Support Document for the Revised National Priorities List Final Rule - July 2000

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ABSTRACT

Pursuant to Section 105(a)(8)(B) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the U.S. Environmental Protection Agency (EPA) periodically adds hazardous waste sites to the National Priorities List (NPL). Prior to actually listing a site, EPA proposes the site in the *Federal Register* and solicits public comments.

This document provides responses to public comments received on one site proposed on January 19, 1999 (64 FR 2950), one site proposed on April 23, 1999 (64 FR 19968), one site proposed on July 22, 1999 (64 FR 39886), and two sites proposed on February 4, 2000 (65 FR 5468). All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in July 2000.

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EXECUTIVE SUMMARY

Section 105(a)(8)(B) of CERCLA, as amended by SARA, requires that the EPA prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. An original NPL was promulgated on September 8, 1983 (48 FR 40658). CERCLA also requires the EPA to update the list at least annually.

This document provides responses to public comments received on one site proposed on January 19, 1999 (64 FR 2950), one site proposed on April 23, 1999 (64 FR 19968), one site proposed on July 22, 1999 (64 FR 39886), and two sites proposed on February 4, 2000 (65 FR 5468). All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in July 2000.

The five sites addressed in this document are listed in the following table.

SITES ADDRESSED IN THIS DOCUMENT

					HRS Score	
Region	**State**	**Site Name**	**City**	**Proposal Date**	**Proposed**	**Final**
3	WV	Big John Salvage	Fairmont	February 4, 2000	48.57	48.57
3	VA	St. Juliens Creek Annex	Chesapeake	February 4, 2000	50	50
6	TX	Star Lake	Port Neches	July 22, 1999	50	50
7	MO	Newton County Wells	Joplin	January 19, 1999	50	50
8	UT	International Smelting and Refining	Tooele	April 23, 1999	58.31	58.31

INTRODUCTION

This document explains the rationale for adding five sites to the NPL of uncontrolled hazardous waste sites and also provides the responses to public comments received on the sites. The EPA proposed one site on January 19, 1999 (64 FR 2950), one site on April 23, 1999 (64 FR 19968), one site on July 22, 1999 (64 FR 39886), and two sites on February 4, 2000 (65 FR 5468). All of the sites are added to the NPL based on an evaluation under the HRS. These sites are being added to the NPL in a final rule published in the *Federal Register* in July 2000.

Background of the NPL

In 1980, Congress enacted CERCLA, 42 U.S.C. Sections 9601 *et seq*. in response to the dangers of uncontrolled hazardous waste sites. CERCLA was amended on October 17, 1986, by SARA, Public Law No. 99-499, stat., 1613 *et seq*. To implement CERCLA, EPA promulgated the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, on July 16, 1982 (47 FR 31180), pursuant to CERCLA Section 105 and Executive Order 12316 (46 FR 42237, August 20, 1981). The NCP, further revised by EPA on September 16, 1985 (50 FR 37624) and November 20, 1985 (50 FR 47912), sets forth guidelines and procedures needed to respond under CERCLA to releases and threatened releases of hazardous substances, pollutants, or contaminants. On March 8, 1990 (55 FR 8666), EPA further revised the NCP in response to SARA.

Section 105(a)(8)(A) of CERCLA, as amended by SARA, requires that the NCP include

> criteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, take into account the potential urgency of such action, for the purpose of taking removal action.

Removal action involves cleanup or other actions that are taken in response to emergency conditions or on a short-term or temporary basis (CERCLA Section 101(23)). Remedial action tends to be long-term in nature and involves response actions that are consistent with a permanent remedy for a release (CERCLA Section 101(24)). Criteria for placing sites on the NPL, which makes them eligible for remedial actions financed by the Trust Fund established under CERCLA, were included in the HRS, which EPA promulgated as Appendix A of the NCP (47 FR 31219, July 16, 1982). On December 14, 1990 (56 FR 51532), EPA promulgated revisions to the HRS in response to SARA, and established the effective date for the HRS revisions as March 15, 1991.

Section 105(a)(8)(B) of CERCLA, as amended, requires that the statutory criteria provided by the HRS be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is Appendix B of the NCP, is the NPL.

An original NPL of 406 sites was promulgated on September 8, 1983 (48 FR 40658). At that time, an HRS score of 28.5 was established as the cutoff for listing because it yielded an initial NPL of at least 400 sites, as suggested by CERCLA. The NPL has been expanded several times since then, most recently on May 11, 2000 (65 FR 30482). The Agency also has published a number of proposed rulemakings to add sites to the NPL. The most recent proposal was on May 11, 2000 (65 FR 30489).

Development of the NPL

The primary purpose of the NPL is stated in the legislative history of CERCLA (Report of the Committee on Environment and Public Works, Senate Report No. 96-848, 96th Cong., 2d Sess. 60 [1980]):

> The priority list serves primarily informational purposes, identifying for the States and the public those facilities and sites or other releases which appear to warrant remedial actions. Inclusion of a facility or site on the list does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. Subsequent government actions will be necessary in order to do so, and these actions will be attended by all appropriate procedural safeguards.

The purpose of the NPL, therefore, is primarily to serve as an informational and management tool. The identification of a site for the NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with the site and to determine what CERCLA-financed remedial action(s), if any, may be appropriate. The NPL also serves to notify the public of sites EPA believes warrant further investigation. Finally, listing a site may, to the extent potentially responsible parties are identifiable at the time of listing, serve as notice to such parties that the Agency may initiate CERCLA-financed remedial action.

CERCLA Section 105(a)(8)(B) directs EPA to list priority sites among the known releases or threatened release of hazardous substances, pollutants, or contaminants, and Section 105(a)(8)(A) directs EPA to consider certain enumerated and other appropriate factors in doing so. Thus, as a matter of policy, EPA has the discretion not to use CERCLA to respond to certain types of releases. Where other authorities exist, placing sites on the NPL for possible remedial action under CERCLA may not be appropriate. Therefore, EPA has chosen not to place certain types of sites on the NPL even though CERCLA does not exclude such action. If, however, the Agency later determines that sites not listed as a matter of policy are not being properly responded to, the Agency may consider placing them on the NPL.

Hazard Ranking System

The HRS is the principle mechanism EPA uses to place uncontrolled waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations -- the preliminary assessment and site inspection -- to assess the relative potential of sites to pose a threat to human health or the environment. HRS scores, however, do not determine the sequence in which EPA funds remedial response actions, because the information collected to develop HRS scores is not sufficient in itself to determine either the extent of contamination or the appropriate response for a particular site. Moreover, the sites with the highest scores do not necessarily come to the Agency's attention first, so that addressing sites strictly on the basis of ranking would in some cases require stopping work at sites where it was already underway. Thus, EPA relies on further, more detailed studies in the remedial investigation/feasibility study that typically follows listing.

The HRS uses a structured value analysis approach to scoring sites. This approach assigns numerical values to factors, that relate to or indicate risk, based on conditions at the site. The factors are grouped into three categories. Each category has a maximum value. The categories include:

- likelihood that a site has released or has the potential to release hazardous substances into the environment;
- characteristics of the waste (toxicity and waste quantity); and
- people or sensitive environments (targets) affected by the release.

Under the HRS, four pathways can be scored for one or more threats:

- Ground Water Migration (S_{gw})
  - drinking water
- Surface Water Migration (S_{sw})
  These threats are evaluated for two separate migration components (overland/flood and ground water to surface water).
  - drinking water
  - human food chain
  - sensitive environments
- Soil Exposure (S_s)
  - resident population
  - nearby population
  - sensitive environments
- Air Migration (S_a)
  - population
  - sensitive environments

After scores are calculated for one or more pathways according to prescribed guidelines, they are combined using the following root-mean-square equation to determine the overall site score (S), which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

If all pathway scores are low, the HRS score is low. However, the HRS score can be relatively high even if only one pathway score is high. This is an important requirement for HRS scoring because some extremely dangerous sites pose threats through only one pathway. For example, buried leaking drums of hazardous substances can contaminate drinking water wells, but -- if the drums are buried deep enough and the substances not very volatile -- not surface water or air.

Other Mechanisms for Listing

Aside from the HRS, there are two other mechanisms by which sites can be placed on the NPL. The first of these mechanisms, authorized by the NCP at 40 CFR 300.425(c)(2), allows each State and Territory to designate one site as its highest priority regardless of score.

The last mechanism, authorized by the NCP at 40 CFR 300.425(c)(3), allows listing a site if it meets all three of these requirements:

- Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release;
- EPA determines the site poses a significant threat to public health; and
- EPA anticipates it will be more cost-effective to use its remedial authority than to use its emergency removal authority to respond to the site.

Organization of this Document

Each section that follows addresses site-specific public comments. The sites are arranged by EPA Region and are listed alphabetically by state and site name. Each site discussion begins with a list of commenters, followed by a site description, a summary of comments, and Agency responses. A concluding statement indicates the effect of the comments on the HRS score for the site.

Glossary

The following acronyms and abbreviations are used throughout the text:

Agency	U.S. Environmental Protection Agency
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601 *et seq.*, also known as Superfund
EPA	U.S. Environmental Protection Agency
HRS	Hazard Ranking System, Appendix A of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
HRS Score	Overall site score calculated using the Hazard Ranking System; ranges from 0 to 100
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
NPL	National Priorities List, Appendix B of the NCP
NPL-###	Public comment index numbers as recorded in the Superfund Docket in EPA Headquarters and in Regional offices
PA/SI	Preliminary Assessment/Site Inspection
PRP	Potentially Responsible Party
RCRA	Resource Conservation and Recovery Act of 1976 (U.S.C. 9601-6991, as amended)
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision, explaining the CERCLA-funded cleanup alternative(s) to be used at an NPL site
SARA	Superfund Amendments and Reauthorization Act of 1986, Public Law No. 99-499, stat., 1613 *et seq.*

REGION 3

1.1 Big John Salvage - Hoult Road, Fairmont, West Virginia

1.1.1 List of Commenters

NPL-U31-3-2-1-R3	Comment dated April 3, 2000 from Greg R. Zumbaugh and Geoffrey A. Glanders of August Mack Environmental, Inc., representing Reilly Industries, Inc.
NPL-U31-5-2-R3	Correspondence dated November 17, 1999 from Governor Cecil H. Underwood of West Virginia

1.1.2 Site Description

The Big John Salvage – Hoult Road Site (BJS site) is located in Marion County, a predominantly industrial/rural county of north-central West Virginia. The Sharon Steel (Fairmont Coke) Superfund Site (Sharon Steel) is located on the southeastern side of the site. The site property was originally owned by the Reilly Tar and Chemical Corporation (Reilly) which began operations at the site in 1932 and ended in 1973 when the property was sold. The property passed through many different hands until it was bought by its current owner Steel Fabricators, Incorporated in 1997. During this time it was primarily used as a salvage yard for scrap metal and crushed glass.

Approximately 12,000 gallons of crude tar waste from the nearby Domestic Coke Corporation and Dupont Coke plants were processed daily at the Reilly site from 1932 until the 1940s. Crude tar was pumped from tank cars to storage tanks and later separated by distillation and condensation processes. The creosote product was removed, stored, and sold as a wood preserving compound. Acid oil was removed and treated at an extraction unit to remove phenol, and the tar was sold to the state road commission for road repair and construction purposes. The acid oil was then cooled to remove naphthalene which was stored on the site. Any remaining crude acids were shipped to other Reilly plants for final processing. Wastes generated by Reilly were retained in an unlined pond near the southern property line. This pond also received wastes from three on-site sewers and several drainage ditches. All cooling waters, acid wastes, and tar wastes were supposed to pass through the pond. Discharge from the retention pond flowed through a pipe in the center of the pond which emptied into an unnamed tributary of the Monongahela River.

The BJS site is directly bordered on the southeast by the Sharon Steel site. An unnamed tributary flows along this border. At least one branch of the unnamed tributary originates from the BJS property, and two branches of the unnamed tributary originate from Sharon Steel property before they merge and flow into the Monongahela River. In addition, an intermittent stream to the north flows from the Sharon Steel property, across the BJS property and into the Monongahela River downstream of the mouth of the unnamed tributary.

In July 1983, the EPA Technical Assistance Team (TAT) and the EPA Environmental Response Team (ERT) collected tar, surface water, sediment, and biological samples from the site. A number of organic and inorganic chemicals were found on the site and in the unnamed tributary adjacent to the site (see pages 18, 65, 256, 345, 346, and 361 of *Federal On-Scene Coordinator's Report* (1985), Reference 7 of the HRS documentation record as proposed). In the fall of 1992, the EPA Region III Superfund Removal Branch conducted a cleanup at the BJS property that focused on the removal of drums containing hazardous materials (see pages 1 and 2 of *Special Bulletin A,* Reference 40 of the HRS documentation record as proposed). In December 1998, the EPA Region III On-Scene Coordinator (OSC) completed a removal action at the site in which two large excavation pits, containing oil and glass cullets, and the surrounding contaminated soil were removed (see page 2 of *Deeds for Big John Salvage - Hoult Road Site,* Reference 41of the HRS documentation record as proposed).

During a March 1999 Site Inspection (SI), environmental media samples were collected to assess the environmental impact the site had on the Monongahela River (see pages 7, 8, and 9 of *Big John Salvage - Hoult Road Trip Report,* Reference 5 of the HRS documentation record as proposed). The samples were collected from the branches of the unnamed tributary that originates on the BJS and Sharon Steel properties and from the main section of the tributary (see Figure 3 of the HRS documentation record as proposed). These samples were collected and analyzed using the USEPA Contract Laboratory Program (CLP) and verified under the EPA Region III CLP Quality Assurance/Quality Control analysis (see *Analytical Data Validator,* Reference 14, *Big John's Salvage - Hoult Road Site Organic Analytical Report, Reference* 15, and *Big John's Salvage - Hoult Road Site Inorganic Analytical Report, Reference* 16 of the HRS documentation record as proposed). The sampling results provide evidence that hazardous substances are migrating from the site into the environment. The March 1999 SI sampling results show that the Monongahela River is being contaminated with elevated levels of polynuclear aromatic hydrocarbons (PAHs), particularly benzo(a)pyrene, which have been and continue to threaten to be released from the sources at the BJS site (see page 9 of *Big John Salvage - Hoult Road Trip Report,* Reference 5 and Figure 4 of the HRS documentation record as proposed).

1.1.3 Summary of Comments

Cecil H. Underwood, Governor of West Virginia, supported the placement of the Big John Salvage - Hoult Road site on the NPL. Reilly Industries (Reilly), whose comments were submitted by Greg R. Zumbaugh, P.E. and Geoffrey A. Glanders, of August Mack Environmental, Inc., opposed the listing of the BJS site. Mr. Zumbaugh and Mr. Glanders, hereafter referred to as Reilly, generally considered the site to be improperly scored, and recommended that it be rescored. More specifically, Reilly commented that EPA has not made an accurate assessment of the total area and property boundaries associated with the BJS site. Reilly questioned the representativeness of the analytical data citing "invalid QA/QC." Reilly also contested the attribution of contamination to the BJS site. Reilly claimed that sample collection did not account for upstream facilities, in particular the Sharon Steel NPL site. Reilly raised various questions regarding the appropriate "segregation" of the BJS site from the Sharon Steel NPL site.

1.1.3.1 Extent of Site

Reilly commented that "EPA has not made an accurate assessment of the total area and property boundaries associated with the BJS site." Reilly stated that "[t]he site is adjacent to Sharon Steel NPL site, and USEPA has not segregated Sharon Steel impacts from the BJS site."

In response, placing a site on the NPL is based on an evaluation, in accordance with the HRS (40 CFR Part 300, Appendix A), of a release or threatened release of hazardous substances, pollutants, or contaminants. However, the fact that EPA initially identifies and lists the release based on a review of contamination at a certain parcel of property does not necessarily mean that the site boundaries are limited to that parcel.

EPA identified the site in the HRS documentation record based on the analytical data available at the time of proposal. Site definition is discussed in Section I-F of the Preamble to the proposal to add the BJS site to the NPL (65 FR 5468, February 4, 2000). The Preamble states:

> When a site is listed, the approach generally used to describe the relevant release(s) is to delineate a geographical area (usually the area within an installation or plant boundaries) and identify the site by reference to that area. As a legal matter, the site is not coextensive with that area, and the boundaries of the installation or plant are not 'boundaries' of the site. Rather, the site consists of all contaminated areas within the area used to identify the site, as well as any other location to which contamination from that area has come to be located, or from which the contamination came.

CERCLA Section 105(a)(8)(A) requires EPA to list national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release and not precisely delineated boundaries. Further, CERCLA Section 101(a) defines a "facility" as the "site" where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." The "come to be located" language gives EPA broad authority to clean up contamination when it has spread from the original source. On March 31, 1989 (54 FR 13298), EPA stated:

> HRS scoring and the subsequent listing of a release merely represents the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary descriptions of facility boundaries at the time of scoring will need to be refined and improved as more information is developed as to where the contamination has come to be located; this refining step generally comes during the RI/FS stage.

Until the site investigation process has been completed and a remedial action (if any) selected, EPA can neither estimate the extent of contamination at the site, nor describe the ultimate dimensions of the NPL site. Even during a remedial action (e.g., the removal of buried waste) EPA may find that the contamination has spread further than previously estimated, and the site definition may be correspondingly expanded.

Concerning the comment that the influence of the Sharon Steel site and the BJS site have not been properly "segregated," EPA interprets this comment as questioning either the attribution of releases to the BJS site or the designation of liability to the BJS site and the Sharon Steel site. For a discussion of attribution, see Section 1.1.3.3 of this support document. Regarding liability, EPA is not required to assign liability at the time of listing. The discussion of costs in NPL rules in the Federal Register is by necessity of a general nature only. The cost discussion clearly states that including a site on the NPL does not cause EPA necessarily to undertake remedial action. In addition, no action is required by, nor liability for site response costs assigned to, a private party (56 FR 21462, May 9, 1991). The cost discussion then outlines the Agency's perception of average potential costs per site that may occur in association with events generally following the proposed listing of a site. Any Agency actions that may impose costs on firms are based on discretionary decisions and are made on a case-by-case basis.

1.1.3.2 Data Quality

Reilly commented that the QA/QC methods used in the investigation of the BJS site are inadequate. Reilly asserted that, according to the laboratory analytical results, certain values were estimated because extraction holding times were exceeded and/or the concentrations were outside the range of accurate quantitation. In particular, Reilly questioned the validity of samples SW6 and SD6.

In response, EPA's methods were appropriate, and the data used were adequate for the purpose of establishing an observed release from the BJS site. The samples used to document an observed release were collected and analyzed using the USEPA Contract Laboratory Program (CLP), the EPA Region III *Modification to the National Functional Guidance for Organic Data Review,* September 1994, and the EPA Region III *Modifications to the National Functional Guidance for Inorganic Data Review,* April 1993 (see page 2 of *Big John - Hoult Road Site Organic Analytical Report* and page 5 of *Big John - Hoult Road Site, Data Quality Report and Analytical Package*, References 15 and 39 of the HRS documentation record as proposed). "EPA analytical methods use a number of QA/QC mechanisms during sample analysis in order to assess qualitative and quantitative accuracy . . . Data which do not meet the guidelines' performance criteria are qualified to indicate bias or QA/QC deficiencies" (see page 3 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed).

Samples SW10, SD10, SD13, SW6, and SD6 had qualified data for certain analytes (see pages 32-41 of the HRS documentation record as proposed). The data in SD6 were qualified because "extraction holding time did not meet QC criteria . . ." (page 3 of *Big John - Hoult Road Site, Data Quality Report and Analytical Package*, Reference 39 of the HRS documentation record as proposed). Samples SW10, SD10, SD13, and SW6 were qualified because ". . . analyte concentrations [were] below the quantitation limit (CRQL)[Contract Required Quantitation Limit]" (pages 206 and 233, Appendix D, *Big John - Hoult Road Site Organic Analytical Report,* Reference 15 of the HRS documentation record as proposed).

Regarding the qualification of sample SD6, the USEPA CLP *National Functional Guidelines for Organic Data Review,* October 1999, states that, "[i]f technical holding times are exceeded, flag all positive results as

estimated 'J' . . . " (EPA 540/R-99/008, p.47). Regarding samples SW10, SD10, SD13, and SW6, their specific qualifier does not necessarily constitute an error in sample collection and/or analysis methods. "The CRQLs are substance specific levels that a CLP laboratory must be able to routinely and reliably detect in specific sample matrices . . . The CRQLs are usually set above most instrument detection limits (IDLs) and method detection limits (MDLs)" (page 2 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed). Therefore, it is possible to have a substance that is detected above the IDL or MDL but is below the CRQL. Usually, detection below the CRQL is treated as non-quantifiable for HRS purposes (page 4 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed).

According to the EPA fact sheet titled *Using Qualified Data to Document an Observed Release and Observed Contamination* (EPA 540-F-94-028), it is appropriate to use qualified data if the data have been adjusted to account for any high or low bias. Because sample SD6 is a release sample of low bias, no adjustment needs to be done. When holding time criteria are violated, organic constituents of the sample are expected to be biased low due to constituent degradation over time. However, to be conservative, sample results were adjusted as if the sample had an unknown bias, thus providing even lower concentration values. More specifically, the sample was adjusted by dividing each concentration by its respective adjustment factor (page 8, Exhibit 3 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed). Each analyte has two adjustment factors, one for each matrix from which it might originate: water or soil. For example, at the BJS site, the concentration for benzo(a)pyrene in sample SD6 is 244,900 J µg/kg (see page 40 of the HRS documentation record as proposed). Because sample SD6 is a sediment sample, the adjustment factor is 10.0 (see page 14, Table 2 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed). If the concentration is divided by this factor, the adjusted concentration would be 24,490 µg/kg (see page 40 of the HRS documentation record as proposed).

As mentioned above, samples SW10, SD10, and SD13 were qualified because certain concentrations from these samples were detected below the CRQL. These qualified data would usually be qualified "UJ," thus, providing that the CRQL would be used as the background level for comparisons made against these analytes. However, to be conservative, these background samples were adjusted as if they were of unknown bias, providing a higher background level. More specifically, they were adjusted by multiplying the concentration by its respective adjustment factor. For example, the concentration for benzo(a)anthracene in sample SD10 is 330J µg/kg (see page 33 of the HRS documentation record as proposed). Because this sample is a sediment sample, the adjustment factor is 10.0 (see page 14, Table 2 of *Using Qualified Data to Document an Observed Release and Observed Contamination,* Reference 33 of the HRS documentation record as proposed). If the concentration is multiplied by this factor, the adjusted concentration would be 3,300 µg/kg. In the HRS documentation record, the adjusted values are in parentheses, and can be found directly below the original concentration values in the sample tables (see page 33 of the HRS documentation record as proposed). Thus, an observed release has been documented, i.e., the release samples are more than or "at least" three times the background samples.

After carefully researching sample SW6, it appears that the qualified concentration from this sample may have been mislabeled. Because this sample was qualified due to concentrations below the CRQL (see page 206, Appendix D, *Big John - Hoult Road Site Organic Analytical Report,* Reference 15 of the HRS documentation

record), the qualified data should have been labeled "U" signifying undetected. This would have made those data ineligible to document a release. However, even if sample SW6 were to be discarded, an observed release is still be documented from sample SD6 as explained above. (Please refer to section 1.1.3.2, page 1.1-7). In addition, an observed release has been documented from other samples: SW4, SD4, SW9, and SD9 (see figure 3 and pages 1-6 of Table 1, *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the documentation record as proposed).

1.1.3.3 Attribution

Reilly raised several issues concerning the attribution of contamination to the BJS site. It claimed that EPA has not made a valid comparison of background and release samples. It stated that "the background data used by USEPA for comparison is not representative of background conditions in the area of BJS." Therefore, the samples, ". . . which were collected from a tributary of the Monongahela River, should [not] be compared to background samples collected from the Monongahela River (SW10, SD10, SW13, and SD13)." Reilly stressed that, "to make a valid comparison [of background and release samples], background samples must be collected from the tributary upstream of BJS locations."

Reilly commented that samples SW6 and SD6 were collected on the Sharon Steel property boundary or Sharon Steel property. Therefore, Reilly asserted that the contaminants found in these samples are associated with Sharon Steel rather than BJS. According to Reilly, the samples do ". . . not accurately represent the site conditions because of the proximity of the sampling sites to Sharon Steel." It cited Figure 4 of the HRS documentation record as support for these comments.

Reilly commented that, even if the samples were collected on BJS property, its proximity to Sharon Steel is such that EPA is obligated to do a full assessment of the contamination contribution from Sharon Steel and other upstream facilities before concluding that a release from BJS has occurred. It suggested that contaminant contributions could include "transport via storm water flow, flooding, and/or tributary backwashing from the adjacent upstream Sharon Steel site."

Reilly commented that analytes detected in samples SD4, SD6, and SD9 were also detected in samples collected from Sharon Steel (SD5 and SD7), and that most of those analytes were detected at a lower concentration on the BJS site. Reilly concluded, "[t]herefore, contaminants found in the BJS sediment samples have originated from Sharon Steel . . . " and "Sharon Steel is the major source of contamination to the unnamed tributary . . . "

In addition, Reilly stated that, "[t]he northern tributary, which crosses the BJS site, is transporting and depositing contaminants originating from the Sharon Steel site and other upstream sites. This stream flows in a westerly direction from Sharon Steel through BJS to the Monongahela River. It is likely the observed contaminants were historically transported and deposited from the Sharon Steel site onto BJS."

In response, EPA has provided an appropriate background level for establishing an observed release from the BJS site to the unnamed tributary and to the Monongahela River. Regarding sample SD6, as stated on page

31 of the HRS documentation record, "[b]ecause this branch appears to originate on the Big John Salvage - Hoult Road Site property, no upstream (background sample) could be collected." Background samples, SW10, SD10, SW13, and SD13, were taken from the Monongahela River. Sample SD13 was taken a short distance upstream of the BJS site, and sample SD10 was taken upstream of the Sharon Steel site. Release samples document a range of organic chemicals in the unnamed tributary (see pages 1-2 of Table 1 and pages 1-2 of Table 2, Reference 5 of the documentation record as proposed). Most of these chemicals are man-made and do not occur naturally in the environment. The samples taken from the Monongahela River, SW10, SD10, SW13, SD13, document that these chemicals are not ubiquitous to the area (see pages 1-2 of Table 1 and pages 1-2 of Table 2 of *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the documentation record as proposed).

A background level is the concentration of a hazardous substance that provides a defensible reference point that can be used to evaluate whether or not a release from the site has occurred. Background level does not necessarily represent pre-release conditions, nor conditions in the absence of influence from a source(s) at the site. Samples SW10, SD10, SW13, and SD13, which were taken from the Monongahela River, were used to provide a reasonable reference with which to document a release from the BJS site when compared with samples SW9 and SD9 also collected from the Monongahela. Samples SW5, SD5, SW6, SD6, SW7, and SD7, which were taken from branches of the unnamed tributary to the Monongahela River, were used to establish the relative contribution of contamination from the BJS site and the Sharon Steel NPL site. Therefore, these samples helped to establish attribution.

With respect to the comments about the location of samples SW6 and SD6, EPA has appropriately designated the location of these samples. The figure in the HRS documentation record cited as evidence, Figure 4, may be confusing because it portrays the sample locations as large dots, which take up more area on the map than they really represent. Figure 3 of the HRS documentation record provides a better representation. In this figure, samples SW6 and SD6 are clearly located on BJS property. Samples SW6 and SD6 were taken approximately 50 feet downstream of the PPE, but above the confluence of the tributary coming from BJS with the main tributary that runs through Sharon Steel, ensuring that contaminants in this sample originated on the BJS property (page 37 of the HRS documentation record as proposed). According to page 3 of the field log book, Reference 6 of the HRS documentation record as proposed, the locations of the samples were carefully selected to ensure that the contribution of contaminants coming from BJS and Sharon Steel were isolated. For example, samples SW5 and SD5 were selected because they are, ". . . believed to contain contaminants associated with the adjacent Sharon Steel Superfund site" (page 8-9, of *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the HRS documentation record as proposed).

Regarding the comment that suggested that contaminants could be contributed to the BJS site from other sources through storm water flow, flooding, and/or tributary backwashing, EPA does not consider this to be an issue at this site. The topography of the site is such that the land on either side of the unnamed tributary is elevated. The unnamed tributary acts as a surface water divide. Therefore, in order for contaminants from Sharon Steel to deposit on the BJS site, it would have to flow uphill (see *Fifteen Mile Downstream Map*, Reference 4 of the HRS documentation record as proposed). In addition, the BJS site and especially sample SD6 are outside the 100 year flood plain for the Monongahela River. Therefore, flooding at this sight is unlikely (see United States Geological Survey (USGS), the *Fairmont East, West Virginia, Flood Prone Area Map*, Attachment A of this support document).

Finally, soil samples taken from the BJS property indicate the presence of large quantities of hazardous substances. In particular, sample CT-1 documents 2,506,600 µg/kg (without adjustment for qualifiers) of benzo(a)pyrene (see page 6 of Table 1 of *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the HRS documentation record as proposed). This sample is located approximately 250 feet from sample SD-6, which, as mentioned in section 1.1.3.2, page 1.1-7 of this support document, indicates a level of benzo(a)pyrene at 244,900 µg/kg (without adjustment for qualifiers). It is unlikely that such a high level of contamination could originate off-site and accumulate on the BJS property through storm water flow, flooding, and/or tributary backwashing. This is especially evident when one notes that sediment sample contamination levels in sample SD-6 are not nearly as high as the level of contamination documented directly from the BJS property in sample CT-1.

Regarding the comment about attribution of the observed releases, EPA has appropriately attributed the observed releases to the unnamed tributary and the Monongahela River to the BJS site. Because release sample SD6 is located on BJS property upstream of the confluence with the tributary coming from the Sharon Steel property, it supports attribution of a release from the BJS site (Figure 3 of the HRS documentation record as proposed). Furthermore, HRS Section 2.3 [51589] provides that, ". . . some portion of the release must be attributable to the site." It is not necessary to document that all of the contaminants released to the tributary are attributable to the BJS site. Even Reilly states that, "Sharon Steel is a major (emphasis added) source of contamination to the unnamed tributary . . . ," and not the sole contributor. In addition, the HRS Table 2-3, *Observed Release Criteria for Chemical Analysis* [51589] provides that "an observed release is established when the sample measurement is three times or more above the background concentration." Though, samples SD4, SD6, and SD9 and samples SD5 and SD7 do contain similar substances (pages 1-6 of Table 1 of *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the HRS documentation record as proposed), contrary to Reilly's contention, the concentrations of substances in sample SD6 from the BJS property are significantly higher than the concentrations of analytes found in either SD5 or SD7 from the Sharon Steel property. On average, substances in SD6 are found in levels more than 50 percent higher than their levels in SD5 and almost 200 percent higher than their levels in SD7 (pages 1-6 of Table 1 of *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the HRS documentation record as proposed). The fact that substance concentration levels are much higher in the sample taken from the BJS property (SD6) than the samples taken from the Sharon Steel property (SD5 and SD7) indicates that at least part of the contamination in sample SD6, SD4, and SD9 can be attributed to BJS, thus helping to support partial attribution from the BJS site.

Regarding the comment about the intermittent "northern tributary," EPA has accounted for this tributary's influence. Even if Sharon Steel had been historically contributing to BJS through deposition of sediment from this tributary, it would have contributed only minimally to the contamination present at BJS. According to pages 15-16 of the field log book, Reference 6 of the documentation record, samples of "pure coal-tar" were collected from the BJS property. It is unlikely that "pure coal-tar" could have accumulated on the BJS property through sediment deposition from the intermittent northern tributary. According to page 13 of the HRS documentation record, approximately 20,000 gallons of coal tar spilled on BJS property in January 1960 (page 1, of *Letter to the State Water Commission from Reilly Tar & Chemical Corp.*, Reference 31 of the HRS documentation record as proposed). In addition, approximately three removal actions have taken place at the site from 1984 through 1998 in which tar related wastes were removed from the BJS site (page 8 of *Federal On-Scene Coordinator's Report* (1985), Reference 7, pages 1-2 of *Special Bulletin A*, Reference 40, and page 2 of *Federal On-Scene Coordinator's Report* (1998), Reference 42 of the HRS documentation record as proposed). More recently, the March 1999 site investigation sampling event indicated levels of

hazardous substances higher than the level found in the samples used to document an observed release (see the *Big John Salvage - Hoult Road Trip Report*, Reference 5 of the HRS documentation record as proposed and page 1.1-10, Section 1.1.3.3 of this support documentation). This helps to support, again, the idea that it is unlikely for the contamination found on the BJS property to have been deposited there from other sources.

1.1.3.4 Scoring Overview

Reilly stated, "[w]e concur that the ground water migration pathway, soil exposure pathway, and air migration pathway will contribute little or nothing to the BJS HRS scoring."

In response, although the ground water, soil exposure, and air migration pathways were not scored for the BJS site, upon further investigation these pathways may be found to be a threat to human health and the environment. The NPL is intended to be a "rough list"of prioritized hazardous sites; a "first step in a process - - nothing more, nothing less" (*Eagle Picher Indus. v. EPA*, 759 F.2d 922, 932 (D.C. Cir. 1985) (Eagle Picher II)). A subsequent stage of the Superfund process, the RI, will characterize conditions and hazards at the site more comprehensively.

1.1.4 Conclusion

The original HRS score for this site was 48.57. Based on the above response to comments, the score remains unchanged. The final scores for the Big John Salvage - Hoult Road site are:

Ground Water:	Not Scored
Surface Water:	97.13
Soil Exposure:	Not Scored
Air:	Not Scored
HRS Score:	48.57

ATTACHMENT A

A copy of the attachment is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

1.2 St. Juliens Creek Annex (U.S. Navy), Chesapeake, Virginia

1.2.1 List of Commenters

NPL-U31-3-4-1-R3	Correspondence dated April 3, 2000 from P.A. Rakowski, P.E., Head, Environmental Programs Branch, Environmental Division, Department of the Navy, Atlantic Division, Naval Facilities Engineering Command
NPL-U31-3-4-2-R3	Correspondence dated April 4, 2000 from Robert Mann, representing members of the Geneva Shores Civic League and the Restoration Advisory Board
NPL-U31-5-4-R3	Correspondence dated October 13, 1999 from John Paul Woodley, Jr., Secretary, Virginia Department of Natural Resources

1.2.2 Site Description

St. Juliens Creek Annex (U.S. Navy) is located in southeastern Virginia at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the city of Chesapeake. The northern boundary of the annex is the boundary between the cities of Portsmouth and Chesapeake, Virginia. The Elizabeth River and St. Juliens Creek form the eastern and southern boundaries of the annex, respectively. Also to the north are residential developments and a road bed of the Norfolk and Western Railroad, and to the south lie sewage disposal and industrial waste ponds and residential developments. A residential section of the city of Chesapeake abuts the annex on the west. Norfolk Naval Shipyard is located less than one mile to the north. St. Juliens Creek Annex occupies approximately 490 acres, including 407 acres of land, 14 acres of marsh, and 69 acres of surface water.

The St. Juliens Creek Annex began operations in 1849 as an ordnance and materiel storage facility. In 1898, the facility was equipped for assembling ammunition. From 1898 to 1970, the facility was used to supply ammunition to the fleet in addition to loading, assembling, issuing, and receiving naval gun ammunition, and conducting experimental and test loading for new ammunition.

In 1969, St. Juliens Creek was consolidated as an annex to the Naval Weapons Station, Yorktown, Virginia. Ordnance operations at the facility were terminated in the 1970s.

Former operations at the facility that generated hazardous substances include metal plating; degreasing; painting; operation of hydraulic equipment, vehicles, and locomotives; pest control; maintenance of lead-acid batteries; and printing. Trash and garbage generated at the facility were disposed in on-site dumps. Wastes were typically disposed in low areas, which are wetlands. Beginning in the late 1930s, waste ordnance materials were disposed on site. On-site disposal and storage of waste created numerous sources of contamination, including landfills and an ordnance disposal (burning) area. Sources of potential contamination located on the facility that were evaluated with the Hazard Ranking System (HRS) include four landfills, an ordnance disposal area, a burn pit, a hazardous waste disposal area, a waste storage area, and

a pesticide disposal area. Those sources were evaluated for actual and potential releases of hazardous substances to surface water (Blows Creek, St. Juliens Creek, and the Southern Branch of the Elizabeth River).

Observed releases of metals and polycyclic aromatic hydrocarbons (PAHs) from the sources to St. Juliens Creek and the Southern Branch of the Elizabeth River have been documented. The Southern Branch of the Elizabeth River provides habitat for numerous species that are identified as threatened or endangered under federal or state legislation. In addition, wetlands are associated with the river. Both St. Juliens Creek and the Southern Branch of the Elizabeth River are used for recreational fishing.

1.2.3 Summary of Comments

John Paul Woodley, Secretary of the Virginia Department of Natural Resources, wrote in support of adding the St. Juliens Creek Annex to the NPL. Robert Mann, representing members of the Geneva Shores Civic League and the Restoration Advisory Board, expressed concern that the St. Juliens Creek estuary has been severely impacted over the years by neglect, pollution and sediment buildup. He raised issues concerning sources evaluated in the HRS scoring package (and some that were not), appropriate background levels, the effects of sediment buildup on navigation and remediation activities, contaminated fish and shellfish, and natural resources. He inquired how problems in each of these areas would be resolved.

P.A. Rakowski, writing for the Naval Facilities Engineering Command, Atlantic Division, Department of the Navy (the Navy), commented that the Navy has an active Installation Restoration Program (IRP) underway at the site addressing all of the sources included in the HRS evaluation. The Navy also submitted technical comments on the proposed listing. It provided what it considered more up-to-date information regarding site conditions. It claimed that the background levels identified in the HRS documentation record, both in the evaluation of sources and for the observed releases, were not valid and that a statistical analysis was required to obtain appropriate background levels. The Navy further commented that based on information received from the Virginia Departments of Agriculture, Conservation and Recreation, and Game and Inland Fisheries, "no reports of Federal or State listed or proposed endangered or threatened species on or in the vicinity of the sites existed in their files." Finally, the Navy identified a number of instances in which, according to the Navy, the quality of the analytical results was not appropriately identified in the HRS documentation record. The Navy requested that these "errors" be corrected and suggested that the Annex's HRS scoring package be reconsidered.

1.2.3.1 Site History and Definition

Robert Mann, representing the Geneva Shores Civic League and the Restoration Advisory Board, commented that "[i]n addition to the currently identified Hazardous Waste disposal sites located at St. Juliens Creek Annex . . . the residents of Geneva Shores feel strongly that the St. Juliens Creek estuary has been severely impacted over the years by neglect, pollution and sediment build-up." Mr. Mann commented that "[t]wo hazardous waste disposal sites are adjacent to an abandoned trolley bridge (Navy Site 2 and Site 15)"

and asked what would be done with associated polluted sediment at this shoreline area. He asked further about the "current extent or levels of any pollution entering St. Juliens Creek or found in these sediments or waters."

Mr. Mann commented that, during the 1930's, "a train trolley bridge bisecting Navy property was abandoned and dropped in place causing increased sediment build-up on the residential side of the bridge" resulting in navigational obstruction that has "impeded recreational boaters from entering or exiting this water during low tide." Mr. Mann requested the assistance of the U.S. Army Corps of Engineers to "make an assessment of the impacts that have occurred to cause this sediment build-up and make recommendations to correct this situation."

Mr. Mann referred to reports that sediments in St. Juliens Creek contain hydrocarbons and heavy metals and expressed concern for fishermen, residents, and consumers of potentially contaminated shellfish. He inquired about what was being done to protect these groups and requested the assistance of the U.S. Fish and Wildlife Service in assessing the potential danger. Mr. Mann also noted that scientists at the Virginia Institute of Marine Science "have reported that shellfish in this area have been found with cancerous lesions" and asked what shellfish sampling had been done by EPA, the Navy, the State, or other agencies.

Mr. Mann expressed concern for negatively impacted natural resources in the community and surrounding waterways. He inquired about the extent of natural resource degradation and whether clean-up activity within St. Juliens Creek could be expected.

Mr. Mann referred to a July 1999 article in the Virginia Pilot indicating the "the City and Navy authorities were discussing potential land use as an Industrial Park." He asked about current plans in this regard and about what effect these plans would have on current and planned clean-up activities. Mr. Mann concluded that "[c]lean-up of St. Juliens Creek has been a concern of the residents of Geneva Shores for many years" and expressed hope that clean-up would be expedited once the site is on the NPL.

In response, Mr. Mann raised questions regarding the extent and degree of contamination at the site beyond those areas identified in the HRS documentation record at proposal, but did not question the information used in the HRS evaluation of the site or the actual scoring. If anything, his comments suggested that certain factor values (such as waste quantity) might be higher than those assigned in the HRS evaluation as proposed. Thus, his comments did not address directly the proposal to place this site on the NPL. The Agency will be better able to address these concerns after performing a more thorough review of the remedial work done to date. Only at that time will the Agency be able to accurately and comprehensively assess conditions at the site and the need for additional remediation effort. It should be noted that, while some factor values might be higher if Mr. Mann's comments were verified and incorporated into the HRS evaluation, the overall score for the site would not change because the site score is based only on the surface water migration pathway which is already at its maximum value.

1.2.3.2 Installation Restoration Program

The Navy commented that its "general concerns center around the juxtaposition of the proposed NPL listing versus ongoing Navy efforts at the St. Juliens Creek Annex." It noted that "[t]he Navy currently has an active Installation Restoration Program (IRP) underway at the Annex in which the United States Environmental Protection Agency (USEPA) and the Virginia Department of Environmental Quality (VDEQ) regularly participate." The Navy noted further that "[a]ll of the sources analyzed by the HRS evaluation (IR Sites 1, 2, 3, 4, 5, 6, 8, 11, and 16) are included in the Annex's IRP and are already under investigation by the Navy."

