Responses to Technical Review Comments

on Final Alternatives Array Document

and Remedial Alternatives Technical Memorandum

Stoughton City Landfill
Stoughton, Wisconsin

ENSR

Submitted By:

Stoughton City Landfill Steering Committee

Document No. 6885-002-420A

Prepared By:
ENSR Consulting and Engineering
740 Pasquinelli Drive
Westmont, Illinois 60559

January 17, 1991

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Comment 1:

General Comments: Contaminated sediments were identified in the Draft Alternatives Array Document as a "media of concern"; however, this media has been removed from consideration in the final document. Some justification should be presented for not considering this media in the development of remedial action alternatives. A discussion of potential ARARs for contaminant levels in sediment is also absent from Appendix A, Evaluation of ARARs.

Response 1:

The results of sediment sampling and analysis are summarized in Table 1-1 and Section 1.2.3.2 of the Final AAD. Exposure to chemicals identified in sediments was considered in the revised risk assessment (Revision 2 of the Draft RI Report). The results of this evaluation are summarized in Section 1.2.5 of the Final AAD. These results indicate that sediment is not a "medium of concern." Therefore, its removal from consideration in the Final AAD is justified and a discussion of potential ARARs is not required.

Comment 2:

Section 1.2.3.1: An estimate of waste volume should be presented here, based on hydrogeologic cross-sections and waste boundary maps contained in the RI Report.

Response 2:

An estimated waste volume will be presented as requested.

Comment 3:

Section 1.2.3.2: Analytical results presented in Table 1-1 indicate the detection of PAH compounds such as benzo(a)pyrene in the landfill waste. These large organic molecules have a high affinity for soils and may be transported via dust generated at the site. The potential for the presence of these compounds in the ambient air in the vicinity of the landfill should be evaluated.

Response 3:

The landfill was closed in 1982 in accordance with State regulations, including the application of cover material and seeding. In general, this cover is in sound condition. Therefore, potential transport of fugitive dust is not likely.

Comment 4:

Section 1.2.4: The potential for exposure to carcinogenic PAH compounds transported via the ambient air should be considered (see comment immediately above).

Response 4:

See Response 3.

Comment 5:

Section 1.2.4: In the second paragraph on page 1-18, please expand upon the statement that groundwater flow to the west of the Site is not an established pathway.

Response 5:

It is not implied that groundwater flow to the west is not an established pathway. Rather, although RI data do not conclusively show groundwater flow in this direction, it is presumed to be an established pathway. This is based on previous groundwater investigations by the USGS that indicate that the Yahara River is a regional groundwater discharge area. The sentence will be reworded to clarify this point.

Comment 6:

Section 1.2.4: At the middle of the last sentence on page 1-18, change "would likely" to "have the potential to."

Response 6:

The suggested rewording will be made.

Comment 7:

Section 1.2.5.1: A summary table consisting of maximum exposure risk for carcinogens should be included here, as well as a summary of hazard indices for non-carcinogens, for each media of concern.

Response 7:

A summary table of the results of the risk characterization will be included as requested.

Comment 8:

Table 2-1: The maximum barium concentration detected in groundwater is 391 ug/l, not 293 ug/l. Please see Table 1-1.

Response 8:

A barium concentration of 391 µg/l was measured in duplicate groundwater sample SLMW2SR2-1-GW, collected from monitoring well MW-2S. This well is completed in refuse and is not representative of groundwater quality in the sand and gravel aquifer. The barium

concentration listed on Table 2-1 (293 µg/l) is from MW-1S. As previously noted, this well is located upgradient of the landfill.

Comment 9:

Section 2.2: Although concentrations of 1,2 dichloroethylene did not exceed the State Enforcement Standard or Preventative Action Limit during RI sampling, historical data does exist which indicates exceedances of both the PAL and ES, and therefore the Site-specific remedial action goals should at least include a discussion for addressing groundwater contamination by 1,2 DCE.

Response 9:

Only the results of the RI are pertinent in consideration of remedial action goals for the site, not those data collected previous to the RI. As noted in Technical Memorandum No. 1 (Appendix A of RI), previous data are suspect. Further, WAC NR 140.16 establishes requirements for monitoring and laboratory data used to assess compliance with Wisconsin groundwater quality standards. Previous site data are not interpreted to satisfy these requirements.

Comment 10:

Section 2.2: On page 2-5, under "Groundwater Operable Unit", we would prefer language which is more consistent with that of the NCP, such as, "Develop a limited array of remedial alternatives which attain site-specific remediation goals (i.e., groundwater standards) within different restoration time periods utilizing one or more different technologies. The exceedance of the selenium PAL could potentially trigger a response although surface water samples in the downgradient wetlands have not yielded detectable selenium levels.

Response 10:

The remedial action objective listed under "Groundwater Operable Unit" will be changed to read "Develop a limited array of remedial alternatives which attain groundwater standards for tetrahydrofuran at MW-3D within different restoration time periods utilizing one or more different technologies."

The concentration of selenium measured in MW-1S (estimated at 7.4 µg/l) is above the PAL. However, this well is upgradient of the landfill based on RI data. Therefore, remediation goals for this constituent are not appropriate.

Comment 11:

Figure 3-2: Retain the "Slurry Wall" process option under the "Vertical Barriers" remedial technology; while we agree that anchoring into bedrock may not be feasible, a hanging slurry wall may inhibit horizontal groundwater gradients, and should be retained for further discussion. Under the remedial technology "Chemical Treatment", retain the "Precipitation" process option

as it may be applicable to selenium contamination at the Site, and can potentially be used in tandem with carbon adsorption to treat groundwater.

Response 11:

The use of hanging slurry walls is generally limited to the control of floating contaminants (U.S. EPA Handbook: Remedial Action at Waste Disposal Sites, 1985). Tetrahydrofuran is miscible in water (RI, Table 5-2) and a nonaqueous phase was not identified in the RI. Therefore, a hanging slurry wall is not appropriate.

Selenium exceeds its PAL at upgradient well MW-1S only. Therefore, it is not attributable to the site. Precipitation is therefore not applicable.

Comment 12:

Figure 3-3: The Technology Process Option of imposing deed restrictions on the landfill property should have been carried forward. A restriction on the future use of the site will necessarily be part of the remedial action to prevent additional exposure or to prevent damage to the instituted actions (e.g., a cap). Under the general response action "Containment", the "Cap Repair" option should be deleted; the cap over the Site as it is does not meet NR 504 requirements for a solid waste cap, and any upgrade to the existing cap would not comply with State ARARs.

Response 12:

The deed restriction option will be carried forward. The cap repair option will not be deleted because the existing cap was installed in accordance with state regulations.

Comment 13:

Tables 3-3D to 3-3H: Under "Implementability", permits will not be needed for on-site activities, but the substantive requirements of any permits to perform on-site actions will need to be met. This does not need to be corrected here, but should be addressed in the Draft FS when discussing the "Implementability" criterion in the text.

Response 13:

We agree that only substantive requirements of any permits will need to be met for on-site activities. If off-site activities are required, permits will be needed. This notation will be added when discussing implementability in the Draft FS.

Comment 14:

Figure 4-1: The "Limited Action" general response action should be eliminated from further consideration at this time, as it will fail to meet the NCP's threshold criteria of protection of human health and the environment and attainment of ARARs.

Response 14:

In accordance with U.S. EPA Guidance, the alternatives presented on Table 4-1 were selected to provide a range of alternatives that represents appropriate treatment and containment options for each medium or operable unit. Because the site was closed and capped in accordance with state regulations, repair of the cap is appropriate for the site. In addition, the action of cap repair and upgrade was evaluated for the Onalaska site. Thus, elimination of this alternative prior to the detailed evaluation is not warranted by guidance or precedence and the alternative will remain in the FS document.

Comment 15:

Table A-3: On the second page of this table, at 40 CFR 122.44(l) and 40 CFR 122.21, do you mean to say "substantive requirements" instead of "administrative requirement" under the "Comment and Analysis" column?

Response 15:

The original rationale in considering these requirements as administrative was that the discharge to the Yahara River was considered off-site. Off-site activities must comply with both substantive and administrative requirements. However, the U.S. EPA Draft Guidance titled CERCLA Compliance with Other Laws Manual: Part I (EPA/540/G-89/006), page xix, states that "a direct discharge of CERCLA wastewaters would be 'on-site' if the receiving water body is in the area of contamination or is in very close proximity to the site"; therefore, discharge to the Yahara River would be considered, in this case, an on-site activity. This distinction is important because, under CERCLA§ 121, on-site activities are exempt from requirements for fulfillment of all administrative procedures such as filing permits. The CERCLA program has its own set of administration procedures to assure proper implementation of CERCLA. Comment 15 is correct in pointing this out and Table A-3 has been changed to reflect this.

Comment 16:

Page 1-8: In the source characterization section, please provide information regarding where the liquid wastes came from, and include a discussion of the cap conditions at the site.

Response 16:

The source of the liquid wastes identified on page 1-8 is not considered pertinent. The same information presented here was presented in the RI Report, in which no comment was made on this subject.

A qualitative discussion of the cap conditions at the site will be added as requested.

Comment 17:

Page 1-16: Both a determination of whether wastes are considered hazardous wastes as well as waste volume needs to be made in order to complete the analyses of ARARs. This is especially important in determining the type of gas extraction system required at this site.

