RI.

9. Comment: Pg. 1-17, paragraph. 2. In summarizing the nature and extent of the contamination found at the Red Lion Creek sediments, it is more relevant to the purpose of this narrative to describe the distribution of the contamination (e.g., the furthest downstream extent and detected concentration) in Red Lion Creek. Description of the location of highest contamination of sediment in Red Lion Creek should be discussed as well.

Response: The requested additional information from the RI will be provided.

10. Comment: Pg. 1-17, para 3. Please rewrite the first sentence to explain that interstitial water was sampled in the sedimentation basin monitoring zone, not surface water. the wording of this sentence has caused some confusion during review.

Response: The requested revision will be made.

11. Comment: Pg. 1-18, paragraph 2. Please state that the explanation of DNAPL migration direction is based on current knowledge of the structural surface of the top of the confining unit.

Response: This additional explanation will be provided.

AR307286

12. Comment: Pg. 1-19, paragraph 3. Please describe briefly the locations of the wells in the site vicinity used to monitor the Potomac Formation aquifer.

Response: An additional figure from the RI will be provided.

13. Comment: Please include site maps defining the areas delineated by the response levels in this section.

Response: Response levels are presented in Section 2. Inclusion of site maps in this Section 1 would confuse the reader.

14. Comment: Pg. 1-19 and 1-20. Non-carcinogenic and carcinogenic risks, as determined by the Baseline Risk Assessment (BLRA) are discussed in this section. While it is recognized that future potential use of ground water as a potable source at the site is not probable, the risks associated with this pathway (as calculated in the BLRA) should be provided (quantitatively) in the FS.

Response: Additional discussion from the BLRA will be included here.

15. Comment: Pg. 1-23, paragraph. 2. No discussion is provided in this report as to the important part that these contaminated subsurface soils would play as a continual source to ground water contamination.

Response: Additional discussion of this potential migration pathway will be provided.

16. Comment: Pg. 1-23, paragraph 6. The integrity of the cover over the soil piles and its ability to reduce the migration of contaminants due to volatilization and the durability of the cover should be discussed. Please state also that the soil pile covers were approved by DNREC as a temporary measure, not a final measure.

Response: Additional discussion of the soil pile covers will be provided.

17. Comment: Pg. 1-23, paragraph 1. Please address subsurface contamination in the vicinity of the effluent underground pipeline. This section should also note that although there may not be direct receptors, the subsurface contamination is a source of ground water contamination.

Response: See response to Attachment II, Executive Summary, Comment 5.

SECTION 2

1. Comment: Pg. 2-2. The remedial action objective of preventing exposure to groundwater/surface water containing organic compounds in excess of the risk-based or ARAR-based action levels should be included in this section.

Response: The requested revision will be made.

2. Comment: Pg. 2-5, Table 2-1. The list of ARARs should include the Coastal Zone Management Act for Location. Please also review the list of ARARs to make sure that necessary ecological ARARs have been included.

Response: The list will be reviewed to identify any additional ecological inclusions.

AR307287

3. Comment: Pg. 2-5, Table 2-1. Please review the Table and correct the names of the appropriate Delaware regulations. Additional regulations that should be included are: Delaware Regulations Governing the Use of Subaqueous Lands, amended 9/92; Delaware Wetlands Act of 1973, revised 6/84; Delaware Regulations Governing Sediment and Stormwater Control; State of Delaware Regulations Governing the Construction of Water Wells; Delaware Coastal Zone Act, amended 9/92; Delaware Executive Order 56 on Freshwater Wetlands; State of Delaware Regulations for licensing Water Well Contractors, Pump Installers, Contractors, Well Drillers, and Well Drivers; Delaware Regulations Governing the Allocation of Water; Delaware Regulations Governing Control of Water Pollution; Delaware Sediment and Stormwater Regulations; Delaware Regulations Governing Hazardous Substance Cleanup; Delaware Environmental Protection Act; 7 Del. Code, Chap. 63.

   Response: The requested revisions will be made. Only promulgated regulations (not acts) will be added. We have requested assistance from DNREC in obtaining copies of several of these cited regulations.

4. Comment: ARARs should not be distinguished as to applicability or appropriateness and relevance.

   Response: This distinction must be provided as part of ARARs analysis in order to perform the alternatives evaluation to inform the reader how the regulation would be applied to remedial actions proposed at the site. or whether the regulation is relevant or appropriate.