In response, in evaluating federal facilities for NPL listing, CERCLA section 120(d)(2)(B) instructs EPA to consider that the head of a federal department that owns or operates such a facility has arranged with the Administrator or the appropriate state authorities to respond to the release or threatened release under a law other than CERCLA. The Navy's IRP at this site is not being conducted under the authority of a law other than CERCLA. Inadequacies in the IRP at the St. Juliens Creek Annex have led both EPA and the Commonwealth of Virginia to pursue NPL listing to adequately address contaminant releases. The Agency does not consider the IRP at St. Juliens to be sufficiently comprehensive to ensure the protection of human health and environmental resources potentially affected by the site. For example, The Navy's IRP does not adequately address ordnance and RCRA issues. In addition, the Navy has not conducted adequate sampling off-site in near-shore areas to assess the extent of contaminant migration from the site. It should also be noted that, after several years of IRP activity at the St. Juliens Creek Annex, no sources of contamination at the site have been completely remediated and closed out.

EPA has a policy of placing Federal facility sites on the NPL if they meet the HRS eligibility criteria (i.e., an HRS site score of 28.50 or greater); in that way, those sites could be cleaned up under CERCLA if appropriate. In 1989, EPA restated its "long expressed . . . view that placing Federal facility sites on the NPL serves an important informational function and helps to set priorities and focus cleanup effort on those Federal sites that present the most serious problems" (54 FR 10520-21, 1989). The Navy has presented no information that would cause EPA to depart from this view in this instance. EPA will assess the effect of the measures instituted by the St. Juliens Creek Annex under its IRP as a means of source control or as a response to existing releases to the environment during the evaluations that follow placing the site on the NPL.

1.2.3.3 Current Conditions

The Navy commented that "[s]pecific information regarding numbers of buildings, miles of railroad track and paved roads, etc. may not be accurate" due to the age of the reference cited in the HRS documentation record for this information (August 1981). The Navy commented that reference 5 to the HRS documentation record, a Phase II RCRA Facility Assessment, has a more recent description (March 1989). It concluded, "[a]lthough a more recent report has not been prepared which could provide more accurate/current conditions for the facility, it should be acknowledged that the referenced documents do not reflect all of the current conditions at St. Juliens Creek Annex due to the closing of numerous buildings and operations at the facility."

The Navy noted, for example, that the description of Source 5 in the HRS documentation record (the burning grounds) includes a reference to Building 23, which no longer exists. The Navy also noted that the description of Source 8 mentions Building 53 on several pages of the HRS documentation record. It stated

that this building and the associated railroad tracks no longer exist. The Navy claimed that "[t]he former railroad tracks have been covered, and [are] currently maintained, through an engineered application of asphalt in this area and other areas where the railroad beds have been removed."

In response, the Agency acknowledges that descriptions of source areas at the St. Juliens Creek Annex may not in all cases be current. Most of the information in the HRS documentation record was collected for the Navy and provided by the Navy for use in evaluating the site for listing purposes as required under CERCLA Section 120, which addresses the application of CERCLA to Federal facilities. Neither of the specific examples of out-of-date information cited by the Navy, however, have any direct effect on the evaluation of specific HRS rating factors, nor did the Navy suggest any such effects. Therefore, these comments have no effect on the HRS score or the Agency's listing decision.

References to building 23 in the HRS documentation record were intended as reference points for the location of Sources 5 and 6. Its removal would have no bearing on conditions at either of these sources. The Navy seems to suggest that Source 8 should be assigned an HRS containment value of zero due to the installation of an engineered cover and, therefore, discounted from the site. The Navy, however, provided no documentation of the response actions taken at this source. The criteria for the various levels of containment are provided in Table 4-2 of the HRS, *Containment Factor Values for Surface Water Migration Pathway.* Criteria for an assigned factor value of zero include such features as run-on control and run-off management systems, double liners, and leachate collection systems, none of which are mentioned by the Navy. A more accurate analysis of site conditions, including those in the areas of Sources 5 and 8, may be a part of future EPA efforts following the addition of the St. Juliens Creek Annex to the NPL.

1.2.3.4 Background

Mr. Mann commented that, during the 1940's, "the Norfolk Naval Shipyard was dredged by a Navy contractor and the dredge spoils were deposited in St. Juliens Creek. The Navy is planning to conduct background sampling in this area to establish a baseline for restoration. We submit that background sampling of this area will create results that will not reflect an accurate baseline of an earlier and cleaner creek bottom." He inquired what the Navy would do to remove dredge spoils from previous disposal practices.

In response, Mr. Mann's comment is not specifically relevant to the Agency's decision to add the St. Juliens Creek Annex to the NPL. The Navy has conducted additional background studies in Blows Creek and St. Juliens Creek and has recommended that a comprehensive study be initiated. The effect of dredge spoils on background determinations and the need for additional background studies for the purpose of establishing the extent of contamination and appropriate remediation goals will be assessed at a later date.

The Navy objected to the number of samples used to establish background levels both for sources at the St. Juliens Creek Annex site and for the observed releases to Blow's Creek, St. Juliens Creek, and to the Southern Branch of the Elizabeth River. These comments are discussed below.

1.2.3.4.1 Background Levels for Sources

The Navy objected to the use of a single sample from one location to determine background concentration for eight of the nine sources evaluated at the site. It commented that this was "inappropriate from a scientific/environmental aspect, and also reckless as this one background sample has been used extensively to propose a facility to the National Priorities List." The Navy continued that "a minimum of 5 non-impacted locations per site is required for statistical evaluation and determination of 'background' concentrations for individual constituents." Alternatively, it claimed that "a facility-wide 'background' data set can be developed, again based on statistical analysis; however, this typically requires 20 or more sample locations per soil type." The Navy concluded that "all statements, references to, and comparisons of sampling data to this single 'background' location" should be deleted, and that a "comprehensive study should be initiated to develop this data set and the package should be rescored."

The Navy commented that the determination of background was further complicated by the fact that "much of the facility's property is land that was reclaimed with dredge spoils; some of the scored sites [sources] are located on areas filled with dredge spoils and others are located on native soils."

The Navy commented that, in addition to the above alleged errors, "the [HRS documentation] package fails to acknowledge that the one 'background' sample (01SS01) may be located in the former landfill itself. Landfill A was operated for a short period in the early 1920s, and the location of the site is approximated based on interviews with long-time employees and available records."

The Navy commented that "[b]ecause 'background' levels have not been established, the EPA commented on the RI workplan . . . for this site indicating that samples collected 'upgradient and downgradient' could potentially be used to determine 'reference' concentrations of the contaminants, but 'background' concentrations could not be established without a statistically based study."

In response, the background level presented in the HRS documentation record is sufficient for the limited purpose of establishing a reference concentration against which to measure contaminants in sources at the St. Juliens Creek Annex for purposes of NPL listing. By making such a comparison, contaminants are clearly associated with these sources. In addition, the Navy provided no additional information on which to base an alternative background. The location of this sample was selected during the relative risk ranking investigation conducted for the Navy and was reported in *Relative Risk Ranking System Data Collection Report, St. Juliens Creek Annex to the Norfolk Naval Base, Chesapeake, Virginia*, reference 9 to the HRS documentation record at proposal. The location of the sample is shown on Figure 3-2 of this reference. As explained on page 17 of the HRS documentation record, this sample was collected outside the area of Source 1 (Dump A) and was considered an appropriate background location. Using this sample as a reference point, the Navy identified the presence of numerous hazardous substances, including inorganics, PCBs, PAHs, organic solvents, and high concentration pesticides, in all nine sources evaluated in the HRS documentation record.

The Navy's contention that sample 01SS01 may have been located in the area of a former landfill has no negative effect on the HRS evaluation of the sources. A review of the analytical results for this sample in reference 9 to the HRS documentation record as proposed (the reference cited to establish the presence of

elevated contaminant levels in sources) reveals that most substances evaluated were below the sample detection limit (reference 9, pages T3-T5). All explosives, pesticides, semivolatile organics, and volatile organics, for example, were below detection limits in sample 01SS01. The only potential effects of the Navy's claim (that the background sample is located in an area of contamination) might be that additional hazardous substances would be found to be elevated in sources or that the levels of contamination in sources are even higher (relative to natural background) than currently reported. This would have no impact on either the HRS score or the listing decision.

Similarly, the Navy's claim that the site evaluation is complicated by the presence of dredge spoils in some areas has no impact on the HRS evaluation. The origin of contaminants in sources has no effect on their presence as hazardous substances. While the presence of contaminants in sources at the St. Juliens Creek Annex site is consistent with information provided in Navy documents regarding activities in the vicinity of the sources, their presence as the result of dredge spoil disposal would not alter the status of these areas as HRS sources.

It should be emphasized that the existence and size of each source at the St. Juliens Creek Annex was established in reports prepared for the Navy by its contractors or by the Navy itself in Notifications of Hazardous Waste Sites, prepared for EPA pursuant to requirements of CERCLA Section 103(c) in 1981. It should also be noted that the hazardous waste quantity rating factor for the site would receive a value of 100 (due to the presence of Level II human food chain and environmental targets, as explained in Section 2.4.2.2 of the HRS, *Calculation of hazardous waste quantity factor value)* even if the sizes of sources at the site were overstated.

Regarding the Navy's reference to the Agency's comments on the remedial investigation workplan, the Navy fails to consider the different levels of certainty required for different end purposes. For remediation purposes, it is important to establish an accurate reference point to be factored into the decisions about cleanup levels. For this purpose, more background samples might be required and possibly some statistical analysis to establish appropriate background concentrations. This requirement would not necessarily apply to establishing a reference point for associating hazardous substances with sources for listing purposes.

1.2.3.4.2 Background for Observed Releases

The Navy commented that it was "inappropriate from a scientific/environmental aspect, and also reckless" to use a single sample to represent background in each of the three surface water bodies identified in the HRS documentation record: Blow's Creek, St. Juliens Creek, and the Southern Branch of the Elizabeth River. It claimed that "a minimum of 5 non-impacted locations per surface water body is required for statistical evaluation and determination of 'background' concentrations for individual constituents." The Navy requested that "[a]ll statements, references to, and comparisons of sampling data to this single 'background' location should be deleted," and that a comprehensive study should be initiated to develop the required data.

The Navy commented that it was "preparing to issue the results of the extensive sediment and surface water 'reference' sampling event conducted in Blow's Creek and St. Juliens Creek . . . which was conducted to support the ecological risk assessments for the ongoing investigations of IRP Sites 2, 3, 4, 5, & 6." The Navy stated that it had offered to provide these data to EPA "in lieu of conducting their [EPA's] HRS sampling investigation in February 1999; however, EPA declined."

In addition to these general comments about the appropriate number of samples required to establish background concentration, the Navy commented that "[t]he one 'background' sample from the Southern Branch of the Elizabeth River was collected approximately 5,000 feet from St. Juliens Creek Annex." It claimed that "the distance and location of this sample may not be appropriate for use as 'background' for the St. Juliens Creek Annex."

Finally, the Navy noted the absence of any benthic tissue sampling in its own investigations at the St. Juliens Creek Annex and observed that "this type of sampling was not conducted as part of the EPA's HRS sampling effort." It suggested, however, "benthic tissue data for species in the Elizabeth River may be available through the State of Virginia or from local environmental organizations, especially the Elizabeth River Project.

In response, the HRS states in the discussion of observed release to surface water "[l]imit comparisons to similar types of samples and background concentrations–for example, compare surface water samples to surface water background concentration" (HRS Section 4.1.2.1.1, *Observed release*). The HRS does not specify a specific number of samples required to establish background levels. The use of limited sampling information for the purpose of establishing reference background concentrations is appropriate, however, given the limited purpose of the HRS as a screening tool for identifying sites requiring further study and possible remediation.

As explained on page 7 of reference 23 of the HRS documentation record as proposed (Final Field Trip Report, USN St. Juliens Creek Annex Facility), background locations were specifically located "upstream of known sources of potential contamination at the facility." Sample locations are identified in reference 23 and in Table 9 and Figures 16 and 17 of the HRS documentation record as proposed (pages 73-75). Sample SD9 is located in St. Juliens Creek, upstream of the probable point of entry (PPE) for Source 2. Sample SD15 is located in Blows Creek, upstream of the PPE for Sources 1, 3, 4, 5, and 6. PPEs for sources are shown on Figures 11, 12 (Source 1), 13 (Source 2), 14 (Source 4), and 15 (Sources 5 and 6) of the HRS documentation record as proposed. As noted on Figure 11, the precise PPE for some sources has not yet been determined. Sample SD22 is located in the South Branch of the Elizabeth River at Gilmerton Bridge and is located upstream of the site as a whole. In each of these samples most of the inorganics and nearly all of the organics were near or below detection limits. When these background levels were compared to samples downstream of sources at the site, all downstream samples indicated an observed release of at least one hazardous substance and most of these samples exhibited an observed release of many hazardous substances from the site.

Regarding the specific location of SD22, the background location for the site as a whole, the Agency sought to identify a location as much as possible beyond any influence from the site. Although sample SD22 is

located 5,000 feet from the St. Juliens Creek Annex, access to surface water bodies at the site was limited, as noted in the Final Field Trip Report for the sampling investigation (reference 23 to the HRS documentation record at proposal). It should be noted that the site would still be eligible for the NPL with an HRS score above 28.50 without the observed release and background samples in the South Branch of the Elizabeth River due to the presence of human food chain targets in both St. Juliens Creek and the South Branch of the Elizabeth River and sensitive environment targets in the South Branch of the Elizabeth River downstream from the observed release samples in St. Juliens Creek.

The Navy is correct regarding the absence of benthic tissue information in the HRS documentation record for the St. Juliens Creek Annex site. HRS evaluations, however, are not dependent on such information. In any case, the availability of this type of information could not have been helpful to the Navy's cause. According to the HRS (Section 4.1.2.1.1, *Observed release* [to surface water]), an observed release to surface water by chemical analysis has been demonstrated when "[a]nalysis of surface water, benthic, or sediment samples indicates that the concentration of hazardous substance(s) has increased significantly above the background concentration for the site for that type of sample." At the St. Juliens Creek Annex site, the observed release to surface water and the presence of Level II concentrations of CERCLA hazardous substances were based on contaminated sediments as discussed in detail in Section 4.1.2.1 of the HRS documentation record as proposed, *Likelihood of release*. The data used to evaluate these factors could not have been negated by the absence of contamination in benthic tissue.

Regarding the Navy's offer to provide background sediment data in lieu of EPA conducting its own investigation, negotiations between the Navy and EPA prior to sampling failed to result in agreement on sampling locations that would provide the information needed for HRS purposes. As a result, the Agency elected to conduct its own data collection. In any case, it should be emphasized that the results of EPA's investigation would not have been negated by contrary findings in the Navy's investigation. As explained above, background locations in the EPA investigation were specifically identified based on the locations of PPEs in each of the three surface water bodies. Regardless of the results of Navy sampling activities, EPA's findings warrant placing the site on the NPL and further investigation.

1.2.3.5 Alleged Errors in Source Descriptions

The Navy identified what it claimed were a number of errors in some of the site information for Sources 2, 3, 4, and 8. These comments are discussed below.

1.2.3.5.1 Source 2–Landfill B

The Navy commented that the hazardous waste quantity calculation for Source 2 (Dump B) was incorrect and should be revised from 19.21 to 19.22.

In response, the Navy is correct that the HRS documentation record contains a typographical error on this point, and the HRS documentation record has been revised to reflect the Navy's comment. However, revision of this value has no impact on the evaluation of any HRS rating factor, the site score, or the listing decision. The value assigned to hazardous waste quantity for the St. Juliens Creek Annex is shown on pages

95 (human food chain threat) and 110 (environmental threat) of the HRS documentation record as proposed. The combined waste quantity for the nine sources at the site is 236.32. This value resulted in a factor value of 100, which is assigned to all hazardous waste quantity values between 100 and 10,000 (See HRS Table 2-6, *Hazardous Waste Quantity Factor Values).* Correction of this typographical error does not alter this factor value or the value assigned to waste characteristics.

1.2.3.5.2 Source 3–Landfill C

The Navy commented on a statement on page 67 of the HRS documentation record, "[l]andfill C (Source 3) was a low-lying area including mud flats that were reclaimed with refuse; however, this portion of the facility was filled with dredge spoils prior to the waste disposal operations in this area." It concluded "[t]he statement, 'wastes were deposited directly into surface water' is conjecture and incorrect.

Also concerning Source 3, the Navy commented that Figure 11 does not illustrate the overland flow from this source to Blow's Creek. It claimed that "[a]s the area at Landfill C remains typically lower than the surrounding elevations, surface water from storm events tend to pond at the site." The Navy suggested the HRS package be revised to include an illustration of the overland flow path from Source 3 and a topographical map to support the determination.

In response, the Navy has suggested alleged errors in the HRS documentation record but provided no additional documentation to support its claims. The precise wording in the HRS documentation record is "[t]he location of Source 3 Dump C was a low-lying area including mud flats that were reclaimed with rubbish and ashes (Ref.4, p. 54). Therefore, wastes were deposited directly into surface water." This reference to reclamation with rubbish and ashes comes from the document *Navy Assessment and Control of Installation Pollutants: Initial Assessment of St. Juliens Creek Annex, Norfolk Naval Shipyard, Portsmouth, VA*, prepared for the Navy jointly by the Naval Energy and Environmental Support Activity (NEESA) in Port Hueneme, CA, the Ordnance Environmental Support Office in Indian Head, MD, and the U.S. Army Engineers Waterways Experiment Station in Vicksburg, MS, in April 1981. The specific reference provided for this information in that document was a *Study of Refuse Collection and Disposal*, prepared by the Maintenance Engineering Division, District Public Works Office, Fifth Naval District, in July 1953. As both of these documents were prepared by and for the Navy, and in the absence of any contradictory documentation from the Navy, the Agency sees no reason to revise the HRS documentation record.

Regarding the overland flow pathway from Source 3, consistent with the Navy's claim concerning ponding of water on the surface of this source, reference 15 to the HRS documentation record at the time of proposal notes "[s]everal low-lying areas inside the estimated boundaries were filled with water at the time of the site visit and drainage swales adjacent to the gravel perimeter road (North Patrol Road) also contained water." This reference, however, also states that the "downgradient direction of the site appears to be to the south towards Landfill D and Blows Creek." As with other documents cited above, this document, *Final Work Plan and Sampling and Analysis Plan for the Remedial Investigation and Feasibility Study Landfill C (Site 3) and Landfill D (Site 4), St. Juliens Creek Annex, Chesapeake, Virginia,* was prepared for the Department of the Navy Atlantic Division, Naval Facilities Engineering Command in May 1997. In the absence of contradictory documentation, the Agency sees no reason to reject this information.

It should be noted that neither the HRS score nor the NPL listing decision is dependent on the inclusion of Source 3 in the calculation. Observed releases in St. Juliens Creek, Blows Creek, and the South Branch of the Elizabeth River are independent of any specific source at the site. Further, as explained above in Section 1.2.3.4 of this support document, the value of 100 assigned to hazardous waste quantity would be unaffected if Source 3 were excluded.

1.2.3.5.3 Source 4–Landfill D

The Navy commented that the distance from Landfill D to Landfill C is not 300 feet as reported in the HRS documentation record as proposed but, rather, 600 feet when measured on Figure 2 of the documentation record (the reference cited on page 35 of the record).

The Navy commented that 4,4-DDD is listed in the source description on page 35 of the HRS documentation record as meeting the HRS criteria for an observed release but is not listed on page 38 in the discussion of hazardous substances. It also commented that pyrene is listed in the source description on page 36 of the HRS documentation record as meeting these criteria but is not listed on page 38.

In response, the Navy is correct that the distance between Sources 3 and 4 may be greater than reported on page 35 of the HRS documentation record, and the documentation record has been revised to reflect the Navy's comment. This error, however, has no impact on any HRS rating factor, the site score, or the listing decision. The distance was provided for informational purposes only and was not a component of any HRS rating factor value.

Regarding the Navy's comment that the discussion of hazardous substances in Source 4 on page 38 of the HRS documentation record did not include all of the substances identified during the two sampling events discussed on pages 35 and 36, the Navy is correct. This fact, however, has no impact on any HRS rating factor value, the site score, or the listing decision. Substances used to assign values to the various waste characteristics rating factors for the site, such as toxicity, persistence, and bioaccumulation, are identified on pages 88-89 (drinking threat), 93-94 (human food chain threat), and 106-109 (environmental threat) of the HRS documentation record as proposed. Neither 4,4-DDD nor pyrene were cited for the scoring of any of these rating factors. Rather, the assigned values were based on other substances such as benzo(a)pyrene, benzo(a)anthracene, and others having higher waste characteristics values than either 4,4-DDD or pyrene (see pages 89, 94, and 108-109 of the HRS documentation record as proposed for waste characteristics values assigned to hazardous substances for each surface water threat). Nevertheless, the HRS documentation record has been revised to reflect the Navy's comment.

1.2.3.5.4 Source 8–Contaminated Soil

The Navy commented that "[t]he description of Source 8 does not reflect the information in the referenced document." It claimed that "TCE waste was managed at the location and the railroad tracks near the location were previously used for disposal of solvents." The Navy stated that "[t]he reference also states that PCBs may have been stored at this location, but no mention of PCB disposal is made or eluded to in the reference."

In response, the description of Source 8 (on pages 16 and 52 of the HRS documentation record as proposed) to which the Navy objects cites HRS Reference 5, pages 1-4 and 4-19 as the source (*Phase II RCRA Facility Assessment of the St. Juliens Creek Annex Facility, Chesapeake, Virginia*). Page 1-4 of this document is a facility map indicating the locations of various sources under investigation. Page 4-19 is a discussion of "Hazardous Waste Disposal Area at Building 53." The discussion of "Waste Managed" states "[t]he wastes managed at this unit were said to include TCE and possibly PCB." This information was attributed to Reference 19 to this report, *Navy Assessment and Control of Installation Pollutants: Initial Assessment Study of St. Juliens Creek Annex, Norfolk Naval Shipyard, Portsmouth, VA*, (included as reference 4 to the HRS documentation record as proposed). The discussion of Building 53 is on page 42 of this document.

The discussion of Building 53 states "[t]he station electricians used about 5 gallons per month of trichloroethylene [TCE] for cleaning and degreasing. Most of this solvent evaporated. The remainder was poured beside the building or on the railroad track bed." The discussion of PCBs is less clear. It refers to a PCB transformer located in the heating plant, Building 283, which "once developed a leak." The discussion also indicates that "[t]he electricians replace an average of about 10 fluorescent ballasts per month. The old ballasts, which normally contain PCB, are disposed of in the dumpster along with the station's solid waste."

From this discussion, it is not entirely clear what may have been actually disposed in the area described as Source 8 in the HRS documentation record. It should be noted, however, that Table 4-18 of reference 9 to the HRS documentation record as proposed (*Relative Risk Ranking System Data Collection Report* prepared for the Navy by CH2M Hill) identifies contaminant levels in sample SJC11SS01DL in Source 8. This report indicates the presence of the PCB Aroclor 1260 in Source 8 at a concentration 6100E μg/kg. The "E" qualifier for this value indicates that the "concentration exceeds the calibration range." This notation strongly suggests the presence of PCBs in this source. In any case, the uncertainty about Source 8 would have no impact on any HRS factor value or the Agency's decision to list this site. The waste quantity for this source is reported as "greater than 0" and, thus, does not contribute to the calculation of waste quantity for the source as a whole. Other waste characteristics factor values (such as toxicity, persistence, etc.) were based on other hazardous substances as noted above in the discussion of Source 4.

1.2.3.6 Sensitive Environments

The Navy commented that the statement on page 114 of the HRS documentation record, "Wetlands and habitat known to be used by Federal and State Endangered and Threatened Species are documented within or along St. Juliens Creek Annex and the Southern Branch of the Elizabeth River" was attributed to references #6 and #7, each dated June 1981. The Navy stated that the status of endangered and threatened species was investigated during the preparation of *Work in Progress, Ecological Risk Assessments, Landfill B (site 2), Burning Grounds (Site 5), Landfill C (Site 3), and Landfill D (Site 4)*, dated February 24, 1998. The Navy claimed that, based upon information provided by the Virginia Departments of Agriculture, Conservation and Recreation, and Game and Inland Fisheries, "no reports of Federal or State listed or proposed endangered or threatened species on or in the vicinity of the sites existed in their files. Also no designated critical habitat was located on or in the vicinity of the sites.

The Navy noted that "[e]leven of the 13 sensitive environments used in the scoring (listed in Table 28 [Level II Sensitive Environments]) were not mentioned in Section 4.1.1.1 along with the discussion of other sensitive

environments. It requested that Section 4.1.1.1 of the HRS documentation record be revised to be consistent with Table 28 or, alternatively, that the other sensitive environments be omitted from Table 28.

In response, the Agency disagrees with the Navy's suggestion that the HRS documentation record requires revision. The discussion in Section 4.1.1.1 is not intended to be an exhaustive description of site conditions. Section 4.1.1.1 of the documentation record is titled *Definition of Hazardous Substance Migration Pathway for Overland Flow/Flood Component.* The text cited by the commenter is introductory in nature and provides very general information about the waterways impacted by the site: Blows Creek, St. Juliens Creek, and the Southern Branch of the Elizabeth River. The references to the American peregrine falcon and the Northern Diamondback terrapin (both federal endangered species) are part of this general background information on these waterways. The information provided is not intended to be exhaustive. The section continues to describe overland pathway and probable point of entry (PPE) for each of the sources at the site.

Table 28 is included in the discussion of Level II sensitive environments in Section 4.1.4.3.1.2, *Level II Concentrations*. This section of the HRS indicates that a value should be assigned from HRS Table 4-23, Sensitive Environments Rating Values, "to each sensitive environment subject to Level II concentrations." As noted by the commenter, the HRS documentation record identifies 13 separate eligible sensitive environments in Table 28. To make the HRS evaluation as accurate as possible, the Agency attempts to identify all relevant sensitive environments in the vicinity of a site; thus, the information provided in Table 28 is more exhaustive than the earlier, generic discussion of the three waterways. It should be noted that the environmental threat component of the surface water pathway would have scored the maximum value of 60 even if only one of the sensitive environments identified in Table 28 had been evaluated. If the value assigned to the environmental threat targets were 50 (the lowest value assigned to any of the sensitive environments in Table 28) rather than 875, the score for the surface water environmental threat would be calculated as 550 (for the observed release) X 320 (waste characteristics) X 50 (targets) ÷ 82,500 = 106.67. This value would be capped at 60 as explained in HRS Table 4-1, *Surface Water Overland/Flood Migration Component Scoresheet.* No change in the HRS score for the site or the listing decision would have resulted. If all of the individual species identified in Table 28 of the HRS documentation record were dropped from the scoring, the surface water pathway environmental threat would still score 53.33. With or without the environmental threat, the site would qualify for the NPL based solely on the human food chain threat.

Regarding the Navy's comment concerning the dates of references cited in the HRS documentation record, the Navy is correct that the general statement on page 114 of the HRS documentation record regarding the presence of wetlands and habitat known to be used by Federal and State endangered species was supported by references from 1981. These references were two Notifications of Hazardous Waste Site submitted to the Agency by the Navy (references 6 and 7 to the HRS documentation record as proposed). Each of the sensitive environments identified in Table 28 of the HRS documentation record, however, was supported by two more recent references. Reference 24, cited in the table, was a correspondence from the Virginia Department of Game and Inland Fisheries "Regarding Threatened and Endangered Species" dated May 18, 1995, when the Agency first began evaluating the site. This correspondence accompanied a database printout from the Virginia Fish and Wildlife Information System, indicating the presence and status of species in the vicinity of the St. Juliens Creek Annex site. All species identified in Table 28 of the HRS documentation record are included in this printout. Reference 27, also cited in the table, is a correspondence from the Virginia Department of Conservation and Recreation, "Regarding Natural Heritage Resources."

Regarding the Work In Progress, Ecological Risk Assessments noted by the Navy, risk assessments are generally conducted at a later stage of the Superfund process to establish specific remediation goals. The document referenced by the Navy is not a final report, and its existence, regardless of its conclusions, would not likely alter the Agency's listing decision, given the presence of both human food chain and environmental targets.

While the information provided the Agency in references to the HRS documentation record may not be consistent with the Navy's information, the Agency's information was provided by Virginia state agencies, thought to be reliable sources. The actual level of ecological risk at the site is not known at this time. If further information is developed, the Agency will consider its influence on the need for additional site activity.

1.2.3.7 Observed Release Data Quality

The Navy offered a number of comments concerning the incorrect transposing of information from the analytical data Form I's (forms recording contaminant concentrations and data qualifiers for each sample) to tables in the HRS documentation record. In HRS Table 11, the Navy commented that the sample identified as MCWH20 should be MCWJ20. It also noted that the following substances identified in Table 11 should have a "B" qualifier as indicated on the Form I's (indicating that these substances were not detected significantly above the level reported in laboratory and field blanks): magnesium (sample SD11), nickel (SD9, SD11, SD12, SD13, and SD14), selenium (SD14), and thallium (SD12, and SD13). The Navy also noted that selenium in SD13 should have been identified as "ND," meaning not detected.

In Table 13, the Navy commented that the following substances should have a "B" qualifier indicating that substances were not detected significantly above the level reported in laboratory and field blanks: antimony (SD20 and SD21) and barium (SD15).

In Table 14, the Navy commented that fluorene (SD18 and SD21) and carbazole (SD21) were detected at levels below the background sample quantitation limit of 1100 μg/kg. It noted that the "HRS states that if the background level is below its Detection Limit, the minimum requirement for establishing an observed release is that the concentration in the release sample is greater than or equal to the *background Sample Quantitation Limit*. As a result, these substances do not meet the criteria for an observed release." Also in HRS Table 14, the Navy commented that fluorene (SD18) should have a "J" qualifier as indicated on the Form I (indicating that the analyte is present in the sample but that reported value may not be accurate or precise) and that phenanthrene (SD18) should be recorded as 1,000 μg/kg rather than "ND."

The Navy commented that in HRS Table 15, barium and cobalt should each have a "B" qualifier in samples SD-22, SD5, SD4, SD3, and SD2 as shown on the Form I's, indicating that these substances were not detected significantly above the level reported in laboratory and field blanks.

The Navy commented that in HRS Table 16, Di-n-butylphthalate (SD5) should have a "B" qualifier (indicating that the substance was not detected significantly above the level reported in laboratory and field

blanks), and that pyrene (SD3) should have an "L" qualifier as indicated on the Form I's. This latter qualifier indicates that the analyte was present but that the value may be biased low such that the actual value is expected to be higher. Also in Table 16, the Navy commented that anthracene should be identified at a concentration of 79J, meaning that the analyte was present but that the value may not be accurate or precise. Finally, the Navy noted that di-n-butylphthalate (SD3) should be identified as "ND" (not detected) as indicated on the Form I's rather than 460L.

In response, the Navy is correct in its comments about concentration values and data qualifiers in the referenced tables from the HRS documentation record, and the documentation record has been revised to reflect the Navy's comments. These omissions, however, have no effect on the HRS score for the St. Juliens Creek Annex site. The cause of these errors is a discrepancy between references cited in the HRS documentation record. The tables are those identifying observed releases of organics and inorganics into Blows Creek, St. Juliens Creek, and the Southern Branch of the Elizabeth River. In each table, the HRS documentation record cited two references–Reference 23, *Final Field Trip Report, USN St. Juliens Creek Annex Facility, Chesapeake, Virginia*, and either Reference 25 or 26, the appropriate inorganic or organic data validation package evaluating the data collected during the field trip, and including the Form I's cited by the Navy. As noted by the Navy, in some cases, concentration values or data qualifiers that were recorded on the Form I's were omitted from the summary tables included with the Final Field Trip Report. These errors and omissions were subsequently repeated in the HRS documentation record.

The identification of these errors and omissions, however, does not affect the determination of an observed release to surface water as reported in the HRS documentation record at proposal. In Table 11, while some of the data qualifiers were omitted, the observed release to St. Juliens Creek is clearly documented for multiple inorganics. Copper, present at 7.3 mg/kg in background sample SD9, was detected in all five downstream samples at concentrations ranging from 28.6 mg/kg (sample SD11) to 72.2 mg/kg (SD14). None of these values was in any way qualified. Lead, also detected at a concentration of 7.3 mg/kg in sample SD9, was identified at observed release concentrations in four of five downstream sample locations at concentrations ranging from 21.9 mg/kg (sample SD11) to 97.2 mg/kg (SD14). Zinc also met the three times background criteria in all five downstream samples in St. Juliens Creek. None of these concentrations were qualified. As noted above, errors and omissions in Table 11 have been corrected in the revised HRS documentation record.

Neither do any of the other errors or omissions identified by the Navy negate the observed releases identified in the other cited tables in the HRS documentation record. In Table 13, demonstrating an observed release of inorganics to Blows Creek, while the "B" qualifier was omitted from the concentration values of some antimony and barium samples, an observed release is confirmed in both downstream samples (SD20 and SD21), when compared to background sample SD15, for chromium (139 and 181 mg/kg in SD20 and SD21, respectively, compared to 20.8 in SD15), copper (823 and 915 compared to 78.5), lead 1560 and 1410 compared to 151), mercury (1.4 and 1.5 compared to 0.37K[1]), and zinc (2550 and 2010 compared to 352). Errors and omissions identified by the Navy in Table 13 have been corrected in the revised HRS documentation record.

[1]The "K" qualifier indicates that the analyte is present in this background sample but biased high. The true value is expected to be lower.

The Navy is correct regarding some of the values for carbazole and fluorene in Table 14, demonstrating the observed release of organics to Blows Creek. Because the concentrations for fluorene in samples SD-18 and SD-21 were below the detection limit for the background sample, these substances cannot be used to establish an observed release of organics to Blows Creek. Nevertheless, these errors do not negate the observed release of carbazole in downstream sample SD18 at a concentration 2100 mg/kg compared to not detected in background sample SD15. Table 14 has been corrected in the revised HRS documentation record to reflect the Navy's comments.

Finally, the Navy is correct in its comments regarding errors and omissions in Table 16, demonstrating an observed release of organics to the Southern Branch of the Elizabeth River. Again, however, these errors do not negate the observed release in the Southern Branch. As indicated in Table 16, all background concentrations in sample SD22 were reported as ND (not detected) or were qualified with a "J" indicating that the analyte is present but that the value may not be accurate (pyrene and benzo(a)pyrene). By comparison, an observed release was documented for naphthalene (detected at 560 μg/kg in downstream sample SD5), anthracene (1400 μg/kg in SD5), fluoranthene (1700 and 1100 μg/kg in SD5 and SD3, respectively), and benzo(a)anthracene (1000 and 600 μg/kg in SD5 and SD3, respectively). Similarly elevated concentrations in downstream samples were documented for chrysene, benzo(b)fluoranthene, and benzo(k)fluoranthene. None of these concentrations were qualified. As noted above, Table 16 has been corrected in the revised HRS documentation record to reflect the Navy's comments.

Thus, while the HRS tables cited by the Navy contained a limited number of errors and omissions, these tables accurately identified an observed release of organics and inorganics from sources at the site to surface water bodies at the St. Juliens Creek Annex.

1.2.4 Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, the score remains unchanged. The final scores for the St. Juliens Creek Annex are:

Ground Water	Not Scored
Surface Water	100.00
Soil Exposure	Not Scored
Air	Not Scored
HRS Score	50.00

Region 6

2.1 Star Lake Canal, Jefferson County, Texas

2.1.1 List of Commenters

NPL-U29-5-7-R6	Correspondence dated 5/11/99 from George W. Bush, Governor, State of Texas.
NPL-U29-3-7-1-R6	Comment dated 9/9/99 from Russell G. Larson, Environmental Technologist, of Texaco Inc.
NPL-U29-3-7-2-R6	Comment dated 10/5/99 from Bill Forbes, Environmental Manager, of Huntsman Petrochemical Corporation.
NPL-U29-3-7-3-R6	Comment dated 10/5/99 from Michael W. Steinberg and Kathy A. Montgomery, of Morgan, Lewis & Bockius, LLP, on behalf of Texaco Inc.

2.1.2 Site Description

The Star Lake Canal site is located in Port Neches, Texas, adjacent to the Neches River. The site consists of approximately two miles of contaminated surface water sediments that extend from the beginning of perennial flow in Jefferson Canal and continue into the Star Lake Canal and the Molasses Bayou. Specific sources of this contamination were not identified during a Screening Site Inspection (SSI) in 1996 and an Expanded Site Inspection (ESI) in 1998 conducted by the Texas Natural Resource Conservation Commission (TNRCC). However, according to the TNRCC, local chemical manufacturing facilities have discharged permitted releases of industrial wastewater and/or disposed of wastes in Jefferson Canal and Star Lake Canal for a number of years.

Samples collected by TNRCC during the 1996 and 1998 sampling events from the sediments of Jefferson Canal, Star Lake Canal, and Molasses Bayou contained elevated concentrations of chromium, copper, benzo(a)anthracene, benzo(a)pyrene, aldrin, and Aroclor-1254. Level II concentrations of chromium, copper, benzo(a)anthracene, benzo(a)pyrene, and aldrin were detected in Molasses Bayou, a wetland eligible to be evaluated under the Hazard Ranking System (40 CFR Part 300, Appendix A, hereafter referred to as the HRS). In addition, the Sabine Lake System fishery is located within the 15-mile target distance limit for the site.

2.1.3 Summary of Comments

Texas Governor George W. Bush supported listing saying that prompt consideration of the site for the NPL will ensure protection of the local drinking water supplies, public health, and the environment.

Russell G. Larson of Texaco Inc., stated that the administrative record was not complete and requested additional information and a 90-day extension of the comment period. He asserted that the absence of key technical information in the administrative record "limits Texaco's ability to submit meaningful comments." He also stated that once the additional information was received, Texaco would need more time to thoroughly review it, thus the need for an extension of the comment period.

Bill Forbes of Huntsman Petrochemical Corporation suggested that EPA should defer cleanup of the site to the State of Texas, as he believes the site "could be adequately addressed under Texas programs" without having to list the site on the NPL. He indicated that it was his company's understanding that there had been no attempts by any Texas regulatory agencies (including TNRCC) to address the contamination at the site despite a statement claiming otherwise made by Texas Governor George W. Bush in a letter to EPA. Mr. Forbes also stated that he was surprised when EPA proposed to list the site in July 1999, because Huntsman was not kept abreast of EPA's intentions to do so. According to Mr. Forbes, Huntsman was not provided with a copy of the ESI report or sampling results prior to the proposed listing despite a written attempt to obtain them from EPA. He also pointed to statements made in documents from the SSI that, at that time, the site failed to meet minimum criteria to be proposed to the NPL. Mr. Forbes further stated that EPA's use of the same data to indicate both a source and a release is contrary to the rules described in the HRS. He went on to question the omission of specific sources of contamination from the HRS documentation record at proposal despite evidence from various references that a number of known manufacturing facilities may have contributed to the contamination. He said that while Huntsman had not received an indication from EPA that its operations contributed to the contamination at the Star Lake Canal site, he noted that the HRS documentation record at proposal references an EPA National Pollutant Discharge Elimination System (NPDES) permit and a TNRCC permit issued to Huntsman. Mr. Forbes stated that the hazardous substances identified in the contaminated sediments at the site either were never detected in Huntsman's effluent or were discharged within permitted limits. He also indicated that Huntsman reviewed and supports the comments submitted by Texaco.

Michael W. Steinberg and Kathy A. Montgomery, of Morgan, Lewis & Bockius, LLP, on behalf of Texaco Inc., urged EPA to withdraw its proposal for listing the site on the NPL. They noted that "Texaco has a direct interest in ensuring that ... EPA accurately assesses the conditions at the Site that may pose a threat to human health or the environment." They based this recommendation to withdraw on their conclusion that "the proposed listing of the Site is unexplained and unsupported" and that "the proposed HRS scoring of the Site is factually unsupported and contrary to law." They elaborated on this conclusion by stating that the TNRCC and EPA failed to comply with CERCLA, the NCP, and their own internal guidance documents in collecting data to support the proposed listing of the site on the NPL. According to Mr. Steinberg and Ms. Montgomery, one such example of a failure to adhere to EPA rules and guidance was that no effort was made in the proposed HRS documentation record to identify other sources of contamination at the site despite existing evidence regarding potential sources of contamination. They interpreted this inaction to be contrary to statements in the HRS rule and guidance that surface water sediments may only be considered a source for scoring purposes when there is no other identified source of the sediment contamination. Mr. Steinberg and Ms. Montgomery also stated that EPA's failure to satisfy a specific Administrative Procedure Act requirement that agencies provide a general statement of purpose when adopting new rules is troublesome, especially in light of purported social and economic consequences for listing a site on the NPL. They also asserted that there are apparent limitations to a generic model like the HRS in that it does not bear a rational relationship to known facts or to realistic risk scenarios. Mr. Steinberg and Ms. Montgomery also contended that EPA's application of the HRS is arbitrary and capricious, as it failed to accurately assess or reflect risks

due to disparities between both EPA's physical contamination and exposure models and actual site characteristics. Specifically, they stated that threats to local fisheries and the surface water environment are unsupported by site data and that HRS methodology for applying human toxicity, bioaccumulation, and ecosystem toxicity factor values is flawed. Mr. Steinberg and Ms. Montgomery went on to state that the proposed HRS score for the site is "based on information that is inadequate, unreliable, and incorrect." One such example, they claimed, is that EPA failed to confirm the presence of wetlands or state endangered species in the area of the site. They also contended that reliance on background and observed release samples from different sediment horizons is erroneous and contrary to EPA policy and that the sediment sample analytical results are "questionable."

2.1.3.1 Support for Listing

Texas Governor George W. Bush indicated that he supported EPA's decision to list the Star Lake Canal site on the NPL based on EPA's and TNRCC's investigations of the site and the HRS evaluation. Governor Bush stated that prompt consideration of the site for the NPL will "ensure protection of ... public health and the environment."

In response, the Agency has added the Star Lake Canal site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate.