Response 17:

An estimate of the waste volume in place at the landfill will be included. Whether disposed wastes are hazardous is viewed as a State or U.S. EPA determination.

Comment 18:

Page 1-16: In the discussion of surface water, please delete the word "marginally". Standards exceedances are not qualitative determinations but quantitative. Either standards were exceeded, or they were not. In addition, please provide a table that identifies the standards as calculated by the consultant. Include the concentration of metals found as well as acute and chronic limits. Be sure that those limits are calculated without dilution, as dilution is not included for water quality calculations in wetlands.

Response 18:

As discussed in the Final RI Report (Revision 3 of Draft RI Report), it is not known whether zinc in surface water exceeds CTC values at these locations because the hardness is outside the applicable range of the equations used to calculate the CTC values. The text in Section 1.2.3.2 will be revised to indicate this.

A table (Table 4-5A) listing the CTC values (standards) calculated without dilution using the upper limit of hardness was prepared for the Final RI Report. Please reference this table.

Comment 19:

Page 1-16: It would be helpful to rename the "Sediment" section on this page to "Sediment/Wetland" to clarify that these are wetland samples.

Response 19:

The first sentence of this section states that the sediment samples were collected from the wetland. No further clarification is considered necessary.

Comment 20:

Page 1-17: It should be stated in the groundwater section that there is groundwater mounding at the site and MW1s could be affected by that mounding. In addition, please clarify whether the reference to MW2s as being screened in "saturated refuse" is meant to distinguish this from a well screened in the water table and whether this is hydraulically connected to the groundwater.

Response 20:

As discussed in comment responses on the Draft RI Report (Revision 2), the general groundwater flow pattern at the site is not influenced by mounding per se. Therefore, the requested reference to groundwater mounding is not appropriate.

The requested clarification of the status of MW-2S will be made.

Comment 21:

Page 1-17: Also, please delete the term "marginally" when discussing the groundwater exceedance for arsenic. Again, this is putting the consultants qualitative evaluation on a quantitative determination. Also, the groundwater quality needs to be compared not only with PALs, but with surface water quality standards, as the groundwater is discharging directly to surface water and wetlands.

Response 21:

Use of the term "marginally" is appropriate because the concentration of arsenic in the referenced sample was 5.2 µg/l (compared to the PAL of 5.0 µg/l). Clarification will be added that the mean arsenic concentration at this location is below the PAL. Also, text will be added concerning the results of comparison of groundwater quality to surface water quality standards.

Comment 22:

Page 1-18: Please state that there is groundwater mounding in the discussion of transport and fate, as this will affect the transport of chemicals in the groundwater.

Response 22:

See Response 20.

Comment 23:

The last paragraph on this page seems out of place and irrelevant to this document. I recommend that it be removed.

Response 23:

The referenced discussion is important to the transport and fate processes that exist at the site.

Comment 24:

Page 1-19/1-20: With respect to the reference to groundwater discharge to the Yahara River, clarification should be made that groundwater discharge would have to meet Wisconsin Water Quality Criteria (both acute and chronic), some of which will be affected by dilution. In addition,

water discharging to a wetlands does not have any dilution for the purposes of establishing water quality criteria.

Response 24:

See Response 21.

Comment 25:

Page 1-19/1-20: Please clarify that metal constituents released to the southeast wetland water body are above background levels, whether diluted or not.

Response 25:

The requested clarification will be made.

Comment 26:

Page 1-19/1-20: Please provide some verification that VOCs measured in the air would not reach significant concentrations downwind of the site. This statement needs additional support in order to be left in the report.

Response 26:

Under Response 40 to comments on the Draft RI Report (Revision 2), the additional support has been provided. Narrative will be added to the Draft FS Report describing the basis of the statement.

Comment 27:

Page 1-19/1-20: Please state the three directions of groundwater transport at the site.

Response 27:

The three directions of groundwater flow are discussed in Section 1.2.4. For clarification, they will be referenced in Section 1.2.5 also.

Comment 28:

Page 1-21: Please identify the chemicals used to calculate the risks at the site. In addition, please provide both the carcinogenic and noncarcinogenic effects for each of the media on the next page.

Response 28:

The chemicals used to calculate risk at the site are those listed in Table 1-1, with the exception of common chemical nutrients (sodium, potassium, calcium, magnesium, iron, and sulfur) and TICs that were not detected in more than one medium, all pursuant to

RAGS. This notation will be added to the text. Also, a table will be added that summarizes the carcinogenic and noncarcinogenic risks for each medium and exposure scenario.

Comment 29:

Page 1-22: Where is the environmental risk assessment for this site. This site is in a very sensitive environment, as the site is surrounded by wetlands and the Yahara River on three sides.

Response 29:

Environmental effects are evaluated in Section 6.7 of the Draft RI Report (Revision 2). The results of this evaluation will be summarized in the Draft FS Report. The need for and scope of any detailed ecological investigation was to be based on the RI results, as discussed in the RI Work Plan. The WDNR reviewed and approved this document.

Comment 30:

Page 2-1: The Remedial Action Objectives should reflect the program goals and expectations as identified by the EPA. Those goals and expectations are listed on the attached sheet. All of these should be clearly stated in this section, not just the limited goals the consultant has included here.

Response 30:

The referenced sheet was not attached to the agency comments. The remedial action objectives are based on and supported by the RI data.

Comment 31:

Page 2-2: It is inappropriate to use the example that future use of groundwater in the sand and gravel aquifer is restricted by the WAC NR 504.07, as this rule provides for exemptions, which are frequently granted. We cannot restrict the installation of new groundwater drinking wells for the Stoughton Landfill.

Response 31:

The reference to WAC NR 504.07 for potential groundwater use restriction will be changed to NR 112.07(2)(q) and it will be noted that variances to this restriction may be granted by the State.

The selected remedies for the Onalaska, Hunts Disposal, and Master Disposal sites include reliance on State institutional controls to restrict groundwater use. Therefore, the referenced example is considered appropriate.

Comment 32:

Page 2-2: Please note that SL2 is located in a wetland.

Response 32:

The suggested note will be added.

Comment 33:

Page 2-2: The reference to Tetrahydrofuran being the only compound exceeding Wisconsin groundwater enforcement standards is irrelevant, as what is critical are the compounds exceeding preventive action limits (PALs). Please be sure the consultant understands the Wisconsin groundwater quality regulation and that we are looking for PAL exceedances, not enforcement standard exceedances.

Response 33:

The reference to tetrahydrofuran (THF) is relevant because PAL exceedances of other constituents in groundwater at the site are not interpreted to require response action at this time, as discussed below.

Under NR 140.14(1)(b), scientifically valid determinations must be made that PALs have been exceeded.

The mean concentrations of THF measured in monitoring wells MW-4D and MW-5S (including data from valid sampling rounds and sample replicates) are below the PAL. Therefore, confinement of groundwater collection of this constituent to the area around MW-3D is appropriate.

The mean concentration of arsenic at MW-2S is also below the PAL. Further, groundwater at this location is not representative of the sand and gravel aquifer, but rather, of the water that discharges to the adjacent wetlands. The levels of arsenic do not exceed either acute or chronic toxicity criteria for this constituent in surface water. Therefore, remedial action is not appropriate.

The concentration of barium exceeded the PAL at MW-1S and MW-2S. MW-1S is located upgradient of the landfill and therefore, exceedances at this location are not attributable to the landfill. As noted above, MW-2S is not representative of the sand and gravel aquifer. No toxicity criteria for surface water for this constituent exist for surface water. Therefore, remedial action for this constituent is not appropriate either.

Chromium was measured at MW-4D below the limit of quantitation and just above the PAL (5 μg/L). The apparent, marginal exceedance of the PAL for this constituent should be validated through continued monitoring proposed in the FS, as provided for under NR 140.14(1)(b) and (2).

Selenium was the only other constituent to exceed a PAL. This PAL was exceeded in MW-1S, located upgradient of the landfill. Therefore, remediation is not appropriate.

Under NR140.28(2), an exemption from remedial action may be granted when a PAL is exceeded if: "...(c) the enforcement standard for that substance will not be attained or

exceeded at the point of standards application; and (d) any existing or projected increase in the concentration of the substance above the background concentration does not present a threat to public health or welfare." Either or both of these citations apply to constituents that exceeded PALs at the Stoughton City Landfill.

The above discussion indicates that remedial action for constituents that are present at concentrations exceeding only PALs is not justified in the case of the Stoughton City Landfill.

Comment 34:

Page 2-2: The groundwater discussion also needs to include a discussion of whether groundwater exceeds surface water quality criteria.

Response 34:

The suggested discussion will be added to this section.

Comment 35:

Page 2-3: Please delete the word "marginally" when identifying that chromium exceeds the groundwater standards.

Response 35:

The fact that chromium was measured at an estimated concentration of 8.0 µg/l compared to the PAL of 5.0 µg/l justifies the use of the word "marginally."