5. Comment: Pg. 2-7, paragraph 4. Please revise the third sentence to reflect the uncertainty or apparent nature of the conclusion regarding the limitation of the groundwater contamination to the shallow Columbia Formation aquifer.

   Response: There is no evidence that there is contamination in the upper Potomac Formation aquifer, and therefore, this sentence is appropriate.

6. Comment: Pg. 2-9, Table 2-2. As of December, 1992, 1 ug/l is the final (rather than the proposed) Maximum Contaminant Level (MCL) for hexachlorobenzene. Table 2-5 should also be modified to reflect this point.

   Response: The requested revision will be made.

7. Pg. 2-9, Table 2-2. The MCL for 1,2,4-trichlorobenzene is 70 ug/l.

   Response: The requested revision will be made.

8. Comment: Pg. 2-10, Table 2-3. Please review the table in light of the newly revised Delaware Surface Water Quality Standards (February, 1993).

   Response: The table will be reviewed and revised as appropriate.

9. Comment: Pg. 2-29. According to page 2-29, for carcinogens, response levels equivalent to a cancer risk of 1.0E-05 were established for the site. Please note, however, that EPA's point-of-departure for carcinogenic risk is 1.0E-06, with the potentially acceptable range being from 1.0E-06 to 1.0E-04, depending upon site-specific conditions. In any case, it is EPA's site manager who determines acceptable risk, not the PRP.

   Response: This will be noted.

10. Comment: On page 2-30 of the report, it appears as though a total clean-up level of 625 mg/kg was calculated for soil contaminants at the site. However, this approach for establishing remediation goals is inappropriate, since it assumes that all contaminants are of equal toxicity or carcinogenic potential. Clean-up levels must be derived for each contaminant of concern at the site.

Response: The response levels do take into account the varying toxicities of the different contaminants and are therefore appropriate.

SECTION 3

1. Comment: A more detailed rationale for elimination of technologies should be included in the text discussions. In some instances the reasons given for elimination were not convincing. For example, sufficient rationale for eliminating solvent rinsing/soil washing was not provided on page 3-39 and 3-40.

Response: The discussions will be checked for consistency, and additional discussion will be provided where necessary.

2. Comment: Soil washing, soil flushing, insitu steam/hot air injection with vapor extraction appear to be viable alternatives for soil remediation and must be evaluated more thoroughly (page 3-58, 59).

Response: See response to Attachment I, Remedial Alternatives, Comment 2.

3. Comment: Air sparging and bio sparging for remediation of contaminated groundwater appear to be viable technologies and should be evaluated in the FS.

Response: See response to Attachment I, Remedial Alternatives, Comment 2.

4. Comment: Pg. 3-15, paragraph 1. The practical depth limitation of a slurry wall is stated to be 25 feet. This is incorrect. Slurry walls will be extended up to 150 feet, depending on site conditions.

The greatest recorded depth to the Merchantville/Potomac Clay at the site is over 70 feet. Slurry walls will be constructed to this depth and at even greater depths. Consequently, depth is not a limiting factor as far as engineering feasibility.

5. Comment: Pg. 3-51, Table 3-3. Please revise this table for depth of slurry walls as discussed in the above comment.

Response: Construction of slurry walls to depths greater than ___ feet require specialized equipment and entail a much higher cost. This screening discussion will be expanded in the text.

6. Comment: Pg 3-15 and Table 3-3. For Interceptor Trenches discussed in this Table and on page 3-15: A more detailed description of the depth limitation of 25 feet should be provided in the narrative. The importance of identifying whether the limitation in depth for this technology is associated with current engineering technology and equipment or cost. A specific detailed discussion must be provided as to engineering difficulties that would make it difficult if not impossible to implement.

Response: Construction of deep interception trenches involve additional complexity with respect to showing and dewatering and a much greater cost. This discussion will be expanded in the text on screening.

7. Comment: Pg. 3-38, paragraph 1. Please define KPEG.

Response: Direct contact with surface soils is one of the primary human health exposure pathways of concern. The volume and location of soil or sediments to be excavated, consolidate or treated hs be included in the cost estimate tables and shown graphically in figures in Section 5.