2.1.3.2 Extend Comment Period

Based on the extent of the site HRS documentation record at proposal and its assertion that some information was not available in the administrative record (see Section 2.1.3.10.1, Omitted or Incomplete References), Texaco requested an extension to the comment period. In its September 9, 1999, comment letter, Texaco stated that it would be difficult to submit meaningful comments on the proposed listing without additional time and information, and requested a 90-day extension to the comment period. In its October 5, 1999, comment letter, Texaco stated that it "reserves the right to prepare and submit supplemental comments in a timely fashion" since "the entire Administrative Record was not made available to Texaco until ... September 29, 1999" because "EPA had to procure missing information from the [TNRCC] in Austin."

In response, Texaco's September 9, 1999 letter requesting an extension to the public comment period included a request that EPA provide the following documents:

- Appendix P (the PREscore Report) of the ESI Report (Reference 5 of the HRS documentation record at proposal).
- References 15 and 16 of the ESI Report.

- Reference 40 of the HRS documentation record at proposal (CompuChem Environmental Corp., Revisions and Quantitation and Ratio Report, November 4, 1996).

- Any "similar reports" that "may have been produced for the other sediment samples that were collected and analyzed by the Texas Natural Resources Commission (TNRCC)."

EPA responded to this request by sending a Federal Express package to Texaco on September 21, 1999, that contained copies of References 15 and 16 of the ESI report, a copy of Reference 40 of the HRS documentation record at proposal, and a letter granting an extension of the deadline for receipt of public comments by 14 days, from September 21, 1999, to October 5, 1999. The enclosed letter explained that References 15 and 16 of the ESI report were provided "as a courtesy" to Texaco because "[g]enerally, EPA does not include references to references to the documentation record in the Administrative Record." The Federal Express package did not contain the requested Appendix P of the ESI report (the PREscore Report) or any "similar reports" from TNRCC. As the enclosed letter explained:

> Appendix P (PREscore Report) is a predecisional document and the HRS documentation record supercedes it. The Agency did not rely upon Appendix P in calculating the HRS score for the site. Therefore, a copy of Appendix P will not be provided. Finally, your letter requests copies of any reports similar to that of Reference 40 regarding additional sediment samples collected and analyzed by TNRCC. Although there are similar reports in the custody of TNRCC, EPA does not have copies of these documents. Nor did EPA rely upon such reports to score the Site under the HRS. For HRS purposes, EPA relied on the data validation reports, chain of custody forms and data summary forms (See References 10-13 and 17-20 of the documentation record) forwarded by TNRCC to support the validity of the data.... While the additional reports are not relevant to the EPA's proposal to list the Site, the Agency has requested that TNRCC send you copies of this information.

As soon as TNRCC provided EPA the raw analytical data from TNRCC's ESI and SSI reports, EPA notified Texaco, by telephone, that these data were also available for Texaco's review. Texaco sent a representative to the EPA Region VI office to review and copy this data.

Both Texaco and Huntsman submitted comments dated October 5, 1999. Those comments are addressed in this support document. Neither Texaco, Huntsman, nor any other party submitted comments after the October 5, 1999, deadline.

2.1.3.3 Notice and Documents Not Provided Prior to NPL Proposal

Texaco stated that it was not provided a specific notice of EPA's proposed listing of the site, but instead had to learn of the proposed listing "indirectly through a review of the Federal Register." Huntsman stated that it was surprised to learn of the proposed listing considering its history of cooperation with EPA and TNRCC, and considering that the only report provided to Huntsman prior to the proposed listing contained a conclusion that listing was not supported by existing data. Huntsman maintained that it had requested reports from TNRCC on several occasions and did not receive a prompt response. According to Huntsman, initial communication with TNRCC promised that Huntsman would receive copies of any final report prepared

based on SSI work, however, "it took many requests by Huntsman to obtain the report." Huntsman stated that it did not receive a copy of the second report, the Expanded Site Investigation (ESI) report, "until *after* the proposed listing was published by EPA in the Federal Register." Huntsman further commented that, "[d]espite having worked cooperatively with the TNRCC and the EPA as a landowner with property under investigation, the only report provided to Huntsman prior to the proposed listing contained a conclusion that no listing was supported by the existing data."

In response, EPA is not in a position to respond to those comments regarding communications with TNRCC. EPA makes every attempt to work cooperatively with all stakeholders involved in the NPL listing process. It is not EPA practice to personally notify all parties that may be interested in learning that a particular site has been proposed to the NPL. Instead, EPA uses a notice and comment process that is consistent with the Administrative Procedures Act (5 USC Section 551 et seq.). According to this procedure, EPA solicits comments on proposed listings, reviews and considers all comments received, and addresses those comments in the final rule. Through this process, commenters can provide any information they believe is relevant to the scoring and listing of proposed sites. A 60-day comment period followed publication in the Federal Register of the proposed NPL rule of which this site is a part. The proposed listing for this site appeared in the Federal Register on July 22, 1999. The proposal provided that the comment period for the proposed rule was to end on September 21, 1999. In response to a request by Texaco, however, the comment period was extended by fourteen days, to October 5, 1999 (see Section 2.1.3.2, Extend Comment Period). Because these comments address notice of the proposed listing and availability of documents, they have no effect on any HRS factor or the overall site score.

2.1.3.4 EPA Should Defer to the State

Huntsman commented that a letter from Texas Governor George Bush had stated "that the TNRCC and the Attorney General's Office have sought to address [the Star Lake Canal site] ... under Texas programs." Huntsman stated that, "[o]ther than the requests for access from TNRCC, which Huntsman cooperatively granted, Huntsman received no requests or inquires [sic] from the TNRCC or the [Attorney General's] office seeking to address this matter under Texas programs." Huntsman further commented that, "there have been no efforts *whatsoever* for the last 14 or 15 years by the TNRCC or any other regulatory authority in the State of Texas to seek to address historical contamination at the Star Lake Canal site." Based on this alleged inaccuracy in the Governor's letter, Huntsman requested "that EPA remand the site to Texas" as it "could be adequately addressed under Texas programs without the necessity of listing on the NPL." Texaco also suggested deferral to the State, citing a recent EPA statement to Congress that the NPL is a "choice" or "tool" of "last resort." Texaco inferred that the site may be better addressed in other ways, including State cleanup programs or voluntary PRP cleanup.

In response to the request to defer this site to the State, EPA is guided by its "*Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions*" issued on May 3, 1995. EPA developed the guidance in an effort to enhance the State role in addressing sites. The deferral program is an administrative tool to enable States and Tribes, under their own laws, to respond at sites that EPA would otherwise not soon address. Generally, under the deferral policy:

- Deferral may be implemented on either a State- or Tribe-wide, or site-specific basis;

- The State or Tribe must express interest in having the site deferred to it and must agree to address the deferred site sooner than, and at least as quickly as, EPA would expect to respond;
- Response actions will be conducted under State or Tribal authority;
- Viable and cooperative PRPs will agree to pay for and conduct response actions--Superfund Trust funds generally will not be made available for conducting response actions;
- Response actions must be protective of human health and the environment and meet State or Tribal and Federal applicable requirements;
- A site may not be deferred if the affected community has significant, valid objections;
- The level of oversight of States and Tribes will be negotiated with the Region; and
- Once a deferral response is complete, EPA will remove the site from CERCLIS and will not consider the site for the NPL unless the Agency receives new information of a release or potential release that poses a significant threat to human health or the environment.

In the case of the Star Lake Canal site, EPA has decided that deferral to the State of Texas is not appropriate. As noted above, EPA's guidance suggests that deferral to a state is generally appropriate only if there are responsible parties prepared to pay for and conduct remedial activities. Because the actual source(s) of the Star Lake Canal site contaminated sediment plume is unknown, neither EPA nor the State of Texas have specifically identified any potentially responsible parties. Therefore, application of EPA's state deferral policy is not appropriate at this time.

Furthermore, TNRCC has indicated to EPA that it is not interested in addressing the site under State authority and that State funds are insufficient to adequately address the site given the extensive site investigation and large scale remediation that will likely be required at the site (see Star Lake Canal Site Summary, dated April 16, 1999, that was included in an April 23, 1999, letter from EPA to Governor Bush).

2.1.3.5 NPL Listing

2.1.3.5.1 NPL Legal Framework and Judicial Review

Texaco's comment letter included a summary of the "legal framework for the CERCLA National Priorities List" that tracked the development of the HRS and NPL. This legal summary emphasized the congressional intent that the HRS should "rank sites as accurately as the Agency believes feasible using information from preliminary assessments and site inspections" and should perform "with a degree of accuracy appropriate to

its role in expeditiously identifying candidates for response actions (H.R. Rep. No. 962, 99th Congress., 2d Sess. at 199-200, 1986)."

Texaco also provided a summary entitled "Judicial Review of NPL Listings" in its comment letter. In this summary, Texaco concluded that the Court has reviewed cases concerning NPL listing with increased scrutiny, over time. Texaco's review quoted Court opinions stating that EPA's listing of sites on the NPL may not be arbitrary or capricious, that EPA must provide "reasoned explanations" for the conclusions and assumptions underlying an HRS score, and that EPA must support and explain its listing decisions with substantial, factual, scientific evidence. Texaco also stated that, in one case, the Court has expressed concern over the "inequities resulting from the HRS' formalistic approach to listing sites."

In response, because Texaco's legal and judicial NPL summary did not contain any comments specific to the proposed listing of the Star Lake Canal site, no EPA response is required or appropriate.

2.1.3.5.2 Economic Impacts and Stigma of NPL Listing

In its comment letter, Texaco cited several Court decisions involving EPA in arguing that listing a site on the NPL "may have severe consequences for affected parties" and that it "dramatically increases the chances of costly [cleanup] activity." Texaco further asserted that listing is "likely to dramatically increase the duration of remedial action." According to Texaco, the perception in the business community is that NPL listing represents "an economic disaster for a site and for property values in the surrounding community." It went on to cite a New York Times article that likens NPL listing to a "scarlet letter" that effectively scares off potential purchasers, investors, and employers. Texaco stated that this argument is supported by a statement attributed to Carol Browner, EPA Administrator: "Even after the contamination has been cleaned up – even if in fact there had never been any contamination – the mere fact of being on the [CERCLIS] list was enough to scare investors away. It's like having a bad credit rating that never goes away." EPA's decision to remove 25,000 sites from CERCLIS that were classified as no further remedial action planned was presented by Texaco as further evidence of the "devastating economic blow" from listing a site on even the larger CERCLIS inventory. Based on these impacts, Texaco called for "a restrained, thoughtful approach to NPL listing decisions."

In response, stigma associated with environmental contamination may be unavoidable, but any such stigma should not be blamed on the process of NPL listing, which is the first stage in cleaning up the site. Inclusion of a site or facility on the list does not in itself reflect a judgment of the activities of its owner or operator, but rather reflects EPA's judgment that a significant release or threat of release has occurred, and that the site is a priority for further investigation under CERCLA. Furthermore, the focus of the CERCLA program is to identify and, where necessary, address hazardous substances releases that may pose a threat to health or the environment.

In response to Texaco's concern for the impact of site listing on remedial activities and the attendant costs, EPA notes that including a site on the NPL does not cause the Agency necessarily to undertake remedial action, or indicate that any action is required by, nor liability for site response costs assigned to, a private party (56 FR 21462, May 9, 1991). Any EPA actions that may impose costs on firms are based on

discretionary decisions and are made on a case-by-case basis. Also, responsible parties may bear some or all the costs of any RI/FS or subsequent work, or the costs may be shared by the EPA and the States. Therefore, the potential expenditures cited by Texaco are associated with events that may follow listing the site, not with the listing itself.

2.1.3.5.3 No Explanation of Purpose of NPL Listing

Texaco stated that the "proposed listing plainly fails to satisfy the Administrative Procedure Act's requirements that agencies engage in reasoned decision making and provide the public with a general statement of the basis and purpose when they adopt new rules." Texaco claimed that EPA proposed the site for NPL listing without explaining "the purpose of listing the Star Lake site" or "why it plans to take this step." According to Texaco, EPA never stated what the Agency hoped to accomplish by the proposed listing. Texaco claimed that EPA's "secrecy" effectively leaves "the public ... in the dark." Texaco further stated that "the lack of any stated reason for this listing is also troubling in view of the very serious consequences discussed above that almost invariably flow from listing a site on the NPL" (see Section 2.1.3.5.2, Economic Impacts and Stigma).

In response, EPA notes that the Administrative Procedures Act requires that agencies "shall incorporate in the rules adopted a concise general statement of their basis and purpose" (5 U.S.C. § 553(c)). EPA maintains that the basis and purpose of listing the Star Lake Canal site on the NPL are so stated in the *Federal Register* notice proposing the site (64 FR 39886, July 22, 1999). The *Federal Register* text contains exhaustive summary and background information on the legislative history and purpose of CERCLA, and thus of listing sites on the NPL.

EPA also disputes Texaco's assertion that the public is left in the dark. The Superfund program offers numerous opportunities for public participation at NPL sites, in addition to commenting on proposed sites, as Texaco and Huntsman have done at the Star Lake Canal site. The EPA Regional Office must develop a Community Relations Plan (CRP) before remedial investigation and any feasibility study (RI/FS) field work begins. The CRP is the "work plan" for community relations activities that EPA will conduct during the entire cleanup process. In developing a CRP, Regional staff interview State and local officials and interested citizens to learn about citizen concerns, site conditions, and local history. This information is used to formulate a schedule of activities designed to keep citizens apprized and to keep EPA aware of community concerns. Typical community relations activities include:

- Public meetings at which EPA presents a summary of technical information regarding the site and citizens can ask questions or comment.
- Small, informal public sessions at which EPA representatives are available to citizens.
- Development and distribution of fact sheets to keep citizens up-to-date on site activities.

For each site, an "information repository" is established, usually in a library or town hall, containing reports, studies, fact sheets, and other documents containing information about the site. The EPA Regional Office continually updates the repository and must ensure that the facility housing the repository has copying capabilities.

After the RI/FS is completed, if EPA develops a preferred cleanup alternative, the EPA Regional Office sends to all interested parties a Proposed Plan outlining the cleanup alternatives studied and explaining the process for selection of the preferred alternative. At this time, EPA would also begin a public comment period during which citizens are encouraged to submit comments regarding all alternatives. Once the public comment period ends, EPA develops a Responsiveness Summary, which contains EPA responses to public comments. The Responsiveness Summary becomes part of the Record of Decision (ROD), which provides official documentation of the remedy chosen for the site.

In addition to meeting these specific Federal requirements, EPA makes every attempt to ensure that community relations is a continuing activity designed to meet the specific needs of the community. Anyone wanting information on a specific site should contact the Community Relations staff in the appropriate EPA Regional Office.

2.1.3.5.4 HRS is a Poor Model

Texaco stated that it was interested in ensuring that "EPA accurately assesses the conditions at the Site that may pose a threat to human health or the environment." But Texaco asserted that the HRS "fails to accurately assess existing site conditions" when applied to the Star Lake Canal site. Texaco acknowledged that the HRS is "designed for widespread use" and "intended for broad-based application" and that the purpose of the HRS is to "accurately assess the relative degree of risk" posed by sites. Citing Eagle Picher Indus. v. EPA, 759 F.2d 905, 922, (D.C. Cir. 1985), Texaco stated that the Court has upheld the idea that the HRS is a "screening tool to implement CERCLA." Nonetheless, Texaco asserted that the application of the HRS to a given site may still be "arbitrary and capricious," citing HULS America Inc. v. Browner, 83 F.3d. 445, 452 (D.C. Cir. 1996).

In support of their assertions, Texaco cited two cases in which the Court concluded that a model used by the EPA for a regulatory purpose must bear a rational relationship to the known behavior of the substance to which it is applied, and that the "more inflexibly the model is applied, the greater scrutiny it deserves in the face of evidence detailing a poor fit between it and reality." Texaco's comment letter provides a brief description of these two cases; Chemical Manufacturers Association v. EPA (28 F. 3d 1259, 1265, D.C. Cir. 1994) and Edison Electric Institute v. EPA (2 F. 3d 438, 446, D.C. Cir. 1993). Texaco's comment letter concludes that the HRS evaluation of the Star Lake Canal site is based on "false assumptions" similar to those found in the two models that were reviewed in the cited Court cases.

In response, the HRS is a final rule and thus is binding on EPA. EPA does not have discretion to deviate from the HRS. The cases cited by Texaco are not on point. Chemical Manufacturers Association v. EPA, 28 F. 3d.1259, 1265 (D.C. Cir. 1994) and HULS America Inc. v. Browner, 83 F.3d. 445 (D.C. Cir. 1996) involved challenges to the use of models that were not final rules. Edison Electric Institute v. EPA, 2 F. 3d

438 (D.C. Cir. 1993) involved a challenge to a rule brought under Section 113(a) of CERCLA which provides for review of final rules within 90 days of their promulgation. These cases do not support that EPA can or should deviate from the HRS in evaluating a particular site for the NPL. Texaco's concerns with the HRS go beyond the scope of this rulemaking.

2.1.3.6 Source Characterization

2.1.3.6.1 No Effort is Made to Identify Sources of Sediment Contamination

Texaco and Huntsman both argued that EPA's failure to identify sources of the sediment contamination is contrary to the HRS, EPA policy, and EPA guidance. In its letter, Huntsman commented that the proposed listing employed a "'pilot' approach," which does not follow the procedures described in the HRS rule. Texaco pointed to the HRS Guidance Manual, which states that efforts should be undertaken to identify sources of contamination before contaminated sediments themselves are evaluated as a source. According to Texaco, efforts to identify sources should include "research regarding site history and regulatory status, evaluation of potential discharge sources, record(s) searches and interviews with employees, and sampling to eliminate or confirm possible sources." Huntsman and Texaco both noted that extensive evidence was readily available regarding a number of known manufacturing facilities that may have contributed to the contamination. Despite the availability of information, Texaco concluded that there was no effort on EPA's part to confirm or deny whether individual sources might be associated with the alleged contamination. Texaco asserted that "EPA has acted in direct contradiction to its own guidance by considering contaminated sediments as a source without making any efforts to identify the original sources of contamination." Texaco stated that the "arbitrary disregard of [EPA's] own regulations and policies" is grounds for withdrawing and reevaluating the proposed listing, especially considering that the HRS scoring is "based upon the erroneous assumption that the contaminated sediments themselves are the source of contamination."

In response, the evaluation of a contaminated sediment plume as a source at the Star Lake Canal site, as described in the HRS documentation record at proposal, is consistent with the HRS and applicable guidance. The HRS definition of "source" explicitly states that "in the case of either a ground water plume with no identified source or contaminated surface water sediments with no identified source, the plume or contaminated sediments may be considered a source" (Section 1.1 of the HRS). The HRS definition of "site" includes "[a]rea(s) where a hazardous substance has been deposited, stored, disposed, or placed, *or has otherwise come to be located*" (Section 1.1 of the HRS, emphasis added). HRS Sections 4.1.1.1 and 4.1.1.2 confirm that "sites" may consist "solely of contaminated sediments with no identified source."

The preamble to the HRS discusses the evaluation of contaminated surface water sediment plumes as sources (55 Federal Register 51569 to 51570 and 51574, December 14, 1990). Section 1 of the preamble (55 Federal Register 51570) states that:

> Under the original HRS[47 Federal Register 31180, July 16, 1982] the Agency took the approach that all feasible efforts should be made to identify sources before listing a site on the NPL. If, after an appropriate effort has failed to identify a source, the Agency believed that the contamination was likely to have originated at the type of source that would be addressed under Superfund, such sites were listed. Subsequent investigations after listing

have generally identified a specific source. In some cases, EPA has not listed contaminated media without clearly identified sources because it appeared the source of pollution would not be addressed by Superfund programs; an example of such a source would be extensive, low-level contamination of surface water sediments caused by pesticide applications. EPA has found this approach to be generally workable and will continue to evaluate, on a case-by-case basis, whether sites with no identified sources should be listed.

The HRS Guidance Manual suggests, as Texaco pointed out in its comment letter, that "efforts should be undertaken to identify the original source(s) of contamination" before evaluating contaminated sediments as a source. The HRS Guidance Manual goes on to suggest that the level of effort to identify the original source(s) should be similar to an ESI. In the case of the Star Lake Canal site, both an SSI and an ESI were conducted and neither concluded that the sediment contamination could be adequately attributed to a specific source.

2.1.3.6.2 Permitted Releases

Huntsman stated that although they had "received no indication from EPA or TNRCC that its operations in any way contributed to the release" at the Star Lake Canal site, the attribution section of the HRS documentation record at proposal does include a reference to "an EPA NPDES permit issued to Huntsman in April 1995, and a TNRCC permit issued to Huntsman, Texaco, and Ameripol Synpol in December 1994." According to Huntsman, hazardous substances found in sediments at the Star Lake Canal site have either never been detected in Huntsman's effluent or were discharged within NPDES permit limits. Huntsman noted that "[NPDES] permit limits were established only after the issuing agency had specifically concluded that discharges made in accordance with the terms of the permit would not represent a threat to human health or the environment."

In response, the HRS documentation record at proposal evaluates the Star Lake Canal site as a contaminated surface water sediment plume with no identified source. Although the attribution section of the HRS documentation record at proposal does state that several chemical manufacturing facilities have discharge permits for the same hazardous substances that are found in the Star Lake Canal sediment plume, none of these discharges were evaluated as sources. As discussed in the preceding response, (see section 2.1.3.6.1, No Effort is Made to Identify Sources of Sediment Contamination) both the SSI and ESI conducted at the site concluded that the sediment contamination could not be adequately attributed to any specific source(s). According to the HRS, "when the site itself consists of contaminated sediments with no identified source, no separate attribution is required" (Section 4.1.2.1.1 of the HRS). Therefore, neither the specific concentrations of hazardous substances in Huntsman's wastewater discharge nor the status of Huntsman's NPDES permit have any bearing on the HRS site score or the NPL listing decision for the Star Lake Canal site.

2.1.3.7 Likelihood of Release

2.1.3.7.1 Comparability of Background and Observed Release Samples

In its comment letter, Texaco maintained that the HRS documentation record at proposal contains "factual inaccuracies and errors which [are] inconsistent with the policies underlying the revised HRS." Texaco contended that one such error occurred when EPA "incorrectly compared concentrations of constituents" found in release and background samples to document an observed release of chromium, copper, benzo(a)anthracene, benzo(a)pyrene, aldrin, and Aroclor-1254. Texaco cited the *Guidance for Performing Site Inspections Under CERCLA* (EPA 9345.1-05, September 1992) to argue that samples may only be compared if they are of the same soil types and are taken from the same soil horizons. Texaco pointed out that the observed release sediment samples were collected from various depths up to 30 inches, while background sediment samples were collected at depths ranging from 0 to 4 inches. Texaco also stated that "the TNRCC field notes ... did not provide a description of the soil horizons." Finally, Texaco noted that background and observed release samples were collected at different time periods.

In response, EPA appropriately selected sediment samples SE-20 and SE-21 to represent sediment background conditions for the plume of contaminated sediments at the site. The HRS does not provide any criteria for selecting background samples, except that background samples must be compared to similar types of release samples (Section 4.1.2.1.1 of the HRS). Section 2.3 of the HRS states that "[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level" but does not specify how that background level should be established or that it necessarily be established based on sampling data. In the case of the Star Lake Canal site, however, EPA chose to compare the release sample concentrations of pesticides, PCBs, and polycyclic aromatic hydrocarbons to the background levels established for these hazardous substances in background sediment samples SE-20 and SE-21. Section 4.1.2.1.1 of the HRS requires that EPA "[l]imit comparisons to similar types of samples and background concentrations." When selecting a background sample, EPA pursues the best available and practicable reference point from which to judge whether a release has occurred from the site. For the Star Lake Canal site, EPA determined that among the surface water analytical data available, sediment samples SE-20 and SE-21 provided not only a reasonable estimate of sediment background conditions in the site vicinity, but also provided a reasonable basis for comparison with the sediment observed release samples.

The only criteria provided by the HRS for comparing background and release samples is that they both must be from a similar sample matrix (e.g., surface water release samples can only be compared to surface water background samples, not sediment or benthic samples) (Section 4.1.2.1.1 of the HRS). Based on its interpretation of SI guidance, Texaco claims that samples may only be compared if they are of the same soil type and are taken from the same soil/sediment horizons. The sediment types were found to be similar for every sample, unconsolidated gray to black silt with some clay (Reference 6, pp 78 - 82; Reference 7, pp. 9, 10, 37, 42, 45 - 47; and Reference 39 of the HRS documentation record at proposal), and each sample was analyzed using the same analytical methods as those used in EPA's Contract Laboratory Program (CLP). The background and observed release sediment samples were collected at different depths due to the fact that the depths of available sediment varied from location to location. At the background sample locations, the sediment layer was only 4 inches thick above a hard clay bottom (Reference 4, p. 9; Reference 7, pp. 9, 10;

and Reference 39, p. 2 of the HRS documentation record at proposal). As such, the 0 to 4 inch background composite samples captured the entire sediment layer. Where the sediment layer was thicker, as in the case of the observed release sample locations, larger composite samples were taken (0 to 8 inches, 0 to 12 inches, and 0 to 30 inches) (Reference 39 of the HRS documentation record at proposal). Note that the sampling probe was 30 inches long, thus limiting the sample collection to the top 30 inches of sediment. Since each of the observed release composite samples represents the entire sediment layer or at least the top 30 inches of the sediment layer, it is appropriate to compare them to the background composite sample that also represents the entire sediment layer. Attachment A of this support document confirms the depths of the available sediments at background sample locations SE-20 and SE-21, as stated in the HRS documentation record at proposal. Attachment A includes a letter from the TNRCC dated July 14, 2000, and 4 additional pages that describe the sampling equipment that was used. In conclusion, these samples provide a reasonable basis for determining that observed releases to surface water have occurred at the site.

With regard to the two-year time difference between some background and observed release samples, EPA again notes that the HRS does not provide specific criteria for sample comparability. Generally, HRS guidance advises that background and release samples be collected during the same general time period, but provides no hard and fast rules for what constitutes an acceptable time period. When the comparison of background and observed release samples involves media, such as air or surface water, where constituent concentrations can conceivably change rapidly from one moment to the next, it is important to collect samples for comparison from the same time period. However, for media, such as soil and sediment, where concentrations generally change more slowly over time, sample collection times can vary more liberally. Regardless, even if EPA removed the ten observed releases samples taken in 1998 that were established based on comparisons to background samples taken in 1996, the HRS site score would remain unchanged. Three observed release samples (SE-11, SE-16, and SE-19) included in the HRS documentation record at proposal were taken on October 23, 1996, the same day that the two background samples (SE-20 and SE-21) were taken. These three samples are sufficient to establish an observed release of benzo(a)anthracene, benzo(a)pyrene, and copper to the site. Aldrin and Aroclor-1254, which were stated in the HRS documentation record at proposal to have the highest toxicity/persistence/bioaccumulation factor values for the human food chain threat, would no longer be included in the observed release to the site. However, with the elimination of aldrin and Aroclor-1254 from consideration, benzo(a)pyrene would have an equivalent toxicity/persistence/bioaccumulation factor value for the human food chain threat. The environmental threat evaluation would remain unaffected as benzo(a)anthracene would continue to be the most hazardous substance. Further, relying solely on these three samples to establish an observed release would decrease the amount of wetland frontage that is used to determine the environmental threat target score. But the wetland frontage that exists within the observed release zone established by these three samples is greater than 0.1 miles and would contribute a value of 25 to the environmental threat target score. This contribution is sufficient to maintain an environmental threat score of 60. Thus, even with the removal of the 1998 observed release samples, there would be no change in the site score.

2.1.3.7.2 Unrealistic Transport Scenario

Texaco stated that “threats to the environment from contaminated sediments are assumed without the benefit of supporting data.” According to Texaco, “[i]n reality, if the catastrophic flood scenario assumed in the proposed HRS scoring actually occurred, then the entire area surrounding the Site for several miles around would be submerged and the limited sediment transport - if it actually occurred - would be of only minor concern.”

In response, it is unclear what Texaco is referring to when it mentioned a "catastrophic flood scenario." The HRS documentation record at proposal does not assume that a catastrophic flood is necessary to realize the inherent risks posed by the site to human health and the environment. It may be that the commenter is applying the HRS's Potential to Release by Flood evaluation to the Star Lake Canal site (Section 4.1.2.1.2.2 of the HRS). In that case, EPA notes that potential to release was not considered for this site, because an observed release was established to the surface water pathway based on the contaminated sediments. In other words, since contamination was *observed* to be affecting the surface water pathway, there was no need to evaluate the potential for hazardous substances to be released to the environment via a flood or any another means. The commenter seems to imply that during a natural disaster like a flood, widespread deposition of hazardous substances would be of "only minor concern." EPA acknowledges that there are numerous concerns during a catastrophic flood event, but does not consider the uncontrolled migration of hazardous substances to be a "minor concern."

2.1.3.7.3 Data Quality

Based on EPA Region 6's data review of sediment sample analytical results, Texaco outlined several "minor and major problems" with some of the analytical results. These problems included the following:

- "data are 'provisional;'"
- "incorrect laboratory dilutions were used;"
- "no custody seals were used;"
- "Aroclor peaks interfered with the identification or quantitation of pesticides in eight (8) samples;"
- "outlying matrix spike/matrix spike duplicate results;"
- "laboratory submitted data package two (2) days late for 35-day turnaround time;" and
- "laboratory 'hold' times were exceeded on some samples;"

Texaco expressed concern that "[d]espite these problems, the laboratory sediment data were used to calculate the proposed HRS Score for the Site."

In response, EPA has found no evidence of unqualified deficiencies in the CLP data used to support the Star Lake Canal site HRS score. CLP laboratories must adhere strictly to the criteria established by EPA and incorporated in the contract, when submitting analytical data. Also, EPA procedures require that CLP analytical data be reviewed or validated by EPA or third party reviewers, to ensure that the data are of known and documented quality and to determine the ultimate usability of the data. Data reviewers conduct both a contractual assessment (i.e., determining whether the laboratory met contractual requirements, also called contract compliance screening) and a technical assessment of the data package. The data reviewer evaluates numerous quality control criteria including: sample holding times; instrument tuning and performance;

calibrations; blanks; system monitoring compounds and surrogates; matrix spike and matrix spike duplicate; internal standards; compound identity and quantitation; and performance and completeness. For a particular CLP data package, each of these quality control criteria are typically deemed acceptable, provisional, or unacceptable. Data for which all quality control requirements are acceptable may be used for HRS purposes without further qualification. Data for which acceptance criteria for quality control requirements have not been met are generally qualified (e.g., with a "J" qualifier, meaning that the hazardous substance was positively identified during the analysis but that the numerical value is an approximate concentration of the hazardous substance in the sample) and are usable for HRS purposes, per guidance presented in EPA's *Using Qualified Data to Document an Observed Release and Observed Contamination* (November 1996). Lastly, data for which quality control criteria requirements have been grossly exceeded are generally rejected and are deemed unacceptable and are not usable for HRS purposes. Following data review, determination of data quality is discussed in a data validation report and is included in each of the CLP data packages used for HRS scoring.

The data validation reviews used for the HRS scoring of the Star Lake Canal site have taken into account any potential deficiencies that may impact the technical data usability. The very purpose for data validation is to ensure that questionable and inaccurate data are not used as a basis for making Agency decisions. When a laboratory produces data which are "questionable," as all laboratories occasionally do, the CLP data validation process identifies the deficiencies in the data, applies the appropriate qualifiers to note where data are questionable or limited, and ensures that the foundation for EPA's decision is sound. Under the CLP, each data deliverable is a stand-alone package which includes all appropriate QA/QC information needed to validate the data and determine their usability. Thus, problems found in one sample set occur independently of all other data sets.

Texaco is partially correct in its assessment that "provisional" data are contained in the HRS documentation record at proposal, as two of the seven analytical packages were deemed provisional by the CLP data validation team. However, Texaco is incorrect in its implication that these data are in anyway inappropriate to use for HRS purposes. For all seven CLP packages, the data validator determined that the data were acceptable and usable. Data that were deemed provisional due to quality control criteria being exceeded, such as sample holding time violations, incorrect laboratory dilutions, or outlying matrix spike/matrix spike duplicate results, were "J" qualified as appropriate by the data validation team. Prior to the use of these data, these "J" qualified data were properly adjusted per guidance presented in EPA's *Using Qualified Data to Document an Observed Release and Observed Contamination* (November 1996, Reference 41 of the HRS documentation record at proposal) as described on pages 40 and 41 of the HRS documentation record at proposal. Based on these adjustments, the only "J"qualified sediment sample concentration that was used to support an observed release was chromium in sample SE-32/MFGQ20, with a concentration of 134 J ug/Kg, as depicted on Table 5, page 41 of the HRS documentation record at proposal. Even if EPA had determined that this chromium value was not usable for HRS purposes, the site score would not be affected because an observed release is established for five other hazardous substances and chromium is not used to calculate toxicity, persistence, bioaccumulation or any other HRS factor value.

Regarding Texaco's comment that Aroclor peaks interfered with the identification or quantitation of pesticides in eight samples, EPA agrees that the quantitation of the pesticide analyses in these eight samples were inaccurate due to the high concentrations of Aroclor compounds in these samples. Aroclors are complex compounds that may interfere with the identification and quantitation of less complex pesticide

compounds in the laboratory. EPA notes that, during data validation, the data reviewer reached the same conclusion as the commenter and, as a result, appropriately qualified the pesticide results as non-detect ("U") and reported the Aroclor results as unqualified (that is, useable as reported by the laboratory). The data reviewer correctly reported the pesticide results for all eight samples as non-detect because the "positive" pesticide results were "false positives" created by the interfering effect of the Aroclor compounds. Even if the data reviewer had elected to qualify the Aroclor results in these samples with a "J" qualifier, there would be no affect on the site score. Aroclor-1254 was detected above background in three observed release samples (FEY13, FEY08, and FEY40DL) and is used in the HRS documentation record at proposal (along with aldrin) as the hazardous substance with the highest toxicity/persistence/bioaccumulation factor value. With the hypothetical "J" qualification, Aroclor results for only two (FEY13 and FEY08) of the three observed release samples in which Aroclor was detected would be affected. The third observed release sample (FEY40DL) was not among the eight samples that contained coeluting Aroclor peaks. See the table below.

AFFECT ON DATA USABILITY BASED ON HYPOTHETICAL "J" QUALIFICATION

CLP Sample ID	Reported Aroclor-1254 Concentration	Hypothetical Aroclor-1254 Concentration with "J" Qualification [1]	SQL	Usable as a Release Value Based on Hypothetical Value?
FEY13	510 μg/kg	510 ÷ 10 = 51 μg/kg	69 μg/kg	No
FEY08	380 μg/kg	380 ÷ 10 = 38 μg/kg	54 μg/kg	No
FEY40DL	1,500 μg/kg	Not Applicable	650 μg/kg	Yes, unaffected

1 - According to guidance presented in the "*Using Qualified Data to Document an Observed Release*" Factsheet (November 1996), release samples that are "J" qualified with an unknown bias may be used after dividing by the appropriate factor.

Regarding the submission of data packages subsequent to the 35-day contractual turnaround time or with no custody seals, the commenter seems to imply that failure to follow an administrative requirement in the CLP Statement of Work (SOW) should invalidate the data. While the Agency might decide to monetarily penalize the laboratory for this administrative error (as specified in the CLP SOW), the laboratory's inaction does not affect the data quality or validity of the samples. A data package may have certain contractual defects, yet it may be very usable for the Region's intended purpose, as long as it meets validation criteria and data usability standards. For the few contractual defects present in some data packages for the Star Lake Canal site, data reviewers have either appropriately qualified the data or indicated that data usability has not been significantly affected.

EPA also notes that Texaco has not provided additional sampling results which contradict those summarized in the HRS documentation record at proposal. Based on the fact that data used in the HRS scoring of the Star Lake Canal site were found to be acceptable by a data validation team and that no contradictory data were provided by Texaco, EPA sees no need to discard or modify any of the site data.

2.1.3.8 Waste Characteristics

Texaco claimed that the "HRS Exposure Model is inappropriate as applied to this Site because it is not designed to accurately assess the toxicity of compounds found in buried sediments but rather is designed to assess toxicity in water." Texaco stated that for the bioaccumulation potential factor, the HRS rule employs a "flawed" scoring methodology consisting of a hierarchy of three chemical characteristics to determine the factor value: the published Bioconcentration Factor (BCF), the log K_{OW}, and the water solubility constant. Texaco argued that these three chemical characteristics "relate to the chemical's behavior in the water column and are of limited relevance in predicting the potential for bioaccumulation of constituents present in buried sediments." For the human toxicity factor, Texaco applied a similar argument claiming that the HRS methodology for calculating this factor is flawed as it does not take into account the bioavailability and ultimately delivered doses of hazardous substances that are found in buried sediments at the site. According to Texaco, this HRS methodology "provides inaccurate results" when applied to the site. Likewise for the ecosystem toxicity factor, Texaco argued that the associated HRS methodology, which uses EPA's Ambient Water Quality Criteria (AWQC) or Ambient Aquatic Life Advisory Concentrations (AALACs), is only relevant to chemicals found in surface waters, not sediments. As such, Texaco concluded that the application of this exposure model "results in a mischaracterization of risks posed by the Site."

In response, the HRS assigns bioaccumulation potential, toxicity, and ecosystem toxicity factor values based on the hazardous substances that "are available to migrate from the sources at the site to surface water" (Sections 4.1.2.2, 4.1.3.2.1, and 4.1.4.2.1 of the HRS). These include "[h]azardous substances that meet the definition of an observed release to surface water" and "[a]ll hazardous substances associated with a source that has a surface water containment factor value greater than 0 for the watershed" (Section 4.1.2.2 of the HRS). In assigning these values, the HRS does not consider whether these substances have ultimately come to be suspended in the water column or deposited in surface water sediments. At the Star Lake Canal site, hazardous substances are present in surface water sediment samples that meet observed release criteria and are associated with a source that has a surface water containment factor value greater than 0 for the watershed (e.g., less than complete containment).

Texaco seems to assert that hazardous substances in surface water will behave differently from the same substances in a water/sediment matrix. Texaco presents no information or evidence, however, to support this assertion. But even if Texaco's assertions were supported by such data, these comments raise issues that are beyond the scope of this rulemaking. The HRS is a final rule and thus is binding on EPA. EPA does not have discretion to deviate from the HRS. The HRS was adopted in its final version on December 14, 1990 (55 FR 51532). This final adoption was preceded by an advance notice of proposed rulemaking on April 9, 1987 (52 FR 11513) and a notice of proposed rulemaking on December 23, 1988 (53 FR 51962). The then-proposed HRS revisions included the "addition of a bioaccumulation factor for evaluation of human food chain toxicity/persistence and population; [and the] addition of ecosystem toxicity to evaluate the environmental threat" (55 FR 51554, preamble Section III M, December 14, 1990). EPA received a number of comments on these factors during the appropriate public comment period. These are summarized, with responses, in the preamble to the HRS (55 FR 51554 to 51560).

2.1.3.9 Targets

2.1.3.9.1 Unrealistic Target Distance Limit

In its comment letter, Texaco stated that when the target distance limit (TDL) was extended 15 miles to include Sabine Lake, "EPA did not confirm impacts to surface water or fisheries in Sabine Lake by sample collection or laboratory analysis." Rather, according to Texaco, EPA assumed without the benefit of sampling that hazardous substances "serve as a threat to potential receptors fifteen miles in the Sabine Lake." Texaco commented that "[t]hrough its strict application of the generic HRS model ... EPA reaches a result that simply does not correspond with reality."

In response, the TDL defines the maximum distance over which targets are considered when evaluating a site. For HRS purposes, at sediment plume sites with no identified sources, the target distance limit begins at the farthest upstream sample meeting observed release criteria and extends 15 miles downstream or to the most distant observed release sample, whichever is greater (Section 4.1.1.2 of the HRS). The in-water segment subject to actual contamination corresponds to the length of surface water between the most upstream and most downstream observed release samples (Section 4.1.1.1 of the HRS). Targets, whether they are fisheries or sensitive environments, that are located partially or wholly within this in-water segment are subject to actual contamination (Sections 4.1.3.3 and 4.1.4.3 of the HRS). Thus, impacts to targets subject to actual contamination are supported by analytical sampling results, as summarized in the HRS documentation record at proposal. The HRS documentation record at proposal demonstrates that a fishery and several sensitive environments lie within either the areas of actual contamination found in Jefferson Canal, Star Lake Canal, and Molasses Bayou, or the target distance limit that includes the Neches River and Sabine Lake. As for potentially contaminated targets that may exist between the most downstream observed release sample and the end of the 15-mile target distance limit, there is no requirement in the HRS for sampling and analysis to document potential targets. Regardless, since numerous targets at the site were found to be subject to actual contamination, potential targets were not scored for this site. Moreover, in as much as these comments seem to question the adequacy of the HRS in its use of the 15-mile target distance limit for the surface water pathway, Texaco's comment raises issues that are beyond the scope of this rulemaking. The current HRS was proposed on December 23, 1988 (53 FR 51962) and comments were received and addressed prior to its finalization in the December 14, 1990 *Federal Register* (55 FR 51532). The HRS is a final rule and thus is binding on EPA. EPA does not have discretion to deviate from the HRS. The methods used to calculate the site score for the Star Lake Canal site are consistent with the HRS, and therefore no change to the site score as proposed results from this comment.

2.1.3.9.2 No Demonstrated Threat to Fisheries

Texaco commented that EPA "failed to support its assumptions of threats to human health and the environment by sampling, and thus failed to accurately assess the risks posed by the Site." Texaco asserted that the assumptions and methodologies employed in the HRS documentation record at proposal bear "no relationship to actual exposure pathways or levels that may occur at the Site. Thus, EPA's proposed listing of the Site is arbitrary and capricious and should be withdrawn." Specifically, Texaco said that contaminated sediments are "assumed" to be impacting local fisheries. According to Texaco, however, "EPA failed to gather the data that would have enabled it to verify the [HRS documentation record's] assumptions that the contaminated sediments have affected local fisheries and the environment." Texaco contended that EPA

should have analyzed the "top several centimeters of the sediment bed" to establish "empirical relationships between sediment [contaminant] levels and fish [contaminant] levels." Texaco stated that without the benefit of sampling or analysis, EPA assumed that "sediments extract themselves from up to 30 inches of depth" and release hazardous substances to the surface water. Texaco argued that "EPA did not collect any surface water samples, wetlands or floodplain samples, or benthic or other tissue samples to support its conclusion that the alleged threats in fact exist." Texaco also claimed that levels of hazardous substances available for bioaccumulation in fish are decreasing through natural attenuation (i.e., via "capping" by newly deposited sediments).