Comment 36:

Page 2-5: The remedial action objectives need to be expanded to be acceptable for this project. The following are my suggestions for changes:

> *Soil/Solid Waste Operable Unit - prevent public from direct contact exposure to landfill refuse and potential hazardous substances contained therein; and to contain wastes such that they are not released to the environment, including air emissions of landfill gas;*
>
> *Groundwater Operable Unit - there are more compounds than tetrahydrofuran that exceed Wisconsin groundwater quality standards. This must be changed to reflect achievement of all groundwater quality standards for this site. In addition, the goal of preventing the release of contaminants from leaving the site once they are in the groundwater must be added, as well as a goal of protecting the adjacent wetlands from both contamination and change in hydrologic conditions. Also, the term "eventual" should be deleted in this context and replaced with "within a reasonable period of time". Finally, EPA has established as an expectation that groundwater will be restored to its beneficial use within a reasonable time frame. This should be included here as well.*

Response 36:

The words "direct contact" will be added to the solid waste remedial action objectives. See Response 33 pertaining to achievement of groundwater standards for constituents other than THF.

Comment 37:

An integral part of our groundwater quality regulations is the non-discretionary requirement to prevent the continued release of contaminants from a site at levels that exceed standards. Because this site is in direct contact with the water table, the only way to comply with our groundwater standards is to contain the site with some type of groundwater extraction system or to contain the groundwater through a barrier system. Thus the soil/solid waste operable unit cannot be separated from the groundwater operable unit. One without the other would lead to a failure of both.

Response 37:

The mean concentration of arsenic in MW-2S (representative of saturated refuse) is below the PAL and no ATC or CTC values for surface water are exceeded at this location. Therefore, the suggested remediation of groundwater in contact with refuse is not justified.

Comment 38:

In addition, in Table 3-3A - 3-4B, the ability to meet remedial action objectives must include a discussion of whether these "technologies" meet ARARs.

Response 38:

According to the RI/FS Guidance Manual (U.S. EPA, 1988), Section 4.2.5.1, the effectiveness evaluation of technologies does not include discussion of ARARs; these are not considered until the detailed analysis of remedial alternatives.

Comment 39:

Page 3-1: The consultant should be using the RI/FS guidance on screening criteria when eliminating technologies. The guidance states that three broad criteria should be used: effectiveness, implementability, and cost. Included in the effectiveness criteria is compliance with ARARs and overall protection of the environment.

Response 39:

The RI/FS Guidance Manual (U.S. EPA, 1988), including screening criteria, was used. For the initial screening, Section 4.2.4 of the Guidance Manual states: "During this screening step, process options and entire technology types are eliminated from further consideration on the basis of technical implementability." For evaluation of technologies, three criteria are used: effectiveness, implementability, and cost. According to Section 4.2.5.1 of the Manual, the effectiveness criterion includes three factors, but ARARs is not one of them.

ARARs are not considered until the detailed analysis of alternatives, according to Section 4.3.2 of the Manual.

Comment 40:

Page 3-3: While it is not incorrect to include cap repair and single layer cap in this document, it is not necessary as the State would not accept either of these alternatives as a final remedy for the solid waste operable unit because of the groundwater ARARs exceedances. Therefore, the consultant can save much discussion by eliminating these from future consideration at an early stage.

Response 40:

The inclusion of cap repair and a single layer cap is correct and applicable to the conditions found at the site. In accordance with U.S. EPA FS guidance, the purpose of the FS is to provide information necessary to "support an informed risk management decision regarding which remedy appears to be most appropriate for a given site." Based on the results of the Risk Assessment, which indicate little or no risk presented by constituents present in groundwater, we believe that discussion regarding consideration of these technologies is required to provide an acceptable range of alternatives as well as to aid in the ultimate selection of a remedy for the site.

Comment 41:

Page 3-4: The screening for vitrification is incorrect as this technology is being used at other sites and is considered an innovative technology. This alternative should remain for further analysis.

Response 41:

In-situ vitrification is correctly screened from further consideration for several reasons: the technology is an innovative technology, is not applicable given the concentration and distribution of the waste constituents found at the site, and is ill-applied in heterogeneous conditions found at the Stoughton City Landfill site. Innovative technologies are defined in Section 4.3.2.4 of the U.S. EPA RI/FS Guidance Manual as technologies that "...are fully developed but lack sufficient cost or performance data for routine use at Superfund sites." Innovative technologies would be carried forward only if there were reason to believe that significant technical performance or cost advantages existed. Given the heterogeneous nature of the landfill waste, the dilute and scattered concentrations of the constituents of interest within the fill mass, the size of the landfill, and the physical performance of in-situ vitrification, no such advantage is believed to exist.

Comment 42:

Page 3-6 and 3-9: Please include the slurry wall (or other containment structure) as part of the remedial action alternatives that are pursued. A hanging slurry wall may be used in conjunction with a groundwater extraction system to contain groundwater, and could help mitigate any negative impacts to the wetlands from a groundwater extraction system. It may be appropriate

to try to isolate the wastes and the groundwater from the surrounding wetlands, and a hanging slurry wall could accomplish that objective.

Response 42:

See Responses 11 and 37.

Comment 43:

Page 3-6 and 3-9: Please add a note to the discussion of institutional controls that they are not "stand alone" actions, but would be used in conjunction with the other active response measures.

Response 43:

The statement that institutional controls are not stand-alone actions, but would be used in conjunction with other response measures will be added.

Comment 44:

Page 3-6: Please discuss the ability of precipitation in removing inorganic contaminants, not only tetrahydrofuran.

Response 44:

See discussion under Response 33 regarding inorganic PAL exceedances. No inorganic constituents are included as constituents of concern, therefore precipitation is not applicable.

Comment 45:

Page 3-9, 3-27, 3-28, 3-29: The exact treatment technology for the extracted groundwater will have to comply with both Wisconsin water quality criteria as well as Best Demonstrated Available Technology (BAT). Once water quality standards are issued for this site, it is the responsibility of the party conducting the remedy to submit a proposal to the WDNR for review of BAT. These are reviewed on a case by case basis, and therefore, the exact treatment technology needs to be selected at a later date.

Response 45:

See Response 54.

Comment 46:

Page 3-11 through Table 3-3: None of the alternatives would meet the second remedial action goal of leaching because of saturated wastes at the site.

Response 46:

Alternatives with cap repair or upgrade would reduce leaching through reduction of infiltration. This would in turn control leaching from saturated wastes, albeit indirectly. Also see Response 37.

Comment 47:

Page 3-10, 3-19, 3-20, 3-21: Surface grading, vegetation, and diversion and collection systems are redundant as these are included in the capping requirements. They do not need to be highlighted as separate actions. In addition, there needs to be a discussion in these alternative about gas extraction. What type of a system is being proposed, active or passive? Will treatment of the air emissions be necessary to comply with NR 445?

Also, please include a discussion of a slurry wall, consistent with Tables in this section.

Response 47:

Surface grading, vegetation, and diversion and collection systems are included in capping requirements and discussion of them as separate technologies will be removed.

See Response 11 regarding discussion of a slurry wall.

Comment 48:

Page 3-23: Please include that deed restrictions will not meet the objective of restoring groundwater to its beneficial use.

Response 48:

The statement that deed restrictions will not meet the remedial action objective of achieving state PALs for tetrahydrofuran will be included.

Comment 49:

Page 3-30: Please discuss how bioremediation would deal with the other compounds of concern in groundwater. In addition, why is ability to meet cleanup objectives different for this technology in that it focuses on groundwater cleanup objectives vs. remedial action goals.

Response 49:

Tetrahydrofuran is the only constituent of concern for which remedial action objectives have been established for groundwater. "Groundwater cleanup objectives" will be changed to "remedial action goals."

Comment 50:

Page 3-31: It is my understanding that the discharge to the Yahara River would be considered an "on-site" discharge, and therefore, no permits would be necessary for the discharge of treated groundwater to the River. Perhaps the Agencies need to discuss this further.

Response 50:

Comment noted.

Comment 51:

Page 3-35: Please include the statement that cap repair would not prevent leaching of contaminants to the groundwater or prevent the release of contaminants from the waste mass to the groundwater. In addition, please add that the synthetic geomembrane cap may be needed to meet ARARs, depending on a hazardous waste determination.

Response 51:

Cap repair and upgrade, which would include addition of up to 2 feet of 10^{-7} permeability clay cover where needed, would significantly reduce the leaching of constituents to groundwater by reducing infiltration.

The following statement will be added: "A synthetic geomembrane may be needed to meet ARARs it if is determined that the waste materials are hazardous wastes and a hazardous waste cap is required."

Comment 52:

Page 3-36: Please include precipitation in the chemical treatment category and include the analyses for precipitation. Also, please discuss how bioremediation would affect inorganics.

Response 52:

Because no inorganic constituents are constituents of concern, precipitation is not applicable and bioremediation is not necessary to remediate inorganics.

Comment 53:

Section 4: There needs to be a clear discussion that the containment of the landfill is intricately connected to the groundwater extraction system in order to comply with ARARs. The continued release of contaminants to the groundwater at levels that exceed groundwater quality standards must be prevented, and since wastes are in contact with the groundwater, an extraction system and/or a groundwater containment system (i.e. slurry wall) with a cap is necessary.

Response 53:

See Responses 33 and 37.

Comment 54:

Page 4-3: The groundwater discharge needs to comply with all water quality criteria as well as BAT. It is incorrect to state that the groundwater would be treated for tetrahydrofuran only. This comment applies to all discussion of groundwater treatment in this report (alternatives 6 and 7), and therefore, I will not repeat it for other sections where it applies.