8. Comment: Pg. 3-62, Table 3-5. Please include in the FS a figure(s) to accompany this table. Rationale for depth of area must be provided. Subsurface contaminated soils must be included in the volume calculations. It is recommended that a similar table be generated for each of the alternatives discussed in Section 4, to include volume of treatment for ground water, surface soils, subsurface soils, sediments. Area of capping should also be provided where appropriate.

Response: A figure will be provided to delineate these areas. Because the response levels are risk-based, the rationale for defining surface soils to a depth of 3 feet is based on the definition of surface soils used during risk assessment.

SECTION 4

1. Comment: In the development and screening of Remedial Alternatives, each of the alternatives (with the exception of No Action) must satisfy minimum criteria as described below:

a) must provide adequate protection of human health and the environment; and

b) must meet the requirements of all federal and state ARARS.

In addition, each of the alternatives must provide information on the amount of waste/media to be treated, duration of clean-up, time frames for treatment, achievable intermediate and final clean-up levels.

Response: See responses to Attachment I, Remedial Alternatives, Comments 6 and 7.

2. Comment: Each alternative must provide a discussion and address remediation of subsurface soils, CB1, and DNAPL(s).

Response: Alternatives 2 and 3 will be revised to address additional subsurface soils at CB-1 and in drainageways where they have been identified. The DNAPL recovery wells now included in Alternative will also be included in Alternatives 2 and 3. See response to Attachment I, Remedial Alternatives, Comment 6.

3. Comment: Inconsistency of approach in discussing implementability, effectiveness, and cost of the various alternatives makes it very difficult to compare them. Please review these section and make them consistent in approach.

Response: The approach will be examined to make it more consistent.

4. Comment: Please describe the difference between "readily accessible, highly contaminated soils" and "sediments and soils exceeding response levels" in the beginning of the section. Some of the discussions are confusing without a clear distinction.

Response: These terms will be defined for each alternative. In short, readily accessible, highly contaminated soils refers to those soils that 1) are accessible without moving plant equipment (does not include the railroad track area), and 2) exhibit a high concentration of contaminants. Readily accessible, highly contaminated sediments refers to those sediments that 1) are accessible for removal to excavation equipment from the shoreline, and 2) exhibit a high concentration of contaminants. Areas containing soils and sediments of high concentration refers to those areas where materials consistently exceed response levels.

5. Comment: Please define the depth used in describing surface soils and reasons for it early in this section. The discussions are unclear until Table 4-5 is reached and even then it is unclear why the depth of 3 feet is used.

Response: See response to Attachment II, Section 3, Comment 8.

6. Comment: Pg. 4-3, Table 4-1. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the soil alternatives? Please include a discussion in the text.

Response: These technologies are factored in to the alternatives. As noted on Tables 4-1 and 4-2, these technologies are represented by similar technologies (thermal desorption and biological treatment, respectively). This is done to allow decision-makers more flexibility when issuing a ROD. For instance, the ROD could identify biological treatment as the preferred technology, but allow for flexibility in the implementation of the technology (solid phase biological treatment or reductive dechlorination could be implemented).

7. Comment: Pg. 4-5, Table 4-2. Why were the innovative treatment technologies: thermal treatment (XTRAX) and biological treatment (reductive dechlorination) not factored into the sediment alternatives? Please include a discussion in the text.

Response: See the response to Attachment II, Section 4, Comment 6.

8. Comment: Pg. 4-6. Table 4-3. Why were biological treatment (aerobic/anaerobic) and chemical/physical treatment (adsorption using synthetics) not factored into the groundwater alternatives? Please provide a discussion in the text.

Response: See the response to Attachment II, Section 4, Comment 6.

9. Comment: Pg. 4-17, paragraph 4. Please provide a reference for the thermal description treatability study.

Response: The requested reference will be provided.

SECTION 5

Overall Comments

1. Comment: All alternatives must discuss remediation of subsurface soils, DNAPLS, and CB1. Based on historical data, the Catch Basin appears to be a continuing source of. contamination and each of the alternatives must address a means of remediating/containing the contamination.

   Response: Subsurface soils in drainage ditches and CB-1 will be included in Alternatives 2 and 3. The DNAPL Recovery wells in Alternative 4 will also be included in Alternatives 2 and 3. See response to Attachment I, Remedial Alternatives, Comment 6.