In response, the HRS specifically allows the use of sediment samples to establish Level II actual contamination for the surface water pathway human food chain threat (Section 4.1.3.3 of the HRS), as was done for the Star Lake Canal site. Thus, EPA was not required to collect surface water or benthic samples to establish actual human food chain contamination or to "verify" the affect on the environment and local fisheries, as Texaco suggests. Again, EPA notes that comments on the adequacy of the HRS raise issues that are beyond the scope of this rulemaking. The current HRS was proposed on December 23, 1988 (53 FR 51962) and comments were received and addressed prior to its finalization in the December 14, 1990 *Federal Register* (55 FR 51532). The HRS is a final rule and thus is binding on EPA. EPA does not have discretion to deviate from the HRS.

Regarding Texaco's claim that levels of hazardous substances available for bioaccumulation in fish are decreasing due to capping by newly-deposited sediments, EPA notes that Texaco does not present any information demonstrating that newly-deposited sediments are present at the site or that such sediments are free of hazardous substances. In the absence of such information, Texaco's "capping" theory is pure speculation. It is just as likely that contaminated sediments are actually eroding from the site or that any newly-deposited sediments are also contaminated. Further, even contaminated sediments capped by cleaner sediments can pose a risk to human health or the environment. The deeper (and theoretically more contaminated) sediments might be disturbed and resuspended in a variety of ways, such as during storm events or via human activities such as boating or dredging. Sediment from different layers might be mixed or re-suspended, so that contaminated sediments are available to the environment.

2.1.3.9.3 Unsubstantiated Sensitive Environments

Texaco claimed that EPA failed to confirm the presence of wetlands or state threatened species in the area of the site. The habitat of the White-faced Ibis, a Texas designated threatened species, is cited in the HRS documentation record at proposal as a sensitive environment impacted by the site. Texaco pointed out that while a reference in the HRS documentation record at proposal supports the fact that the White-faced Ibis is known to inhabit wetlands near the site, it also goes on to state that "data do not provide a definite statement as to the presence or absence of special species ... nor can these data substitute for an on-site evaluation by qualified biologists." Texaco's review of the Administrative Record did not confirm that EPA had conducted an assessment to verify the presence of the White-faced Ibis in the area of the site. As such, Texaco contended that the assigned sensitive environment factor value of 50 is incorrect. Regardless, Texaco recommended that the term *endangered species* be replaced with *threatened species* in the summary site description "to avoid confusing or alarming the public."

Similarly, Texaco stated that supporting documentation was not provided for 0.56 miles of HRS-qualifying wetland frontage that, according to the HRS documentation record at proposal, were identified during the SSI. Texaco further suggested that the remaining 2.54 miles of the 3.1 miles of wetland frontage scored as a sensitive environment in the HRS documentation record at proposal should have been "independently field verified by EPA." As a basis for these assertions, Texaco cited the *Superfund Program Representative Sampling Guidance, Volume 5: Water and Sediment*, an EPA guidance document, which indicates that National Wetlands Inventory Maps "serve as an excellent starting point for identifying wetlands at a site, but should not be used as the sole source of identification ... where possible an attempt should be made to field verify and document (e.g., logbook, photograph) the wetlands location area."

In response, EPA considers the identification of sensitive environments at the Star Lake Canal site to be adequately documented. Table 4-23 of the HRS, assigns a value of 50 for sensitive environments for the presence of a "[h]abitat known to be used by State-designated endangered or threatened species" along the hazardous substance migration path. According to the HRS Guidance Manual (pages A-9 and A-10), sufficient evidence to establish the presence of a habitat known to be used by a State-designated endangered or threatened species includes "a written statement from a representative of an appropriate Federal, state, county, or local agency, or from a recognized expert [that] indicates that the area of concern is suitable habitat for and is within the current range of the species in question." The HRS documentation record at proposal cites such a statement in documenting that the habitat of the White-faced Ibis, a State threatened species, is located along the hazardous substance migration route of the Star Lake Canal site. EPA cited a letter from the Texas Parks and Wildlife Department (TP&WD), dated October 10, 1996, which concludes that White-faced Ibis (among other species of concern) is known to inhabit the area within or near the Star Lake Canal. This conclusion is based on information stored in the Texas Biological and Conservation Data System, which is the best data currently available to the State regarding threatened and endangered species.

Although, Texaco correctly quotes a subsequent statement in this same TP&WD letter that "data do not provide a definite statement as to the presence or absence of special species ... nor can these data substitute for an on-site evaluation by qualified biologists," EPA notes, that there is no HRS requirement to independently field-verify the presence of a threatened or endangered species habitat, as Texaco suggested. Written verification from a qualified State agency, as provided for the Star Lake Canal site, is sufficient evidence to classify the site area as a sensitive habitat and thus, as a sensitive environment for HRS purposes. Therefore, EPA correctly assigned a sensitive environment value of 50 based on the presence of a habitat known to be used by the State-designated threatened species, the White-faced Ibis, along the hazardous substance migration path for the site. In addition, Texaco did not provide any information contradicting the presence of a habitat known to be used by a State-designated threatened species within the TDL. EPA, therefore, relies on the information provided by the Texas Parks and Wildlife Department, as presented in the HRS documentation record at proposal.

EPA agrees that the White-faced Ibis is not an endangered species, but rather a State-designated threatened species. As Texaco recommended, EPA has ensured that the White-faced Ibis is referenced solely as a State-designated threatened species throughout the Administrative Record. This comment has no affect on the site score.

Regarding Texaco's comment on wetland delineation, the wetland frontage used to score the sensitive environments factor was appropriately documented. According to Table 4-24 of the HRS, eligible wetlands are defined in 40 CFR 230.3. This definition states that wetlands are "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." The HRS documentation record at proposal referenced a recent National Wetlands Inventory (NWI) map from 1998 to document that two types of wetlands lie along the Level II segment of the in-water hazardous substance migration path. These wetland types, estuarine intertidal emergent persistent irregularly flooded (E2EM1P) and palustrine emergent persistent seasonally flooded (PEM1C), fit the wetland definition described above and as a result are considered HRS-eligible. Further support for this assertion can be found in the HRS Guidance Manual on page A-22, which confirms that both estuarine intertidal emergent wetlands and palustrine emergent wetlands "can be presumed to meet the 40 CFR 230.3 definition of a wetland."

NWI maps are prepared by the U.S. Fish and Wildlife Service, primarily by analysis of high altitude photographs based on vegetation, visible hydrology, and geography in accordance with Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS- 79/31 December 1979) (Reference 25 of the HRS documentation record at proposal). EPA maintains that it is appropriate to rely on these maps because they were prepared by a Federal government agency with significant expertise in wetland delineation and mapping. In the HRS documentation record at proposal, additional documentation for the presence of HRS-eligible wetlands is provided through photographs taken during the ESI (Reference 5, pp. 127-140 of the HRS documentation record at proposal). These photographs corroborate the presence of the wetland types depicted on the NWI map.

EPA disagrees with Texaco's comment that EPA acted contrary to its own policy in relying on NWI maps to document the presence of HRS-eligible wetlands. The HRS does not require an independent field verification of wetlands. The use of NWI maps and corroborating photographs to document wetlands is consistent with the level of effort suggested by HRS guidance materials and by the guidance cited by Texaco. Furthermore, the commenter did not provide their own field verification or any other information to contradict the presence or length of HRS-eligible wetlands within the TDL for the Star Lake Canal site. A citation to the photographs taken during the ESI (Reference 5, pp. 127-140 of the HRS documentation record at proposal) has been added to section 4.1.4.3.1.2 of the HRS documentation record at proposal to further support the presence of wetlands at the Star Lake Canal site.

Texaco stated that no supporting documentation was provided for the statement in the HRS documentation record at proposal that 0.56 miles of HRS qualifying wetlands were identified along the hazardous substance migration route during the SSI.

In response, Figure 2 of the SSI report (Reference 4, page 13 of the HRS documentation record at proposal) supports this number. The 0.56 mile value is equal to the length of HRS-qualifying wetlands along the hazardous substance migration path from the farthest upstream point of known contamination in Jefferson Canal (SE-16) to the farthest downstream point of known contamination in Molasses Bayou (SE-11), based on samples collected during the SSI. Additional sampling during the subsequent ESI, however, established an observed release further downstream, resulting in an estimate of HRS-eligible wetland frontage subject to Level II concentrations of 8.32 miles (Reference 5, p.117 of the HRS documentation record at proposal). But

during the review of the HRS documentation record prior to proposal, EPA decided to use a more conservative, straight line measurement of wetland frontage, rather than using the actual shoreline frontage determined during the ESI. This conservative approach yielded the 3.1 miles of wetland frontage which was used to score the environmental threat. The note in section 4.1.4.3.1.2 of the HRS documentation record at proposal has been deleted because this information was not relied upon in evaluating the HRS score for the site.

In conclusion, regardless of the length of wetland frontage used to score the site, the environmental threat score would still reach the maximum of 60 based on the presence of a habitat known to be used by a State-designated threatened species. Alternatively, even if the environmental threat were scored using only the smallest category of wetland frontage on HRS Table 4-24 (0.1-1 mile), the environmental threat score would be 53, and the overall site score would drop to 47.83. This would have no effect on the site's NPL listing status.

2.1.3.10 References and Documentation

2.1.3.10.1 Omitted or Incomplete References

Texaco stated that "some of the technical information necessary to fully evaluate the proposed listing was not included in the Administrative Record, either at EPA Headquarters or at EPA Region 6, and had not been otherwise made available to the public for review and comment." According to Texaco, additional or missing information was needed to evaluate "the technical merit for USEPA's proposal to list the [site] on the [NPL]." Specifically, Texaco stated that the following materials were not included in the HRS documentation record at proposal:

- Reference 40 (CompuChem Environmental Corporation. *Revisions and Quantization and Ratio Report, Client Sample ED:FEZ01*. November 4, 1996. 63 pages);
- Appendix P (PREscore Report) from Reference 5, *Expanded Site Inspection (ESI) Report*;
- TNRCC. *Preliminary Assessment/Screening Site Inspection Workplan for Star Lake Canal, a.k.a. Jefferson Canal*, TX0001414341, Port Neches, Jefferson County, Texas. September 1996; and
- TNRCC. *Expanded Site Inspection Workplan for Star Lake Canal, a.k.a. Jefferson Canal*, TX0001414341, Port Neches, Jefferson County, Texas. February 1998.

Texaco requested copies of this information so that it could complete its review and evaluation of the site package. Texaco also stated that Reference 40 implies that similar reports may have been produced for additional sediment samples that were collected and analyzed by TNRCC. If such reports exist, Texaco requested copies of them as well.

In response, Texaco's request for the information described above was contained in their comment letter dated September 9, 1999. EPA shipped the documents specifically requested by Texaco on September 21, 1999, via Federal Express, to Texaco representative Ms. Kathy Montgomery. In addition, EPA made all site-

related Contract Laboratory Program data available to Texaco. Texaco representative Mr. Roland White visited the EPA Region 6 office on September 29, 1999, to review and copy the site files. EPA also requested that TNRCC send Texaco copies of any "similar reports," as requested by Texaco, even though no such reports were either in EPA's possession and or used by EPA to determine the site's HRS score. In addition, EPA granted a two week extension to the comment period to allow Texaco time to review the additional information (see Section 2.1.3.2, Extend Comment Period).

2.1.3.10.2 Discrepancies Between Site Documents

Both Huntsman and Texaco objected to EPA's proposed listing given the Agency's own conclusion in 1997-1998 that the site failed 'to meet the minimum criteria required to be included or proposed' on the NPL at that time. Huntsman cited a cover memo that it received with the SSI Report that stated "the SSI identified only 'one or two points of identified contamination, versus a widespread contamination.'" Texaco also stated that the following discrepancies exist between the ESI Work Plan and the ESI Report:

- "[Sample] location information in the ESI Work Plan (Table 4) does not correspond to the ESI Report (Table 4) [sample] location information";
- "[Sample] location information in the ESI Report (Table 4) does not correspond to [sample] location information in Appendix O (Field Notes). [Sample] location information in Appendix O is not present for all sample locations, and is not provided in any summary table in the main text";
- "Latitudes and longitudes contained in the [s]ite descriptions of the ESI Work Plan and ESI Report do not correspond with each other";
- "HRS in-water segments described in the ESI Work Plan and ESI Report do not correspond with each other";
- "There is no mention in the ESI Report as to whether QA/QC procedures were followed or not"; and
- "The objective in the ESI Work Plan concerning establishing the presence of endangered species within a four (4)-mile radius is not substantiated by any new information in the ESI Report. The same [Texas Parks and Wildlife Department] letter (October 10, 1996) is referenced in the ESI Work Plan and the ESI Report."

In response, an ESI contains more information and therefore generally supports a higher HRS score than an SSI. With regard to discrepancies between the ESI Work Plan and the ESI Report, these comments have no affect on the HRS score of the proposed site. The purpose of the ESI Work Plan for the site was to efficiently schedule resources such as personnel, equipment, and laboratory services, and to plan field and sample collections operations. Certain elements of work plans, such as the proposed sample plans, serve merely as guides for performing field work activities. Once in the field, investigators may use their professional judgement to take more or fewer samples than called for in the work plan or to take samples from alternate locations when conditions or circumstances warrant it. Therefore, Texaco's comment that sample information in the ESI Work Plan do not correspond to that in the ESI Report is irrelevant.

Texaco is correct in pointing out that sample location information is not provided in the ESI field notes for all samples. Sample location information is provided in the field notes, Reference 6 in the HRS documentation record at proposal, for observed release samples SE-31, SE-32, SE-36, SE-37, SE-38, and SE-39, but not for samples SE-17, SE-23, SE-26, and SE-27. However, photographs were taken at all sample locations and were included in the ESI Report (Reference 5 of the HRS documentation record at proposal). Also, the HRS documentation record at proposal contained a memorandum from the TNRCC (Reference 39) that discussed where each ESI sample was collected. This information is sufficient to fill in that which is missing from the reference copy of the ESI field notes. Texaco further commented that the sample location information that is present in the field notes does not correspond to that in the ESI Report. Upon review, EPA is unaware of any case where the sample location information in the ESI Report differs from the ESI field notes. The commenter does not point out specifically what sample location is allegedly misrepresented. Also, EPA is unclear on what text Texaco is referring to when it contends that sample location information is not provided in a "summary table in the main text." If the "main text" refers to the ESI Report, then EPA notes that Table 1 on pages 15 to 17 contains just such information. If instead the "main text" refers to the HRS documentation record at proposal, then EPA notes Table 1 on pages 13 to 15. In any case, the presence or absence of summary tables has no effect on the data or on the HRS score.

Latitude and longitude in the ESI Report are reported for four distinct locations within the Star Lake Canal site boundaries, of which one was reported as the latitude/longitude measurement in the HRS documentation record at proposal. Latitude and longitude measurements for a site are typically taken from a distinct point of reference at a site (e.g., a site building, a street corner) or from the approximate center of the site. It is not unusual for site boundaries to change from one investigation to the next, especially for plume sites, as additional samples are collected or more information is uncovered at the site. This is what occurred at the Star Lake Canal site. As there is no requirement that latitude/longitude measurements be identical from one investigation to the next, this comment has no affect on the HRS site score.

HRS in-water segments are defined in the ESI Work Plan and the ESI Report based, in part, on the location of the most distant (downstream) sample location meeting observed release criteria. The ESI Work Plan relied on data from the SSI to define this location. Additional sampling was conducted during the ESI, resulting in a new most-distant sample location, and subsequent re-definition of some in-water segments. Any further differences between the descriptions of the in-water segments in the ESI Work Plan and the ESI Report can simply be attributed to an increased understanding of the site based on the results of the ESI. To reflect this increased understanding and new data, the HRS documentation record at proposal relies entirely on the information from the ESI Report to define in-water segments. This comment has no bearing on the HRS site score.

With regard to the comment that there is no mention in the ESI Report as to whether QA/QC procedures were followed, page 12 of the ESI Report states that "all samples were collected according to the EPA approved Quality Assurance Project Plans."

Texaco is correct in pointing out that the same TP&WD letter is referenced in the ESI Work Plan and the ESI Report. EPA has concluded that the letter provided sufficient evidence to prove that the habitat of the White-

faced Ibis, a State threatened species, is located along the site hazardous substance migration route. See EPA's response in Section 2.1.3.9.3, Unsubstantiated Sensitive Environments.

2.1.4 Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, the score remains unchanged. The final score for the Star Lake Canal site is:

Ground Water	Not Scored
Surface Water	100.00
Soil Exposure	Not Scored
Air	Not Scored
HRS Score	50.00

ATTACHMENT A

A copy of the attachment is available at the EPA Headquarters Superfund Docket:

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Crystal Gateway #1, 1st Floor
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3.1 Newton County Wells, Newton County, Missouri

3.1.1 List of Commenters

NPL-U27-3-9-1-R7	Comment not dated, Mr. and Mrs. Steve Hammonds, Citizens of Joplin, Missouri.
NPL-U27-3-9-2-R7	Comment dated 2/26/99 from Mary L. Plunkett, Citizen of Joplin, Missouri.
NPL-U27-3-9-3-R7	Comment dated 3/15/99 from Sara B. Alyea, of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation.
NPL-U27-3-9-4-R7	Comment dated 3/22/99 from Michael W. Steinberg, of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation.
NPL-U27-3-9-5-R7	Comment dated 3/23/99 from Sara B. Alyea, of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation.
NPL-U27-3-9-6-R7	Comment dated 4/29/99 from David R. Erickson, of Blackwell Sanders Peper Martin, LLP, on behalf of Midcon Cables Company.
NPL-U27-3-9-7-R7	Comment dated 4/30/99 from Carol M. Wood of King & Spalding, on behalf of Gulf States Corporation.
NPL-U27-3-9-8-R7	Comment dated 4/30/99 from Michael W. Steinberg, of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation.
NPL-U27-3-9-9-R7	Comment dated 5/12/99 from Michael W. Steinberg and Mark C. Pennington, of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation.
NPL-U27-5-10-R7	Correspondence dated 3/18/97 from Governor Mel Carnahan, State of Missouri.
NPL-U27-5-17-R7	Correspondence dated 3/31/99 from Jeremiah W. Nixon, Attorney General of Missouri, and Shelley A. Woods, Assistant Attorney General of Missouri.
NPL-U27-5-19-R7	Correspondence dated 5/17/99 from Jeremiah W. Nixon, Attorney General of Missouri, and Shelley A. Woods, Assistant Attorney General of Missouri.

3.1.2 Site Description

The Newton County Wells site is located in Newton County, southwestern Missouri. The site was initially identified in 1991 following a sampling event at the International Paper (IP) State Registry site by the Missouri Department of Health (MDOH). MDOH sampled the closest wells downgradient of the International Paper (IP) site, all located approximately 1 mile south of IP in the village of Silver Creek. Trichloroethene (TCE) and cis-1,2-dichloroethylene (cis-1,2-DCE), which are not associated with the wood treatment wastes at the IP site, were detected in two residential wells located on Moorhead Drive, directly south of the FAG Bearings property in the village of Silver Creek. TCE and cis-1,2-DCE were detected at concentrations exceeding the Maximum Contaminant Level (MCL) established by EPA. Based on the detection of elevated concentrations of TCE in the Moorhead Drive wells, nine other residential wells along Moorhead Drive were sampled for TCE. Results of this second sampling event indicated that homes located along Moorhead Drive to the immediate south of FAG's property had the highest incidence and concentrations of TCE in the village of Silver Creek. EPA and the Missouri Department of Natural Resources (MDNR) were notified and conducted follow-up sampling and analysis. At the time of TCE discovery, ground water was the sole source of drinking water for the people in Silver Creek, Missouri.

Several investigations were conducted at the site, including a Preliminary Assessment, Site Inspections with several sampling events, a Removal Action, an Expanded Site Inspection, a Phase I and II Remedial Investigation, and several private well sampling events. TCE contamination has been found in over 30 residential wells located within 2 miles of the FAG Bearings property, inclusive of the villages of Silver Creek and Saginaw. In August 1991, EPA began providing bottled water to 11 residences in Silver Creek and in January 1992, construction was initiated for Silver Creek to access the Missouri American Water Company. In July 1992, EPA began providing bottled water to the residents of Saginaw. Early in 1994, state funds were used to extend Joplin's water system to Saginaw.

There are two aquifers present in the Newton County area that are separated by a non-continuous layer of shale: a shallow aquifer (consisting of residuum and limestone bedrock) that has been documented as a karst aquifer, and a deep aquifer (consisting of limestones, dolomites, and sandstones) that is not karst. Both of these aquifers are used for drinking water purposes by the residents of Newton County. The two aquifers are documented to be interconnected in the HRS documentation record. Interconnection of these aquifers is due to fracturing, leakage, absence of any confining layer, and because of wells that are open to both aquifers.

Seven source areas were identified at the Newton County Wells site with adequate documentation to associate the volatile organic compounds (VOCs), such as TCE, found in ground water underlying the villages of Silver Creek and Saginaw to the sources. All of these source areas of TCE, identified thus far, are located on FAG property and are considered contributors to the contamination of the ground water beneath the villages of Silver Creek and Saginaw.

3.1.3 Summary of Comments

Mrs. Pat Hammonds and Mr. Steve Hammonds, citizens of Joplin, Missouri, expressed their support for listing the Newton County Wells site on the NPL. Mrs. Hammonds described problems with the water quality at her house. For example, [after] storing water in empty milk containers, she found "brown, greasy

globs of some kind of [unknown material]" in them. She described how her husband's clothing and their linens are stained and disintegrate quickly after washing. She also described kidney problems that her husband began having after they moved to their Joplin home, and stated that her neighbor had two miscarriages during the two years they lived in Joplin. She stated that it made her angry "living and trying to keep healthy enough to go to work each day to pay your bills and live a life. And some company doesn't care if the community lives or dies."

Ms. Mary L. Plunkett expressed her support for listing the Newton County Wells site on the NPL, stating that she was very concerned about the ground water and that she wanted the problem cleaned up as soon as possible.

Sara B. Alyea of Morgan, Lewis & Bockius, LLP, submitted comments on behalf of FAG Bearings Corporation, and stated that the administrative record was not complete and requested additional technical information and an extension of the comment period.

Michael W. Steinberg of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation, suggested that EPA should defer listing the Newton County Wells site at this time to allow the FAG Bearings Corporation to complete its scheduled removal actions. He stated that if EPA chooses instead to proceed with NPL listing, EPA should re-define the site to include additional sources upgradient of the FAG Bearings Corporation property because available data do not sufficiently explain the existing contamination. Mr. Steinberg also stated that not all data had been made available to FAG and that FAG had requested an extension of the comment period to allow for receipt and review of those data. Following subsequent receipt of the additional data by FAG, Mr. Steinberg submitted supplementary comments, stating that the information did "not change the conclusions in FAG's Original Comments."

Mr. Steinberg and Mark C. Pennington, also of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation, submitted an additional letter concerning an EPA investigation of irregularities in data generated by a certain Texas laboratory. FAG stated that EPA and FAG both relied on these data in evaluating the site and stated that it would send an update as soon as possible.

David R. Erickson, of Blackwell Sanders Peper Martin, LLP, on behalf of Midcon Cables Company (Midcon), submitted comments to correct what he called "inaccurate and misleading information" from FAG Bearings Corporation. These comments included reports prepared during earlier lawsuits brought by FAG against Gulf States, Midcon, International Paper, and other companies.

Carol M. Wood of King & Spalding, on behalf of Gulf States Corporation, stated that Gulf States has no position on the listing of the Newton County Wells site on the NPL and that Gulf States' comments are "limited to correcting misstatements made by FAG Bearings Corporation" in its comments submitted to EPA.

Mel Carnahan, Governor of Missouri, requested that the Newton County TCE site be placed on the NPL.

Jeremiah W. Nixon, Attorney General of Missouri, and Shelley A. Woods, Assistant Attorney General, stated that the comment period should not be extended at FAG's request, as FAG already has all documents pertaining to the site. Mr. Nixon stated that if the comment period is extended, however, then the state of Missouri should be allowed to comment on FAG's comments on the site listing. Mr. Nixon and Ms. Woods also submitted separate comments on "numerous inaccuracies and inconsistencies" in the comments from FAG Bearings Corporation.

3.1.3.1 Support Listing

Mel Carnahan, Governor of Missouri, Mrs. Pat Hammonds and Mr. Steve Hammonds, and Ms. Mary L. Plunkett, citizens of Joplin, Missouri, expressed their support for listing the Newton County Wells site on the NPL.

In response, the Agency is adding the Newton County Wells site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate.

3.1.3.2 No Position on Listing

Two companies (Midcon and Gulf States), whose properties are located near the FAG Bearings Corporation property, assumed no position on the proposed NPL listing of the FAG site. However, these companies asserted that if EPA agreed with FAG to redefine the site boundaries, they requested that they be excluded from the site definition.

In response, EPA has listed the Newton County Wells site on the NPL. Furthermore, at the time of listing, EPA has not redefined the site to either include or exclude the Midcon and Gulf States facilities. See Section 3.1.3.5, Site Definition, of this support document for discussion regarding the site definition.

3.1.3.3 Defer Listing, Agreement Already in Place

Michael W. Steinberg of Morgan, Lewis & Bockius, LLP, on behalf of FAG Bearings Corporation, stated that EPA should defer listing the Newton County Wells site at this time. Mr. Steinberg also submitted supplemental comments regarding additional data that FAG had requested in its initial comments and subsequently received from EPA, and stated that the additional data did "not change the conclusions in FAG's Original Comments" that the site should be deferred or redefined.

FAG suggested that deferral of the site would give EPA, the PRPs, and the affected communities "the ability to implement swift cleanups while avoiding protracted court battles over the proposed NPL listings." FAG noted that EPA has postponed final action and ultimately withdrawn the proposed NPL listing for several

sites based upon the cooperation of the PRPs. FAG cited several examples of NPL Listing Deferrals, such as the Annie Creek Mine Tailings Site (South Dakota), the Triumph Mine Tailings Pile (Idaho), Kennecott (Utah), and National Zinc Company (Oklahoma).

In its comment letter, FAG pointed to the negotiated Abatement Order on Consent (AOC) with MDNR as its primary argument for deferring the NPL listing of the site. FAG stated that the AOC is sufficient and EPA should defer listing the site. An AOC with MDNR and the state Attorney General was signed in December, 1998. The AOC requires FAG to:

> (1) further investigate potential areas of contamination on its property (including areas specifically identified by MDNR); (2) install a dewatering and soil vapor extraction system to clean up identified areas of concern in overburden soils on the FAG property; (3) conduct additional sampling of residential wells in Saginaw and Silver Creek; and (4) reimburse MDNR for past response costs and future oversight costs.

FAG asserted that, under the AOC with MDNR, it has begun to perform extensive additional investigations at and around its property, and has committed to install a soil vapor extraction system and dewatering system to remove the volatile organic contamination detected in overburden soils on the FAG property over the next two to three years. FAG stated that these activities "will be performed promptly and will be subject to MDNR's oversight. FAG is committed to work cooperatively with MDNR" and will "perform additional removal actions, if deemed necessary by MDNR, to protect human health and the environment."

FAG stated that "the agreement presents a sensible phased approach for dealing with" the contamination, and that its understanding was that the State would not require an RI/FS for the site while work on the AOC was being performed. FAG continued, stating that the scope of its commitment under the AOC "is roughly consistent with the commitments of Gulf States, MidCon, and International Paper, none of which were required by MDNR to undertake remedies more extensive than source control."

FAG stated that its agreement with MDNR should be treated the same as other sites where listing was deferred because of agreements between the PRPs and the State to perform the cleanup. According to FAG, "[i]n most of these cases, EPA has agreed to defer final action...."

According to FAG, "MDNR has stated in public meetings that an NPL listing is the only method to ensure that 'the responsible party' will perform a groundwater remedy at the Site." FAG stated that it "is prepared to handle the problem in a phased manner, as the AOC contemplates, and to review the situation with MDNR as the results of the investigation and removal action become available." However, FAG continued, "[w]ithout further information on regional hydrogeology, contaminant fate and transport, and the practicability of a groundwater remedy, FAG is currently in no position to make such a commitment." FAG also stated that it has planned to conduct a bedrock study and that it has discussed this with MDNR, although MDNR at one time retracted its support for FAG's bedrock investigation. FAG stated that it will conduct the bedrock study as stated in the "Bedrock Scope of Work," and "will seek MDNR approval on all aspects of the work to be conducted."

FAG continued, stating that the AOC represents a consensus on a plan to address contamination that has been identified on the FAG property. FAG conceded that the agreement was reached "after a series of admittedly contentious exchanges between MDNR and FAG...." Although EPA, MDNR, and other parties had conducted many studies, FAG stated that "it was not until June of 1997 that FAG determined that there was the potential for contaminated groundwater, in a thin water bearing zone in the overburden soils at the FAG property" and this had the potential to "reach the Grand Falls Chert."

In discussing the AOC, FAG concluded that "its actions send the clearest possible signal of its willingness to work in good faith with MDNR to bring these problems to resolution," noting that it has reimbursed MDNR and EPA and has paid the cost of supplying alternative drinking water to Silver Creek and Saginaw in addition to undertaking the actions in the AOC.

The Attorney General stated that the "AOC is a start," but emphasizes that "the proposal is to do a very limited investigation and clean up. FAG did not commit to any remediation that would extend beyond the shallow soils at the facility." The State has acknowledged since the discovery of the site in 1991 that the principal long-term threat posed by the site is ground water contamination, which is not addressed in the current AOC with FAG.

The Attorney General, representing the State, "strongly support[s] the interim EPA decision that this site should be placed on the NPL. The site warrants placement on the NPL because it is extremely complex and very contaminated, making it among the worst sites in the country." The Attorney General also cited FAG's "long history of recalcitrant behavior" as possibly necessitating the use of the remedial enforcement provisions of CERCLA.

The Attorney General asserted that from 1991 to the present, FAG has consistently declined to even discuss conducting a RI/FS at the site. Although FAG now states that "it is committed to performing 'what else needs to be done,'" it does not indicate what work this would entail. In addition, the Attorney General, with regard to FAG's comments on MDNR's removal of support for the bedrock investigation, stated "the bedrock investigation proposed by FAG was not a complete, scientifically sound investigation. Rather than delay the execution of the AOC any longer, the MDNR elected to remove the provision dealing with a bedrock investigation...." The Attorney General continued, "MDNR intends to either conduct a complete bedrock investigation of the site itself or direct FAG to conduct the investigation...."

The Attorney General stated that FAG neglects to include in its comment letter any mention of the nearly "eight years of denial, delay and evasion" in FAG's attempt to avoid taking responsibility for contamination at the site prior to the AOC.

Regarding FAG's assertion that its commitments are roughly consistent with those of the other firms, the Attorney General stated that International Paper Company:

> was required to do much more than source control. International Paper Company has been required to pump and treat its groundwater, maintain hydraulic containment, excavate

> contaminated soil material, conduct subsidence monitoring and develop and maintain an elaborate landfarm treatment system for its contaminated soils. This is all in addition to the extensive subsurface investigation mandated by the MDNR.

The Attorney General noted that the State had advised FAG of its intention to seek listing for this site and the State did not suggest that it had changed its position during AOC negotiations. The date of the AOC was December 11, 1998.

In its comment letter, Midcon quoted Judge Joseph E. Stevens, who presided over a court case filed by FAG against Midcon, International Paper, and Gulf States in 1995 (FAG Bearings Corporations, plaintiff v. Gulf States Paper Company, Midcon Cables Company, Criton Technologies, and Esterline Technologies Corporation). Midcon provided the following excerpt from Judge Stevens' analysis of the level of cooperation demonstrated by FAG is given below:

> [p]rior to the Fluor Daniel, GTI, Inc. (FDGTI) site investigation at FAG in the Spring of 1997, FAG limited MDNR access to the site and refused to investigate areas that were logical source areas for TCE contamination based on historic practices at FAG's facility.... Even though FAG was unable to account for significant amounts [of] TCE and historic investigations identified numerous TCE findings across FAG's facility, FAG denied that it was the source of TCE contamination until early 1997 when FDGTI's investigation and testimony of former FAG employees proved that FAG had released TCE.

Midcon clarified that FAG did not sign the AOC with MDNR until after it received Judge Stevens' opinion, which was after the June 1997 work.

In response to the commenter's request for deferring site listing, EPA is not confident that a complete site cleanup will be accomplished without NPL listing. While the AOC is a beginning step in addressing site contamination, EPA disagrees with FAG that the AOC between MDNR and FAG at the Newton County Wells site justifies deferral from listing the site on the NPL.

MDNR has entered into an Abatement Order on Consent with FAG Bearings to conduct a removal action at the Newton County Wells site. The purpose of the action was to quickly take actions to limit the existing public health hazards and environmental impacts. Thus, the removal response actions were designed to reduce the potential for exposure to contaminants on-site and limit the movement of contaminants off-site. They were not designed to be permanent remedial activities and do not include a full RI/FS, but rather were designed to provide a quick solution to imminent threats. The only removal actions agreed to thus far by FAG at the site are the connection of individuals' homes to water supply, source containment, and soil removals. These removal actions are helpful, but further response actions may be necessary. Further site characterization may still be required to fill in any existing data gaps necessary to evaluate the necessity of permanent remedial activities.

At this site, the ground water over a large area of several square miles and up to 300 feet in depth has been impacted by contaminants released from the sources at the site. Ground water flow regimes in this area are complex due to karst geology (solution channels, sinkholes, and cave/void systems) and fractures. Source removal and containment should result in some reduction in contaminant levels in the ground water, but EPA cannot say with any certainty how quickly this is likely to happen. There may be smaller sources, such as pooled liquids, that exist on the bedrock surface or in cracks or fissures in the karst areas that cannot be physically removed and will continue to create future ground water contamination. A comprehensive investigation and evaluation of cleanup options specifically focusing on ground water contamination, a RI/FS, will be necessary to obtain a better idea of the likelihood of success of cleaning up the ground water.

On May 3, 1995, EPA issued *Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions* (OSWER Directive 9375.6-11). In a discussion of sites eligible for deferral, this guidance states that "the State must express interest in having the site deferred to it for response. The State and EPA also should agree that the State will address the deferred site sooner than, and at least as quickly as, EPA would expect to respond." In the present case, no such interest has been expressed. This site is currently a State-lead site, but EPA has received a letter from Governor Mel Carnahan of Missouri supporting the listing of this site on the NPL. Furthermore, the Attorney General, representing the State, has requested that the Newton County Wells site be listed on the NPL.

In general, EPA's policy is that deferral to a State is appropriate only if the State requests the deferral, as noted above, and only if there are responsible parties prepared to pay for and conduct remedial activities. In this case, FAG has only agreed to conduct surficial removal actions in the AOC and has not agreed to complete an RI/FS. Because of the expressed wishes of the Governor of Missouri and due to the recalcitrant behavior and lack of commitment of the FAG Corporation to complete a RI/FS, application of the Agency's deferral policy would not be appropriate at this time. EPA finds that the Newton County Wells site qualifies for inclusion on the NPL and that listing is appropriate to ensure a long-term remedial solution.

In response to FAG's comment about Triumph Mine Tailings Pile and National Zinc Company, the State agreed to the deferral of the site, which is not the case for the Newton County Wells site. In response to FAG's comment on Kennecott, EPA, in an enforcement pilot, signed a Memorandum of Understanding with a PRP directing various parties to enter into AOCs for several projects, including removals and an RI/FS. The Annie Creek Mine Tailings site was withdrawn from proposal based on a risk assessment which showed the site no longer posed a significant risk to human health and the environment. This decision was supported by the results of an engineering evaluation/cost assessment (EE/CA) for the site and by the protectiveness that is provided by the completed non-time critical removal action which took place at this site.

3.1.3.3.1 NPL Listing is Last Resort

FAG considers the NPL listing unnecessary in light of the AOC that FAG has entered into with MDNR. FAG quoted EPA as stating that "'the NPL is a choice of last resort' to be used when a contaminated site cannot be addressed in some other fashion." FAG continued, "it would be premature to jump to this mechanism of 'last resort,' because other mechanisms are already in place to address contamination at the Site." FAG submitted that EPA should defer listing the site "to allow the sensible, phased approach" in the AOC to function, or alternatively, to redefine the site to include potential upgradient sources and additional

contaminants. FAG concluded that "[i]n light of these commitments, undertaken in an Abatement Order on Consent, there simply is no reason to hurdle over the removal action process. To do so would undermine EPA's policy of using the NPL listing process as the 'choice of last resort'".

The Attorney General asserted that "[t]he state's position is that this site is [emphasis added] at the point of last resort." The Attorney General also stated that "EPA may have acknowledged that 'the NPL is a choice of last resort,'...but this does not constitute a formal policy, as is implied on page 7 [of FAG's comment letter]. The purpose of the NPL is defined by law." The State has spent years trying to get a full investigation and clean up accomplished at this site while FAG delayed and prevented work from being performed.

In response, EPA 's policy is that generally deferral is appropriate only if the State requests deferral and there are responsible parties who are viable and cooperative. However, in the case of this site, as noted earlier, EPA has received reports from the State that FAG has not been cooperative. Also, the State has not requested deferral of the site listing, and in fact the State Governor and Attorney General have expressed their desire to have this site listed on the NPL. For these reasons, EPA finds that it is not appropriate to defer listing the site.

3.1.3.4 Economic Effects and Stigma of NPL Listing

FAG contended that "there is no need to inflict the high costs and stigma of Superfund on FAG and its neighbors" unless the AOC with MDNR fails to work. FAG quoted the D.C. Circuit Court stating that "'listing [a site on the NPL] dramatically increases the chances of costly [cleanup] activity.' Mead Corp v. Browner, 100 F. 3d 152, 155 (D.C. Cir. 1996)." FAG continued, "[i]n addition to increasing costs, listing is likely to dramatically increase the duration of remedial action. For both reasons, listing is widely perceived in the business community as an economic disaster for a site and for property values in the surrounding community."

The Attorney General responded to FAG's comment regarding the "high costs and stigma of Superfund on FAG and its neighbors" by suggesting that the communities of Silver Creek and Saginaw have already been forced to bear the high costs and stigma and health risks of contaminated drinking water. The Attorney General submitted that "[o]ver 80 households were affected by the contaminated groundwater. Many people had to use bottled water for several years." The State proposed that listing the site on the NPL will "bring a sense of closure" to the residents because a clean up will be guaranteed.

In response, inclusion of a site or facility on the list does not in itself reflect a judgment of the activities of its owner or operator, but rather reflects EPA's judgment that a significant release or threat of release has occurred, and that the site is a priority for further investigation under CERCLA. Furthermore, the focus of the CERCLA program is to identify and, where necessary, address hazardous substances releases that may pose a threat to health or the environment. Adverse economic impacts are not a factor to be considered in identifying sites for the NPL. Stigma is not a criterion that EPA is required to consider under the CERCLA statute or regulation in listing sites on the NPL. Further, as discussed above, EPA has determined that it is not appropriate to defer listing of this site based on the AOC between FAG and MDNR.

In response to FAG's concern for the impact of site listing on remedial activities and the attendant costs and the duration of cleanup, including a site on the NPL does not cause EPA necessarily to undertake remedial action, or indicate that any action is required by, nor liability for site response costs assigned to, a private party (56 FR 21462, May 9, 1991). Any Agency actions that may impose costs on firms are based on discretionary decisions and are made on a case-by-case basis. Also, responsible parties may bear some or all the costs of the RI/FS, if conducted, and subsequent work, or the costs may be shared by the EPA and the States. Therefore, expenditures cited by the commenter are associated with events that generally follow listing the site, not with the listing itself.

3.1.3.5 Site Definition

3.1.3.5.1 Other Sources

FAG stated that if EPA proceeds with NPL listing, EPA should redefine the site to include additional sources upgradient of the FAG property. FAG stated that "[i]f the Site is included on the NPL, FAG encourages EPA to include within the definition of the Newton County Wells site all potential areas that may be contributing to the contamination in residential wells in the Villages and to fully investigate all potential contaminants of concern." FAG argued that there are multiple other sources of the ground water contamination in the area, and stated that the "data demonstrate that groundwater in the Mississippian Aquifer is generally moving south to the Villages from the contaminated areas" to the north of the FAG facility.

Specifically, FAG urged EPA to include the Midcon, Gulf States, International Paper and other facilities within the "Area" (depicted in its attached Figure I-1) as part of the site. FAG stated that the "HRS Scoresheet" excludes facilities located north of I-44 from the site based on the "erroneous assumptions" that the site is underlain by karst terrain and that "there is a groundwater divide to the north of the FAG property" which prevents migration of substances from those facilities south to the villages. FAG stated that "[t]he data demonstrate that it is reasonable to conclude that contamination exists at least as far as 1.5 miles north of the Villages," and that "[t]he data also indicate that the complex hydrogeologic system that exists under the Area is capable of transporting contaminants long distances without significant dilution of contaminants due to dispersion." FAG stated that the HRS documentation record at proposal's assertion that "the highest concentrations of hazardous substances have been detected in residential wells located on Moorhead Drive, located directly south of the FAG property is extremely misleading." FAG continued, "several wells exist along the extreme northern edge of the FAG property where several types of contaminants including TCE (at concentrations as high as 170 ug/L) have been detected." FAG stated that "[t]he highest concentrations of the degradation products of TCE (i.e. 1,2-DCE and vinyl chloride) anywhere in the Area" were detected in samples taken from monitoring well MC-01, which is "located in the Industrial Northern Area" of the Midcon site. According to FAG, the "wells along FAG's north border are located approximately 3000 feet from the facility in a upgradient and cross gradient direction."