Response 54:

The concentrations of the constituents of interest in groundwater extracted from the site are currently unknown because an extraction system does not exist. The operation of an extraction and treatment system will need to meet the Wisconsin water quality standards and BAT. However, determination of constituent concentrations and treatment technologies for the purpose of design and compliance with standards can only be accomplished following pump testing in the predesign phase of the remedy for the site. Tetrahydrofuran is the constituent of interest for purposes of evaluation and costing of technologies. It is understood that modification of a treatment system may be required to meet discharge standards.

Comment 55:

Page 4-10: The consultant limits the groundwater recovery wells to the western boundary of the site. This is not necessarily the case, as mounding is occurring at the site. Again, we must prevent the release of contaminants from the site, and a well recovery system must be designed to accomplish all of the objectives of the remedial action.

Response 55:

See Response 33. Also, long-term groundwater monitoring of the site is expected to provide for the detection of any future potential releases. If such releases are observed, appropriate action will be taken. The response actions evaluated in the FS were selected to address the current conditions at the site.

Comment 56:

Appendix A - Page 1: The minimum technology discussion in the third paragraph should also include replacement units, as well as an expansion of an existing landfill.

Response 56:

It is assumed that the reference to "units" refers to solid waste management units (SWMUs). Inclusion of "an expansion of an existing landfill" as an example would be redundant because this example is already given in the paragraph. It should be noted that the intent

of this paragraph was only to give examples of RCRA-type actions; it was not intended to be all-inclusive.

Comment 57:

In the fourth paragraph, the last sentence should be clarified to state that MCLs may not be appropriate to use for groundwater that is designated a Class III aquifer pursuant to EPA's groundwater classification system. This is an important distinction from one that has no potential as drinking water.

Response 57:

Comment noted; text will be changed accordingly.

Comment 58:

Page 2: To Be Considered criteria has nothing to do with risk assessments, as stated in the last paragraph prior to section 1.1. Perhaps a better example of a To Be Considered is the RCRA cap guidance.

Response 58:

The U.S. EPA draft guidance document CERCLA Compliance with Other Laws Manual: Part I (EPA/540/6089/006) clearly states in Section 1.4 that TBC values such as health advisories and reference doses used in the risk assessment are TBC criteria to be used in the absence of chemical-specific ARARs. Exhibit 1-10 of the same manual supports this.

Comment 59:

Table A-1: Please specify in the title that these are Potential Federal Contaminant Specific ARARs.

Response 59:

Comment noted; Table A-1 will be changed accordingly.

Comment 60:

Table A-3: The consultant has not discussed how the wastes that result from treating the groundwater are going to be handled. These wastes could be considered hazardous wastes and would need to comply with the appropriate ARARs. This is an important discussion that needs to be included somewhere in this report. The result of that discussion could affect the ARARs analyses included in this table.

Response 60:

A discussion of potentially hazardous residuals generated during groundwater treatment has been added to appropriate sections of the Draft FS and appropriate ARARs in Table A-3 have been adjusted accordingly.

Comment 61:

Page 4 of Table A-3: There is a typographical error under the 1st Requirement - I believe "store" should be "storm".

Response 61:

Comment noted; text will be changed accordingly.

Comment 62:

Page 1 of Table A-4: Chapter 144, Wisconsin Statutes needs to be included in this table.

Response 62:

The referenced statutes will be included in the table.

Comment 63:

Wisconsin Groundwater Quality Standards, NR 140, are applicable, not relevant and appropriate as stated in this table. This needs to be corrected. In addition, Chapter 160, Wis. Stats., needs to be included as an ARAR.

Response 63:

Wisconsin Groundwater Quality Standards, NR 140, are relevant and appropriate and not directly applicable because the effective date of these standards was October 1, 1985, after the Stoughton City Landfill had been officially closed. Chapter 160, Wisconsin Statutes will be included as an ARAR.

Comment 64:

NR 1.95, wetlands protection policy, needs to be included in this table as a To Be Considered.

Response 64:

Comment noted; Table A-4 will be changed accordingly.

Comment 65:

NR 214 is misspelled at the bottom of this page as NR 2114.

Response 65:

Comment noted; Table A-4 will be changed accordingly.

Comment 66:

NR 141, monitoring well construction needs to be added as an ARAR for this site.

Response 66:

Comment noted; NR 141 will be added to Table A-4.

Comment 67:

Wisconsin Hazardous Waste Rules (RCRA) have been changed from the NR 181 series to the NR 600 series. This should be reflected in this table.

Response 67:

Comment noted; Table A-4 will be changed accordingly.

Comment 68:

Page 2 of Table A-4: It is possible that air stripping will be required, or the release of hazardous air from gas venting could occur after the site is capped. Therefore, it is imperative that NR 445 be included as an ARAR for this site.

Response 68:

Air stripping is recognized as a potential groundwater treatment alternative. Also, gas venting may be required for some alternatives. NR 445 was included as a potential ARAR (see page 2 of Table A-4).

Comment 69:

Also, please include NR 504.07 for landfill gas control and capping requirements. While this is included in the general NR 504 citation, it should be clearly identified here for clarification.

Response 69:

The determination of the necessity of landfill gas collection will be made when a decision on the degree and extent of cap repair is made. NR 504.07 will be included as a potential ARAR.

Comment 70:

NR 504.05(7) for landfill gas control is considered an ARAR as well.

Response 70:

NR 504.05(7) will be included in Table A as a potential ARAR.

Comment 71:

Page 16 of Appendix A: There should be a discussion of the need to prevent the release of contaminants to the groundwater at levels that exceed standards at the point of standards application in the overall discussion of NR 140. For Superfund sites in Wisconsin, the point of standards application is considered the waste/fill boundary.

Response 71:

As stated in NR 140, having a point of standards application (design management zone) at the waste/fill boundary only applies to hazardous waste disposal facilities, waste piles, landfills, and surface impoundments subject to regulation under NR 181.49(6), which is for new facilities. Superfund sites are not mentioned in the regulation. For these reasons, the site is not covered under this regulation.

Also, the application of this regulation is contingent upon whether disposed wastes are considered hazardous. This determination is viewed as a State or U.S. EPA issue and has not yet been resolved. Until this determination is made, it is correct to consider the design management zone for a solid waste disposal facility as the area within a vertical plane located within 300 feet of the facility boundary. This design management zone will be revised, if necessary, upon determination of the site category.

Comment 1:

Page 2-5; Section 2.8 and 2.9: State acceptance and community acceptance will be evaluated and addressed based on comments to the Proposed Plan, not the Feasibility Study.

Response 1:

Sections 2.8 and 2.9 will be changed; "Feasibility Study" will be replaced with "Proposed Plan." (Footnote to Table 2-1 will be changed also.)

Comment 2:

Page 3-1; Section 3.1: It is noted that increased groundwater monitoring and implementation of groundwater use deed restrictions are institutional control measures that are not technically compatible with the No Action alternative.

Response 2:

Deed restrictions will be removed from the No Action alternative, although groundwater use may be restricted by State regulations regardless. Groundwater monitoring is appropriate, however, according to language in the RI/FS Guidance Manual. In Figure 4-6 of the Manual, the example shows the No Action alternative to include groundwater monitoring.

Comment 3:

Page 3-2; Section 3.1.2.1: The statement that "it can be assumed that groundwater affected by releases from the landfill has already discharged to the Yahara River", should be removed. Leachate passing through waste materials and/or horizontal groundwater flow through the saturated waste can contribute to groundwater contamination for years.

Response 3:

The statement merely notes that based on calculated groundwater flow velocities, groundwater that may have been affected by releases from the landfill may have already discharged to the river. The statement does not eliminate the possibility of leachate contributing to groundwater contamination.

Comment 4:

Page 3-2; Section 3.1.2.1: Evaluation of the potential effects of contaminant migration on the environment, particularly the surrounding wetlands, should be included.

Response 4:

An evaluation of these potential effects will be included.

Comment 5:

Page 3-3; Section 3.1.2.2: Protection of wetlands may be an ARAR that would not be addressed if contaminated groundwater is allowed to continued to discharge to the surrounding wetlands.

Response 5:

The RI data indicate that groundwater affected by releases from the landfill does not exceed either ATC or CTC values established for the protection of surface water.

Comment 6:

Page 3-4; Section 3.1.2.4: Natural attenuation processes are not appropriate to be considered as treatment in the evaluation of reduction of toxicity, mobility, or volume.

Response 6:

The last sentence of Section 3.1.2.4 will be removed because the criterion considers reduction in toxicity, mobility, and volume "through treatment."

Comment 7:

Page 3-4; Section 3.1.2.7: Net present worth of this alternative should be presented in the section.

Response 7:

The following sentence will be added to this section: "The net present value of this alternative over the life of the project (estimated 30 years) at a 7% discount rate would be $840,130."

Comment 8:

Page 3-6; Section 3.2.2.1: See comment No. 4.

Response 8:

See Response 4.

Comment 9:

Page 3-6; Section 3.2.2.2: Natural attenuation through dispersion is not an acceptable method of complying with groundwater quality standards.

Response 9:

Appendix F of the RI/FS Guidance Manual, a case study of detailed analysis, includes natural attenuation of groundwater as an alternative component.