2. Comment: For evaluation purposes Section 5 should include calculations of cubic yards, gallons, etc. of soil to be treated, capped, contained. Use of a table for each of the alternatives is recommended.

   Response: The volumes of material to be treated under each alternative is already presented graphically on the figures, and quantitatively on the cost tables for each alternative.

3. Comment: The costs of compliance with the National Historic Preservation Act should be integrated into the cost tables for the remedial alternatives.

   Response: See response to Attachment I, Archeological Issues.

4. Comment: Terms such as "readily accessible" and "highly contaminated" must be clearly defined whenever they are used.

   Response: See response to Attachment II, Section 4, Comment 4.

5. Comment: Pg. 5-2, paragraph 1. Please define ROD.

   Response: The requested definition will be provided

Alternative 1

Comment: Pg. 5-7 The rate of the passive biodegradation mechanism should be incorporated in the text.

Response: The bench scale treatability study currently underway should provide information on bioremediation rates and mechanisms. The results of this testing will be available as an addendum to the FS. See response to Attachment II, Executive Summary, Comment 12.

Alternative 2

1. Comment: Alternative 2 must comply with ARARs and it does not currently appear to do so. Please modify this alternative so that it does comply with ARARS.

   Response: Alternative 2 will be revised to include additional groundwater extraction wells to limit the lateral movement of shallow groundwater and discharge into surface water thereby further addressing the surface water quality ARAR. See response to Attachment I, Remedial Alternatives, Comment 6.

AR307292

2. Comment: Page 5-7 is incorrect when it states that Alternative 2 will provide on-site containment. This alternative does not adequately provide for on-site containment. This alternative would more appropriately be labeled "Limited Action" in that it only provides for limited action above and beyond the existing pump and treat and monitoring system.

   Response: With the addition of control measures for subsurface soil at CB-1 and drainageways in addition of DNAPL recovery and groundwater extraction wells further containment of contaminants will be achieved. See response to Attachment I, Remedial Alternatives, Comment 6.

3. Comment: Pg. 5-13, paragraph 4. The statement is made that " ... final capping and closure will address the RCRA design criteria for surface impoundment closure". This is incorrect (see 40 CFR Ch.1 Section 264.228).

   Response: The final cover for Alternative 2 will consist of a multilayer cap which will address RCRA design criteria. The basin material will be stabilized to provide sufficient bearing strength to support the final cover. This will be clarified in the FS text.

Alternative 3

1. Comment: Alternative 3 does not adequately address remediation of the sediments in the unnamed tributary. Figure 5-6 identifies areas along the sides of the unnamed tributary to be excavated. Analytical results from the RI reveal that most sampling locations downgradient of the soil dike are contaminated. This alternative must provide an option for excavation and treatment of sediments above response levels.

   Response: Removal of these additional wetland sediments will create an adverse ecological impact in these areas due to destruction of habitat, disturbance by heavy construction equipment and sediment transport. Operation of excavation equipment in these soft sediments is also problematic and may require placement of temporary access roads which would cause additional ecological impact.

2. Comment: On page 5-20, a slurry wall should be included as an alternative for containing groundwater. Please discuss briefly possible contingency measures for treatment of off-gases in the event that production processes are curtailed and the discharge will no longer be burned in the boilers. In addition, please reference documentation that the boilers will effectively destroy/remove the volatile and semi-volatile constituents.

   Response: Slurry walls are a method for limiting lateral groundwater migration, and their feasibility is dependent upon site geologic conditions. For the SCD site, a successful slurry wall would have to be combined with groundwater recovery via recovery wells or an interception trench. Otherwise, groundwater movement could occur around the limits of the slurry wall or the additional head could drive groundwater vertically into the deeper aquifer. Slurry walls could be substituted for the interceptor trench as the commentor indicates. As set forth in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", representative process options are selected to represent process options that are sufficiently similar. The ROD, if worded with enough flexibility, will allow the implementation of either process option. During the remedial design, it could then be decided whether to implement an interceptor trench system, or a slurry wall system. This type of flexible wording is recommended.

   Contingency measures for off-gas treatment will be briefly discussed. The boilers are currently destroying the compounds that are expected to result from remedial action. This is evidenced by the fact that there are no air permit violations from the boiler.