The Attorney General commented that the State of Missouri is very familiar with FAG's claims that other parties are responsible for the ground water contamination and that FAG has provided EPA with "a huge amount of data" that supposedly supports its position.

The Attorney General stated that Judge Stevens' Findings of Fact indicates that the only area of TCE contamination discovered at the Midcon property is a zone of approximately 30 feet in radius and 50 feet in depth in the vicinity of the "Hazardous Materials Storage Area." It also indicates that "the only contaminants at the Gulf States' property that have migrated vertically from the surface to the primary water-bearing unit" and that have the potential to migrate off site are 1,1,1-TCA and 1,1-DCE.

The Attorney General also stated that contamination released to ground water in this area "fans out in multiple directions" through dispersion and diffusion, creating a plume in the general direction of ground water flow rather than "moving in a discrete mass or slug" from Midcon to the villages "without significant dilution of concentration," as FAG contends. The Attorney General stated that "there is no credible and reliable scientific evidence to support FAG's claim that there is an underground pathway through which contamination has traveled from the Mid-Con Property" to FAG and the villages, and that "[e]ight of FAG's experts testified at trial ... that they could not identify or trace" such a pathway. According to the Attorney General, FAG's claim that "contamination found in wells located along the southern edge of Interstate 44 indicates that there are sources of contamination north of the Interstate" was not supported by the Findings of Fact in the subject court case. The Attorney General stated that FAG's assertion that the wells along Interstate 44 are 3,000 feet from the FAG facility "is incorrect and misleading," because "[t]he picket line of monitoring wells that FAG constructed may extend for 3000 feet or more, but many of the wells in the line are constructed within 200 feet of manufacturing buildings." The Attorney General stated that FAG's claim failed for several reasons, including a lack of sampling of shallow ground water by FAG and trial testimony that established that FAG pumped TCE into an on-site lagoon and onto the ground. The Attorney General stated that because "TCE in DNAPL form can move against the flow of groundwater" and, it is "highly likely that TCE in DNAPL form exists at FAG and was caused by FAG's releases." The Missouri Attorney General continued, "[a]lthough the groundwater at FAG flows south, TCE could have been released and moved north on the surface, migrated vertically in the soil to the bedrock aquifer, and then moved south with the groundwater."

Midcon stated that "FAG's theories of contaminant fate and transport," which conclude that hazardous substances have migrated from facilities north of Interstate 44, "have previously been examined and rejected." Midcon added that, despite multiple sampling events, TCE has never been detected in the 27 wells installed in the one mile area between Midcon and FAG. According to Midcon, the limited TCE release at the Midcon facility is "orders of magnitude less" than the TCE contamination at FAG. Midcon stated that the TCE contamination, near monitoring well MC-01, does not extend to the Mississippian aquifer (as FAG contends), but is confined to a very shallow zone of 30 to 35 feet deep.

Midcon claimed that "[n]o TCE has been detected in the deep (200 feet) aquifer at Midcon or at any location between Midcon and FAG." Midcon stated that FAG did not demonstrate a connection between the shallow contamination at Midcon and the deep or intermediate contamination at FAG, even though FAG installed 6 wells on Midcon's property and "over 20 wells at points between Midcon's property and FAG's property." According to Midcon, "[t]hese deep wells were installed in the Grand Falls Chert, which FAG claimed was the underground highway through which contamination traveled." Midcon added that "in order for contamination to have traveled from Midcon to FAG," it would have to flow to the south, but "there is a groundwater divide between Midcon and FAG" and the ground water at Midcon "flows north/northwest, not south to FAG."

Gulf States commented that "the parties' experts [experts who testified at the aforementioned trial] are in general agreement on the hydrogeology of the area," and that "[t]he Grand Falls Chert, the subsurface formation that FAG claims is the aquifer where contaminants would migrate, is a highly fractured, well-interconnected formation." Gulf States concluded that "[i]f contaminants were moving from the Gulf States property to the Villages, there would be evidence of that migration, but as the Court found ... there is no such evidence." Gulf States asserted that FAG's statements "attempt to cast doubt on the thoroughness of the sampling in the Villages and the evaluation of the hydrogeology in the area" are "incorrect." Gulf States noted that MDNR and its contractor, Black and Veatch, have "tested for and reported other chemicals [all volatile organic chemicals, or VOCs] in the Villages in addition to TCE." Gulf States concluded that "TCE and its degradation chemicals are the chemicals of concern at the Site."

In response, it is possible that future investigations at the Newton County Wells site will reveal additional sources on the properties named above, or at other locations. The site and its boundaries are not defined strictly at the listing stage. Although all seven of the sources described in the HRS documentation record at proposal occur on the FAG property, this does not negate the possibility that other sources are contributing to the ground water contamination in the area. A site may consist of an identified area of known contamination with the sources less than fully specified. See Washington State Department of Transportation v. EPA, 917 F. 2d 1309 (D.C. Cir. 1990). In addition, even though the currently known contaminant of concern at this site is TCE (see Section 3.1.3.9.4, Additional Contaminants, of this support document), this does not preclude the possibility that other substances will need to be addressed in future remedial activities. Thus, FAG's comments do not undermine EPA's basis for listing.

3.1.3.5.2 EPA is Arbitrarily Singling Out FAG

FAG commented that "EPA would be acting arbitrarily if it decided to list the Newton County Wells Site on the NPL" without including the other "portions of the Area within its definition of the site." FAG also stated its belief that there are "additional contaminants" and asked "that the Site be redefined to include potential upgradient sources and additional contaminants that may otherwise go unaddressed." Even in consideration of all recent studies, FAG stated that it "firmly believes that the problem is larger than FAG."

FAG continued:

> [i]f the Newton County Wells site is listed, but the site definition arbitrarily excludes properties to the north where contaminants have been detected at regulatory levels of concern, future investigations will likely be technically incomplete, due to the failure to consider all potential contaminants of concern and all potential sources. As a result, a technically incompetent remedy for the site may ultimately be selected.

FAG stated that it would be inappropriate "for EPA to arbitrarily exclude ... areas to the north of I-44, where contamination has been detected in the Mississippian aquifer in far higher concentrations than at the FAG property." FAG stated that "MDNR has focused on FAG" to the exclusion of other facilities in the area using TCE "in spite of the fact that PCE, TCE and their degradation compounds have been detected on the MidCon property," and 1,1-DCE at the Gulf States property "at levels significantly exceeding the drinking water standard."

FAG also stated that EPA's failure to include the entire "Area" within the site "would likely lead to future investigations that failed to fully address all risks affecting groundwater in the Villages and could produce a technically incompetent remedy." According to FAG, "EPA should not choose sources or contaminants in an arbitrary fashion, picking some sources or contaminants and ignoring others."

The Attorney General stated that FAG's comments about sampling and sampling results associated with International Paper Company, Midcon, and Gulf States are "misleading." The Attorney General stated that:

> [a]t the time of the ESI investigation in 1994, MDNR was considering five other facilities as PRPs in addition to FAG: Gulf States Paper (Motorola), International Paper, Mid-Con Cables, Consolidated Freightways, Inc. and the Pillsbury Company. Mid-Con and Gulf States were excluded from primary consideration as PRPs for the reasons stated in the ESI report. At that time, the level of TCE that was detected in the Mid-Con groundwater wells were lower than the levels detected in monitoring wells on the FAG property and the residential wells along Moorhead Drive. Monitoring wells between the two companies, north of the FAG facility and south of Mid-Con cables, were sampled and did not reveal TCE contamination. Gulf States Paper did not use TCE. In addition, 1,1,-DCE is not a typical breakdown product of TCE.

The Attorney General also stated that "FAG does have a series of wells along the southern edge of Interstate 44. Of these wells, the ones that have the highest levels of TCE are the ones closest to the plant." He continued, "MDNR wells 2S and 2D are located north of Interstate 44, directly across from the FAG property, and have never detected TCE or its daughter products." The Attorney General also quoted Judge Stevens' Findings of Fact as stating that "[n]either TCE nor TCE-related contamination has ever ben [sic] detected in the 27 deep monitoring wells installed between Mid-Con and FAG Bearings," and that experts employed by Gulf States, Midcon, and FAG have all concluded that there is a plume of contamination emanating from the FAG facility and migrating to the south.

The Attorney General quoted the Findings of Fact as stating that "[i]t is undisputed that the highest levels of TCE in the soil and groundwater in the 'Study Area,' (defined by FAG...) are located at FAG," including 21,000 ppb of TCE in ground water in FMW-1, and 57,400 ppb of TCE in soil at SB-3.

Midcon objected to FAG's assertion that EPA is acting arbitrarily by singling out FAG to conduct a more thorough investigation and remediation through site listing than Midcon, International Paper, and Gulf States. Midcon countered this suggestion by summarizing its immediate response to investigate and remediate contamination at its facility, which is ongoing, with the Missouri's Voluntary Cleanup Program after the contamination was discovered.

Midcon submitted that its assessment report and the FDGTI site investigation report constitute the comprehensive analysis of Newton County Wells site that FAG asserts is lacking. According to Midcon, these two expert reports contain review and analysis of historical data in the area and include an "analysis of

FAG's expert report and [point] out exactly where and how FAG's theories were inconsistent with the facts and inconsistent with good scientific methodology."

In response, EPA disagrees with FAG that EPA is acting arbitrarily in listing the Newton County Wells site on the NPL. EPA is aware of the history of site investigations and previous lawsuits involving this site.

The HRS documentation record at proposal does not exclude potential sources to the north of the FAG facility. Pages 75 and 76 of the HRS documentation record at proposal describe the Midcon Cables, Motorola/Displaytek (now Gulf States), and International Paper facilities located north of the FAG facility as "other potential sources." As stated on page 75, the International Paper facility is currently undergoing closure under RCRA, which should address any potential creosote and pentachlorophenol issues. Page 76 of the HRS documentation record at proposal states that "[d]iscussions with Missouri [Department of Geology and Land Survey] have indicated that there could be two individual plumes of contaminated groundwater within the Newton County area."

EPA notes that before any remedial action is taken, an RI/FS will be conducted and will provide more information on sources at this site. In addition, before any remedy is chosen, FAG will have an opportunity to raise any concerns about additional sources. FAG's comments on other potential sources do not affect the validity of the listing of this site.

Placing a site on the NPL is based on an evaluation, in accordance with the HRS, of a release or threatened release of hazardous substances, pollutants, or contaminants. However, the fact that EPA initially identifies and lists the release based on a review of contamination at a certain parcel of property does not necessarily mean that the site boundaries are limited to that parcel.

CERCLA Section 105(a)(8)(A) requires EPA to list national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. Further, CERCLA Section 101(a) defines a "facility" as the "site" where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." The "come to be located" language gives EPA broad authority to clean up contamination when it has spread from the original source. On March 31, 1989 (54 FR 13298), EPA stated:

> HRS scoring and the subsequent listing of a release merely represent the <u>initial</u> [emphasis added] determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will need to be refined and improved as more information is developed as to where the contamination has come to be located; this refining step generally comes during the RI/FS stage.

The revised HRS (40 CFR Part 300, Appendix A, hereinafter referred to as the HRS; 55 FR 51587, December 14, 1990) elaborates on the "come to be located" language, defining "site" as "area(s) where a

hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources, and may include the area between the sources."

3.1.3.6 Site Hydrogeology

FAG discussed several aspects of the site hydrogeology, implying that the hydrogeology of the area would prevent contamination from their facility entering the Mississippian aquifer. FAG suggests that the contamination discovered in the Saginaw and Silver Creek wells originates from facilities north of the FAG facility and that there are other sources that should be included in the HRS documentation record .

3.1.3.6.1 Overview

FAG stated that "[m]uch of the sampling conducted around the Site has been in the context of litigation," and as a result, the site investigation was subsequently "thrust ... into an adversary mode, in which studies have been conducted in a limited and piecemeal fashion." FAG contended that this approach has resulted in a lack of a comprehensive regional hydrogeology report on contaminant fate and transport.

FAG also stated that the hydrogeology of the area is very complex and this complexity is not fully accounted for by EPA in the HRS documentation record at proposal. FAG summarized its understanding of the paleohydrogeology of the area, in which the original karst terrain has been replaced and recemented with chert from hydrothermal brines upwelling through the original formations. FAG contends that the site is not underlain by karst, as presented in the HRS documentation record at proposal, and that EPA's assumption that the site is underlain by karst led to errors in the evaluation of the potential targets for the site score. This issue of karst terrain is discussed further in Section 3.1.3.6.4, Karst Terrain, of this support document.

In contrast, the Attorney General of Missouri stated that FAG's comment that "'[m]uch of the sampling conducted around the Site has been in the context of litigation' is misleading." He continued, "[o]ver 300 residential well samples were collected by EPA, DNR, or MDOH by November of 1992, when FAG was named as a defendant in Silver Creek class action lawsuit."

King and Spalding, Attorney for Gulf States Paper Corporation stated, "the parties' experts [experts who testified during the previous lawsuits] are in general agreement on the hydrogeology of the area. The Grand Falls Chert, the subsurface formation that FAG claims is the aquifer where contaminants would migrate, is a highly-fractured, well-interconnected formation."

Blackwell Sanders Peper Martin also contested FAG's statement that no comprehensive analysis of the site has been conducted, stating that "Midcon's Assessment report and the FDGTI Site Investigation at FAG constitute such an analysis."

In response, the HRS does not require a comprehensive analysis of the hydrogeology of a site prior to NPL listing. However, at this site, EPA, MDNR, four consulting firms hired by FAG Bearings Corporation, Fluor Daniel GTI (hired by International Paper and Midcon companies), and Conestoga-River and Associates (hired by Gulf States) have conducted over 20 separate sampling events and investigations at the site over the past ten years, as FAG summarizes on page 14 of its comment letter.

In general, EPA also is not required to, and does not, conduct a comprehensive site investigation at the NPL listing stage. For this site, an observed release of TCE has been documented in seven sources at the site, in ground water beneath and in the vicinity of the sources, and in 30 drinking water wells at concentrations over health-based benchmarks within 4 miles of the FAG facility. These data justify listing the site under the HRS because an observed release to the aquifer in question has been documented, and drinking water wells have been contaminated at levels above health-based benchmarks. Although FAG contends that the hazardous substances released at their facility could not have reached the drinking water aquifer, the evidence presented in the HRS documentation record at proposal supports the fact that the geologic layers in this area are interconnected and vulnerable to contamination. After the initial site investigations, an RI/FS may be conducted, in this instance by the MDNR, which is a detailed investigation of site contamination and a risk analysis of the threat posed by the site to the surrounding community and the environment.

3.1.3.6.2 Hydrogeologic Units

FAG contends that EPA is mistaken in its treatment of the site hydrogeology, and that the geologic layers under the site should not be considered a single hydrologic unit or aquifer.

FAG stated that:

> [t]he HRS Scoresheet treats the soils and bedrock under the Site as a single hydrogeologic unit. (See HRS Scoresheet at 79-83.) In order for the soils and bedrock under the Site to be a single hydrogeologic unit, the bedrock would need to be highly fractured such that any groundwater in the overburden soils would move freely to the fractured bedrock. However, the data collected to date in the Area, including the data available in the public domain, demonstrate that the Site is not one hydrogeologic unit, but is much more complex.

In response, in this support document, the term "aquifer" is used to describe a geologic formation that is "saturated and sufficiently permeable to yield economically significant quantities of water to wells or springs" (HRS Guidance Manual, p. 116), while the term "layer" is used to describe any formation below the ground surface, including those that are not aquifers. As is stated on page 79 of the HRS documentation record at proposal, "[t]here are two aquifers present in the Newton County area; the shallow, Mississippian aquifer made up of Mississippian-age limestones found between 0 and 300 feet below ground surface (bgs), and the deep, Cambrian-Ordovician Aquifer, consisting of Cambrian and Ordovician-age dolomites and sandstone found between 300 and 1,800 feet bgs." The issue raised by FAG in their comments regarding this aquifer is the lack of connection among the strata composing the Mississippian aquifer. EPA's description of the aquifers underlying the site is supported by a statement in a Water Resources report from the United States Geological Survey (USGS), which states "[b]ecause of hydrologic considerations, the aquifers have

been grouped into two principal units: the Mississippian aquifer will be referred to as the shallow aquifer, and the Cambrian and Ordovician aquifers will be referred to collectively as deep aquifers." (HRS documentation record at proposal, Reference 28, p. 8)

3.1.3.6.3 Fractured Bedrock

FAG argued that the Mississippian aquifer itself should be sub-divided into smaller layers for HRS purposes. FAG states that the layers composing the Mississippian aquifer are not hydraulically connected, and therefore can not transmit contamination, although they do not state how this would affect the site score. FAG discussed the 100 feet of bedrock overlying the Grand Falls Chert, (which is a layer within the Missippian aquifer) stating that it is:

> mostly unfractured and produce little if any groundwater. Bedrock that is thick enough that it does not transmit groundwater will not transport contaminants either. Dense non-aqueous phase liquids ('DNAPL') can penetrate unproductive bedrock if a sufficient mass of DNAPL is present. However, no such large DNAPL source over unfractured bedrock has been found on the FAG property.

In contrast, the Attorney General of Missouri stated, "[t]here is no evidence to support the claim that the overlying Mississippian-age limestones are unfractured. Indeed, the evidence produced by Burns and McDonnell [consultants for FAG Bearings] and other consultants points to the contrary. Cross sections produced by Burns and McDonnell show numerous faults in the Mississippian bedrock." The Attorney General also stated, "[t]he data produced by Colog Geophysical during the Phase II Remedial Investigation showed significant fracturing in the Mississippian-age limestone bedrock overlying the Grand Falls Chert."

Blackwell Sanders Peper Martin, representing the Midcon Cables Company, stated that "in the summer of 1997 FAG and its experts undertook last minute efforts to generate evidence that the contamination was limited to the shallow aquifer (less than 200 feet) and that the TCE could not travel off-site because an aquitard existed under FAG's property."

In addition, Blackwell Sanders Peper Martin stated that:

> Judge Stevens specifically rejected FAG's claims in his lengthy opinion. For example, in addition to the fact that there are multiple conduits through which TCE can travel under FAG's property, Judge Stevens concluded that FAG's own drilling activities probably contributed to cross-contamination of the deep aquifer (approximately 200 feet) in the Elsey Formation (referred to as the Grand Falls Chert). In addition, a groundwater sample from FAG 22 at 90' to 96' below ground level tested 560 ppb [of TCE] from FDGTI's own split sample. FAG well 22 is located on the FAG property. FAG never produced the lab results of its split sample. (See Judge Stevens' Opinion, p. 25-26).

In response, the administrative record supports the presence of fractures in the bedrock overlying the Grand

Falls Chert formation, which is part of the Mississippian aquifer. Although FAG suggests that hazardous substances would not be able to travel through these subsurface formations and contaminate ground water because the bedrock is unfractured, EPA disagrees. As described on page 80 of the HRS documentation record at proposal, "the movement of groundwater in the Joplin area is affected by rock fracturing." Reference 28 (pp. 4-10) documents the presence of fractures in this area and their influence on the availability and movement of ground water. Voids were also identified in a 1991 Woodward-Clyde Consultants boring at depths of 78 and 110 feet (Midcon's Assessment Report for TCE Ground Water Contamination, submitted as part of Midcon's Comments on the proposed NPL listing of Newton County Wells, April 4, 1997, pp. 2 - 18). These voids are further evidence of fractured bedrock and the presence of karst in the area. The different formations composing the Mississippian aquifer do yield differing amounts of ground water due to variations in the amount of fracturing present, as discussed on page 80 of the HRS documentation record at proposal. The different formations can yield between 50 and 300 gallons per minute (gpm) (Reference 28 of the HRS documentation record at proposal).

In addition, evidence of interconnection from fracturing or aquifer tests can be used to document interconnection of geologic strata layers for HRS purposes (HRS Guidance Manual, p. 127). For this site, the following information documents the interconnection of the geologic layers composing the Mississippian aquifer. An aquifer test, specifically referred to as a packer test, was conducted in 1997 by Fluor Daniel, GTI, to demonstrate hydraulic connection between the hydrogeologic layers within the Mississippian aquifer. Well FAG-15, which is 186.5 feet in depth, was pumped, and water levels in the MDNR-5S, which is 109.8 feet deep, were measured. During the packer test, water levels in MDNR-5S decreased, demonstrating that the shallower formations in the Mississippian aquifer are hydraulically connected to the deeper formations (Reference 5, pp. 3-10 through 3-12, and 4-4 of the HRS documentation record at proposal). This evidence is counter to FAG's argument that the layers composing the Mississippian aquifer are not hydraulically connected. Also, evidence that contaminants have migrated across boundaries between formations can be used to document interconnection of formations within the Mississippian aquifer (HRS Guidance Manual, p. 127). At this site, observed releases of TCE are documented in soil samples from up to 30 feet bgs and in ground water samples ranging from 20 to 300 feet bgs, which supports the view that contamination can migrate from the overlying shallow soil layers to the deeper formations comprising the Mississippian aquifer. Therefore, contrary to FAG's statement, there is sufficient evidence to conclude that ground water and contaminants are able to move throughout the fractured bedrock. FAG's argument that the shallow formations are not connected to the Mississppian aquifer is not correct

In addition, although FAG stated that no large mass of DNAPL such as TCE exists at its facility at a location overlying unfractured bedrock, the HRS documentation record at proposal documents that fractured bedrock exists underlying the site (as discussed earlier in this section). Also, documentation indicates that FAG used approximately 30,000 gallons of TCE during operations for over ten years at its facility. References in the HRS documentation record at proposal include depositions from FAG employees who describe how TCE was routinely dumped or released on the ground at the facility (HRS documentation record at proposal, Reference 9 and Reference 12). Also, it is documented in the HRS documentation record at proposal that the bedrock in this area is fractured and other formations, such as solution channels and mining shafts, provide additional routes for contaminant transport. These comments have no effect on the site score.

Regarding the presence of fractures in the Grand Falls Chert formation, FAG continued:

> [t]he replacement chert bodies like the Grand Falls Chert are comprised of brecciated rock that are recemented, typically with silica. As a result of the brecciation there are many discontinuous voids within the massive chert rock body. Because the chert is much more brittle than the limestone cover, the Grand Falls Chert formed a rock unit that contains significant fractures. Some of the fracture apertures are large, and they may be discontinuous.

FAG also stated that flow in the aquifer is complex and is "probably dominated by fracture flows" and that "transport of contaminants is controlled by a few fractures within which the contamination is contained." FAG also noted the presence of fractures north of the site.

The Attorney General stated that:

> [t]he only aquifers of concern at the site are the large water-producing Mississippian-age Grand Falls Chert and the perched water found in the residuum on top of the Burlington Limestone bedrock.... The water-bearing characteristics of the Grand Falls Chert are not derived from the primary porosity of its lithology; rather, water is readily produced from prominent/extensive horizontal fractures of open bedding structures.

According to the Attorney General, "[t]he voids in the Grand Falls Chert are not discontinuous as suggested [by FAG]...." He continued, "[t]he Grand Falls Chert/Elsey Formation is a productive aquifer, indicating a considerable amount of interconnection between void space."

The Attorney General stated that according to page 39 of FAG's comment letter, when a well in the Grand Falls Chert is pumped, many of the wells in the area quickly respond. The Attorney General noted that this indicates a fair degree of interconnectivity of fractures within the Grand Falls Chert. Furthermore, FAG's experts have testified that the Grand Falls Chert is the primary water-bearing unit in the upper bedrock aquifer (Findings of Fact, p. 36). This, too, the Attorney General noted, indicates a fair degree of interconnectivity of fractures within the Grand Falls Chert. Finally, the Attorney General points out that according to the Findings of Fact (p. 24), a 1997 Fluor Daniel GTI investigation of FAG included a packer test at an open borehole (FAG-15, 180 ft bgs) on FAG's property. The test and associated drawdowns observed in MDNR-5S (109 ft bgs) and FAG-8 (124 ft bgs) reportedly confirm that there is hydraulic communication within the bedrock underlying FAG's property and the Grand Falls Chert.

In response, FAG suggests in the previous comments that any fractures that exist below the site are isolated and not interconnected, and would act to contain any hazardous substances that are released. It suggests that any hazardous substances released into these fractures would be contained by the fracture and the substances would not be released to the aquifer or impact the ground water. EPA disagrees with this conception of the hydrogeology. "Brecciated" describes rock that has been significantly fractured and broken from geological processes. Brecciated rock can be "recemented" if fluid circulating through the rocks deposits minerals such as calcite or silica among the broken or fractured bedrock. At this site, there are interconnected fractures in

the bedrock overlying the Grand Falls Chert and the Grand Falls Chert itself (which is part of the Mississippian aquifer), as discussed in the previous sections of this document, Sections 3.1.3.6.2 and 3.1.3.6.3, Hydrogeologic Units and Fractured Bedrock, respectively of this support document. In addition, voids were noted in 1991 Woodward-Clyde Consultants boring in the limestone bedrock at depths less than 100 feet (Midcon's Assessment Report for TCE Ground Water Contamination, Submitted as part of Midcon's Comments on the proposed NPL listing of Newton County Wells, April 4, 1997, pp. 2 - 18). Fractures, mud, loose rock and gravel were identified in wells logs from wells FAG 3 at 83 feet, and well FAG 13 at 83 feet, 97 feet, 117 feet, and 137 feet on the FAG property, which demonstrate the presence of significant fractures in the Great Falls Chert formation (Reference 7, Well logs 3 and 13, Submitted as part of FAG's comments on the proposed NPL listing of Newton County Wells). Therefore, voids and fractures have been documented to be present in both the limestone bedrock (< 100 feet bgs) and in the Great Falls Chert (>100 to 300 feet bgs). These voids and the evidence from aquifer pump tests, well logs, and the distribution of contamination in the aquifer all support the assertion that the formations comprising the Mississippian aquifer are fractured and interconnected.

3.1.3.6.4 Karst Terrain

FAG stated that the site area is not underlain by karst, despite conclusions in the HRS documentation record at proposal that there have been releases from sources to the "shallow karst aquifer" and the "shallow Mississippian" aquifer. FAG's comments suggest that if the aquifer were not karst, the contamination at their facility would not be able to migrate through the aquifer to the Mississippian aquifer. The presence of karst terrain at a site affects the evaluation of some HRS factors, in this case the potential ground water targets. However, the aquifer is documented to be karst by references presented in the HRS documentation record at proposal.

FAG contested this classification of the aquifer as karst by stating:

> the Area is frequently mistaken as karst terrain due to the karst features that generally occur in the carbonate rocks to the east of Jasper and Newton Counties. A substantial number of historic investigations associated with prior mining activity in the region clearly demonstrate that the Area is not presently underlain by a karst aquifer and that the terrain is not affected by karst features. Thus, sources identified in the HRS Scoresheet may not fully account for contamination detected in the Villages.

FAG discussed the historical documentation regarding karst geology in the Joplin area, and stated that much of the karst in the area has been replaced by mineralization and has been recemented with silica. FAG stated that "[a]ll of the geologic evidence collected in the Area confirms the historic studies dating back as far as the early 1900's that the Area is not affected by karst, but has been significantly altered during mineralization."

FAG also stated "[a]n oversimplification in describing the geologic complexities of the Site hydrogeology is to simply refer to it as a karst system. The expectation is that karst terrain readily leaks and can be easily contaminated by adjacent and upgradient properties."

The Attorney General of Missouri described the Joplin area as "a young, redeveloping, karstic terrane overlain by a thick, discontinuous veneer of protective weather-resistant Pennsylvanian-age bedrock." The Attorney General further stated:

> [a]lthough the area does not exhibit all of the landforms that typify a karst geomorphology, enough karst characteristics exist to support the designation as karstic terrane. The strongest evidence to support the karst designation is the extensive system of losing streams and springs. These zones of discrete recharge and discharge of groundwater are definitive of a karst system. There are 27 mapped caves in Jasper County and 54 mapped caves in Newton County. Prominent cutter and pinnacle weathering is not evident in the Joplin area, but relict chert beds found in the surficial residuum indicate deep chemical weathering, a prerequisite to developing karst terrane. Finally, voids have been encountered in bedrock in several wells drilled in the study area.

The Attorney General continued:

> FAG claims that, although karst geology was, at one time, present under the site, the site is not presently underlain by a karst aquifer. Although the study area may not possess the characteristics of a highly karstic area, some karst features do exist. For example, Woodward-Clyde Consultants drilled one borehole on the FAG property. The boring was installed to a depth of 195 feet below ground surface, and voids were noted at 78 feet and 110 feet below ground surface. Very muddy sediments were found from 130 feet to 145 feet below ground surface in possible solution channels (Findings of Fact, p. 15). [A solution channel is an open area within karst bedrock through which groundwater is flowing in large volumes, resulting in the deposition of muddy sediments in the solution channel.] Such voids and solution channels are indicative of karst terrane. During the 1998 [sic] trial ... FAG's experts admitted that the 1991 Woodward-Clyde soil boring indicated that there were solution channels and voids located in the bedrock above the Grand Falls Chert, that groundwater was moving through these openings, and that such evidence was inconsistent with FAG's theory that there is an impermeable layer of bedrock at FAG's property which prevents migration of contaminants from the overburden through the bedrock into the lower aquifer identified in this case as the 'Grand Falls Chert' (Findings of Fact, p. 16).

The Attorney General also stated that "FAG-22 encountered large openings at approximately 90 to 96 feet below ground surface, through which large quantities of heavily-contaminated water were traveling (Findings of Fact, pp. 25-26)." Finally, the Attorney General continued, "FAG's own experts have conceded that there were numerous areas on FAG's property which were permeable and 'leaky' and that the void at FAG-22 dramatically shows that the shallow bedrock at FAG is permeable (Findings of Fact, p. 67)."

In response, the HRS documentation record at proposal states that the "[Mississippian limestone aquifer] is characterized by the enlargement of openings by solution along bedding planes and fractures which have given rise to caves, solution channels, lost rivers, sinkholes and springs, all of which are characteristic features of limestone terranes (Reference 15, p.2; Reference 17; Reference 28, p.6; Reference 35, p.12)." This is consistent with the definition of karst in HRS Section 1.1, which states:

> [t]errain with characteristics of relief and drainage arising from a high degree of rock solubility in natural waters. The majority of karst occurs in limestones, but karst may also form in dolomite, gypsum, and salt deposits. Features associated with karst terrains typically include irregular topography, sinkholes, vertical shafts, abrupt ridges, caverns, abundant springs, and/or disappearing streams. Karst aquifers are associated with karst terrain.

The presence of the characteristics listed in the HRS documentation record at proposal and data from the site support the designation of this aquifer as a karst aquifer (HRS documentation record at proposal, Reference 15, p. 2; Reference 28, p. 6; Reference 35, p. 12). The USGS report (Water Resources of the Joplin Area, MO) and MDNR geologist's report mentioned in Section 3.1.3.6.2, Hydrogeologic Units, of this support document, also document the presence of karst characteristics. As stated in the previous section, Section 3.1.3.6.3, Fractured Bedrock, of this support document, voids and solution channels were identified in several wells and soil borings, such as FAG-3, FAG-13, and in the 1991 Woodward-Clyde Consultants boring (Reference 7, Well logs 3 and 13, submitted as part of FAG's comments on the proposed NPL listing of Newton County Wells; Midcon's Assessment Report for TCE Ground Water Contamination, submitted as part of Midcon's Comments on the proposed NPL listing of Newton County Wells, April 4, 1997, pp. 2 - 18). Therefore, the aquifer underlying the site meets the definition of a karst aquifer for HRS purposes.

In response to FAG's comment that the aquifer is not a karst aquifer and "[t]hus, sources identified in the HRS Scoresheet may not fully account for contamination detected in the Villages," FAG's comment suggests that if the aquifer were not karst, the contamination at their facility would not be able to migrate through the aquifer to the Mississippian aquifer. However, the aquifer is documented to be karst by references presented in the HRS documentation record at proposal. The only scoring factor that the presence of karst terrain affects for this site is the potential ground water targets (HRS, Section 3.3.2.4), which do not contribute a large number of points to the site score for this site (approximately 15% of the targets points). If the potential targets were evaluated as being located in a non-karst aquifer (instead of karst, as they are evaluated in the HRS documentation record at proposal), they would contribute 41.7 points instead of 261 points to the targets portion (3% of the targets points instead of 15%). However, even if the potential targets were not scored at all for this site, the site score would not change, because the final ground water pathway score for this site is 369 points which is reduced to the maximum score for the groundwater pathway of 100 points. Because of the large number of Level I targets at this site, the site score exceeds the maximum allowed site score by over 200 points. Therefore, this comment has no effect on the site score.

3.1.3.6.5 Confined Aquifer

FAG continued their argument that the Mississippian aquifer is not karst by discussing the confined nature of the aquifer. In referring to the Mississippian aquifer, FAG stated that this aquifer is:

> confirmed to be a strongly confined aquifer (10^{-6} storage coefficient). At the southern end of the Site, at least one spring discharges at an approximate rate of 2000 gpm. One unique feature of the spring is that it does not seem to respond dramatically to significant rainfall or recharge events as with karst controlled systems.

FAG also stated "the results of a pump test conducted at the site in 1996 demonstrated that the aquifer storage coefficient was approximately 10^{-6}, a classic sign that an aquifer is well confined." FAG continued, "[i]n contrast, karst aquifers are generally only weakly confined at best." FAG stated that the data demonstrate that the aquifer "is not a karst system behaving as a watertable aquifer, but is a confined aquifer, with isolated areas where recharge and leakage are likely." Therefore, FAG asserted, "[d]ue to the character of the bedrock in the Area, it is necessary to determine specific leakage rates at source areas in order to determine if the source is contributing to contamination at the Site."

FAG also stated that:

> [t]he combination of a massive fractured chert overlain by a thick sequence of generally unfractured limestones, results in a very productive confined aquifer. The Grand Falls Chert and the cherty limestones that exist under the Grand Falls Chert transmit the majority of the water in the Mississippian bedrock in the Area. The overlying bedrock appears to be leaky in only a few areas such as where faulted shear zones intersect the surface, or where there are isolated fractures in the bedrock that are sufficiently weathered to leak.

FAG continued, "[t]he generally non-leaky character of the limestones above the Grand Falls was confirmed by observation and testing of the bedrock with over 60 boreholes spread over an area of approximate two square miles. (See Attachment C, References 26-59 and 7, 13, and 61.)" However, FAG also stated that "[d]ata collected from FAG-24 ... completed in shallow bedrock below the overburden revealed TCE contamination." FAG continued that in the area south of Source 1, where FAG-24 is located, "[t]he system of fractures is suspected of leaking but is not known to leak."

The Attorney General of Missouri noted that:

> [a]s stated in the FAG comment letter, the Grand Falls Chert behaves as a confined aquifer, i.e., it exhibits strong head in wells that intercept the water-bearing fractures. However, evidence indicates that the aquifer is not confined across the entire site, which does not preclude the possibility of being contaminated from above. Extensive vertical fractures or faults (as depicted by the Burns and McDonnell Conceptual Removal Action Plan, a document submitted on behalf of FAG and to the MDNR) and breccia zones allow for hydraulic communication between the perched water table and Grand Falls aquifer. A relationship of hydraulic communication between water in the Grand Falls and water in the shallower Burlington-Keokuk Limestone was proven during the Burns and McDonnell pump test of July 1996, which showed declining water levels in shallow wells, while the deeper Grand Falls aquifer was pumped. Unfortunately, FAG did not collect information from the perched water table during this pump test.

The Attorney General of Missouri continued, "[t]he Mississippian aquifer is not considered strongly confined throughout the Joplin area. The Mississippian aquifer exhibits confining characteristics in some areas, but not over the entire Joplin area. 'Water Resources of the Joplin Area,' Water Resources Report #24, by G.L. Feder, John Skilton, H.G. Jeffery and E.J. Harvey, 1969." The Attorney General stated that "[t]he state is not aware of, and has therefore not had an opportunity to review, any of the hydraulic testing that is alleged to

have taken place in over 60 boreholes." The Attorney General further asserted that "[a]ccording to the information available, only the Bonner residence has a well open to alluvium. The other wells in the Thurman Creek valley are cased through the surficial alluvium and are open to the Grand Falls Chert/Elsey Formation."

In response, the record shows that the shallow and deeper units within the Mississippian aquifer are connected. Observed releases of TCE are documented in wells ranging in depths up to 300 feet bgs at the site, which support this hydraulic communication between the surficial soil and limestone bedrock and the deeper Grand Falls Chert formation of the Mississippian aquifer. Hydraulic connection is further supported by the documented presence of fractures and voids in the limestone bedrock (referred to by FAG as the "confining limestone"), as previously discussed in Section 3.1.3.6.3, Fractured Bedrock, of this support document. Furthermore, the USGS Water Resources report classifies this aquifer as karst and states that the aquifer is not confined throughout this area.

3.1.3.6.6 Ground Water Divide

FAG stated that "[b]ased upon the inference that there is a hydrogeologic divide to the immediate north of the FAG property, EPA concluded that observed groundwater impacts resulted from historic degreasing operations conducted by FAG Bearings." FAG contends that EPA does not consider additional sources as part of the site, because they are located north of this ground water divide. FAG also stated that

> [t]he HRS Scoresheet excludes areas to the north of Interstate 44 due to the presence of an assumed groundwater divide north of Interstate 44. The Scoresheet assumes that any contaminants north of such a divide would migrate to the north, not to the south. However, in support of the assumed divide, EPA relies only upon two secondary sources ... neither of which provides true evidence of a divide. (See HRS Scoresheet at 76.)

FAG continued, "MDNR has also assumed that there is a groundwater divide ... in an east to west direction from about the center of MidCon's property to the west across the International Paper property," and "[t]he eastern end of the assumed groundwater divide coincides with the edge of an area where there are a number of very shallow monitoring wells."

FAG also stated:

> MDNR and consultants for MidCon have relied on the watertable elevation to support their assumption that the Mississippian groundwater flows to the northwest. The water levels in these very shallow wells on the MidCon and International Paper properties reflect the surface of the local watertable, and cannot be used as a basis for determining the groundwater flow directions in the Mississippian aquifer. MDNR's interpretation that the groundwater in the Mississippian aquifer flows to the north also contradicts the Missouri Geological Survey & Water Resources (see Appendix A, Reference 6), as well as the interpretations of other groups. (Attachment C, Reference 66.) However, EPA's HRS Guidance Manual does not permit the use of groundwater flow directions as the basis for

establishing aquifer discontinuities for purposes of excluding sources or target populations. (See HRS Guidance Manual at 125.)

The Attorney General of Missouri stated that FAG's comments about the detection of TCE at Midcon upgradient of its facility are in error. He continues,

> Hydrologic information collected over multiple years from both the Newton County TCE investigation and the International Paper remedial action have shown that Silver Creek, a perennial stream, acts as a groundwater discharge feature [e.g., the ground water divide] between the Mid-Con and the FAG properties. Information collected from various monitoring wells reflect this relationship. These relationships have been graphically demonstrated in all groundwater potentiometric maps produced by all consultants involved in these investigations, including Burns and McDonnell, when groundwater contouring methods, commonly accepted within the scientific community, are used.

The Attorney General also stated that "[a]s recently as 1998, FAG's experts admitted that historic data indicated that shallow groundwater flowed northwest; they refused to agree on the direction of deep groundwater flow, even [though] they had not contoured the deep aquifer at [Midcon] (Findings of Fact, pp. 40-41)." The Attorney General contended:

> [s]ince the act of groundwater pumping alters natural groundwater gradients, it is incorrect to assume that a residence is/was forever cross-gradient to the FAG facility based on groundwater information taken after the majority, if not all, of the residences have stopped pumping. One may assume that the gradient would be steepened toward a cluster of residential pumping wells. That gradient would slowly revert to natural conditions, which may reflect a cross-gradient position, after the conclusion of pumping.

The Attorney General of Missouri continued, stating:

> [a]ccording to FAG, EPA relied upon only two secondary sources to support the theory that there is a groundwater divide to the immediate north of the FAG property.... While EPA's HRS Score may have been based only upon these two sources, there are many other sources available that also support this conclusion. For example, several historic studies of groundwater flow direction performed at IPCO's [International Paper Company's] property indicate that shallow as well as deep groundwater flows north/northwest beneath the Mid-Con property, away from FAG's property (Findings of Fact, pp. 39-40), [sic] In addition, in 1997, Mid-Con and Gulf States experts constructed a potentiometric map which incorporated data from wells located on FAG, International Paper Company (IPCO), Mid-Con, and Gulf states properties and wells located between these properties. The potentiometric surface map shows a groundwater divide to the south of Mid-Con's property.... In fact, FAG's own attorneys and consultants have, in the past, recognized that a groundwater divide is located to the south of Mid-Con and the north of FAG (Findings of Fact, p.41). An exchange of letters in June 1992 between one of FAG's attorneys and one of their consultants referred to a proposed well location on the Mid-Con property as 'north of the groundwater divide' (Findings of Fact, p.41). Additionally, in a September 1992

> facsimile from an [sic] FAG consultant to FAG's attorney, the consultant confirms that there is a groundwater divide across IPCO.

Blackwell Sanders Peper Martin, representing Midcon Cables Company, stated that:

> in order for contamination to have traveled from Midcon to FAG and points south, the ground water flow direction would have to be to the south. As established in Midcon's expert report and in testimony by Midcon's experts and MDNR representatives, there is a groundwater divide between Midcon and FAG. The groundwater at Midcon flows north/northwest, not south to FAG. MDNR recognized this groundwater divide for years prior to trial. International Paper documented the presence of the groundwater divide as part of its remediation activities years prior to trial. Although FAG's experts had not documented or studied the direction of groundwater flow, at trial in 1997 several of FAG's experts admitted that a groundwater divide existed.

In response, the ground water divide was not considered in assigning values to any factors in the HRS documentation record at proposal, and does not effect the site score. Contrary to FAG's statement, EPA does not use the ground water divide as reason to exclude additional sources or targets from consideration at the site. The ground water divide is merely described in the HRS documentation record at proposal to provide background information on the hydrology of the site. EPA cites Reference 29, pages 2 through 4, and Reference 30 of the HRS documentation record at proposal to support the existence of the ground water divide between the Midcon and FAG facilities.