Comment 10:

Page 3-7; Section 3.2.2.4: See comment No. 6.

Response 10:

The last sentence of Section 3.2.2.4 will be removed, because the criterion considers reduction in toxicity, mobility, and volume "through treatment."

Comment 11:

Page 3-10; Section 3.3.2.1: See comment No. 4.

Response 11:

See Response 4.

Comment 12:

Page 3-10; Section 3.3.2.2: See comment No. 5.

Response 12:

See Response 5.

Comment 13:

Page 3-11; Section 3.3.2.5: Time to protectiveness should be evaluated in this section.

Response 13:

The following sentence will be added: "Investigation, design, and construction of the landfill cap is expected to require 1 year."

Comment 14:

Page 3-12; Section 3.3.2.7: Indirect capital costs (bid and scope contingencies) should be included so that the presented total capital cost equals the presented components of the cost.

Response 14:

The following sentence will be added: "Indirect capital costs, including bid and scope contingencies, mobilization/demobilization, health and safety, and sampling plan costs would be $852,500."

Comment 15:

Page 3-13; Section 3.4.2.1: See comment No. 4.

Response 15:

See Response 4.

Comment 16:

Page 3-13; Section 3.4.2.2: See comments No. 5 and 9.

Response 16:

See Responses 5 and 9.

Comment 17:

Page 3-14; Section 3.4.2.4: See comment No. 6

Response 17:

The last sentence of Section 3.4.2.4 will be removed, because the criterion considers reduction in toxicity, mobility, and volume "through treatment".

Comment 18:

Page 3-15; Section 3.4.2.5: See comment No. 13

Response 18:

The following sentence will be added: "Investigation, design, and construction of the landfill cap is expected to require 1 1/2 years."

Comment 19:

Page 3-16; Section 3.4.2.7: See comment No. 14.

Response 19:

The following sentence will be added: "Indirect capital costs, including bid and scope contingencies, mobilization/demobilization, and health and safety costs would be $2,625,500."

Comment 20:

Page 3-19; Section 3.5.2.4: The statement that the groundwater treatment (carbon adsorption) would "result in reduction in the toxicity and volume of tetrahydrofuran" should be clarified. Extraction of contaminants from groundwater does reduce the toxicity of the groundwater, but carbon adsorption of itself does not affect the toxicity of the compound tetrahydrofuran. Ultimate disposal or treatment (i.e., regeneration) of the spent carbon should be addressed.

Response 20:

The second-to-last sentence in Section 3.5.2.4 will be replaced with: "This would result in reduction of the total volume of tetrahydrofuran in groundwater. Regeneration of the spent carbon by thermal treatment would destroy the tetrahydrofuran, thereby reducing its toxicity."

Comment 21:

Page 3-21; Section 3.5.2.7: Total capital costs, with all included components, should be presented in this discussion.

Response 21:

The following sentence will be added: "Indirect capital costs, including bid and scope contingencies, mobilization/demobilization, and health and safety costs would be $936,300."

Comment 22:

Page 3-24; Section 3.6.2.4: See comment No. 20.

Response 22:

The second-to-last sentence in Section 3.6.2.4 will be replaced with: "This would result in reduction of the total volume of tetrahydrofuran in groundwater. Regeneration of the spent carbon by thermal treatment would destroy the tetrahydrofuran, thereby reducing its toxicity."

Comment 23:

Page 3-26; Section 3.6.2.7: See comment No. 21.

Response 23:

The following sentence will be added: "Indirect capital costs, including bid and scope contingencies, mobilization/demobilization, and health and safety costs would be $2,774,300."

Comment 24:

Page 3-28; Section 3.7.2.4: Since this alternative involves chemical degradation of the principal contaminant, there should be a discussion of the treatment residuals (i.e., aerobic degradation products of tetrahydrofuran) that would remain in the environment. This comments also applies to Alternative 8.

Response 24:

The following sentences will be added to the above-referenced sections: "The aerobic degradation products of tetrahydrofuran are anticipated to be CO_2, H_2O, and cellular materials. The compound (C_4H_8O) consists of carbon, hydrogen, and oxygen and the primary breakdown products would likely enter microbial metabolic pathways to provide energy or cellular materials."

Comment 25:

Page 3-29; Section 3.7.2.6: This section should include a discussion of the reliability of the in-situ treatment of groundwater relative to the specific contaminant of concern. This comment also applies to Alternative 8.

Response 25:

The following sentences will be added to the above-referenced sections: "The reliability of in-situ bioremediation for numerous organic compounds has been proven in field and laboratory testing. In-situ bioremediation of polynuclear aromatic hydrocarbons (PAHs) at a Superfund site in Montana is being performed as specified in the Record of Decision for that site. Because PAH compounds are less susceptible to biological attack than THF, bioremediation is expected to be highly reliable."

Comment 26:

Page 4-2; Section 4.2: It is stated in section 3.2.1.1 that the No Action alternative does not meet the current Wisconsin requirements for final cover of solid waste disposal facilities. Such should be specifically noted in this section. Also, as stated in earlier comments, natural attenuation processes over time is not an acceptable method of complying with the groundwater ARAR.

Response 26:

The first sentence of Section 4.2 will be changed to read: "The No Action alternative does not meet the current Wisconsin requirements for final cover at solid waste disposal facilities (WAC NR 504.07) because the landfill was closed in accordance with a closure plan approved by the State. This closure was essentially in conformance with NR 506.08(3)." According to the case study in Appendix F of the RI/FS Guidance Manual, natural attenuation can be considered an alternative component.

Comment 27:

Page 4-2; Section 4.3: There is no discussion in this section concerning the long-term effectiveness and permanence of the portions of the various alternatives that directly affect groundwater (i.e., carbon adsorption, in-situ degradation). Such discussion should be included.

Response 27:

The following sentences will be inserted in Section 4.3: "The long-term effectiveness and permanence of groundwater treatment technologies (i.e., carbon adsorption, in-situ degradation) would essentially be equal. Both technologies ultimately result in destruction of tetrahydrofuran and will be operated until cleanup objectives are achieved."

Comment 28:

Page 4-3; Section 4.4: The statement that reduction of toxicity, mobility, and volume using in-situ bioremediation would be more immediate than using carbon adsorption, should be changed or clarified. It is noted that the estimates of time to meeting cleanup objectives using carbon adsorption is 5 years less than for in-situ bioremediation.

Response 28:

The last sentence of Section 4.4 will be changed to read: "The reduction would be more direct than using carbon adsorption, however, because tetrahydrofuran would be destroyed in place."

Comment 29:

Page 4-4; Section 4.5: A comparative analysis of the time required by each alternative to meet remedial objectives should be included.

Response 29:

A comparative analysis of time required to meet remedial objectives will be added to Section 4.5 (as discussed in Section 4.2).

Comment 30:

Page 5-1; Section 5.0: As stated earlier, use of natural attenuation processes is not an acceptable method of complying with groundwater ARARs. In addition, this alternative takes no active measures to protect adjacent wetlands from continued degradation due to discharge of contaminated groundwater, and therefore, may not comply with ARARs concerning protection of wetlands. Since a selected remedy must comply with identified ARARs (unless a waiver is granted), Alternative 2 is not appropriate for selection as the preferred alternative.

Response 30:

See Responses 5 and 9.

Comment 31:

The decision of which remedy is preferred is U.S. EPA's in consultation with WDNR. The Feasibility Study is to be an objective evaluation of alternatives against the nine criteria. It is inappropriate and premature to place a preferred alternative in the FS. The preferred alternative is presented by U.S. EPA, in consultation with the State in the Proposed Plan. Therefore, all references to a preferred alternative must be deleted form the FS. If the PRPs wish to present their preference for an alternative, they may do so in a letter to EPA and WDNR. The Janesville Disposal Facility NPL site alternatives was managed in this fashion.

Response 31:

The Draft FS has been developed as an objective evaluation of alternatives for the existing conditions at the site against the seven criteria. Presentation of the PRPs' conclusions and recommendations regarding a preferred alternative is not specifically precluded by guidance. While the WDNR may not recognize the PRPs' recommended alternative as its preferred alternative, the PRPs believe it is important to present their conclusions and recommendations regarding the FS evaluation in the report.

Comment 32:

Because certain alternatives were not carried through the detailed analysis (i.e. barrier system/cutoff wall, chemical treatment of pumped groundwater), the draft FS is incomplete and must be revised to include these alternatives. The WDNR will be providing additional comments on the next revision of the FS.

Response 32:

Please see previous comment responses for rationales for not carrying forward certain technologies.

Comment 33:

Page 1-1: This document ignores the Alternatives Array document which identifies groundwater standards exceedances in various wells for various compounds besides tetrahydrofuran. This is a major flaw in this document. As stated in my comments in the Alternatives Array Document, groundwater preventative action limits are the standards for which compliance with ARARs are measured. In addition, since the waste is in direct contact with the groundwater, containment of the groundwater is necessary to comply with the groundwater standards.

Response 33:

See Response 33 under Final AAD comment responses.

Comment 34:

Page 1-1: The State does not accept the statement that the groundwater operable unit is limited to the one compound in the vicinity of monitoring well 3D, especially when there is documented mounding of the groundwater at the site, the site is surrounded by wetlands, more compounds than tetrahydrofuran were found to exceed Wisconsin groundwater standards at more than the one well identified here, and wastes are in direct contact with the groundwater. Clearly, limiting the operable unit to this limited scope is not supported by the technical information presented in the documents previously submitted.