AR307293

3. Comment: Pg. 5-23. Please discuss briefly alternative technologies (other that air stripping) if it could be used for treating wastewater, which in turn will treat contaminated ground water. Please let DNREC know if SCD believes that the recent events regarding the NPDES effluent discharge permit will have any effects on the Feasibility Study.

   Response: Other technologies that could be used will be discussed briefly. SCD believes that the recent events regarding the NPDES effluent discharge will not effect the FS.

4. Comment: Pg. 5-23. Details on volume of soil to be excavated and stabilized should be provided. Table 3-5 suggests excavation to a depth of 3 feet, whereas sample location #SS-29 showed contamination to a depth of five feet.

   Response: See response to Attachment II, Section 3, Comment 8.

5. Comment: Pgs. 5-22, 5-24, Figures 5-4 and 5-5. Concern has arisen that care should be taken in choosing the location of the interceptor trench in that it should be located out of the flood plain and at a higher elevation than the expected ground water seasonal high. Please clarity the figures and text.

   Response: The current location of the interceptor trench, as depicted on Figure 5-4, is conceptual in nature. The information required to determine the exact location of the interceptor trench must be collected during remedial design.

6. Comment: Please discuss in more detail the effectiveness of the interceptor trench in controlling the seeps.

   Response: The requested discussion will be incorporated.

7. Comment: Please include a more detailed discussion about the liner proposed for the interceptor trench and the ramifications of either including the liner in the alternative or not.

   Response: The requested discussion will be incorporated.

8. Comment: The new silt fence discussed on page 5-32 will only minimize migration and should only be considered as an interim measure as opposed to a permanent solution.

   Response: The installation of a new silt, and proper maintenance of the fence, will serve as a long term mitigation of the risks associated with these sediments.

9. Comment: Rationale for the extent of the asphalt cap around the catch basin should be included in the description.

   Response: The rationale will be provided. The cap will be installed to an areal extent that joins with other asphalt covered areas in the vicinity.

10. Comment: Justification and rationale for placement of manholes 300 feet apart for the interceptor trench should be included in the description.

    Response: See response to Attachment II, Section 5, Alternative 3, Comment 5.

AR307294

Alternative 4

1. Comment: Pg. 5-39. The technology for treatment of contaminated ground water must be delineated.

   Response: The agencies need to realize that this is an operating manufacturing facility, subject to process changes. Although air stripping is currently employed, the facility must have the ability to evaluate and implement other technologies for effectiveness or economic considerations. In this event, the agencies will be given proper notice, and will evaluate the new treatment scheme with respect to the remedial actions presented in the FS.

2. Comment: Provide more detail on the LTTT, size of unit, flow input, management of contaminated media, etc.

   Response: More information concerning thermal desorption will be provided. However, many of these details would be appropriately during the RD phase. The agencies are reminded that several implementations of thermal desorption exist (LTTT, XTRAX, and others) and therefore only generalizations will be provided.

3. Comment: Please expand the description of free product recovery.

   Response: More detail will be provided.

4. Comment: Pg. 5-40, Figure 5-7. Concern exists that the recovery well locations proposed in Figure 5-7 may not encounter free organics because the distribution of the free organics on this site did not coincide with the contouring of the confining unit (see Fig. 3-6, RI report). Therefore it appears that recovery well locations should be placed near and down-slope of monitoring wells TW-5, TW-28, TW-30 (ones that have shown free organics since 1988). Please indicate uncertainty as to number and location of Product Recovery wells.

   Response: As with the location of the interceptor trench, the location of the product recovery wells is only presented on a conceptual basis. However, the location of these wells will be moved closer to the cited wells.

5. Comment: Pg. 5-40, Figure 5-7. Please depict the existing wells which have historically contained DNAPL directly on this figure.

   Response: A figure, depicting these wells will be presented in Section 1.

Alternative 5

Comment: The results of the Bioremediation Treatability Study must be submitted with the revised FS to demonstrate its application and limitation.

Details on ultimate disposition of soil piles after bioremediation should be included.

Response: Results of the biological treatability study will be incorporated as they are made available. At this time, more details concerning Alternative 5 will be provided.

AR307295

SECTION 6

Comment: Pg. 6-2. It is mentioned that the on-site groundwater is expected to meet MCLs over the long term. An approximate time frame should be furnished for each alternative.

Response: See response to Attachment I, Remedial Alternatives, Comment 7.