With regard to FAG's comment that MDNR has only measured the shallow and not regional ground water flow, well MW-2D is located north of the FAG facility, between the FAG, Midcon, and International Paper facilities, and is screened at a depth of 159 to 179 feet bgs. Also, well J23-164 is located further north of the FAG facility, between the Midcon and International Paper facilities, and has a total depth of 164 feet. These wells are deep enough to represent flow in the Grand Falls Chert formation and not just the water table in the shallower formations.

FAG stated that "[i]n some boreholes, the groundwater is stagnant, with little groundwater movement (yet these holes easily produce 100+gpm when pumped)."

The Attorney General commented that "[g]roundwater that maintains constant elevation (hydraulic head) in monitoring wells is not necessarily stagnant. Groundwater movement may occur with little corresponding variation in hydraulic head within a single well."

In response, FAG does not state what it means when it asserts that the ground water is "stagnant" or how this would affect the site evaluation or the HRS score. The commenter also does not provide any data to support this comment. The Attorney General is correct in noting that although the hydraulic head in a well might be constant, that does not mean that the ground water is not flowing. The water level in a well is related to the

pressure exerted on the water within the aquifer, and may not change as the ground water flows, even if the ground water flow rate is fairly high.

3.1.3.6.7 Potentiometric Maps

FAG commented that the HRS documentation record at proposal "erroneously states that no representative potentiometric maps documenting groundwater flow direction on FAG Bearings property have been developed...." On the contrary, it stated "[w]ater level data from the wells were used to produce several potentiometric surface maps."

In response, the reference referred to by FAG in its comments (Attachment A, Reference 66) as containing the potentiometric surface maps contained maps of the mining areas in the Region and are not potentiometric surface maps. However, Reference 64, which FAG included with its comments, did contain copies of the potentiometric surface maps from the FDGTI report. As a result, EPA has revised the HRS documentation record at proposal to reflect the presence of these maps in Reference 64. This comment has no effect on the site score.

3.1.3.7 Analytical Data

FAG submitted "Supplemental Comments" after reviewing the additional information it had requested from EPA and MDNR regarding the NPL listing of the Newton County Wells site. Regarding this additional information, FAG stated:

> [t]he Supplemental Information did not include raw data for approximately 52 residential well samples listed in Table 2-1 of Reference 27. It appears that 24 of these locations may not have actually been sampled. The two copies of Reference 27 that EPA provided contain two different versions of Table 2-1. The version that EPA provided with the original HRS Scoring package included 24 wells that were sampled and contained no detectable levels of trichloroethylene (TCE). The version of HRS Reference 27 that FAG received from EPA on April 1, 1999 indicates that these 24 wells could not be sampled. In addition, the two different versions of Table 2-1 contain numerous other discrepancies regarding the other 27 samples for which we have not located raw data.... None of the discrepancies affect our comments or the tables or attachments to our comments.

In response, FAG states that none of the discrepancies it noted affect its comments. EPA has reviewed the discrepancies in the two versions of Reference 27 noted by FAG and has similarly determined that they do not affect the HRS site score. Upon review of Table 2-1 that was contained in Reference 27 to the HRS documentation record at proposal and the Table that was sent to FAG by Region 7, there do appear to be differences in the reported values. The version of Table 2-1 in the HRS documentation record at proposal was a draft version. The version of Table 2-1 sent to FAG by Region 7 and the MDNR, as a result of their March 15, 1999 letter, was the final version of this table. The final version of the table was inadvertently left out of the HRS documentation record at proposal. The final version of Reference 27, excluding the geologic cross sections, has been included in the administrative record and is available in the public document.

Of the wells identified by FAG in Attachment B of their comment letter, only one residential well (RW-27) is used in the observed release section of the HRS documentation record at proposal. If this well was removed from the observed release table, no changes to the HRS documentation record at proposal would be necessary and the site score would remain unchanged since the concentration of TCE in this well is 8 μg/L, which is greater than the maximum contaminant level, but not the highest concentration detected in a residential well. Twenty-five other residential wells meet observed release criteria and the highest concentration of TCE in these wells is 327 μg/L. Therefore, observed release criteria would still be met without the inclusion of RW-27. In addition, if all residential wells in question are removed from the target section of the HRS documentation record at proposal, four residential wells associated with Level I targets and one residential well associated with Level II targets would be removed. The points associated with Level I concentrations would decrease from 1,352 to 1,248 and the points associated with Level II concentrations would decrease from 65 to 62.4. The ground water migration pathway score would not change and the calculated score would remain at the maximum score of 100. These discrepancies have no effect on the site score.

With regard to the missing raw data (e.g., laboratory data summary sheets) for 52 of the residential wells, Reference 27 of the HRS documentation record at proposal contained the laboratory data sheets for all residential wells that were included in the HRS documentation record at proposal. Because FAG does not provide the well numbers for the 52 wells in question, EPA can neither confirm nor deny if the data were missing. EPA notes that a complete final version of Reference 27, excluding the geologic cross sections, was made available to FAG on March 31, 1999 and EPA can confirm that this version did also contain the laboratory data sheets for all residential wells used in the HRS documentation record at proposal. This comment has no effect on the site score.

FAG submitted notice that EPA is investigating a laboratory that analyzed samples for FAG's consultants, Burns and McDonnell. According to FAG, this laboratory, owned by Intertek Testing Services (ITS), is being investigated for performing "inappropriate manual integrations of VOC data." ITS analyzed samples collected at the FAG Bearings property in 1996 and 1997, which is within the time frame of activities for which the laboratory is under investigation.

FAG also commented that EPA relied on data from this laboratory in calculating the HRS score for the Newton County Wells site. Specifically, FAG stated that EPA relied on the Burns and McDonnell data in evaluating Source 6 and Source 7 in the HRS documentation record at proposal. FAG further commented that, "[d]ata from this laboratory are also included in EPA's references to the HRS Scoresheet for the proposed site (e.g. References 5 and 43)." FAG stated that it had also "relied on this data in commenting on the proposed listing of the 'Newton County Wells Site' on the NPL, and provided copies of the data with its comments on the proposed NPL listing."

FAG stated that it "understand[s] that ITS previously self-reported certain data irregularities to EPA, and has undergone a careful process of working with its clients and regulatory authorities to develop appropriate procedures for identifying any problems with the data." Nonetheless, FAG asserted that the circumstance of this investigation "requires careful consideration in connection" with the NPL listing of the site. As a result, FAG has asked its consultants to "validate the data as soon as possible."

In response, EPA did not rely on the Burns and McDonnell data in the calculation of the HRS site score. The Burns and McDonnell data are summarized in a report by Fluor Daniel GTI (Reference 5, HRS documentation record at proposal), which is cited in the HRS documentation record at proposal to provide background on site activities that contributed to TCE contamination at Sources 6 and 7. EPA relies upon References 13 (data from the MDNR Environmental Services Program) and 14 (data from Eagle Picher laboratory) in the HRS documentation record at proposal, rather than Reference 5, to document the presence of TCE in Source 6 and Source 7. EPA's investigation of the ITS laboratory does not impact the HRS site score for the Newton County Wells site.

Similarly, no analytical data from Reference 43 are cited in the HRS documentation record at proposal. Reference 43 does not contain primary analytical data and is referenced only to provide information on well locations in the HRS documentation record at proposal.

3.1.3.8 References

FAG stated that information provided to evaluate the proposed listing of the Newton County Wells site to the NPL was incomplete, and that this information has not been made available to the public for review or comment. Further, FAG claimed that this information was necessary for FAG to evaluate the analytical results obtained and the conclusions drawn from the site. FAG Bearings Corporation specifically requested certain documents and requested an extension to the comment period.

In response, on March 31, 1999, Region 7 sent a copy of Reference 24 and a copy of Reference 27 to the HRS documentation record at proposal to Morgan, Lewis & Bockius on behalf of FAG and to the public dockets. In a letter dated April 6, 1999, EPA granted the extension of the public comment period for 30 days. That letter also explained that Items 2, 4, 5, and 6 requested in the March 15, 1999 letter from Morgan, Lewis & Bockius were not used as References to score the site, but could be requested from MDNR. Items 2, 4, 5 and 6 were as follows:

> 2. Reference 27 (seven aerial photographs from EPA) to Reference 35 of the HRS Scoresheet (MDNR's September 24, 1993 SI Report);
>
> 4. Reference 11 (MDNR, Information obtained from MDNR RCRA files regarding Midcon Cables Company - Spill Report, Hazardous Waste Generator Letters, Hazardous Waste Inspection Reports - August 1, 1991, May 28, 1991, November 17, 1989, January 28, 1987 - 19 pages.) to Reference 8 of the HRS Scoresheet (Missouri Department of Natural Resources Hazardous Waste Program, Expanded Site Inspection Report Newton County Wells Silver Creek and Saginaw Villages, September 23, 1994);
>
> 5. Reference 36 (MDNR, Newton County TCE Site, Commonly Asked Questions and Answers, prepared for the availability sessions held June 11, 1991 (3 pages)) to Reference 8 of the HRS Scoresheet (Missouri Department of Natural Resources Hazardous Waste Program, Expanded Site Inspection Report Newton County Wells Silver Creek and Saginaw Villages, September 23, 1994); and

6. Reference 38 (Wallen, Al, HWP, DEQ, MDNR, Data collected by Environmental Investigator, including telephone records regarding the 1983 cutting oil spill on FAG property, 3 pages; FAG Industrial and Hazardous Waste Survey, 1976, 2 pages; Information In the Matter of Thomas v. FAG Bearings/Contract Freighters, 1993, 234 pages) to Reference 8 of the HRS Scoresheet (Missouri Department of Natural Resources Hazardous Waste Program, Expanded Site Inspection Report Newton County Wells Silver Creek and Saginaw Villages, September 23, 1994).

Therefore, all information used to support the HRS score was made available to the public, and the comment period was extended to allow sufficient time to review the documents.

3.1.3.8.1 Secondary References

FAG stated that the HRS documentation record at proposal uses references in direct contradiction of EPA's own policies and "relies upon and includes only secondary sources of information rather than the original material from which information was obtained." As an example, FAG stated the "HRS Scoresheet identifies MDNR's 1992 Site Inspection and 1994 Expanded Site Inspection (HRS References 35 and 8) as primary sources of information; however, this is in direct contradiction to the HRS Guidance Manual."

Blackwell Sanders Peper Martin stated that Midcon believes "EPA should use all available primary and secondary information regarding the site," including information generated as part of litigation.

In response, the Agency disagrees with FAG that the HRS documentation record at proposal uses and relies solely on secondary references. As defined in the HRS Guidance Manual (p. 29), a primary reference is "the original material from which the information was obtained," such as a geologic publication, field observation records/measurements, analytical data reports, waste manifests, phone logs, field notebooks, or contractor's reports. In contrast, a secondary reference is a summary report or other document that is not the original source of the information, although it may include the primary source as a reference. Examples of secondary references are summaries of analytical data (without the appropriate QA/QC information) and PA or SI reports. All assertions used to score the site are supported by primary references, or by a combination of primary and secondary references. Additionally, the commenter does not state which section of the HRS Guidance Manual contradicts EPA's use of the SI and ESI reports. With regard to SI reports, the HRS Guidance Manual (p. 29-30) and the Regional Quality Control Guidance for NPL Candidate Sites (OSWER Publication 9345.1-08, December 1991, p. 16) both state, "Site Inspection (SI) investigations can be used to score an HRS package if the documents referenced within these documents are used as the primary references in the HRS documentation record."

For example, on page 11 of the HRS documentation record at proposal, the ESI (Reference 8) is referenced to demonstrate consistency of TCE, 1,2-DCE, and PCE contamination in monitoring wells between 1992 and 1994. To further support this statement, the HRS documentation record at proposal also references a 1992 MDNR Site Sampling Report containing data from June 17 through July 16, 1992 (Reference 6) and from

April 29 through April 30, 1992, and May 18, 1993 (Reference 7). References 6 and 7 contain the actual analytical data reports and therefore are appropriately used as primary sources of information. EPA can use secondary references, such as PA or SI reports and summaries of analytical data, when necessary, to provide supplemental information about a site (HRS Guidance Manual, p. 29).

FAG stated that "the HRS Scoresheet's reliance upon Reference 5, a report entitled 'Subsurface Environmental Investigation FAG Bearings' (April 3, 1997) prepared by Fluor Daniel GTI ('Fluor Report"), as a primary source of historical information regarding the use of TCE at the Site is misplaced." It also claimed that the "depositions and regulatory documents, rather than a summary of those documents prepared by a third party, having no direct knowledge of past operations at FAG, should have been included as the primary sources of information regarding past operations at FAG."

In response, the commenter is correct in stating that Reference 5 is a secondary reference with regard to TCE usage and past operations at the FAG facility. EPA has revised the HRS documentation record at proposal to include citations to primary References 9 and 11, which are depositions of Sam Charles, the former service building operator for FAG Bearings Corporation. Mr. Charles describes the amount of TCE used at the FAG facility, the locations where it was used, the approximate amount of TCE purchased on a weekly basis at the facility, and the locations where TCE was stored and dumped on the FAG property. EPA has also added a citation to Reference 10, which includes records from the McKesson company on the amount of TCE sold to FAG Bearings Corporation from 1977 to 1982. In addition, EPA has cited Reference 18, which is a deposition of Marvin Haase, who was the former plant services manager at the FAG facility. These primary references support all assertions made regarding TCE usage at the site in the HRS documentation record at proposal.

Finally, FAG stated that "the Scoresheet relies upon HRS Reference 29, comments that MDNR prepared on a report entitled 'Silver Creek and Saginaw Village Groundwater Contamination Experts Report' (May 1993) prepared by Tetra Tech ('MDNR Comment Document'), as a primary source of information regarding hydrogeologic conditions at the Site." FAG stated that providing comments on a report without providing the report itself is confusing and misleading, and the MDNR Comment Document is not a primary source of information regarding hydrogeologic conditions at the site. In addition, the commenter stated the HRS documentation record at proposal "implies that HRS Reference 29 includes groundwater studies and potentiometric surface maps supporting the existence of a supposed groundwater divide." It continued, "HRS Reference 29 includes no studies or maps; rather it is merely a secondary source including oblique references to the groundwater studies and maps."

In response, regarding Reference 29 of the HRS documentation record at proposal, although FAG stated that it is confusing to provide MDNR's comments on the Tetra Tech report without providing the report itself, FAG should have had an opportunity to review the report because it was prepared for FAG (HRS documentation record at proposal, Reference 8, p. 31). Reference 29, which the Agency agrees is a secondary source of information and does not include the maps and ground water studies to which FAG refers, is used to support the statements regarding the potentiometric surface of the aquifer and the presence of a ground water divide north of the FAG Bearings property (see page 80 of HRS documentation record at proposal; see also Section 3.1.3.6.6, Ground Water Divide, of this support document). However, Reference 30 of the HRS documentation record at proposal, a primary reference, also supports these statements and is

cited in the HRS documentation record at proposal. To further support these statements, the fifth paragraph on page 80 of the HRS documentation record at proposal has been revised to include a citation to Reference 30, in addition to Reference 29.

FAG does not provide any information that would contradict MDNR's comments in Reference 29 in its critique of the Tetra Tech report. FAG also did not provide any data to substantiate the assumptions made in the Tetra Tech report. EPA will make the changes to the HRS documentation record that are described, but these comments have no effect on the site score.

3.1.3.8.2 Selective Use of Data

FAG commented on the use of data in the HRS documentation record at proposal by stating, "[t]he HRS Scoresheet also omits from consideration various data regarding the Site." The commenter stated the HRS documentation record at proposal "fails to identify data collected by Allgeier Martin in 1991 and 1992 and work completed by Burns & McDonnell in 1996 as sources of analytical data used in the HRS Scoresheet." The commenter further stated that, "[i]n particular the 1996 data collected by Burns & McDonnell provided significant information demonstrating that the residuum (overburden) and the Grand Falls Chert zone of the Mississippian aquifer are hydrologically separate."

In response to the comment suggesting that EPA evaluate the site for listing by using additional data than that in the HRS documentation record at the time of proposal, the data used are adequate to score this site and meet the explicit criteria for both the types and quality of information required by the HRS. Further, commenters can, during the public comment period (typically 60 days), supply the Agency with up-to-date data or any other information deemed relevant to the proposal and/or HRS score, as FAG Bearings Corporation has done at this site. EPA carefully considers all comments received during this comment period and responds to these comments in a support document such as this one.

Furthermore, the HRS documentation record at proposal does cite the 1991 and 1992 Allgeier Martin Engineering Reports as references. These reports are used specifically for source characterization of Source 5 (contaminated soil in vicinity of former sewage lagoons), Source 6 (small cooling tower pond), and Source 7 (large cooling tower pond). In addition, EPA has reviewed the Burns and McDonnell data and determined that they do not impact or contradict the evaluation of the aquifer in the HRS documentation record at proposal. FAG commented previously that the laboratory that analyzed these samples is under investigation, and the data should not be used. EPA responded to these comments in Section 3.1.3.7, Analytical Data, of this support document. Regarding the 1996 Burns and McDonnell data reports, the HRS documentation record at proposal scores the Mississippian Aquifer as a single aquifer, as discussed in Section 3.1.3.6.2, Hydrogeologic Units, of this support document. The HRS documentation record at proposal and other site studies document that the residuum and Grand Falls Chert in the vicinity of the site are hydrologically interconnected.

FAG stated, "in numerous instances, the HRS Scoring Package includes and references only the text of reports (or certain portions of the text) regarding environmental investigations of the Site, omitting the

underlying data." FAG claims only portions of Reference 5, Reference 27, and Reference 43 are included in the HRS documentation record at proposal and stated, "[i]t is inappropriate for EPA to rely on the interpretations of this data from environmental engineers in forums other than this listing process. Rather, the Agency should rely upon the data itself."

In response, EPA disagrees that it omitted the underlying data. EPA has reviewed sufficient data associated with these and other reports to determine that this site meets the NCP criteria for NPL listing. These data are included within the referenced document or within other primary references provided in the HRS documentation record at proposal. For example, text from the Fluor Daniel GTI report (Reference 5) is cited on page 43 of the HRS documentation record at proposal, as well as the analytical data from the NEI/GTEL Laboratory that are included in Reference 5. EPA has determined these reports provide sufficient information and/or primary documentation to be included in the HRS documentation record at proposal.

3.1.3.8.3 Findings of Fact, Conclusions of Law and Order

FAG stated that although it is not discussed in the HRS documentation record at proposal nor included in the list of references, "EPA provided a non-final order in litigation regarding portions of the Newton County Wells Site as an attachment to the HRS Scoresheet [HRS documentation record at proposal]." FAG states that it is unclear as to why this document was included with the scoring package as it has no bearing on whether the site should be listed on the NPL. FAG further commented that "[i]t is inappropriate for EPA to rely on opinions of a federal judge expressed in a non-final order." FAG asserted that the Court's opinion is based on rules and standards inapplicable to the NPL listing process, and the Court's opinion is not binding on EPA. FAG further stated, "[a] federal agency may not allow its investigations to be limited by a court's fact-finding in a prior suit to which the agency was not a party." The commenter contended that no judgment exists to date, and the "opinion should not have been included in the HRS scoring package" and is "neither final, nor persuasive 'evidence' of anything."

Further, FAG stated that the Court's opinion is also not binding on the MDNR, and that "Missouri law mandates courts to defer to the expertise of MDNR in 'reaching decisions based on scientific and technical data.'" FAG also emphasized the Court's opinion is "one step in resolving a dispute among alleged polluters, not a road map to scientific understanding."

The Attorney General of Missouri, however, comments that "the [Court] Order is, for the purposes of EPA and its factual research, final." The State of Missouri asserted that this U.S. Federal Judge's opinion represents that of a non-biased reviewer of fact, and should be noted as a reliable third-party opinion.

In addition, the Attorney General stated that there are numerous instances where the testimony quoted in the Final Order, including that of FAG's own expert witnesses, directly contradicts claims made in FAG's March 22, 1999, comment letter and/or enclosures. According to the Attorney General, the Court, which utilized an independent consultant, found that the evidence simply did not support FAG's position, despite data submitted on behalf of FAG.

Blackwell Sanders Peper Martin, on behalf of Midcon Cables, commented that:

> [t]he litigation with FAG included extensive deposition testimony and trial testimony from fact witnesses who worked at FAG and who described how TCE was released by FAG. Of [particular] interest might be FAG's response to two EPA requests for information where FAG claimed to have handled only four barrels of TCE when it was later established through third party discovery that FAG actually bought in excess of 30,000 gallons of TCE during only a fraction of the period of TCE operations at FAG. The third party discovery was necessary because FAG destroyed all of its relevant chemical use records.

Midcon stated that "FAG limited MDNR access to the site and refused to investigate areas that were logical source areas for TCE contamination based on historic practices at FAG's facility."

In response, EPA attached the Findings of Fact to the HRS documentation record for informational purposes, and did not rely on this document in supporting the conclusions in the HRS documentation record. However, EPA has evaluated the site based on the investigations conducted by MDNR, and the threat posed by this site has been documented in the HRS documentation record at proposal. Although EPA has included the Final Order as an attachment to the HRS documentation record at proposal, it is not used to support the conclusions in the HRS documentation record at proposal. All statements made in the HRS documentation record at proposal are supported by references independent of the Findings of Fact.

3.1.3.9 Source Description and Associated Contaminants

3.1.3.9.1 TCE Use and Disposal

FAG stated that "[w]hen describing each of the source areas, the HRS Scoresheet contains very misleading statements regarding the amounts of TCE used at and disposed from the FAG facility." FAG stated that TCE was used at its facility from 1972 to 1981 to degrease ball bearings, and that "[t]he entire degreasing operation was designed as a closed loop system to minimize escape of TCE to the environment." FAG admits, however, that the system lost TCE vapors and that the system also included a "separate distillation unit in the service building which periodically generated still bottoms." FAG further stated that "no major TCE spills were reported by any party" during the time that TCE was used on site, but that "minor releases of TCE (not known to be in the form of a pure phase DNAPL) appear to have occurred which require further investigation and quantification."

According to FAG, the fact that 551 drums of TCE were delivered to the FAG site, but only 2 drums of TCE waste were removed from the facility "is not surprising, and ... does not suggest improper disposal of TCE waste materials." FAG explains, "at least 40 tons of TCE were lost to air emissions" each year and "[t]he remaining spent TCE was lost to various sources," including indoor evaporation, adsorption to ball bearings, steam condensate, and still bottoms from the distillation of spent solvent. FAG concluded, "[g]iven the amount of air emissions, it would be unreasonable to expect that all TCE product delivered to the facility would have been removed as waste." FAG further concluded that the small number of existing disposal manifests is not evidence of on-site disposal because the RCRA manifest requirements were not instituted

until after 1980, and "prior to that there were not procedures for tracking the shipment of hazardous materials from the facility...."

Midcon stated that FAG's comment that no major spills occurred is "directly contrary to the indisputable evidence" and that "FAG is unable to account for approximately 35,000 - 50,000 gallons of TCE that it purchased." Midcon stated that "[t]wo ex-FAG employees testified by deposition and at trial about how TCE was continuously, intentionally, and repeatedly released onto the ground at FAG," and that FAG's former plant manager "provided corroborating testimony" (Findings of Fact, pp.9-10).

The Attorney General of Missouri stated that a written statement and the legal testimony from former FAG employees "describe dumping of TCE waste on FAG's property, and FAG's former employees who serviced the degreaser equipment testified to large volumes of releases and regular leaks from the system."

In response, the HRS does not require documenting of "major spills" of wastes in order to associate those wastes with a source or attribute an observed release of contaminants associated with those wastes to a facility. Nor does EPA "expect that all TCE product delivered to the facility would have been removed as waste", as FAG states. In this case, the presence of TCE and its degradation products in both source and release samples is sufficient to document that a release of TCE to ground water is at least partially attributable to FAG operations and to the sources described in the HRS documentation record at proposal (HRS, Section 3.1.1). As defined in the HRS Guidance Manual (p. 55), attribution requires "documenting that at least one hazardous substance found in a release at a concentration significantly above background was produced, stored, deposited, handled, or treated at the site; and at least a portion of the significant increase could have come from a source at the site." TCE is documented to have been used and stored at the FAG Bearings facility (HRS documentation record at proposal, pp. 97-98). TCE and its degradation products were found in significant concentrations in samples taken from each of the seven FAG sources scored (see HRS documentation record at proposal, pp. 14, 22, 25, 35, 45, 51, 53, 61, and 69), TCE and its degradation products have been documented in an observed release to on-site monitoring wells (as described on pp. 11, 21, 33, 42, 50, 59, 67, 84-85, and 91- 92 of the HRS documentation record at proposal), and TCE and its degradation products have been documented at concentrations above health-based benchmarks in an observed release to nearby residential wells (HRS documentation record at proposal, pp. 105-132).

Moreover, contrary to assertions in FAG's comment letters, FAG employees testified that TCE was repeatedly released onto the ground at the site. Specifically, Mr. Sam Charles (a former FAG employee) stated that TCE was dumped on the ground at the facility and that barrels storing TCE on FAG's property leaked (Reference 9, pp. 5- 6, Reference 11). Therefore, the trial testimony cited by the Attorney General and Midcon supports EPA's conclusion that disposal of TCE waste occurred at the FAG facility. The disposal of TCE waste at FAG is relevant to the HRS score for this site because the HRS requires that an observed release be at least partially attributable to a site in order to be scored. Attribution is documented by providing evidence that a hazardous substance in a release was stored, handled, used, or treated at a facility, and that it is present in sources at the site and has the potential to have migrated from the sources at the facility.

3.1.3.9.2 TCE in Sources

FAG stated that "the Scoresheet's conclusion that 'TCE was used in processes that occurred in all six sources' (HRS Scoresheet at 97) is patently wrong." Specifically, FAG stated that "[t]he HRS Scoresheet erroneously includes two cooling water ponds (Sources 6 and 7) as waste sources for the Site." FAG stated that TCE was neither "used in either of the cooling-water ponds" nor "used in or introduced into the sanitary lagoons." FAG asserted that the inclusion of these ponds as sources is inappropriate because the ponds were not constructed until 1985, after FAG had stopped using TCE at its facility and after the vapor degreasing system was decommissioned, and that the ponds were never used for managing TCE wastes. FAG stated that the ponds were permitted to receive non-contact cooling water from plant equipment and storm water runoff from the FAG facility.

In discussing these same ponds, the Attorney General of Missouri stated that "trial testimony established that FAG pumped TCE (and possibly other chemicals) into a lagoon on the northwest corner of its property."

In response, EPA agrees that the references cited on page 97 of the HRS documentation record at proposal do not support the conclusion that TCE was "used in processes" that occurred in all six sources, unless "used in processes" includes the disposal of TCE to the source. The cited references throughout the source characterization section of the HRS documentation record at proposal do, however, clearly support the conclusion that TCE was "used in processes" at several sources on site and has been disposed or has otherwise come to be located in all seven sources at the site. Specifically, TCE and its degradation products were found in significant concentrations in samples taken from each of the seven sources (see HRS documentation record at proposal, pp.14, 22, 25, 35, 45, 51, 53, 61, and 69). In addition, the HRS documentation record at proposal and supporting references clearly document that TCE is now present in both the cooling water ponds (sources 6 and 7) and sanitary lagoons (source 5), (pp. 53, 61, and 69). Although TCE may not have been "used in" all of these sources as part of an industrial process, TCE has clearly been either intentionally or unintentionally "introduced into" all of them. To clarify this distinction, the referenced statement (on p. 97 of the HRS documentation record at proposal) has been amended to state that "TCE and its degradation products have been found in all seven sources at the FAG facility." The paragraph following this statement also has been amended to include the seventh source and to more fully support the revised statement using existing references. This change does not affect any HRS factor or the overall site score.

3.1.3.9.3 Contaminant Migration

FAG stated that "the Scoresheet contains various factual inaccuracies with respect to all source areas" and that the "HRS Scoresheet" does not show that the hazardous substances contained in on-site soil sources have migrated to the Mississippian aquifer. FAG stated that "[t]he residential wells in the Villages were drilled in the Mississippian aquifer" and, therefore, "migration to groundwater needs to be documented as migration to the Mississippian aquifer." FAG stated that the only ground water contamination that can be attributed to on-site soil sources is within the "unconfined watertable aquifer" that exists at a depth of 19 to 22 feet and is within the "overburden which is above the confining limestone bedrock and the shallow (Mississippian) aquifer."

Midcon stated that "TCE and its degradation compounds were found in the highest concentrations in Newton County from just below ground surface to 200' below ground surface directly beneath the FAG facility." Midcon further stated that:

> FAG's arguments that there was an impenetrable barrier under its property and that the TCE contamination was limited to small areas were discussed at length in Midcon's experts' reports. Such arguments were factually inaccurate at best. The testimony at trial dealt extensively with these issues. Judge Stevens specifically rejected FAG's claims in his lengthy opinion. For example, in addition to the fact that there are multiple conduits through which TCE can travel under FAG's property, Judge Stevens concluded that FAG's own drilling activities probably contributed to cross-contamination of the deep aquifer (approximately 200 feet) in the Elsey Formation (referred to as the Grand Falls Chert). In addition, a groundwater sample from FAG 22 at 90' to 96' below ground level tested 560 ppb from FDGTI's own split sample. FAG well 22 is located on the FAG property.

In response, FAG contends that the geologic layers from 0 - 300 feet consist of two separate aquifers, although the evidence presented in the HRS documentation record at proposal documents that all geologic layers from 0 - 300 feet are part of one aquifer. The aquifer characterization is important because it affects how points are assigned to human targets for the ground water pathway. An observed release must be documented to each aquifer to which target points are assigned, and therefore if there are more aquifers present beneath a source, evidence must be presented to document an observed release to each aquifer to which target points are assigned. However, there is sufficient evidence at the Newton County Wells site to support that the characterization of the area from 0 to 300 feet below ground surface (bgs) as a single aquifer, the shallow, Mississippian aquifer (see Section 3.1.3.6.2, Hydrogeologic Units, of this support document). Therefore, the monitoring well samples taken at depths of 19 to 22 feet can be used to document an observed release to the Mississippian aquifer. Moreover, TCE and its degradation products also have been documented in an observed release to FAG's monitoring wells and to nearby residential wells screened at depths ranging from 20 to 300 feet bgs (as described on pp. 92 and 105-132 of the HRS documentation record at proposal). These samples document an observed release to the Mississippian aquifer, and any people drinking water from this aquifer can be scored as drinking water targets. This contamination is at least partially attributable to FAG because of the history of TCE usage at the facility, the presence of TCE in the sources, and the company's admission and employee testimony (Reference 9, HRS documentation record at proposal) that TCE was released onto the ground surface.

3.1.3.9.4 Additional Contaminants

FAG expressed concern that EPA should consider additional chemical contaminants besides TCE in defining the site. FAG stated that "[t]he highest concentrations of PCE at the Area were detected in the Industrial Northern Area in the lower numbered MidCon wells (MC-01, MC-02, and MC-03)." However, FAG stated, "[t]he contamination found on FAG's property includes small amounts of TCE, but no definite source area for the downgradient contamination, and does not include a range of other chemicals found in the Villages."

FAG further stated that PCE and related chlorinated aliphatic hydrocarbons (TCA, DCA, and PCA) "have been reported throughout the Area," including one sample from the "Schlegel spring" containing 14 ug/L of

PCA, in excess of "the Missouri Water Quality Standard of 0.17 ug/l." FAG stated that naphthalene has been detected in significant concentrations at International Paper and in lower concentrations on the Midcon, Gulf States, and FAG properties, and that along with TCE and cis-1,2-DCE, semi-volatile compounds (including bis(2-ethylhexyl)phthalate, di-n-butylphthalate, phenol, benzoic acid, chlorinated phenols, substituted benzene compounds, and PAHs) and the volatile compounds trihalomethane, methylene chloride have been detected in monitoring well samples from Midcon's Industrial Northern Area extending to the FAG property.

Midcon stated that "many of the other FAG 'chemicals of concern' were probably caused by FAG's methods of investigation and are probably the result of lab contaminants. Midcon's expert report and trial testimony by Midcon's experts, PACE Lab personnel, and by the court-appointed experts explained these findings in detail."

The Missouri Attorney General, in response to FAG's contentions that EPA should redefine the site to include the additional contaminants detected in ground water beneath the surrounding facilities, stated that the Findings of Fact conclude that no chemicals that may have been released at the Gulf States or Midcon properties have migrated to either the FAG property or the villages of Saginaw and Silver Creek. According to the Attorney General, the Court found that the contamination at FAG and in the villages is "overwhelmingly and almost exclusively TCE and TCE-related chemicals," and the Court agreed with MDNR's determination that "TCE and TCE-related compounds are the only chemicals that need remediation at FAG and in the Villages ... (Findings of Fact, pp. 61-62)." The Attorney General stated that the Court concluded that "[w]hile FAG continually refers to minute detections of various other chemicals at its property or in the Villages, even if contamination came from other sources, FAG's responsibility far out shadows that of any other sources." According to the Attorney General:

> the state [of Missouri] contends that dissolved-phase contamination would be subject to significant dilution during transport over long distances, especially in the water-filled voids of the Grand Falls Chert. Water-filled mine voids located to the north of FAG, between Mid-Con and FAG, would greatly affect dilution of any dissolved-phase contaminants that might migrate toward FAG from facilities located to the north.

The Attorney General also stated that, in asserting that contamination from the Midcon, Gulf States, and International Paper facilities "passes beneath the FAG facility and into the villages of Saginaw and Silver Creek," FAG "ignores facts about site hydrology and the isolated nature of the contamination found at the other sites" and that "FAG also ignores the fact that TCE was never used at Gulf States or International Paper." The Attorney General stated that "[r]eferences to a TCE detection at the Mid-Con Property as being upgradient from the FAG facility are in error." The Attorney General asserted that hydrologic data collected from "the Newton County TCE investigation and the International Paper remedial action" demonstrate that Silver Creek "acts as a groundwater discharge feature between the Mid-Con and the FAG properties." The Attorney General stated that this Silver Creek discharge feature is reflected in monitoring well data and has been "graphically demonstrated ... by all consultants involved in these investigations ... when groundwater contouring methods, commonly accepted within the scientific community, are used."

In response, EPA has determined that the primary chemical of concern at this site is TCE, along with its transformation products. TCE was detected over its health-based benchmarks (MCL) in the ground water

near the FAG facility more than 60 times, while three of the many other chemicals that FAG discusses (PCE, benzene, and vinyl chloride) were each detected only once over the MCL. In addition, vinyl chloride is a known transformation product of TCE. As discussed in the HRS documentation record at proposal, EPA has investigated contamination at other facilities near the FAG site and at this time they have not been included as potential sources at the site. However, if other sources are identified at a later time they will be addressed. Also, if there are other contaminants that are of concern at a site, that does not undermine the basis for listing this site. The presence of TCE in ground water near the site and the toxicity data for TCE are sufficient to justify listing of Newton County Wells on the NPL at this time. If an RI/FS is conducted and reveals other contaminants at the site, they will be addressed, as appropriate.

3.1.3.9.5 Source 1 - Contaminated Soil in the Vicinity of the Vault

FAG stated that "the Scoresheet erroneously implies that all of the wells sampled in the area of Source 1 (the vault) revealed contamination." Specifically, FAG states that "Well MDNR-4S, which is drilled through the bottom of the former sewerage lagoon and located approximately 2300 feet west of the vault (Source 1), did not reveal any contaminated soil or groundwater."

In response, well MDNR-4S was not used to characterize Source 1. This well is located 2,300 feet west of Source 1 and is within the boundaries of Source 5 (contaminated soil in the vicinity of the former sewage lagoons), on the opposite end of the FAG facility and on the far side of Sources 2, 3, 4, 6, and 7 from Source 1. Therefore, MDNR-4S has not been considered in the description and characterization of Source 1. However, even if this well were included in characterizing Source 1, it would not change the site score. Furthermore, sampling of well MDNR-4S did in fact reveal the presence of TCE in ground water; these data are cited to document the presence of TCE in Source 5 on page 51 of the HRS documentation record at proposal. These comments have no effect on the site score.

FAG stated that wells MDNR-4D, MDNR-5S, and MDNR-5D, are located hydraulically cross gradient and/or upgradient (of the south-southeastern ground water flow direction) from Source 1 and from the Grand Falls Chert zone of the Mississippian aquifer under Source 1. FAG stated that these wells are "completed in the residuum, not in the Mississippian aquifer." FAG concluded that "it is not appropriate to cite or use data from MDNR wells as evidence that the vault (Source 1) is a source of contamination in the aquifer," and that "[t]he closest appropriate downgradient well to use to determine whether Source 1 has impacted the Mississippian aquifer is FAG-10 (completed in the Grand Falls Chert zone of the Mississippian aquifer) which was not contaminated by TCE." FAG also stated that the use of soil samples from GP-22 and GMW-5 to document contamination at Source 1 was misleading because sample GP-22 was collected very close to the location of monitoring well GMW-5. Furthermore, FAG contended that "the contamination found is limited to the approximate 20 foot interval."

In response, the HRS documentation record at proposal does not attribute the hazardous substances detected in ground water samples from wells MDNR-4D, MDNR-5S, and MDNR-5D to Source 1. The HRS documentation record at proposal cites sample data from monitoring well MDNR-4D to document the presence of TCE in Source 5; and TCE and 1,2,-DCE detected in samples from monitoring well MDNR-5D and MDNR-5S are used to document an observed release attributed to Source 2 (see HRS documentation

record at proposal, pp. 21-22). Rather, the HRS documentation record at proposal (pp. 11-14) attributes the observed release of TCE to the shallow karst aquifer at monitoring well GMW-2 to Source 1 and uses ground water samples from GMW-5, soil samples from borings SB-5 and SB-5D, and geoprobe borings GP-22 and GP-19 to document the presence of TCE and its degradation products in Source 1 (see HRS documentation record at proposal, pp. 11- 14).

The Mississippian aquifer is documented in the HRS documentation record at proposal to extend from 0 to 300 feet below ground surface (bgs), as described in Section 3.1.3.6.2, Hydrogeologic Units, of this support document. It is therefore reasonable to consider the TCE contamination detected in samples taken from monitoring well GMW-2, which is screened at a depth of between 18'8" and 25'8" bgs, as demonstrating an observed release to the Mississippian aquifer. The entire depth from 0 to 300 feet bgs is considered part of the Mississippian aquifer, and therefore any release to depths within the range of 0 to 300 is documented as a release to the Mississippian aquifer. Furthermore, since monitoring well GMW-2 is drilled within the boundaries of Source 1 and monitoring well FAG-10 is located approximately 700 feet southeast of Source 1, EPA does not concur that FAG-10 is the "closest appropriate downgradient well to use to determine whether Source 1 has impacted the Mississippian aquifer." The soil and ground water samples collected from source 1 were intended to document TCE contamination at source 1 and not a release to the Mississippian aquifer. Source samples need only demonstrate the presence of a hazardous substance in the source. Other samples are used to document an observed release to the Mississippian aquifer at this site, and they are samples from wells MW-2D, the Switzer residence, the Murphy residence, MDNR-4D, MDNR-5D, and the wells listed in Table 19 in the HRS documentation record at proposal (pp. 84 - 96). However, even if FAG-10 was included in determining whether a release from Source 1 to the Mississippian aquifer had occurred, it would not change the site score. An observed release does not have to be documented at every location, or at every sampling event in order to be scored at a site. A single documented observed release is sufficient to document an observed release at a site, if the data meet HRS standards (HRS Section 2.3, 49 FR 37078, September 21, 1984).

FAG also stated that GP-22 and GMW-5 are located 70 feet west of Source 1 and:

> are located near an underground storage tank (UST) used to accumulate waste water that is 80 feet west of the vault (Source 1). The contamination found near the UST in GP-22 and GMW-5 is likely from the UST, rather than the vault (Source 1) and the data from GP-22 and GMW-5 should not be used to expand the size or diameter of the contaminated soils around the vault (Source 1).

In response, the commenter appears to be mistaken regarding Source 1 characterization. As described in the HRS documentation record at proposal (p. 9), Source 1 comprises an area of contaminated soil in the vicinity of the vault, not the vault itself. Furthermore, the samples cited by FAG are not used to expand the size of the area of contaminated soil around the vault. The area value for the contaminated soil source is assigned a ">0" value in the HRS documentation record at proposal, as contamination was documented to be present in the area, but a volume or area of contaminated soil was not delineated. The UST discussed by FAG is included as part the structure through which TCE waste was transported at the vault, which contributed to the contaminated soil in this area. It cannot be fully known at the time of NPL listing if the ground water contamination in the vicinity of Source 1 originated from the contaminated soil comprising Source 1, from the UST, or from both. If the UST was used solely as Source 1, it would increase the site score, because the

hazardous waste quantity for the UST would be based on the volume of the tank, instead of the estimate of ">0" that is used for the contaminated soil area for Source 1. However, the exact origin of the contamination in this source area does not affect the score for this source, so this comment has no effect on the site score.

3.1.3.9.6 Source 2 - Contaminated Soil in the Vicinity of the Service Building

FAG stated that "contrary to the conclusion in the HRS Scoresheet, contamination detected in groundwater near Source 2 was not in the shallow (Mississippian) aquifer, but in overburden that is isolated from the Mississippian aquifer by more than 100 feet of confining limestone above the Grand Falls Chert." FAG further stated that its 1997 data reveal that a "zone just below the bedrock surface under the contaminated overburden produces small amounts of water that have been documented as uncontaminated in monitoring wells," including wells FAG-17, FAG-19, and FAG-20. FAG further stated that "the HRS Scoresheet presents data from one sampling event at MDNR-5S which revealed contamination, but fails to mention a subsequent sampling event at which no contamination was detected."