Response 34:

See Response 33 under Final AAD comment responses.

Comment 35:

Page 1-1: Modification of remedial action objectives is needed in this document. The groundwater operable unit and the solid waste operable unit must have remedial action objectives that are protective of human health and the environment and meet ARARs, the threshold criteria by which Superfund remedies are selected. The remedial action objectives must be comprehensive and consistent with the remedial action objectives established in the Alternatives Array Document, on which I have submitted comments separately.

Response 35:

See Response 36 under Final AAD comment responses.

Comment 36:

My comments on the remedial action objectives for the AAD are as follows:

> *Soil/Solid Waste Operable Unit - prevent public from direct contact exposure to landfill refuse and potential hazardous substances contained therein; and to contain wastes such that they are not released to the environment, including air emissions of landfill gas;*
>
> *Groundwater Operable Unit - there are more compounds than tetrahydrofuran that exceed Wisconsin groundwater quality standards. This must be changed to reflect achievement of all groundwater quality standards for this site. In addition, the goal of preventing the release of contaminants from leaving the site once they are in the groundwater must be added, as well as a goal of protecting the adjacent wetlands from both contamination and changed in hydrologic conditions. Also, the term "eventual" should be deleted in this context and replaced with "within a reasonable period of time". Finally, EPA has established as an expectation that groundwater will be restored to its beneficial use within a reasonable time frame. This should be included here as well.*

Response 36:

See Response 36 under Final AAD comment responses.

Comment 37:

Page 2-1: Long term effectiveness and permanence consider the magnitude of residual risk, and adequacy and reliability of controls over time.

Response 37:

Comment noted.

Comment 38:

Page 2-5, State acceptance: The discussion of state acceptance is inaccurate in limiting the evaluation to the FS report. The section should address the technical and administrative issues and concerns the state may have regarding each of the alternatives and will be addressed in the ROD once comments on the RI/FS and proposed plan have been received. The same comment is true for the discussion on Community Acceptance.

Response 38:

The last sentence of Sections 2.8 and 2.9 will be changed to read "This criterion will be addressed in the U.S. EPA's ROD once comments on the RI and FS reports and Proposed Plan have been received."

Comment 39:

Page 3-1: The no action alternative must be limited to monitoring only. As stated in the RI/FS Guidance "Although a no-action alternative may include some type of environmental monitoring, actions taken to reduce the potential for exposure (e.g., site fencing, deed restrictions) should not be included as a component of the no-action alternatives. Such minimal actions should constitute a separate "limited" action alternative." Therefore, all references to deed restrictions in this alternative need to be eliminated.

Response 39:

The No Action alternative will be limited to monitoring only.

Comment 40:

In addition, the report inaccurately states that the future development of groundwater resources within 1200 feet of the landfill boundary is restricted by WAC NR 112.07(2)(q), as there are provisions in this regulation for the granting of variances. In addition, this analyses does not address how the no action alternative provides adequate protection to the surrounding wetlands.

The discussion focuses on whether there is likely to be development of the landfill site or the installation of groundwater wells. This discussion needs to be rewritten.

Response 40:

The reference that the citation restricts groundwater use will be changed to "allows restriction." The RI data do not indicate adverse environmental effects on the surrounding wetlands.

Comment 41:

The statement that the only chemical that consistently exceeded federal or state groundwater standards was tetrahydrofuran is misleading. The State preventive action limits are the groundwater standards that are used to determine compliance with ARARs. In addition, with the limited sampling conducted during the remedial investigation, it is impossible to state whether there is consistent compliance with a standard. Any sampling that shows exceedances of standards is important in determining compliance with ARARs.

Response 41:

See Response 33 under Final AAD comment responses.

Comment 42:

I would not consider 660 ug/l of tetrahydrofuran "relatively low" when the standard for this compound is 10 ug/l. Please delete this from the text.

Response 42:

These words will be deleted.

Comment 43:

Page 3-2: It is incorrect to state that the potential public (which should be reworded to say "human") health risk associated with the consumption of groundwater containing even the maximum concentration of tetrahydrofuran was not identified.

Response 43:

The results of the risk assessment and related calculations (Table 2-1 of Final AAD) warrant the statement. The word "public" is suitable and consistent with the language under NR 140.10, which refers to "public health related groundwater standards."

Comment 44:

I am pleased to see the statement that there is radial groundwater flow from the site to the surrounding wetlands. This is very important in the evaluation of protectiveness of the

environment. However, I note that groundwater recharge occurs across the entire site, and is not limited to the vicinity of the landfill shelter, especially when the integrity of the landfill cap is in question. Groundwater elevations at the site show higher groundwater elevations in the vicinity of the shelter, however, that does not mean that groundwater is only being recharged in this portion of the site. Clearly there are impacts to the groundwater beneath the site, not only the "groundwater" that flows to MW-3D. Other wells have identified groundwater contaminants at levels that exceed State groundwater quality standards. In light of the concentration of contaminants in the waste, we can only project that contamination will occur over time across the entire site.

Response 44:

See Response 33 under Final AAD comment responses. Also, it will be noted that the central portion of the landfill is the primary recharge area. The statement that contamination of groundwater will occur over time across the entire site is presumptuous. Continued groundwater monitoring would be used to determine any changes in groundwater quality at the site.

Comment 45:

I agree that with "geologic" time, concentrations of tetrahydrofuran will likely decrease, however, the Superfund program usually focuses on a relatively shorter time of 30 years or less. In addition, short term effectiveness and long term effectiveness should be considered in this evaluation.

Response 45:

Comment noted.

Comment 46:

The discussion focusing on tetrahydrofuran does not take into account other contaminants at the site. The discussion of discharge to the Yahara River emphasizes that the no action alternative is not protective of the environment, and this should be included in this discussion. Sediments, surface water and wetlands are included in the definition of "the environment", for which the final remedy must be protective. Uncertainties with respect to potential impacts to the wetlands and surface water should be highlighted here as well.

Response 46:

See Response 33 under Final AAD comment responses. The discussion emphasizes the insignificant impact on the Yahara River. No effects warranting remediation were measured in surface water or sediments, including those in the wetlands.

Comment 47:

A statement needs to be included in this discussion that "the no action alternative is not protective of human health and the environment". In addition, we ask that all references to "public" health be changed to "human" health, as that is the terminology used in the Superfund program.

Response 47:

The statement is made in the last sentence of paragraph 1 of Section 3.1.2.1 that the landfill is not a current threat to human health or the environment. The statement is also made that this alternative is not likely to be protective in the long term because of the potential for waste contact.

Comment 48:

Page 3-3: It is adequate to simply say that the No Action alternative does not comply with ARARs with respect to capping and groundwater quality standards.

Response 48:

The more detailed discussion is appropriate.

Comment 49:

It is misleading to state that natural attenuation would reduce the toxicity, mobility and volume of tetrahydrofuran over time, as the reduction of toxicity, mobility and volume of contaminants through treatment is one of the criteria being evaluated on the next page. This could be confusing to the public reviewing this document. I recommend that this statement be removed from the text, as it clearly states on the next page that there would be no reduction of toxicity, mobility or volume through treatment of the waste material.

Response 49:

The second sentence in Section 3.1.2.3 will be changed to read "Dispersion and transformation/attenuation processes in the sand and gravel aquifer, including natural biodegradation, would provide reduction in the concentration of tetrahydrofuran in groundwater over time."

Comment 50:

Page 3-4: The statement should be included in the section on reduction of toxicity, mobility, or volume through treatment ignores the fact that there would be no reduction in toxicity, mobility or volume through treatment for contaminated groundwater as well. The report omits the discussion of the second operable unit here.

Response 50:

The last sentence of Section 3.1.2.4 will be changed to read: "There would be no significant reduction of the toxicity, mobility, or volume of tetrahydrofuran in groundwater due to treatment, because no groundwater treatment is included."

Comment 51:

With respect to short term effectiveness, the "natural attenuation" processes would not meet the remedial action objectives that the agency feels are appropriate. The remedial action objectives identified in this document are not acceptable to the State.

Response 51:

See Response 36 under Final AAD comment responses.

Comment 52:

I do not agree that the existing cap condition is sound if there is evidence of waste in one part of the site cause by incomplete capping or erosion of the cap. How can the cap be sound if erosion has removed portions of the cap from part of the site and there are animal holes observed on the cap?

Response 52:

The words "in general" are used in discussing the soundness of the landfill cover.

Comment 53:

Page 3-5: I strongly disagree with the statement that cap repair would be protective of human health and the environment. As with the Algoma Landfill, Onalaska Landfill and Wheeler Pit Superfund sites, cap upgrades or repair to any standards less than NR 504 are not protective and should be removed from the analyses since they do not meet the threshold criteria of protectiveness, nor the balancing criteria of long term effectiveness. Cap repair does not address the contaminated groundwater and would not prevent the discharge of contaminated groundwater to the environment. Therefore, this statement cannot be included in this section. This alternative is not protective of the environment.