In response, regarding FAG's assumption that the ground water contamination near Source 2 is in the overburden and that the overburden is separated from the Mississippian aquifer by a "confining limestone," as described in Section 3.1.3.6.2, Hydrogeologic Units, of this support document, the HRS documentation record at proposal documents that the Mississippian aquifer extends from 0 to 300 feet bgs. As described on pages 23 through 25 of the HRS documentation record at proposal, hazardous substances were detected in soil samples collected from Source 2 at depths ranging from 1.5 to 28.2 feet bgs, and in ground water samples collected from wells near the source at depths of 18.7 and 166 feet bgs. These samples are sufficient to document the presence of hazardous substances in that source, and in shallow and deeper ground water zones of the Mississippian aquifer beneath the source. Therefore, the ground water contamination detected in wells in the vicinity of Source 2 establish an observed release to the Mississippian aquifer.

Regarding the alleged uncontaminated " zone," as described in Section 3.1.3.6.3, Fractured Bedrock, of this support document, there are several reasons why certain samples from this area may not be contaminated, although the majority of samples collected in the vicinity of the FAG facility document TCE contamination. The Mississippian aquifer is documented to be highly fractured and is characterized by karst features that include voids in the bedrock. This aquifer structure can result in the sometimes sporadic detection of contaminants. In addition, the contaminant at this site, TCE, has physical properties that make it move in an unpredictable manner in the subsurface. TCE is not highly soluble in water and does not dissolve evenly in ground water, and is denser than water, which causes it to sink through the subsurface and form pools in subsurface zones. Other factors, such as the sampling technique or method, the season and temperature when the sample was collected, or the sample's holding time can affect a particular sample's results. Therefore, a single uncontaminated sample or the presence of uncontaminated ground water within a certain stratum of the aquifer during a specific sampling event does not contradict the conclusion that hazardous substances have migrated through that stratum at a different location or at a different point in time.

Finally, regarding FAG's assertion that the HRS documentation record at proposal omits mention of a sampling event during which no contamination was detected in well MDNR-5S, Section 2.3 of the HRS

states that an observed release has occurred if a contaminant is measured significantly above background and if some portion of the release is attributable to the site. The TCE release is attributable to FAG Bearings' facility because of their history of use of TCE at the facility, manifests documenting the purchase of approximately 30,000 gallons of TCE, TCE contamination in sources at the site, TCE contamination in soil and ground water at the facility, and employee depositions documenting the usage and release of TCE on the ground at the facility. A trend need not be established (49 FR 37078, September 21, 1984). Thus, new data submitted by a commenter showing the absence of a release do not necessarily refute the earlier data used to assign a value for an observed release because many releases vary in concentration through time or occur sporadically. The courts have upheld EPA's interpretation on this point (see City of Stoughton v. E.P.A., 858 F.2d 747, 756 (D.C. Cir. 1988)). In this case, References 5, 6, 7, 17 24, 27, and 38 in the HRS documentation record at the time of proposal demonstrate an observed release.

FAG stated that "[t]he description of hazardous substances detected in soils comprising Source 2 fails to mention that GMW-1/SB-1 (monitoring well soil boring) and GP-34 (geoprobe boring) are all at the same location and that contamination was found at the same depth in both borings."

In response, EPA disagrees that samples GMW-1/SB-1 and GP-34 were collected from the same location and depth. Rather, GMW-1/SB-1 and GP-34 were collected 50 feet apart and at varying depths (19 to 21 feet bgs and 25 to 28 feet bgs, respectively). The spatial relationships and depths of these samples are demonstrated on pages 23 and 30 and in Figure 6 of the HRS documentation record at proposal. These samples are sufficient to determine that contamination, including TCE, is present at this source location. In addition, the distribution of these sample locations has no effect on the site score, because a single sample can be used to document the presence of a hazardous substance in a source.

FAG stated that "Table 3 of the Scoresheet which details samples collected near Source 2 does not include samples that EPA collected at locations near GMW-1." FAG stated that "the HRS Scoresheet erroneously calculates the area of Source 2" because uncontaminated soil samples GP-4, GP-5, and GP-11 were included within the triangular area of the source defined by sampling points FAG-15, SB-1, and GP-11.

In response, FAG does not specify which "samples that EPA collected at locations near GMW-1" were excluded from Table 3. EPA assumes that FAG refers to sample locations GP-4, GP-5 and GP-11, mentioned above. Contrary to FAG's comment, analysis of soil sample GP-11 did reveal the presence of cis-1,2-DCE at 5 μg/kg, as reported in Table 4 on page 25 of the HRS documentation record at proposal. No soil sample concentrations are reported in Table 3 of the HRS documentation record at proposal because this table presents only ground water sample data. It is true that samples collected from locations GP-4 and GP-5 were not contaminated, but the HRS does not require that contamination occur at every point within a contaminated soil source when calculating the area of that source. In defining a contaminated soil source, Section 5.0.1 of the HRS states, "consider both sampling location(s) with observed contamination from the site and the area lying between such locations to be an area of observed contamination, unless available information indicate otherwise." Such information might include details about site activities that certain areas were not used for activities that might lead to releases of hazardous substances, or the presence of paved area that might have prevented a section of the area from becoming contaminated. In this case, employees testified that TCE was routinely dumped and released in this area, so it is logical to evaluate the entire area between contaminated samples (HRS documentation record at proposal, Reference 9). According to the HRS

Guidance Manual (p. 345), "[i]f the principal mechanism of deposition is spills (e.g., at a loading dock or process area), then generally, the entire area delineated by samples is likely to be subject to observed contamination." The presence of some samples that are not contaminated within the area delineated by contaminated samples does not invalidate the area of observed contamination. The contaminated samples in this area and site history suggest that this area should be more fully investigated as a source to ensure all contamination is identified and removed. Additionally, even if the area of this source were evaluated as unknown but ">0," the hazardous waste quantity value would remain unchanged. Therefore, this comment has no effect on the site score.

3.1.3.9.7 Source 3 - Contaminated Soil in the NW Corner of the Manufacturing Building

FAG stated that "the HRS Scoresheet erroneously concludes that monitoring wells in the vicinity of Source 3 reveal a release to the shallow aquifer." FAG stated that a "zone in the limestones" under Source 3 is not contaminated, as is documented by well FAG-20. FAG stated that the "bedrock below the zone and above the Grand Falls Chert (the water bearing zone of the Mississippian aquifer) does not produce water and adds to the proof ... that the overburden and Mississippian are not one unit, but are hydrologically separate."

In response, regarding FAG's assumption that the ground water contamination near Source 3 is in the overburden and that the overburden is hydrologically separate from the Mississippian aquifer, as described in Section 3.1.3.6.2, Hydrogeologic Units, of this support document, the HRS documentation record at proposal documents that the Mississippian aquifer extends from 0 to 300 feet bgs. As described on pages 34 and 35 of the HRS documentation record at proposal, hazardous substances were detected in soil samples collected from Source 3 at depths ranging from 2 to 25 feet bgs. These samples are sufficient to document the presence of hazardous substances in Source 3. Furthermore, since Source 3 was documented to have incomplete containment (i.e., no liner), as stated on page 33 of the HRS documentation record at proposal, Source 3 may have contributed to the shallow ground water contamination detected in wells in the vicinity of the source.

Regarding the alleged uncontaminated "zone," as described in Section 3.1.3.6.3, Fractured Bedrock, of this support document, the Mississippian aquifer is documented to be highly fractured and is characterized by karst features that include voids in the bedrock. This condition results in sometimes sporadic detection of contaminants. Therefore, the presence of uncontaminated ground water in a sample taken within a certain stratum of the aquifer during a specific sampling event does not negate the observed release that has been established in shallower and deeper units of that aquifer.

FAG stated that "the Scoresheet's discussion of hazardous substances associated with Source 3 relies only upon results of samples from geoprobe and monitoring well borings that are immediately adjacent to each other with contamination at the same depth." FAG concluded that, because "[t]here is no discussion of results above or below this interval or in any direction from this location ... identification of the source is determined based upon one discrete sampling location."

In response, pages 38 and 39 of the HRS documentation record at proposal confirm that sample locations GP-36, SB-4, and KVA-2B are in relatively close proximity to one another (i.e., less than 40 feet apart) and that they are arranged in a linear fashion. For this reason, Source 3 is conservatively assigned a source hazardous waste quantity value of ">0" based on its area (Tier D). Page 38 of the HRS documentation record at proposal also states that "the vertical boundaries of contaminated soil are not well-defined and insufficient to evaluate volume [Tier C] for Source 3." However, page 35 of the HRS documentation record at proposal does indicate that soil samples were collected at depths ranging from 2 to 25 feet bgs at locations GP-36, SB-4, and KVA-2B. Therefore, these samples document the presence of hazardous substances in more than "one discrete location."

3.1.3.9.8 Source 4 - Contaminated Soil at the Concrete Pit in the Vicinity of the Manufacturing Building

FAG stated that the "Scoresheet" incorrectly implies that the TCE contamination in Source 4 is due to the "disposal of sediments from a separator adjacent to the service building." FAG stated that it is not known how TCE could be present in the sediment from the separator since the separator was not built until the early 1980s and TCE was not used at the facility after 1981.

In response, the documentation cited in the HRS documentation record at proposal supports the conclusion that the separator waste contained TCE. Page 11 of Reference 5, a report on the Subsurface Environmental Investigation for FAG Bearings, states that:

> In the early 1980's the sump was re-plumbed to discharge to a separator.... The separator discharged to the small discharge pond.… The purpose of the sump was to provide a collection point for process fluids (TCE, cutting oils, kerosene, etc.) which were released as a result of equipment failures occurring in the service building.

Despite the limited time frame during which the separator existed and TCE was used at the facility, evidence indicates that there is an overlap in time between the construction of the sump and TCE usage. The method of deposition of TCE in this source is not relevant to the site score, because it is documented to be present in the source. Evidence also suggests that TCE and its degradation products have come to be located in Source 4 from processes at the facility, as described on pages 41 through 45 of the HRS documentation record at proposal and according to former employees (Reference 5, p. 11). This evidence includes soil boring samples SB-3 (from 5 - 7 feet, and 9 - 14 feet) and GP-38, which contained TCE at concentrations ranging up to 2,300 μg/kg and cis-1,2-DCE at concentrations ranging up to 2,900 μg/kg. Therefore, the conclusion that TCE wastes were present in the separator and were disposed in the concrete pit at Source 4 is appropriate (HRS documentation record at proposal, p. 41).

FAG stated that the HRS documentation record at proposal "incorrectly relies upon the detection of TCE in a well screened in the overburden (GMW-3) to demonstrate a release to the Mississippian aquifer."

In response, as described in Section 3.1.3.6.2, Hydrogeologic Units, of this support document, the HRS documentation record at proposal documents that the Mississippian aquifer extends from 0 to 300 feet bgs. Therefore, samples from GMW-3 (screened between 20'8" and 30'5" bgs) are appropriate to document an observed release of TCE to this aquifer. Even if samples from GMW-3 could not be used to document an observed release, TCE and its degradation products have been documented in an observed release to other monitoring and residential wells screened in the Mississippian aquifer (as described on pp. 92 and 105-132 of the HRS documentation record at proposal). Because TCE and its degradation products are present in Source 4 and because Source 4 is not completely contained (e.g., the source is not enclosed to prevent hazardous substances from leaking from the source see HRS documentation record at proposal, pp.41- 45), any of these releases of TCE is at least partially attributable to Source 4 (HRS Section 2.2.2, 2.3, Table 3-2).

3.1.3.9.9 Source 5 - Contaminated Soil in the Vicinity of the Former Sewage Lagoons

FAG stated that "[o]nly very low levels of soil contamination were detected, and no water bearing zones were encountered" while drilling wells in the vicinity of Source 5. FAG stated that "[t]he contamination observed at Source 5 was not found deeper than 15 feet in the soils and was not continuous in nature." FAG characterizes this contamination by stating that "[t]he highest TCE concentration in soil was only 3.14 ppb; the highest vinyl chloride concentration was 59.2 ppb ... and the highest DCE concentration was 10.2 ppb." FAG concluded that "[t]hese levels do not support a major source area in the former lagoons (Source 5) and cannot be used to explain the TCE levels found in the residential wells directly to the south of the lagoons, nor in monitoring wells MDNR 4S and 4D in the lagoon area."

In response, TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride were detected in soil samples from Source 5. The concentrations of each of these substances were above the detection limits for the sample analyses, as summarized on page 53 of the HRS documentation record at proposal. These substances are not naturally occurring and are attributable to site processes, as described on page 52 of the HRS documentation record at proposal. Also, activities at the site involved deposition of hazardous substances in the lagoons (Findings of Fact, p. 10). Therefore, these samples are adequate to determine the presence of hazardous substances in a source for HRS scoring purposes (see HRS Section 2.2.2 and Table 2-3). In addition, because Source 5 was incompletely contained, (that is the source is not enclosed to prevent hazardous substances from leaking from the source), contamination from this source (including TCE) may indeed have migrated to the nearby monitoring wells and the residential wells directly to the south of the site. The HRS documentation record at proposal does not imply, however, that all of the contamination detected in the residential wells originated specifically from Source 5.

FAG stated that "the Scoresheet incorrectly relies upon the detection of TCE in MDNR-4S and MDNR-4D to demonstrate a release of contaminants to the shallow aquifer." FAG stated that "these wells were completed in the overburden, not in the Mississippian aquifer."

In response, as described in Section 3.1.3.6.2, Hydrogeologic Units, of this support document, the HRS documentation record at proposal documents that the Mississippian aquifer extends from 0 to 300 feet bgs. Therefore, samples from MDNR-4D (screened between 176 and 196 feet bgs) and MDNR-4S (screened between 135 and 155 feet bgs) are appropriate to document an observed release of TCE to this aquifer in the

vicinity of Source 5. MDNR file materials contain sampling data from MW-4D on at least two occasions. No VOCs were detected during the July 6, 1992 sampling event (sample number 92-6906). Toluene (98.3 ppb) and TCE (13 ppb) were detected in the ground water sample collected from MW-4D on April 30, 1993 (sample number 93-2112).

FAG stated that:

> the discussion of the sampling results from MDNR-4D is extremely confusing. The writer first states that FAG's contractor obtained an analytical result of 0.62 ug/L of TCE from MDNR-4D (this concentration is not included on HRS Table 7) and then states that FAG's contractor obtained an analytical result of 74.73 ug/L of TCE from MDNR-4D (this result is included in HRS Table 7). Apparently, since MDNR chose not to analyze its split sample from MDNR-4D during the first sampling FAG's results were not included in the analysis of this source. There are references to 0.62 ug/L of TCE being detected in a water sample, but no datasheets documenting the result have ever been located by FAG and others. It is uncertain what was actually sampled.

In response, there is a typographic error on page 50 of the HRS documentation record at proposal. According to pages 59 and 62 of Reference 16 of the HRS documentation record at proposal (a report from FAG's contractor), the 0.62 ug/L TCE result was obtained from well MDNR-4S, not from well MDNR-4D. This error has been corrected and a citation to Reference 16 has been added to page 50 of the HRS documentation record at proposal. The sample data have been added to Table 7, on page 51 of the HRS documentation record at proposal. These changes have no effect on any HRS factor or the overall site score.

3.1.3.9.10 Source 6 - Small Cooling Tower Pond and Source 7 - Large Cooling Water Pond

FAG objected to the classification of Sources 6 and 7, the small and large cooling ponds, as sources in the HRS documentation record at proposal. FAG stated that the HRS definition of a source is "any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance," but excludes "those volumes of ... surface water, or surface water sediments that have become contaminated by migration...." FAG stated that the low levels of TCE contamination detected within Sources 6 and 7 "could not have been the result of the direct deposition or placement of these materials, but must have been caused by migration of contamination from elsewhere." Therefore, FAG reasons that the ponds are surface water bodies and not "sources" as defined in the HRS. FAG concluded, however, that eliminating the two ponds as sources in the HRS documentation record at proposal would not affect the hazardous waste quantity factor value or the site score because a default value of 100 would be assigned based on the presence of Level I targets.

The Attorney General also noted that even if the waste characteristics score for all sources was reduced to a value of 18, the site would still qualify for the NPL based on the number of drinking water targets.

In response, Source 6, the small cooling water pond, has been appropriately evaluated as a source because there is sufficient evidence to conclude that hazardous substances have been "deposited, disposed, or placed" into the pond. Employees testified that liquids containing TCE were dumped into the sump at the western end of the service building (HRS documentation record at proposal, Reference 9). As described in Reference 5, page 11, waste from the sump in the service building (near Source 2) was discharged to Source 6. Therefore, waste containing TCE that was disposed in the sump also would have been discharged to Source 6.

Similarly, EPA has appropriately evaluated Source 7, the large cooling tower pond. As is documented in the HRS documentation record at proposal (p. 41), former FAG employees stated that TCE was used in the main manufacturing building for degreasing activities, and TCE from those activities was dumped into a sump that discharged to a separator located east of the service building. Solid wastes from this separator were then dumped into a concrete pit at the southeast corner of the manufacturing building. As shown in Figure 9 of the HRS documentation record at proposal, Source 7 received waste from an outfall leading from the concrete pit (near Source 4) at the southeast corner of the main FAG manufacturing building. Therefore, any TCE deposited in the concrete pit would have drained into the large cooling pond. As documented in Reference 8 (p. 21) of the HRS documentation record at proposal samples collected from inflows into the large cooling pond contained TCE. Reference 8 (p. 64) shows a diagram of the inflows from the FAG facility buildings to the cooling ponds.

Furthermore, based on the above descriptions, both Source 6 and Source 7 meet the definition of a surface impoundment. A surface impoundment is defined as a source type in the HRS, and is therefore not considered to be a surface water body that is vulnerable to contamination (HRS Table 3-2, HRS Guidance Manual, p. 43). According to the HRS Guidance Manual (p. 43), a surface impoundment is a "topographic depression, excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold accumulated liquid wastes, wastes containing free liquids, or sludges ... structures that may be more specifically described as lagoon, pond, aeration pit, settling pond...."

EPA agrees with the commenters that eliminating Sources 6 and 7, the large and the small cooling water ponds, would not affect the hazardous waste quantity factor value or the overall site score. The HRS states (Section 2.4.2.2) that if any Level I or Level II targets exist for a site, one should assign the hazardous waste quantity from HRS Table 2-6 or a value of 100, whichever is higher. Therefore, based on the presence of site-attributable TCE in drinking water wells at concentrations exceeding health-based benchmarks, the minimum hazardous waste quantity value for this site is 100.

3.1.3.10 Targets

FAG noted that:

> [i]n considering potentially affected targets at the Site, the HRS Scoresheet erroneously double counted certain residences and improperly scored the Site as a karst aquifer... 77 of the Water Company's service connections are associated with residences in Silver Creek and Saginaw which the Scoresheet includes as Level I and Level II target populations.... These 77 service connections should have been subtracted from the total before performing the

apportionment calculations. As such, the correct effective population served should have been 5,622 (21,624 connections x 2.6 persons/connection x 10% groundwater).

FAG continued:

> [s]ince the Missouri American Water Company wells are tapping the deeper, Ordovician aquifer which is a non-karst aquifer, the 'non-karst' portion of Table 3-12 should have been utilized. (HRS Scoresheet at 134; see Section V(A) above). Using the 3,001-10,000 population range and the 3-4 mile distance category in the 'non-karst' portion of this table, a distance-weighted target value of 417 should have been assigned for the potentially affected population served by Missouri American Water Company. As such, a PC of 42 (417÷10) should have been used for the potentially affected population.

FAG concluded:

> [t]he overall effect of the errors in scoring the potentially affected target values reduces the Site's target factor from 1,733 to 1,514. Using this corrected value results in an uncapped groundwater pathway score of 322 versus 369 as presented in the HRS Scoresheet. Since the individual pathway scores are capped at 100.0, the Site would still receive the maximum groundwater pathway score of 100.0 and an overall Site score of 50.0. Even though these errors do not change the ultimate result, they reveal that EPA failed to consider the complex geology in the Area.

In response, the commenter is correct in that there is a calculation error in evaluation of potential targets, but it does not affect the pathway or site score for this site. The HRS documentation record at proposal has been revised to reflect the corrected targets values. However, the commenter is incorrect in stating that this error reveals that EPA did not consider the complex geology in the area. This error occurred simply because some wells that were contaminated at concentrations above health-based benchmarks were scored separately as Level I and Level II targets, and therefore should have been subtracted from the remaining population value that was scored as potentially contaminated. This error is not related to an evaluation of the geology in the area. With regard to the commenter's statement that EPA improperly scored the aquifer as a karst aquifer, see Section 3.1.3.6.4, Karst Terrain, of this support document.

FAG commented:

> [i]n discussing targets affected by the Site, the Scoresheet mistakenly concludes that 'No aquifer discontinuities of a geologic, topographic or other structure/feature are known to exist within the 4 mile groundwater target distance limit. Some geologic, topographic and structures/features present may increase groundwater movement. (Reference 8, p. 14).' (HRS Scoresheet at 82.) This is simply incorrect. As discussed in Section V.A and Appendix A, there are significant geologic features located in the Area north of FAG Bearings that represent significant recharge areas into the Mississippian aquifer.

In response, the HRS documentation record at proposal does not discuss recharge areas for the aquifer in the section on aquifer discontinuities. In the HRS, aquifer discontinuities consist of geologic or topographic features that entirely transect the aquifer under evaluation, preventing the migration of contamination from one aquifer or formation to another. Examples of aquifer discontinuities include geologic faults or a large river, if the river entirely bisects the aquifer under evaluation and would therefore prevent contamination from migrating to some part of the aquifer (see HRS Guidance Manual, Section 7.1). There is no evidence for the presence of an aquifer discontinuity preventing the transport of contamination across the 4-mile target distance limit (TDL) around this site. Moreover, the commenter does not state which aquifer discontinuity is believed to be present in the TDL or which wells would be protected from contamination by this discontinuity. The commenter does not provide any evidence supporting the assertion of a hydrologic discontinuity. This comment has no effect on the site score.

3.1.4 Conclusion

The original score for the Newton County Wells site was 50.00. Based on the above response to comments, the site score remains unchanged. The final score for the Newton County Wells site is:

Surface Water	Not Scored
Ground Water	100.00
Soil Exposure	Not Scored
Air Pathway	Not Scored
HRS Site Score	50.00

REGION 8

4.1 International Smelting and Refining

4.1.1 List of Commenters

NPL -U28-3-13-L1-R8	Comment dated July 22, 1999 from Richard O. Curley, Jr., of Arnold & Porter, representing ARCO Environmental Remediation, L.L.C.
NPL-U28-3-13-L2-R8	Comments dated October 1, 1999 from Richard O. Curley, Jr., of Arnold & Porter, representing ARCO Environmental Remediation, L.L.C.
NPL-U28-5-13-R8	Correspondence dated March 8, 1999 from Governor Michael O. Leavitt of Utah.
NPL-U28-5-14-R8	Correspondence dated June 17, 1999 from David Evans, Director, State, Tribal & Site Identification Center, EPA.

4.1.2 Site Description

The International Smelting and Refining (ISR) site is located on the west flank of the Oquirrh Mountains near the mouth of Pine Canyon, approximately 2 miles northeast of Tooele, in north central Utah. The canyon is drained by Pine Creek, which flows over an alluvial fan at the mouth of the canyon. The smelter and distal tailings ponds were located on the alluvial fan. Copper smelting began in 1910 under the ownership of ISR, with a capacity of 4,000 tons of copper ore per day. Two years later copper ore supplies declined and ISR built a lead smelter. In 1915, Anaconda Copper Company purchased the ISR subsidiary. Over several years the owners added a lead-zinc sulfide flotation mill and a slag treatment plant for lead and zinc recovery. Copper production ceased in 1946, when the copper smelter closed. Lead smelting ceased in early 1972 and the site was reclaimed in 1986. An estimated 650,000 tons per year of tailings, slag, and flue dust were produced during the early years of operations at the ISR site.

Historic livestock deaths associated with smelter operations in the area of the site have been attributed to arsenic, lead, and sulfuric acid poisoning. The State of Utah Department of Environmental Quality, through personal communication, also documented 20 cattle deaths due to cadmium poisoning. During a 1985 site inspection, EPA noted dust blowing off tailings. Emissions of metal-containing smoke and acid gases were reported during ISR operations.

The site comprises about 1,200 acres. Site sources consist of approximately 330 acres of tailings, 27.5 acres of metals-contaminated slag, 13 acres of settlings ponds, 50 acres of landfills, and 125 acres of smelter wastes

associated with the site operations. Investigations indicate the presence of arsenic, cadmium, copper, lead, mercury, and zinc in contaminated soils, tailings, and slag.

In 1985, a consultant completed a Reclamation/Stabilization Plan (RSP) for the Carr Fork and ISR sites. Samples were collected from wells and springs down-gradient of the ISR property, and from many on-site and off-site soils and tailings, waste piles, and dumps. This investigation noted arsenic and lead concentrations in ground water and surface water samples that exceeded maximum contaminant levels (MCLs) for drinking water.

In 1986, reclamation work included adding 6-8 inches of topsoil and lime, re-seeding and construction of erosion, sediment, and drainage controls over much of the site, including ISR tailings and the slag pile in Pine Canyon. The dump did not receive any additional soil cover during reclamation.

The State of Utah performed an Expanded Site Inspection (ESI) in 1996. The ESI Analytical Results Report indicates that soil caps overlying numerous source areas are eroding or are poorly vegetated. The source areas do not have containment features and numerous tailings piles are deposited along the banks of Dry Creek, an ephemeral drainage on the south side of the site, and Pine Creek. Data from the ESI indicate observed release concentrations of several metals in samples collected from soil, surface water, and ground water.

Soils in Lincoln (currently named as the town of Pine Canyon), Utah have been affected by emissions from the site. A 1985 EPA study documented dust blowing off of tailings piles and during the 1995 Division of Environmental Response and Remediation Expanded Site Inspection (DERR ESI), children were observed playing on bare soils. The site is accessible and used for recreation by off-road motorcyclists and all-terrain vehicle users. The area surrounding and including the ISR site was designated the "Carr Fork Reclamation and Wildlife Management Area" in 1994.

4.1.3 Summary of Comments

Governor Michael O. Leavitt of Utah supported the addition of the ISR site to the NPL.

Richard O. Curley, Jr. submitted comments on behalf of ARCO Environmental Remediation, L.L.C. (AERL) objecting to EPA's proposal to list the International Smelting and Refining site on the NPL. Mr. Curley, hereafter referred to as AERL, stated that EPA's listing of the ISR site is inconsistent with EPA policy and that numerous material errors occur in EPA's HRS scoring package. According to AERL, the site has been reclaimed and the current site score is significantly higher than the original site score. AERL concluded that EPA's scoring of ISR significantly overstates the risk posed by the site and "EPA's proposal to list the site on the NPL is inconsistent with EPA policy and the express requirements of CERCLA and the NCP, and is arbitrary and capricious and otherwise not in accordance with the law."

AERL also added that all of the data relied on by EPA to support its proposal to list the ISR site fail to meet EPA's own quality assurance/quality control (QA/QC) protocols. AERL also contended that EPA evaluated an observed release to surface water based on flawed background samples and that the observed release does not represent the other influences on Pine Creek. Commenting on the soil exposure pathway, AERL stated that EPA should have evaluated the nearby population threat instead of the residential threat because the residents of Lincoln do not reside on Source 1. AERL presented its own scoring scenario for ISR in which it concluded that the site score should have been 16.03.

Although Lincoln, Utah has been renamed Pine Canyon, Utah, throughout AERL's comments and EPA's responses, Lincoln, Utah will be used to refer to this town.

4.1.3.1 Defer Listing

AERL stated that EPA should defer listing this site because AERL is ready to voluntarily work with EPA and the Utah Department of Environmental Quality (UDEQ) to address any risk posed by this site. Listing this site, according to AERL, is inconsistent with EPA's policy to defer from the NPL sites that are otherwise being addressed and would waste EPA's scarce Superfund resources. AERL referred to EPA's *Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions*, OSWER Directive 9375.6-11 (1995).

AERL also stated that during the summer and fall of 1999, it was prepared to do additional response work to supplement its 1985 - 1987 reclamation activities and its 1998 maintenance of the reclamation[2]. AERL then contended that given that its response action proposal satisfies the major substantive requirement and spirit of EPA's deferral guidance, EPA should exercise its discretion and agree to defer listing the ISR site on the NPL.

In response, EPA has placed the ISR site on the NPL because the site score was sufficient to warrant listing. The mandate of CERCLA Section 105 (a)(8)(A) required the establishment of criteria for determining priorities among releases or threatened releases; the Agency listed three methods in the NCP by which releases may be determined eligible for the NPL. As one of the three methods for placing a site on the NPL, the NCP at 40 CFR 300.425(c)(1) states that a release may be included on the NPL if "[t]he release scores sufficiently high pursuant to the Hazard Ranking System as described in Appendix A to this part (40 CFR

[2]AERL stated that it is prepared to undertake the following nine additional responses: (1) sample surface water, sediments and soil at the site; (2) conduct a risk assessment; (3) maintain existing caps; (4) conduct evaluation on whether there is a need to reclaim other parts of the site; (5) design a reclamation plan to address issues related to the slag pile and Pine Creek and its riparian zone; (6) work on improving wildlife habitat within the Carr Fork Reclamation and Wildlife Management Area; (7) develop a plan to address off-site issues related to sampling and risk assessment; (8) develop a revised surface water management plan which meets wildlife enhancement goals, reclamation goals, and allows appropriate off-site water use; and (9) draft a plan for long-term monitoring and maintenance of the caps in place at the ISR site.

Part 300.425)." As indicated in the HRS documentation record for the ISR site, the site scored 58.31, which is well above the HRS cutoff score of 28.50 (page 1 of HRS documentation record; 55 FR 51569 (December 14, 1990)).

In addition, the ISR site has scored the maximum score for the soil exposure pathway and the environmental threat component of the surface water overland/flood migration pathway. Extensive deposits of slag and tailings are located throughout the site. The site score of 58.31 is based on documented observed releases to Pine Creek and residential and terrestrial sensitive environments within areas of observed contamination. Concentrations of metals in the surface water sediment observed release samples are as high as 2,244 mg/kg (copper) and 1080 mg/kg (zinc). Contaminated residential soils have been documented above EPA's benchmark for arsenic, cadmium, copper, lead, and zinc; residents residing at these properties have been evaluated as Level I targets. Also AERL's responses focus on studies, risk assessment, and management plan development rather than addressing the remediation of contaminated soils and surface water (See footnote 1).

As evidenced by the HRS score and the contamination and releases at this site, this site fulfills the recommendations set forth in EPA 1992 *Guidance on Setting Priorities for NPL Candidate Sites.* This guidance states that high priority should be given to sites where people are currently exposed to hazardous substances; where actual contamination has been documented, especially at or above a health-based benchmark; where contamination to a sensitive environment or fishery has been documented; and where the State has recommended the site be listed on the NPL.

A more precise assessment of the risk posed to these targets and of the need for remedial response will take place during the remedial investigation/feasibility study (RI/FS) and record of decision (ROD) stage of the evaluation process. If at that time the Agency determines that no further actions are warranted, the site may be removed from the NPL. Until that time, however, based on the HRS evaluation, the Agency considers it reasonable to proceed with the listing process.

Regarding AERL's comments on EPA's *Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions*, the purpose of this policy is to defer to States sites that the **State wants** deferred. As evidenced by a letter dated March 8, 1999, from Governor Michael O. Leavitt of Utah (NPL-U28-5-13-R8), the State supports the placement of the ISR site on the NPL and did not express interest in having the site deferred to it. Moreover, placement on the NPL does not preclude AERL from undertaking any of the additional response activities mentioned in its comments.

4.1.3.2 Degree of Risk

AERL commented that "the fundamental problem with EPA's proposal" is that it fails, as required by CERCLA, to "accurately assess the relative degree of risk to human health and the environment. . . ." posed by the site. AERL contended that this is apparent from the fact that EPA proposed a score of 58.31 for this site although it is largely reclaimed and is in a remote, sparsely populated location. AERL noted that its HRS

score approaches or exceeds that of Love Canal, Rocky Mountain Arsenal, and Rocky Flats. According to AERL, the risks posed by the ISR site do not "even remotely approach those posed by these other sites."

AERL stated that although Love Canal, Rocky Flats, and Rocky Mountain Arsenal were scored using the original HRS rather than the current HRS, this cannot justify a score for ISR that ranks it among the worst NPL sites in the country[3]. Citing the preamble to the current HRS, AERL stated that the "cutoff score for the revised HRS [should] be functionally equivalent to the current cutoff score of 28.5" and that EPA evaluated the "functional equivalence" of the original and current HRS scores by statistical analysis to determine what revised HRS score best corresponds to 28.5. AERL contended that, "given its [EPA's] own finding of functional equivalence between scores generated by the original and the current HRS Rules, EPA cannot explain away the anomaly of assigning a HRS score of 58.31 to the ISR site by pointing to the differences between the original and the current HRS rules."

AERL asserted that the absence of an explanation of the conflicting scores is contradictory to guidance and the standards established by the D.C. Circuit Court of Appeals. AERL contended that EPA must explain the conflict between its earlier score of 9.27 in 1985 and the present score of 58.31 according to the "standard established by the D.C. Circuit Court of Appeals." The standard according to AERL is represented by the following statement: "While we do not require the EPA's listing decisions to be perfect, or even the best, see City of Stoughton, 858 F.2d at 756, we do require that they not be arbitrary or capricious." Kent County v. EPA, 963 F.2d 391, 394 (D.C. Cir. 1992). Moreover, the D.C. Circuit has overturned proposed listings in the past where EPA failed to explain or justify its decision. See Anne Arundel County v. EPA, 963 F.2d 412, 416 (D.C. Cir. 1992). Finally, AERL cited EPA's *HRS Guidance Manual* as suggesting that "any preliminary HRS scoring results (e.g., PA score results) should be reviewed as a means of generating hypotheses about which pathways and factors are likely to be most significant in scoring the site."

In response, EPA finds that the present HRS score for the ISR site is reflective of a site that warrants placement on the NPL for further investigation. As stated in CERCLA Section 105, Congress required that EPA revise the HRS such that it "accurately assesses the *relative* degree of risk to human health and the environment posed by sites and facilities subject to review (emphasis added)." In so doing, the current HRS became EPA's primary tool for placing hazardous waste sites on the NPL. As the primary method for placing sites on the NPL, the HRS is intended to measure "relative" rather than absolute risk and consequently has been designed so that it may be consistently applied to a wide variety of sites. It is beyond the scope of the HRS, as a screening tool, to provide quantitative risk assessment evaluations.

[3]In comparing the scores of ISR to Love Canal, AERL noted that the ISR site score is 6 points higher than the Love Canal site score. AERL contended that at Love Canal more toxic wastes were present and homes and an elementary school were built directly over a chemical waste facility. Similarly, AERL noted that the Rocky Mountain Arsenal site score was a slightly lower score than the ISR site score, and the Rocky Flats site score is only 6 points higher.

Although EPA has found that the ISR site poses sufficient risk to warrant placement on the NPL, EPA did not establish the site score of 58.31 as a measure of absolute risk. On the contrary, EPA stated the following in the preamble to the HRS:

> Because the HRS is intended to be a *screening* system, the Agency has never attached significance to the cutoff score as an indicator of a specific level of risk from a site, nor has the Agency intended the cutoff to reflect a point below which no risk was present. The score of 28.5 is not meant to imply that risky and non-risky sites can be precisely distinguished. Nevertheless, the cutoff score has been a useful tool that has allowed the Agency to set priorities and move forward with studying and, where appropriate, cleaning up hazardous waste sites. The vast majority of sites scoring above 28.5 in the past have been shown to present risks (emphasis added) (55 FR 51569 (December 14, 1990)).

The preamble to the HRS also explains that in EPA's analysis of establishing the current HRS cutoff score, EPA scored 110 sites using both the original and the revised HRS. Data from this analysis showed that few sites scored between the range of 25 to 30 with the revised HRS and that the sites scoring above that range are clearly the types of sites that the Agency should capture with a screening model. Moreover, "[b]ecause the analysis did not point to a single number as the appropriate cutoff, the Agency has decided to continue to employ 28.50 as a management tool for identifying sites that are candidates for the National Priorities List." [55 FR 51569 (December 14, 1990)] A comparison of the ISR site score to other sites, for example Love Canal (52.2), only indicates that both of these sites warrant placement on the NPL for further CERCLA action; site scores are not a measure of the absolute level of risk posed by one site as compared to another site.

Under SARA, Congress required that EPA amend the HRS to more accurately assess the relative risk posed to human health and the environment by sites subject to review. EPA responded by adding the soil exposure pathway and the environmental threat of the surface water pathway. The soil exposure pathway, which is assigned the maximum score of 100 in this evaluation of the ISR site, was not a component of the original HRS site score (47 FR 31219; pages 6 and 7 of the HRS documentation record). In addition, the hazard posed to environmental targets received only minimal attention in the original HRS and is more heavily weighted in the revised HRS. At the ISR site, this threat received the maximum score of 60 based on the presence of state land designated for wildlife or game management (see pages 5 and 62 of the HRS documentation record as proposed). Also, although AERL compared the present ISR HRS score with that of Love Canal, which was scored under the original HRS, AERL failed to consider that Love Canal, like ISR, would score differently under the revised HRS because, as stated earlier, the original and the revised HRS are different. Furthermore, EPA's analysis of the functional equivalency of the original and the revised HRS was limited to the evaluation of the cutoff score; it found that for both the original and the revised HRS, 28.50 as a cutoff score was a useful ". . . management tool for identifying sites that are candidates for the National Priorities List." [55 FR 51569 (December 14, 1990)] As stated previously, because EPA's analysis did not reveal a specific cutoff score or a reason to change, EPA continued to use the original cutoff of 28.50. Moreover, to the extent that AERL's comment questions the adequacy of the HRS and its ability to adequately measure relative risk, AERL's comment is beyond the scope of this rulemaking; the current HRS was finalized on December 14, 1990 (55 FR 51532, (December 14, 1990)).

4.1.3.3 Data Review

AERL commented that it reserves the right to comment further on data issues after it receives the CLP data validation documents it had requested from EPA. AERL also noted that EPA claimed that it did not have the data validation documents until three days before the closure of the comment period. AERL stated that although EPA failed to provide the complete contract laboratory program (CLP) data validation document before the close of the comment period, EPA refused to extend the comment period to allow AERL reasonable time to review and comment on the complete CLP data validation package. AERL submitted Appendix A, a letter dated July 21, 1999, from Richard O. Curley, Jr., of Arnold & Porter, to David Williams and David Evans of EPA requesting the "CLP documentation" and an extension beyond July 22, 1999 so that it may review the analytical data.

In correspondence dated October 1, 1999, AERL stated that it received voluminous CLP documents from EPA on August 5, 1999, and that it provided additional comments based upon its review of the documents. AERL stated, "[t]hese supplemental comments are submitted within sixty days of AERL's receipt of EPA's CLP documentation and AERL respectfully requests that EPA consider and respond to its supplemental comments . . ."

In response, all late comments received on the ISR site were considered by the Agency, as discussed below.

4.1.3.3.1 Overall Data Quality

AERL submitted comments that they indicated affected portions of the overall data and individual samples. This part of Section 4.1.3.3 will address AERL's more comprehensive comments on data quality. These include the assignment by the validator of the "precision not determined" (PND) and "recovery not determined" (RND) qualifiers to nearly all data used in the evaluation of this site. AERL also contended that EPA's observed release is based on surface water and sediment data that failed EPA's QA/QC requirements. The commenter stated EPA provided no explanation of how it could be appropriate to use data qualified as PND and RND. According to AERL, the data validator should have flagged the data "R," and designated them as "unusable for HRS scoring purposes."

AERL stated that the data relied on by EPA (1) failed to meet EPA's QA/QC protocols, (2) are flawed to the extent that magnitude or direction of the bias is unknown, and (3) cannot be adjusted with any certainty. In its supplemental comments dated October 1, 1999, AERL commented that all of the data except eight soil samples and four lysimeter samples were assigned a qualifier or footnote of PND or RND. According to AERL, PND and RND are not official EPA data validation qualifiers nor are they standard terminology used by quality assurance professionals, and that the report contained no explanation or discussion of the reason for assigning these qualifiers. Additionally, AERL noted that although matrix spike and laboratory duplicate

results were missing for several of the data packages, the PND and RND qualifiers were assigned to almost all of the data and not just to those data packages for which there were no matrix spike and no laboratory duplicate results.

AERL claimed to have reviewed the data for consistency with the CLP SOW and national functional guidelines. It noted that Section V of the Contract Laboratory Program Statement of Work (CLP SOW) lists "13 operations that are 'minimum QA/QC operations necessary to satisfy the analytical requirements of the contract.' U.S. EPA ILM 03.0 at P. E-14." In discussing matrix spike and duplicate analysis, which are addressed in sample-specific detail below, AERL stated that these analyses are "an inherent part of the CLP method" and need not be requested when submitting samples for CLP analyses because they are required. It indicated that this is a "key" issue in the data used in the site scoring.

In response, the data used to evaluate the ISR site are of adequate quality for the purpose of placing this site on the NPL despite some irregularities in the sampling and analysis, which were recorded and explained by the laboratory. AERL makes several erroneous assumptions in its comments on data quality. First, AERL is mistaken in its apparent assumption that the HRS requires that data used to list sites under CERCLA be generated within the CLP and that CLP documentation is required for the analytical data. The HRS specifically allows for the use of non-CLP data in Table 2-3, *Observed Release Criteria for Chemical Analysis* [HRS Section 2.3, *Likelihood of release*]. According to HRS Table 2-3, 'If the sample analysis is not performed under the EPA Contract Laboratory Program, use the detection limit (DL) in place of the SQL [sample quantitation limit]." There is no requirement in the HRS that CLP data be used to support the listing of all sites on the NPL if data of adequate quality are available from other sources. In fact, in the absence of other conflicting data, the Agency frequently uses data developed by various state programs as well as data developed by PRPs when the data are of sufficient quality to meet the limited purposes of the HRS to characterize sources and evaluate releases from sites being considered for the NPL.

Second, AERL is mistaken in its assumption that the data for this site were analyzed as part of the CLP. Although the data were evaluated with CLP guidance, the analytical data forms indicate that the data were not produced by a CLP laboratory. Third, AERL is in error when it assumes that the data are unreliable unless all QA/QC recommendations in the SOW for the method are followed.