Response 53:

As stated in Section 6.1.2.1 of the Draft FS, the Stoughton City Landfill is not a current threat to human health and the environment. By repairing and upgrading the existing cover, this alternative would be protective regardless of whether it meets ARARs.

Comment 54:

Page 3-6: The short term effectiveness should state that groundwater contamination would not be addressed in the short term. In addition, impacts of capping the site on the adjacent wetlands should be discussed.

Response 54:

The following sentences will be added to the end of Section 3.2.2.5: "Remedial action objectives related to preventing direct contact with waste materials and controlling leaching of constituents would be met in 1 year. Groundwater standards for tetrahydrofuran would eventually be achieved by dispersion and natural attenuation, but would not be achieved in the short term."

Comment 55:

This alternative does not comply with either the groundwater quality standards or the landfill capping requirements outlined in NR 504, as would be required for this site.

Response 55:

See Response 33 under Final AAD comment responses. The landfill was closed in accordance with State regulations.

Comment 56:

The discussion of long term effectiveness should clearly state that groundwater would remain uncontrolled as well as the untreated waste remaining at the site.

Response 56:

The third sentence of Section 3.2.2.3 will be changed to read: "However, no groundwater treatment is included, and the potential residual risk from constituents in groundwater may not be addressed."

Comment 57:

Page 3-7: There is no permanent way to restrict the development of groundwater in the area near the landfill. In fact, the area near the landfill is being rapidly developed for residential use.

Response 57:

See Response 31 under Final AAD comment responses pertaining to control of groundwater use. Residential water users would be supplied by the city.

Comment 58:

Because many of the wastes are in contact with the groundwater, the statement that the cap would reduce the mobility of contaminants is false and should be taken out of the text. Clearly there will be no reduction of toxicity, mobility or volume of contaminants with this alternative.

Response 58:

See Response 46 under Final AAD Comment responses. The last sentence of Section 3.3.2.4 will be removed.

Comment 59:

Page 3-8: What does the consultant mean by "infringe on a small portion of the wetlands bordering the landfill to the east"? Will portions of the wetlands be destroyed and if so how will this impact be mitigated?

Response 59:

As is discussed in Section 3.2.2.6, it may be necessary to extend the cap into wetland areas to ensure that all waste materials are covered, and that the cover is properly supported and structurally sound. In order to accomplish this, it may be necessary to place fill in wetland areas adjacent to the landfill, and/or place shoring or other support structures in the wetland. Based on the assessment of the existing cap and preliminary design of the cap repairs, it will be determined whether filling and/or placing structures in the wetlands is necessary. If so, mitigation measures will be decided upon. If a permit is required from the U.S. Corps of Engineers, mitigation measures will be required as part of the permit.

Comment 60:

Page 3-9: The Subtitle D cap (i.e. NR 504 cap) alone would not be protective of the environment as it would not contain wastes from entering the groundwater due to the fact that groundwater is in direct contact with the waste materials. Please keep in mind that it is likely that these wastes will be considered hazardous wastes. Therefore, the alternative is not protective of the environment and that statement should be changed to address this fact. Because of the contact between groundwater and waste, migration of contaminants to the groundwater cannot be prevented.

Response 60:

See Response 53 regarding protectiveness of Subtitle D cap. The State or U.S. EPA should make the determination regarding whether the wastes are hazardous. Based on RI data, leachate from refuse discharges to the southeast wetland and is not hydraulically connected to the sand and gravel aquifer.

Comment 61:

Page 3-10: This alternative will not comply with the State groundwater quality standards and therefore, will not comply with ARARs. This statement should be clearly made in the section on compliance with ARARs.

Response 61:

State groundwater quality standards would be met in the long term, as discussed in Section 3.3.2.2.

Comment 62:

Remedial objectives for groundwater would not be met with this alternative, nor would they be met for containment of wastes, as wastes are in direct contact with the groundwater. In order for the remedial action objectives to be met, as defined by the State, a groundwater containment system is necessary.

Response 62:

See Response 61 regarding meeting groundwater remedial objectives. Containment of wastes is not a remedial action objective; no significant effects on surface water were measured or observed during the RI.

Comment 63:

Page 3-11: It is inappropriate to include dispersion and transformation/attenuation processes in the discussion of reduction of toxicity, mobility, or volume through treatment as it clearly states there will be no treatment with this alternative. The consultant should remove the remaining discussion after the first sentence.

Response 63:

The last sentence in Section 3.3.2.4 will be removed. The following sentence will be added in its place: "There would be no significant reduction of toxicity, mobility, or volume of tetrahydrofuran in groundwater due to treatment, because no groundwater treatment is included."

Comment 64:

Again, please explain what it means to "infringe" on the wetlands.

Response 64:

See Response 59.

Comment 65:

Please include a discussion of the gas collection system that would accompany this cap. Would active or passive gas extraction be proposed by the consultant. Would treatment of the air emissions occur?

Response 65:

The following sentences will be included in Section 6.3.1: "The collection of a gas from beneath the cap may be required. The proposed collection system would consist of a passive gas extraction system. The need for treatment of air emissions from this system can only be determined based on actual site data that would be obtained after the system was installed. For the purpose of this evaluation, it is assumed that minimal air emissions control will be required. Although this assumption may impact the cost to operate and maintain a capping system, it is assumed that equal cost impact will be encountered by all capping alternatives. Thus, comparison of costs between alternatives is not affected and the potential for an over-inflated operating cost is avoided."

Comment 66:

Page 3-13: The Subtitle C cap would not be protective of the environment as it does not address the groundwater contamination at the site. In addition, since wastes are in direct contact with the groundwater, migration of contaminants to the groundwater would not be prevented with this alternative.

Response 66:

See Responses 61 and 62.

Comment 67:

ARARs would not be complied with through the installation of a Subtitle C cap with respect to Wisconsin's groundwater quality standards.

Response 67:

See Response 61.

Comment 68:

Page 3-14: Remedial Action Objectives would not be met with this alternative. Groundwater contamination would not be controlled in that wastes are in direct contact with the groundwater.

Response 68:

See Responses 61 and 62.

Comment 69:

Again, please limit the discussion of reduction of toxicity, mobility, or volume through treatment to exactly that - through treatment. Any additional discussion is inappropriate and misleading.

Response 69:

The last two sentences of Section 3.4.2.4 will be removed.

Comment 70:

Page 3-15: Please replace the word infringement with destruction, if that is appropriate.

Response 70:

See Response 59.

Comment 71:

Page 3-16: It is impossible at this time to know what treatment technology for contaminated groundwater will meet water quality discharge criteria including BAT. Treatment will likely be required for more that tetrahydrofuran as other organic and inorganic compounds are in the groundwater. In addition, groundwater collection will need to be expanded to ensure protection of the wetlands that surround the site. Since groundwater mounding is taking place, it is likely a groundwater extraction system designed to account for groundwater in contact with the waste will be necessary. In addition, any groundwater collection system will need to address potential impacts to the wetlands due to decreasing the water table/soil moisture content. Finally, the use of slurry cutoff wall (hanging) may be required to adequately protect the wetlands. Please take out the reference to limit the groundwater extraction system to extract groundwater where there is tetrahydrofuran, as there are other groundwater standards exceeded at this site that will have to be remediated as well as tetrahydrofuran.

Response 71:

See Response to Comment 54 in the Final AAD.

Comment 72:

The consultant needs to identify how the residuals from groundwater treatment will be handled. It is possible that residuals would be considered a hazardous waste. Again, the exact treatment technology cannot be determined at this time. We can assume, however, that organics and inorganics will likely need treatment prior to discharge. Proposals for treatment are reviewed by the DNR Bureau of Wastewater on a case by case basis.

Response 72:

The following sentence will be added: "Spent carbon will be regenerated off-site using thermal destruction. The carbon will be handled, stored, shipped, and treated as a hazardous waste."

Comment 73:

In addition, please discuss the type of gas extraction system proposed by the consultant. If an active gas extraction system with treatment for hazardous air contaminants is necessary, this could dramatically elevate the costs.

Response 73:

See Response 65.

Comment 74:

Please add that the groundwater collection and treatment system would be protective of human health and the environment in that it will contain the contaminated groundwater. Therefore, uncertainties about future groundwater contamination will be addressed. Groundwater in direct contact with the wastes will be collected and treated.

Response 74:

The first sentence of Section 3.5.2.1 will be change to read: "The alternative will be very protective of human health and the environment by preventing direct contact with the solid waste and by containing groundwater and removing it for treatment."

Comment 75:

Page 3-17: The remedial action objectives would be met for this alternative. Please be sure to change the references that limit ARARs to tetrahydrofuran, as there are other groundwater standards exceeded.

Response 75:

See Response 33 under Final AAD comment responses.

Comment 76:

Page 3-19: Since a groundwater extraction system would be designed to adequately contain all contaminated groundwater from the site (north, south, east, and west) it is appropriate to say that the groundwater collection and treatment system would reduce the volume of contaminants at the site. The toxicity and mobility of the contaminants removed would depend on the treatment process used at the site. Since the groundwater extraction system is designed to contain contaminated groundwater from leaving the site over time, it is anticipated that this system will

need to be operated for a very long time. The only way for wastes and the contaminants found in those wastes to be contained is for groundwater collection to continue to operate over time to ensure protection of the environment.

Response 76:

As is explained in Section 3.5.1.2, groundwater recovery wells would be installed west of the landfill near MW-3D. All groundwater from the site would not be contained, just groundwater from the area where tetrahydrofuran was detected at levels above Wisconsin enforcement standards. The toxicity and mobility of the tetrahydrofuran removed would be decreased by adsorption onto carbon and eventual destruction during carbon regeneration. Groundwater collection and treatment is estimated to require 5 years.

Comment 77:

Page 3-21: Please revise the costs to cover a longer operation and maintenance for the groundwater extraction and treatment system. Since this alternative will be needed to ensure protection of the environment over time, a 30 year operation is more likely than 5 for the groundwater extraction and treatment option.

Response 77:

Based on existing data, protection of the environment will be achieved when tetrahydrofuran in groundwater has been reduced to PALs at the monitoring detection point. Although source materials are likely to exist within the fill mass, the capping system is expected to minimize infiltration of precipitation, which is the primary transport mechanism for these materials into the groundwater. The long-term lifecycle of the actions proposed for the site include a 5-year groundwater collection and treatment option and 30-year groundwater monitoring program. If additional groundwater collection and treatment is warranted based on the results of groundwater monitoring, such action will be taken. For the purpose of this evaluation, however, the focus of the remedial alternatives is on the known existing conditions at the site.

Comment 78:

Page 3-22: Again, please revise the discussion of compliance with ARARs for tetrahydrofuran, as groundwater standards for other compounds will have to be addressed through the remedial action alternatives.

Response 78:

See Response 33 under Final AAD comment responses.

Comment 79:

Page 3-2: Please note that Wisconsin groundwater quality standards (PALs and Enforcement Standards) will need to be met, not groundwater enforcement standards.

Response 79:

See Response 33 under Final AAD comment responses.

Comment 80:

Page 3-24: Please note that the groundwater treatment system will not be limited to tetrahydrofuran, as it will need to meet both BAT and water quality discharge criteria. In addition, note that it will not be limited to only the vicinity of MW-3D, as containment of groundwater that is in contact with the waste will be necessary, as well as containment of all contaminated groundwater in order to be protective of the environment.

Response 80:

See Responses 33 and 54 under Final AAD comment responses.

Comment 81:

Page 3-27 - 3-35: In-situ groundwater bioremediation would be difficult to conduct at this site for a number of reasons. First, the source of the contamination would not be treated and therefore, the bioremediation of groundwater would need to take place over a long period of time. Secondly, there are other contaminants at this site that exceed groundwater quality standards and those would not be addressed through biological degradation. Finally, the containment of the groundwater to ensure protection of the environment would not occur through biological degradation of the groundwater. I recommend that this alternative should be removed from consideration due to the inability of this alternative to provide protectiveness to the environment. Further discussion of this alternative should be eliminated.

Response 81:

Based on existing data regarding the presence of source materials at the site, it appears that the tetrahydrofuran is being transported from the area of the fill mass into groundwater via infiltration of precipitation. The proposed capping system associated with the bioremediation is expected to minimize this infiltration and thus significantly reduce or halt the transport of tetrahydrofuran, or other constituents contained within the fill mass, to the groundwater. Bioremediation would be effective, therefore, at removing tetrahydrofuran to the cleanup objectives in groundwater.

With regard to other constituents at the site, as indicated in Response 33 to the Draft AAD, tetrahydrofuran is the only constituent that requires action at the site. Long-term protection of the environment will be achieved with this option through a monitoring program that will, for 30 years, evaluate the potential release of tetrahydrofuran and other source materials from the landfill to the environment. Based on the results of this monitoring, appropriate actions, such as continuation of groundwater collection and treatment, modification or expansion of the groundwater collection and treatment system, and/or continued monitoring, will be implemented. The purpose of this FS evaluation is to respond to and develop a remedy for the known conditions at the site and to provide for adequate

protection against future releases. The bioremediation option and monitoring program accomplishes this purpose.

Comment 82:

Page 4-1: The discussion on protectiveness seems to be misdirected. This is a yes or no question and answer. Are the various alternatives presented in this document protective of human health and the environment or not? The No Action alternative is not the least protective of human health and the environment; it is not protective. This discussion should begin by stating that the No Action alternative, the cap repair alternative, and the cap upgrade alternatives are not protective of human health and the environment. Further discussion is not necessary once that statement has been clarified.

Response 82:

According to Section 6.2.6 of the RI/FS Guidance Manual, "The comparative analysis should include a narrative discussion describing the strengths and weaknesses of the alternatives relative to each other..." This section of the Manual goes on to suggest that under each criterion, the alternatives should be "...discussed in the relative order in which they perform." This is the manner in which Section 4.0 is presented. In addition, Section 6.2.3.1 of the Manual specifies that overall protectiveness should "...focus on whether a specific alternative achieves adequate protection and should describe how site risks...are eliminated, reduced or controlled..." We believe this statement implies different levels or degrees of protectiveness; therefore, the discussion is not misdirected and is appropriate as presented.

Comment 83:

The only alternatives that are protective of human health and the environment are the NR 504 (Subtitle D) cap with groundwater extraction and treatment and the RCRA (Subtitle C) with groundwater extraction and treatment. Again, there are not degrees of better protection and lesser protection as this section implies. Either an alternative is protective or it is not. Clearly, the alternatives that do not include groundwater extraction are not protective of the environment.

Response 83:

The purpose of the FS is to conduct an objective evaluation of alternatives for the existing conditions at a site against the seven criteria; protection of human health and the environment is one of these criteria. Alternatives that do not include groundwater extraction are protective of the environment because they reduce the leaching of constituents of concern from the landfill, which is the primary transport mechanism of constituents to groundwater. This is inherent in the discussion of landfill final cover requirements in NR 506.08(3): "...Placement of final cover in accordance with s. NR 504.07 may be required if the department determines that this type of final cover system is necessary to prevent or abate attainment or exceedance of groundwater standards contained in ch. NR140." Also, see Response to Comment 82.

Comment 84:

Page 4-2: The section on compliance with ARARs should state which alternatives comply and which do not. Those alternatives that are either not protective of human health and the environment and those that do not comply with ARARs can be dropped from further analyses as they do not meet the threshold criteria. Therefore, the cap repair, cap upgrade and the no action alternatives do not comply with ARARs, neither do the alternatives that do not include a groundwater extraction and treatment component. These alternatives can be eliminated from further analyses.

Response 84:

The purpose of an FS is to provide an objective evaluation of alternatives for the existing conditions at the site against the seven criteria. In accordance with U.S. EPA Guidance, the alternatives presented were selected to provide a range of alternatives that represent appropriate treatment and containment options for each medium or operable unit. Because the site was historically closed and capped in accordance with State regulations, the cap repair/upgrade and no action alternatives are appropriate and required for an objective evaluation of alternatives for the site. We do not believe it is objective to remove technologies from further consideration at this stage of the FS due to their degree of protectiveness or compliance with ARARs, especially considering the results of the risk assessment for the site, which indicate minimal impact to human health from the site. In addition, a cap repair or upgrade alternative would be effective in meeting ARARs with time because it removes the primary transport mechanism for constituents in the fill mass to groundwater. Thus, further consideration of all alternatives is warranted.

Comment 85:

As stated in Section 300.430 of the National Contingency Plan, EPA expects to use engineering controls for containment, for waste that poses a relatively low long-term threat or where treatment is impracticable. Therefore, the treatment of the waste source is consistent with NCP. Please refer to the program goal and expectations I included in my comments for the Alternatives Array Document.

Response 85:

As noted previously, the referenced attachments were not included with the comments.

Comment 86:

There seems to be some confusion between protectiveness and long term effectiveness. The statement that capping alternatives would be more "protective" is not relevant to this section. In addition, the consultants subjective comment about the leaching of constituents from the landfill not resulting in significant releases to the groundwater should be taken out of this discussion, as well as discussions of dispersion and "natural attenuation".

Response 86:

The sentence referring to protectiveness will be removed, because it is not relevant in this section. The comment about leaching of constituents is not subjective; it is based on extensive investigation and data collected during the RI. This comment and the discussion of dispersion and natural attenuation are relevant, because they describe the magnitude of residual risk.

Comment 87:

Page 4-3: Please revise the discussion of reduction of toxicity, mobility or volume through treatment to be limited to just those alternatives that provide treatment. Extraneous discussions are misleading and could be confusing to the public reviewing this document.

Response 87:

The discussions in the above-referenced section are presented to provide a framework for viewing the overall reduction of toxicity, mobility, or volume of waste materials through treatment. It is essential that the public understand that the waste materials will not be treated but that reduction of infiltration to the waste fill will reduce the transport of constituents in the waste mass to groundwater. It is also important for a clear understanding of the site to point out that tetrahydrofuran will be naturally degraded, dispersed, or attenuated in the subsurface.

Comment 88:

Appendix B: This appendix assumes that the groundwater extraction system will be limited to one compound in one area of the site. This assumption is false and the appendix should be revised to reflect a groundwater extraction system that will contain contaminated groundwater at the site.

Response 88:

As explained in the Final AAD (p.2-5), "The groundwater operable unit is limited to the vicinity of monitoring well MW-3D, the only location where groundwater in the sand and gravel consistently exceed any groundwater standards." Also, see Response 33 to the Final AAD.