Concerning the use of the "PND and the "RND" qualifiers in UDEQ'S 1997 *Analytical Results Report, Anaconda Copper-Carr Fork Site* (Reference 8 of the documentation record), these qualifiers were assigned to assess the usability of the data for purposes other than NPL listing. These data were collected by the Utah Division of Environmental Response and Remediation for an Expanded Site Inspection and limited remedial investigation (page 14 of HRS documentation record). According to Reference 8, data were reviewed according to the guidelines used for removal investigation quality control/quality assurance, in the interim final *Quality Assurance/Quality Control Guidance For Removal Activities*, OSWER Directive 9360.4-01, April 1990. This document states that the PND qualifier is applied to data if a minimum of eight replicates were not analyzed. Likewise, the RND qualifier is applied to data if at least eight spike replicates for the matrix of interest were not analyzed at the required frequency. In its introduction of Part II, *Data Validation Procedures*, the directive states that it was "developed for the Emergency Response Division's (ERD) use

and is not intended to supercede the guidance documents developed for CLP data validation used for remedial activities." Therefore, this directive and these criteria are not relevant to the usability of data collected for the purposes of placing a site on the NPL, and EPA finds that the application of the PND and the RND qualifiers has no bearing on scoring the ISR site.

Overall, the data used to score the ISR site were collected for purposes other than the NPL. There is no requirement in the HRS that only CLP data can be used for scoring a site. As is also evident by the data used to score this site, an independent review other than CLP data review was conducted for the analytical data, and it was found to be sufficiently reliable, as discussed below.

4.1.3.3.2 Source Data

AERL alleged that the analysis of sample delivery group (SDG) 33364 is not in compliance with the CLP and the results should not be used for HRS scoring. Affected samples mentioned by the commenter include AC-SC-04, AC-B1-07, AC-B2-01, AC-SC-05, and AC-SC-06. AERL contended that EPA identified mercury in the slag pile despite the fact that the only sample containing mercury at levels three times background concentrations failed EPA's QA/QC standard for reproducibility. AERL alleged that the relative percent difference (RPD) for sample AC- SC-04 and a split taken by ARCO is 81%, which clearly violates EPA's RPD[4] standard of +/- 35%.

In its supplemental comments dated October 1, 1999, AERL again commented on the mercury analysis for the sample results reported in SDG "data package" 33364.[5] According to AERL, the laboratory narrative for this SDG states that 'no mercury matrix spike/duplicate analysis was requested or performed on samples from this SDG. Sufficient QC has been reported for this project in previously submitted data packages.' AERL contended that the laboratory apparently relied on quality control results from another batch of samples in an attempt to satisfy CLP quality control requirements.

AERL claimed to have identified several improper laboratory practices which create the appearance of an acceptable matrix spike result. AERL also stated that in the raw data for mercury analysis, the laboratory indicated that 'there was not enough volume to do duplicate and matrix spike on sample 32770,' which AERL considered an "admission" by the laboratory that it failed to properly prepare a separate sample for

[4] Laboratory precision based on each sample matrix is measured by the relative percent difference (RPD) calculated for duplicate analyses. Duplicate samples are split in the laboratory and each aliquot is prepared and analyzed individually. Analytes in the duplicate sample pair must show a relative percent difference (RPD) in concentration of 35 percent or less (*USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* 1994, page 25).

[5] Throughout its comments, AERL confuses sample numbers and SDG numbers. AERL incorrectly referred to samples AC-B1-07 and AC-B2-01 as sample delivery group numbers. It also refers to an SDG as a data package. For clarity, EPA has substituted AERL's terminology "data package" with SDG and sample numbers, where appropriate.

duplicate and matrix spike analysis. AERL noted that the CLP Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration (ILM 01.0 June 1994) requires that solid splits of the sample, the duplicate, and the matrix spike be prepared. AERL alleged that the laboratory "prepared a matrix spike and duplicate from another sample set, found the results of this sample to its liking, and reused the results from this sample for the analysis of the duplicate and matrix spike for AC-B1-07 [SDG # 33364]."

AERL noted "similar CLP protocol violations" in the matrix spike and duplicate for SDG 33364, which AERL said had significant QA/QC exceedences because the laboratory chose to analyze a sample which contained significant levels of mercury for both the matrix spike and the duplicate. AERL stated that the analysis exceeded the calibration range of the cold vapor atomic absorption, obliging the laboratory to dilute and reanalyze the original or unspiked sample. AERL contended that this was never performed, and all the results for mercury in SDG 33364 should have been rejected.

AERL's supplemental comments also noted that the narrative for SDG 34216 states that matrix spike and laboratory duplicate analyses were not required or performed. However, according to AERL, matrix spike and duplicate analyses are listed among the thirteen operations that are the "minimum QA/QC operations necessary to satisfy the analytical requirements of the contract" and they need not be requested when submitting samples to the laboratory for CLP analyses. AERL further added that because matrix spike and laboratory duplicate analyses are an inherent part of the CLP method, *EPA's Functional Guidance for Inorganic Analyses*[6] (U.S. EPA 1994) "does not even address or contemplate what action should be taken when these analyses are not conducted." AERL claimed that reporting of the data from package 34216 is highly irregular for CLP analyses and that the data from SDG 34216 should have been qualified "R" and rejected it for HRS scoring.

In response, EPA finds the analytical data associated with SDGs 33364 and 34216 to be sufficient for HRS scoring purposes. The data requirements for evaluating hazardous substances identified in source samples are not as stringent as those required for observed release samples. In characterizing sources the Agency only requires that hazardous substances are identified in a source (HRS Section 2.22). However, for analytical data documenting an observed release by chemical analysis and areas of observed contamination, the Agency requires that significance above background be established (HRS Section 2.3, *Likelihood of release*). Accordingly, the Agency reviewed the data associated with SDG 33364 and 34216 to assess the overall quality of the analytical process. This review addressed instrument performance, the possibility of instrument and/or laboratory contamination, laboratory performance, and matrix performance. These analyses were sufficient to identify the hazardous substances associated with the sources at this site and for the observed release data; where applicable, the data were qualified and adjusted according to EPA guidance. Further discussion of the observed release data and EPA requirements for using qualified data will follow.

[6] The correct title of this document is *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (1994).

Samples Not Used For Scoring

With regard to AERL's comments on Samples AC-B1-07 and AC-B2-01 (collected from soil borings 1 and 2, respectively), these samples were analyzed as part of SDG 33364, but were not used for HRS scoring. Concerning sample 32770, this sample is not associated with any of the SDGs containing analytical data used to evaluate the ISR site; this sample is not part of the HRS evaluation of ISR, and AERL's comments on mercury analysis for sample 32770 are not relevant.

Reproducibility of Mercury in Slag Pile

Regarding source data from sample AC-SC-04, the raw analytical data sheet on page 115 of UDEQ's 1997 *Analytical Results Report* shows that mercury data for this sample was qualified with an "*," although the duplicate analysis for mercury was not outside the quality control limits. As reported on *Duplicates*, Form VI of the raw analytical data forms, which AERL received based on its FOIA request, the RPD for mercury in soil sample 33383D associated with SDG 33364 is reported as 25.2%, which is **within** the criteria of $\pm$ 35%[7] (page 25 of EPA's 1994 *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review)*. Sample AC-SC-04 is analyzed as part of SDG 33364 and the associated RPD for mercury in 33383D is representative quality assurance for the analytical data associated with sample AC-SC-04.

EPA was unable to verify AERL's claim that the RPD for mercury and its split is 81%. The HRS documentation record and Volumes I and II of UDEQ's 1997 *Analytical Results Report* (References 7 and 8 of the HRS documentation record, respectively) contain no record of a split sample for AC-SC-04 and AERL has not provided relevant sample results.

Regarding the performance of matrix spikes/duplicates for SDG 34216 and 33364, as noted by the manager of the laboratory in letter dated 10/30/95 and 10/31/95, sufficient QC samples had already been run for the data.[8] Gary Hahn, Manager of Analytical Services Center indicated that these analyses were not performed but, as noted by AERL, added that the laboratory had already reported sufficient QC data on the project. Moreover, the data validator did not consider these data unusable because of these omissions.

Although matrix spike and duplicate analyses were not performed for SDG 34216, this does not affect the usability of samples AC-SC-12, AC-SC-13, and AC-SO-19, which were used to characterize Source 4.

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[7] Page 25 of *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* states the following: "The control limits as specified above ($\pm$ 20% RPD and $\pm$ the CRDL) are **method requirements** for duplicate samples, regardless of the sample matrix type. However, it should be noted that laboratory variability arising from the sub-sampling of non-homogeneous soil samples is a common occurrence. Therefore, for **technical review purposes only**, Regional policy may allow the use of less restrictive criteria (e.g., $\pm$ 35% RPD, $\pm$ 2x the CRDL) to be assessed against duplicate soil samples."

[8] Although there was no mercury spike for these SDGs, the laboratory performed a mercury duplicate analysis for SDG 33364.

Sample AC-SC-LY-02 was not used in the HRS evaluation of the ISR site. While the laboratory did not perform a mercury matrix spike or duplicate analysis for these samples, it did perform several other quality control (QC) analyses for this SDG. For example, the initial and continuing calibration verification (ICV/CCV) as indicated on Form II (*Initial and Continuing Calibration Verification*), the blank analysis as indicated on Form III (*Blanks)*, and the interference check sample (ICS) as indicated on Form IV (*ICP Interference Check Sample)* were all performed for this sample group. Because these laboratory analyses were within the specified criteria for these samples, EPA considers samples AC-SC-12, AC-SC-13, and AC-SO-19 suitable for characterizing Source 4. No error is evident in these associated analyses, and EPA sees no reason to assume the laboratory was incorrect in considering it unnecessary to run the samples. EPA considers the data sufficient for HRS scoring.

Mercury Duplicate Analysis and Other QA/QC

While the laboratory did not perform a mercury matrix spike analysis for SDG 33364, it **did** perform a mercury duplicate analysis for this SDG. As explained above, the EPA sample number associated with mercury duplicate analysis for SDG 33364 is 33383D, as shown on Form VI, *Duplicates.* The laboratory performed several other quality assurance analyses for this SDG. For example, the initial and continuing calibration verification (ICV/CCV) as indicated on Form II (*Initial and Continuing Calibration Verification*), the blank analysis as indicated on Form III (*Blanks)*, and the interference check sample (ICS) as indicated on Form IV (*ICP Interference Check Sample)* were all performed for this sample group. The initial calibration check showed that the instrument was capable of producing acceptable results and the continuing calibration check showed that the initial calibration was still valid. The interference check showed no unacceptable interference and the blank analysis showed no contamination associated with the data used for scoring. Also, the laboratory reports analytical results for the laboratory control sample for mercury.[9] Form VII, *Laboratory Control Sample* indicates that the %R is 102.8, within the CLP criteria. Although mercury matrix spike analysis was not performed, EPA sees no reason to suspect the laboratory and the data validator are incorrect in indicating that the additional QC is unnecessary. EPA considers that the data are sufficient to use samples AC-SC-04, and AC-SC-06 to characterize Source 4, and sample AC-SC-05 to characterize Source 1.

Thus, AERL's comment that the laboratory engaged in improper practices to create the appearance of acceptable matrix spike results is unfounded. Matrix spike analyses were simply not conducted. The data, however, are sufficient for use in HRS scoring due to the reasons stated above.

Mercury Impact on Site Score

Even if EPA was to disregard the mercury analytical data for samples associated with SDG 33364 and 34216, this would not affect the site score. First, page 34 of the HRS documentation record indicates that mercury data from the JBR 1986 *Reclamation/Stabilization Plan*, to which the commenter voiced no objection, was used to characterize Source 5 (Reference 29 of the HRS documentation record). Therefore, even if all of UDEQ's mercury data were rejected, mercury would still be part of the scoring of the site. Further, arsenic, cadmium, and lead in Sources 1, 3, 4, and 5; and the lead in Source 2 would continue to

[9] The laboratory control sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation.

support the human toxicity factor values used to calculate the waste characteristics factor category factor values for this site (pages 6, 15, 20, 26, 29, 34, 52, 58, and 59 of HRS documentation record). Moreover, even if mercury is disregarded from the calculation of the site score, the waste characteristics for the environmental threat would be reduced from 1000 to 320. This reduction would have no impact on the environmental threat overall score because, when the waste characteristics of 320 is combined with the observed release assigned value (550) and the targets assigned value (75), the maximum assigned value for the surface water environmental threat (60) would still be achieved (pages 4 to 7, 15, 19 to 20, 26, 29 to 30, 34, 46 to 47, and 58 to 59 of the HRS documentation record).

4.1.3.3.3 Surface Water Data

AERL claimed that the surface water data are of poor quality. AERL concluded that sample pair AC-SW-07/08 used for establishing an observed release to surface water by chemical analysis fails EPA's QA/QC standard and refutes EPA's observed release to surface water by chemical analysis. In support of this statement, AERL cited poor reproducibility and a "mix-up" in the field. It also cited the results of split samples shared with ARCO as exhibiting poor reproducibility.

AERL complained about extremely poor reproducibility in duplicate surface water samples AC-SW-07 and AC-SW-08. AERL noted that the RPDs for arsenic, copper, lead, and zinc are 46%, 68%, 61%, and 64%, respectively, while "EPA's guidance requires an RPD for surface water samples of +/- 20%." AERL cited the following documents for support: *US EPA Contract Laboratory Program Statement of Work to Inorganics Analysis*, Document Number ILM 03.0, pp. E-22 and E-23, and *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, July 1988, p. 10-11.

AERL also added in comments dated October 1, 1999, that the usability of samples AC-SW-07 and AC-SW-08 are questionable because the laboratory narrative for data package 33364 stated that field samplers may have confused the filtered and unfiltered samples for these locations. AERL noted that the laboratory stated that this "mix-up" is the reason that a duplicate for this sample was not analyzed but asserted that duplicate analysis is required by CLP protocols. AERL added that because of this omission, there is no feasible means of assessing sampling or analytical accuracy or precision with the exception of field duplicate precision for co-located duplicate samples AC-SW-07 and AC-SW-08.

AERL contended that surface water samples AC-SW-05 and AC-SW-06, split with ARCO's representative, exhibited poor arsenic and lead reproducibility in sample AC-SW-05 and copper and lead reproducibility in sample AC-SW-06. AERL also commented that the required laboratory duplicate was not analyzed, and therefore, no RPD was calculated. According to AERL, the only precision values provided (RPDs) are those for the field duplicate and the split samples which were outside the acceptable limits.

In response, EPA has found the data in the HRS documentation record to be of adequate quality to document an observed release by chemical analysis for the site. The following response is limited to comments on specific samples questioned by AERL. With specific regard to sample pair AC-SW-07 and AC-SW-08,

these samples are designated as field, rather than laboratory, duplicate samples (page 24 of Reference 7 of HRS documentation record). As stated by AERL and according to the data validation quality assurance review on page 4 of Reference 8, *duplicates were not analyzed* because the filtered and unfiltered samples were mixed up before the samples arrived at the laboratory. Thus, field duplicate comparisons were not performed for samples AC-SW-07 and AC-SW-08, and the data for these two samples are independent of each other. Also, because these samples are field duplicates, like the field splits collected by ARCO, variation in the results are expected. Page 35 of EPA's 1994 *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* states the following:

> Field duplicate samples *may be* taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than lab duplicates which measure only lab performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field samples. . . . There are *no 'required' review criteria for field duplicate analyses comparability* [emphasis added].

Thus, the RPD[10] for samples AC-SW-07 and AC-SW-08 and ARCO's splits are not necessarily relevant to the usability of samples AC-SW-07 and -08. Moreover, a laboratory duplicate analysis for mercury associated with samples AC-SW-07 and AC-SW-08 in SDG 33364 was provided as reported on Form VI, *Duplicates*, as EPA sample number 33687D, showing an RPD of 0%;[11] this showed that the reproducibility within the laboratory data set was acceptable. Also, Section 2.3 of the HRS (55 FR 51589, December 14, 1990) states that an observed release has occurred if a contaminant is measured significantly above background if some portion of the release is attributable to the site. A trend need not be established (49 FR 37078, September 21, 1984). Thus, new data submitted by a commenter showing the absence of a release or a difference in concentration do not necessarily refute the earlier data used to assign a value for an observed release because many releases vary in concentration through time or occur sporadically. The courts have upheld EPA's interpretation on this point (see City of Stoughton v. E.P.A., 858 F.2d 747, 756 (D.C. Cir. 1988)). In this case, the Agency considers it more appropriate to compare analytical results from the same laboratories than from different laboratories. Thus, the analytical data in References 7 and 8 of the HRS documentation record at the time of proposal demonstrate an observed release and AERL's data does not refute that.

Samples AC-SW-05 and AC-SW-06, which AERL stated were split with ARCO's representatives, were not used in the HRS evaluation of the ISR site. Therefore, any comments relating to the usability of these samples are not relevant to the HRS score for this site.

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[10]Laboratory precision based on each sample matrix is measured by the relative percent difference (RPD) calculated for duplicate analyses. Duplicate samples are split in the laboratory and each aliquot is prepared and analyzed individually. Analytes in the duplicate sample pair must show a relative percent difference (RPD) in concentration of 35 percent or less (*USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* 1994, page 25).

[11] The concentrations in these both samples were non-detect with a contract required detection limit (CRDL) of 0.2 μg/L.

4.1.3.3.4 Sediment Data

AERL claimed that sediment samples AC-SE-07 and AC-SE-08 from SDG 33364, which were used to establish an observed release by chemical analysis, do not meet EPA's RPD and spike recovery standards and should not be used to score the site. For sediment samples AC-SE-07 and AC-SE-08, AERL noted that the RPD for copper is 66% while the "EPA RPD standard for solid media samples is +/- 35%." AERL commented that the required spike recoveries for copper in both of these sediment samples were not within control limits and that these samples were flagged with a "J" despite the "indications" of a systematic problem with the copper analysis. AERL concluded that the sediment data should have been flagged "R" and designated unusable for HRS scoring purposes.

In response, EPA finds that the data for samples AC-SE-07 and AC-SE-08 are of sufficient quality for documenting an observed release by chemical analysis under the HRS. According to page 68 of UDEQ'S 1997 *Analytical Results Report*, which contains the data quality assurance review narrative summary, the duplicate sample analysis was within the control limits of $\pm$ 35% for the sediment samples (page 25 of EPA's 1994 *Contract Laboratory Program National Functional Guidelines for Inorganic Data Reviews*). A laboratory duplicate analysis for copper associated with samples AC-SE-07 and AC-SE-08 in SDG 33364 provided on Form VI, *Duplicates*, as EPA sample number 33392D shows an RPD of 16.6%. AERL is incorrect in its assumption that, like the similarly located surface water samples AC-SW-07 and AC-SW-08, samples AC-SE-07 and AC-SE-08 are the *laboratory duplicates* used for precision analysis. Like the surface water samples discussed above, these two sediment samples were collected as *field duplicates* and their analytical results were not used for the laboratory duplicate sample analysis to show laboratory precision. Furthermore, according to page 35 of EPA's 1994 *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, the results of field duplicates may have more variability than laboratory duplicates because of the difficulties associated with collecting identical field samples. Also, EPA guidance states that there are no review criteria for **field** duplicate analyses comparability. Thus, the 66% RPD calculated by AERL has no bearing on the usability of samples AC-SE-07 and AC-SE-08.

EPA does note, however, that the analytical data for copper in samples AC-SE-07 and AC-SE-08 are qualified "J" as estimated because the *matrix spike recovery* was 47.4% (page 68 of UDEQ'S 1997 *Analytical Results Report*). Copper was detected in these samples at 2040 ppm and 1030 ppm, respectively, with an IDL of 3.2 ppm for both analyses. According to page 29 of EPA's 1994 *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, for matrix spike results that are outside the control criteria: "If the spike recovery is > 125% or < 75% and the sample results are > IDL, qualify the data for these samples as estimated (J)." Thus, because the copper result was above the IDL and the matrix spike recovery was below 75%, the validator appropriately applied a "J" qualifier. An "R" qualifier applies only "[i]f spike recovery results fall < 30% and the sample results are < IDL...." (page 29 of EPA's 1994 *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*). The analytical data for copper do not meet the requirement for the "R" qualifier and EPA finds the analytical data for copper acceptable for HRS purposes.

4.1.3.4 Source Characterization

Throughout its comments AERL confuses source characterization with areas of observed contamination. AERL contended that EPA evaluated sources at the ISR site that are not eligible for HRS evaluation. These comments are related to source definition, source containment, and hazardous waste quantity.

In response, EPA has appropriately characterized the sources and areas of observed contamination at this site. Sources available to the surface water migration pathway are evaluated according to the directions of HRS Section 2.2.2, and areas of observed contamination eligible for the soil exposure pathway are evaluated according to the directions of HRS Section 5.01. Sections 4.1.3.4 .1 through 4.1.3.4.3 and Section 4.1.3.6.1 of this support document discuss source characterization and areas of observed contamination, respectively.

4.1.3.4.1 Source Definition

AERL complained that EPA did not accurately define or characterize the sources of hazardous substances at the ISR site. AERL added that the sources identified by EPA are not based on the distinct, identifiable physical and chemical characteristics of the potential source materials including appropriate source containment and hazardous waste quantity.

Source 1: ISR Tailings Dike; Slag Piles; Several Piles of Smelting Wastes/Stockpiled Ore and Concentrate/Flue Dust/Stack Dust

Commenting on the "Carr Fork tailings dike," AERL stated that EPA's characterization of the tailings impoundment dike is flawed. According to AERL, the Carr Fork tailings impoundment was built with native soils excavated from nearby borrow pits. It claimed that because neither EPA nor UDEQ sampled the dike, the dike cannot be identified as a "source" because there are no samples showing hazardous substances present at more than three times background. In support of its assertion, AERL stated that none of the samples used to characterize Source 1, (AC-SC-01, AC-SC-02, and AC-SO-18) were collected from the Carr Fork tailings dike. AERL cited page 15 of HRS Reference 8 and Figures 3a and Tables 1 and 7 of HRS Reference 7 and added that the Carr Fork tailings dike has been reclaimed and should not be included as a source.

In response, EPA has correctly characterized Source 1, including the ISR tailings dike, slag piles, and the Dump, as part of Source 1 at the ISR site. None of the samples used to characterize the areas that comprise Source 1 were collected from the Carr Fork tailings dike, which has not been included in the HRS scoring of this site. AERL has mistakenly assumed that the ISR tailings dike and the Carr Fork tailings dike are the same. Figure 2 of Reference 15 and Figure 3a of Reference 7 show that the locations of samples AC-SC-01, AC-SC-02, and AC-SO-18 are clearly south of the area of the Carr Fork Tailings,
and were collected from Source 1. AERL's concerns regarding the Carr Fork tailings dike are not relevant to the HRS evaluation of the site and have not been addressed in this support document.

Source 3: Contaminated Soils in Lincoln

For Source 3, AERL commented that EPA included "all of the land between the Town of Lincoln and the 'waste' piles" although the soil data between those two areas do not show an exceedence of three times background.

In response, EPA appropriately characterized Source 3, contaminated soil, identified by four contaminated surficial soil samples collected from residences in Lincoln. Source 3 does not include "all of the land between the town of Lincoln and the 'waste' piles" (Figure 2 of HRS documentation record). According to HRS Section 2.2.2, *Identify hazardous substances associated with a source*, "[f]or each of those migration pathways, consider those hazardous substances documented in a source (for example, by *sampling*, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway. . . . (emphasis added)." The concentrations cited on page 26 of the HRS documentation record for samples AC-SO-01, AC-SO-04, AC-SO-05, and AC-SO-07 range from 47.1 mg/kg to 79.5 mg/kg arsenic, 4.8 mg/kg to 12.9 mg/kg cadmium, 182 to 341 mg/kg copper, 563 mg/kg to 1,040 mg/kg lead, 1.8 mg/kg mercury, and 639 to 819 mg/kg zinc (pages 131, 134, 135, and 137 of Reference 8 of the HRS documentation record). The source background samples, identified on page 26 of the HRS documentation record, contain the following concentrations: arsenic (14.9 ppm (mg/kg)), cadmium (1.46 ppm), copper (50.5 ppm), lead (127.5 ppm), mercury (0.18 ppm), silver (1.84 ppm), and zinc (206.1 ppm).

According to HRS Section 2.2, *Characterize sources*, source characterization includes the following: identification of the source; hazardous substances associated with the source; and pathways potentially threatened by theses hazardous substances. As cited above, HRS Section 2.2.2, *Identify hazardous substances associated with a source*, does not require that samples used to establish the existence of a source meet the significance above background level which is required for samples used to establish areas of observed contamination, as directed in HRS Section 5.01 (which directs the scorer to Table 2-3 in HRS Section 2.3). However, because Source 3 is also an area of observed contamination, the concentrations identified in the samples associated with Source 3 were all evaluated to meet the significance above background level. That is, hazardous substances associated with Source 3 were all three times source background levels for metals identified in the background samples or were above the background detection limit for metals not detected in the background samples for this site (page 26 of HRS documentation record; HRS Section 2.3; HRS Table 2-3).

Moreover, far from considering "all" the land between the Town of Lincoln and the waste pile, the Agency identified a narrow strip of land delineated by samples AC-SO-01, AC-SO-04, AC-SO-05, and AC-SO-07 (Figure 2 of HRS documentation record). In reality, the contamination at Source 3 may be more extensive than the area described by these samples. The Agency did not evaluate the full extent of contamination in the Town of Lincoln that may be attributable to ISR. For example, the full extent of meteorological conditions, such as varying wind speed and direction, atmospheric temperature and humidity, and the impacts that may be caused by buildings, pavement, and human activity have not been evaluated. These phenomena can affect the rates and locations of metal deposition, and resuspension and persistence of particles in the atmosphere and in the soil (*Air Pollution: It's Origins and Control* by Kenneth Wark and Cecile Warner, 2nd, Edition,

1981). Thus, the extent of contamination in the Town of Lincoln is not fully known and may comprise an even larger area.

Also, in calculating the hazardous waste quantity for the site, only Source 1 was assigned a hazardous waste quantity factor value; Source 3 was assigned a hazardous waste quantity value of unknown but greater than zero. However, in evaluating the waste characteristics for this site, all the sources were used; thus the toxicity, persistence, etc., of all the hazardous substances associated with all the sources were used in the overall site evaluation. With specific regard to Source 3, arsenic, cadmium, copper, lead, mercury, and zinc were detected in the source samples. These metals were also detected in other sources at this site. Thus, although AOC A (Source 3) is significant to the target score of the soil exposure pathway, its contribution to the hazardous waste quantity does not impact the site score. This comment has no impact on the HRS site score.

Source 4: Discrete Piles in the Former ISR Facility Process Area

AERL contended that data collected by JBR in 1985 confirm the unreliability of the data in *Analytical Results Report, Anaconda Copper - Carr Fork Site,* Volume 2 of 3 (Reference 8 of the HRS documentation record) which was used to characterize the slag pile. According to AERL, JBR's 1985 data found mercury concentrations of 0.20, 0.14, and 0.11 mg/kg which are 23 to 42 times lower than UDEQ's 1995 analytical results. Citing Appendix M of its comments, AERL also stated that two samples it collected in June of 1999 from the fine slag pile adjacent to Pine Creek had mercury concentrations of 0.09 and 0.05 mg/kg, neither of which is greater than three times background. AERL concluded that its "data are consistent with the fact that mercury would have been driven off as vapor during the smelting process and would be present in the slag at very low concentrations, such as those found in the JBR samples." AERL contended that "mercury should not be considered as a constituent of the slag."

In response, EPA has appropriately identified mercury as a hazardous substance associated with the slag piles that are part of Source 4 at the ISR site. According to HRS Section 2.2.2, *Identify hazardous substances associated with a source*, "[f]or each of those migration pathways, consider those hazardous substances documented in a source (for example, by *sampling*, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway. . . .(emphasis added) [HRS Section 2.2.2]"

According to page 28 of the HRS documentation record, Source 4 consists of piles which contain flue dust, ore waste, tailings, and slag. On page 29, the HRS documentation record lists seven source samples used to characterize the piles comprising Source 4: AC-SC-04, AC-SC-06, AC-SC-07, AC-SC-12, AC-SC-13, AC-SC-19, and Boring B6-06. Sample AC-SC-04, collected from a slag pile at the smelter (Figure 1 of HRS documentation record), contain mercury at a concentration of 4.7 mg/kg (page 29 of HRS documentation record). Although this concentration is estimated, **even if** adjusted according to EPA guidance[12], the resulting

[12] Data are reviewed and qualified, if necessary, according to *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (1994). Qualified data are then adjusted according to the directions in the EPA factsheet, *Using Qualified Data to Document an Observed Release and Areas of*

concentration of 2.56 mg/kg would still be three times the background level for mercury. Additional sampling of the piles that comprise Source 4 also documents mercury at concentrations as high as 484 mg/kg (Boring B6-06) and 50.1 mg/kg (Sample AC-SC-13). Thus, these data also confirm the presence of mercury at concentrations three times the background level.

Further, regarding the presence of some samples with lower mercury levels, there is no reason to assume that samples characterizing a source will show similar levels of a particular hazardous substance throughout the source. AERL's heterogeneous mercury concentrations in Source 4 do not negate the analytical data in the HRS documentation record and its associated references. Moreover, the comments about lower mercury levels in samples collected earlier and that the smelting process would have driven off mercury as vapor do not refute the data in the 1995 *Analytical Results Report*, which have been shown in Section 4.1.3.3 of this support document to comply with relevant EPA data quality criteria.

Moreover, this source is documented on page 28 of the HRS documentation record to contain flue and stack dusts. As stated on pages 5 through 7 of Reference 26 of the HRS documentation record, *Compilation of Air Pollutant Emissions Factors*, oxides of mercury are present in emissions from lead smelting. Dusts collected from the flues and stacks at the ISR smelter were deposited in Source 4. For the commenter's assertion to be valid, all of the mercury would have to be released from the stacks before oxidizing, a highly unlikely scenario. It is more likely that some mercury was contained in the dusts from the flues and stacks, as documented in samples from this source.

4.1.3.4.2 Source Containment and Site Reclamation Activities

AERL commented that the site has been reclaimed and that Source 1 has been adequately contained and should be excluded from HRS scoring.

Reclamation Activities at the Site

AERL contended that EPA has failed to consider the actual site conditions. AERL stated that the UDEQ *Analytical Results Report* (Reference 7 of HRS documentation record as proposed) recognizes that between 1985 and 1987 "most" of the Site was capped and revegetated and that UDEQ only found erosion of the caps occurring in 'several' areas.

AERL claimed that by relying on inaccurate information in the UDEQ documents, EPA underestimated the protectiveness of the reclamation undertaken by ARCO and approved by the Utah Division of Oil, Gas and Mining. AERL contended that EPA uses a very selective and skewed characterization of the site conditions

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Observed Contamination, OSWER 9285.7-14FS, July 1996. EPA's factsheet *Using Qualified Data to Document an Observed Release and Areas of Observed Contamination* is applicable **only** to observed release and areas of observed contamination (AOC) analytical data. This factsheet is not applicable to data characterizing sources. However, to indicate the conservativeness of the mercury data in Sample AC-SC-04, and **even if** scenario of the data is mentioned above.

ranging from mischaracterization to ignoring the reclamation. AERL cited as an example page 17 of the HRS documentation record where EPA calculated the area of the three waste piles using the entire area of each pile even though one of those piles was completely covered by the reclamation and the other two piles were mostly covered by reclamation activities. AERL also claimed that the Carr Fork tailings dike has been reclaimed and should not be designated as a source at all.

According to AERL, the *Analytical Results Report*, EPA's key reference, oversimplifies the reclamation of the tailings pile by stating that it consisted of regrading, a one-foot thick soil cover, and revegetation with native grasses and forbs. AERL cited Appendix H of its comments, an affidavit by Mr. Steven Anderson that discusses the reclamation.

In another example, AERL complained that page 1 of Reference 7 of the HRS documentation record suggests that the wastes were thoughtlessly spread and distributed over the site, whereas in reality, the wastes were segregated and characterized, consolidated within areas such as the tailings pond and existing on-site landfills, and then capped to ensure against releases into the environment. AERL cited Appendix H of its comments (page 7) in support of its comments.

In response, even after consideration of the cover and regrading, AERL's reclamation activities at ISR do not exclude this site from HRS evaluation because the sources have insufficient containment features to prevent contaminant migration to surface water and insufficient cover material to prevent direct exposure to the contaminants. Further discussion of source containment and areas of observed contamination are discussed below.

Source Containment Features

AERL's comments on the waste piles evaluated for Source 1 of the HRS documentation record state that this source is adequately contained and should be excluded from HRS consideration. AERL stated that Reference 11, a memo by Eva Hoffman, EPA remedial project manager, claims that there are no clay liners used in the construction of the tailings pond and the potential for migration exists. AERL noted that the UDEQ report also claims that "No containment features such as a cap or liner are present for any of the sources except for the waste repository trench, which had approximately 4 inches of bentonite spread in the trench bottom by a backhoe bucket." According to AERL, neither of these statements is accurate and Appendix H of its comments supports the following:

> ARCO lined part of the waste isolation cell with four to six inches of bentonite and the other part with a synthetic liner. ARCO also incorporated the bentonite into the top twelve inches of tailings within which the cell was excavated with the teeth of a hydraulic excavator bucket. This provided a mixture that was ten percent bentonite by volume. The surface was then compacted to ninety-five percent which provided a field constructed liner with a calculated permeability of approximately 1×10^{-8}. . . . The liners and caps combined with the installation of the surface water run-on controls effectively isolated the wastes placed in the cell from surface water, groundwater and direct contact by humans or animals. Thus, the

wastes located in the cell have clearly been reclaimed in such a way that they do not pose any threat to human health or the environment.

Commenting on the Elton tunnel "dump,"AERL stated that the reclamation effort at the dump included run-on and runoff controls and engineered covers, which would effectively remove the vast majority of this supposed source area from the surface water and soil exposure pathways. AERL added that only a small portion, approximately 0.3 acres, of this area is exposed where the soil cover and vegetation were not effective.

Concerning the slag at Source 1, AERL stated that the only portions of this pile that were not capped are the steeper, inaccessible areas and these areas constitute less than 10 acres.

In response, EPA has correctly evaluated the sources at the ISR site for HRS purposes in terms of containment with respect to the surface water migration pathway and eligibility as areas of observed contamination in the soil exposure pathway. The evaluations of the sources' containment for the surface water migration pathway and the corresponding areas of observed contamination in the soil exposure pathway are discussed below.

According to HRS Section 2.2.3, *Identify hazardous substances available to a pathway*, for the surface water pathway overland/flood component, hazardous substances from sources at the site are available to migrate to surface water if these "hazardous substances are associated with a source with a surface water containment factor value greater than 0 for the watershed (see Section 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1)." For the soil exposure pathway, Section 2.2.3 of the HRS directs the scorer to consider "hazardous substances that meet the criteria for observed contamination at the site (see section 5.0.1)." [Section 2.2.3 of the HRS]

In evaluating source containment under the surface water migration pathway, HRS Section 4.1.2.1.2.1.1, *Containment*, directs the scorer to assign a containment value from Table 4-2. Source 1 consists of several piles, and it is evaluated under the *All Source Category* of HRS Table 4-2, *Containment factor Values for Surface Water Migration Pathway*. [Section 4.1.2.1.2.1.1 of the HRS]

According to HRS Table 4-2, to assign a surface water containment value of "0," the source must have the following attributes: "Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present." [Section 4.1.2.1.2.1.1 of the HRS]

For Source 1, including the dike, the slag pile, and the dump, page 13 of the HRS documentation record states that "the topsoil and reseeded covers on Source 1 areas were not maintained engineered covers, nor

were there functioning and maintained run-on control systems and run-off management systems during construction or throughout the active years of smelter operations. . . . ." AERL also admits in it's comments that the "soil cover" is eroding in several areas, which further confirms that the source is not adequately contained to exclude it from HRS evaluation. The fact that the soil cover was eroding in several areas shows that this cover was not **maintained** and that it cannot control migration from parts of the source. Moreover, the soil cover alone is inadequate to exclude the waste piles from HRS evaluation; they must also have a run-on control and runoff management system which EPA did not find during site investigations and which AERL does not mention with respect to this source. For these reasons, and as appropriately indicated on page 13 of the HRS documentation record, a containment factor value of 10 was assigned to Source 1. Thus, EPA has correctly evaluated Source 1 under the surface water pathway at the ISR site.

With specific regard to the Elton Dump, EPA was unable to discern if AERL is referring to the dump evaluated as part of Source 1. However, even if EPA disregarded the hazardous waste quantity for the Dump evaluated as part of Source 1, the hazardous waste quantity of the site would remain unchanged because the area of the slag and the dike which are evaluated as part of Source 1 still contributes an area assigned value of 14,7433.8[13] which, when applied in HRS Table 2-6, still yields an assigned value of 10,000.

With specific regard to AERL's comments on the memo by Eva Hoffman and the construction of the tailings pond and the waste repository trench, AERL has improperly considered these areas as part of Source 1. EPA did not include these waste areas as sources or areas of observed contamination in the ISR HRS site evaluation. Thus, whether or not there have been effective containment features at either of these waste areas is irrelevant to the ISR HRS site score.

The soil exposure pathway does not require a containment evaluation; rather, it requires scoring of "areas of observed contamination." When evaluating areas of observed contamination under the soil exposure pathway, HRS Section 5.0.1, *General considerations*, directs the scorer to consider observed contamination to be present at sampling locations where analytical evidence indicates that "[a] hazardous substance attributable to the site is present at a concentration significantly above background levels for the site . . . and [t]his hazardous substance, if not present at the surface, is covered by 2 feet or less of cover material . . . ." [Section 5.0.1 of the HRS] HRS Section 5.0.1 also directs, "[i]f an area of observed contamination (or portion of such an area) is covered by a permanent, or otherwise maintained, essentially impenetrable material (for example, asphalt) that is not more than 2 feet thick, exclude that area (or portion of the area) in evaluating the soil exposure pathway." [Section 5.0.1 of the HRS] The soil cover placed over portions of AOC B (Source 1) was less that two feet thick (page 12 of HRS documentation record). Moreover, hazardous substances (Arsenic, Cadmium, Copper, Lead, Mercury, Silver, and Zinc) at concentrations greater than 3 times the background level were documented for this source (pages 14, 15, 55, and 62 through 64 of HRS documentation record).

In summary, EPA has correctly evaluated Source 1 as being available to the surface water migration pathway

[13]The Dump is 480,000 square feet; the dike is 740,520 square feet; and the slag is 1,176,120 square feet. The dump and the slag is a combined area of 1916640 square feet which when divided by the divisor for piles (13) in HRS Table 2-5 yields an assigned value of 147433.8.

because it was not adequately contained to exclude it from HRS evaluation. For the soil exposure pathway, AOC B was eligible for evaluation because it contained hazardous substances that were significantly above background and was covered by less than two feet of cover material.

4.1.3.4.3 Hazardous Waste Quantity

AERL objected that EPA included the entire area of 2,396,640 square feet to calculate the hazardous waste quantity of Source 1 because this includes wastes that were reclaimed. According to AERL, Source 1 includes only 10 acres or 450,000 square feet of uncapped waste. Citing page 101 of Reference 13 of the HRS documentation record, AERL specifically stated that all of the Carr Fork tailings dike, 97% of the Elton dump, and 70% of the slag pile have been successfully reclaimed.

AERL also stated that although the hazardous waste quantity for Source 1 was incorrectly calculated and a much smaller area of exposed wastes comprise Source 1, pursuant to Section 2.4.2.1.4 of the HRS rule, the score for this much smaller area would still remain 10,000.

In response, EPA correctly evaluated the hazardous waste quantity of Source 1[14]. According to HRS Section 2.4.2.1, *Source hazardous waste quantity*, a source hazardous waste quantity is assigned to **each** source having a containment factor value greater than zero. As discussed in Section 4.1.3.4.2 of this support document, Source 1 was assigned a containment factor value of 10, thus making it eligible for HRS evaluation. Page 17 of the HRS documentation record states that the area of Source 1 comprises 2,396,640 square feet; this area consists of the dike, slag, and the dump, which are 740,520, 1,176,120, and 480,000 square feet, respectively. Using the divisor of 13 for piles, as required in HRS Table 2-5 [Section 2.4.2.1.3 of the HRS], the area assigned value of Source 1 is 184,356.9. The areas that AERL stated were capped were not found to be adequately contained nor were they adequately covered to exclude them from HRS evaluation. Additional discussion of the containment of the sources, as it applies to sources available to the surface water migration pathway, and of cover material, as it applies to areas of observed contamination being evaluated under the soil exposure pathway, are found in Section 4.1.3.4.2 of this support document.

Furthermore, as AERL recognized, its reevaluation of the area of Source 1 would have no impact on the overall hazardous waste quantity for this source; its source hazardous waste quantity of 450,000 would still produce a pathway hazardous waste quantity well within the range of 10,000 to 1,000,000 required to assign a pathway hazardous waste quantity factor of 10,000[15].

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[14] As explained in Section 4.1.3.4.1 of this support document, the characterization of Source 1 consists of the waste piles that comprise ISR Tailings and Dike, the Slag Pile, and the Dump; the Carr Fork Tailings were not evaluated as part of Source 1.

[15] Considering that Table 2-5 requires a divisor of 13, results in 34,615 (450,000 ÷ 13) which then produces a 10,000 factor value from Table 2-6.

4.1.3.5 Observed Release to Surface Water

AERL objected to EPA's evaluation of a surface water observed release by both direct observation and chemical analysis. AERL commented that although EPA claimed to have documented an observed release by direct observation, it still attempted to confirm an observed release by chemical analysis even though "an observed release need only be documented by one of these methods." AERL contended that EPA was unsure whether it could document an observed release by either method, so "it hedge[d] its position by claiming it has confirmed a release by both direct observation and chemical analysis."

In response, according to HRS Section 2.3, *Likelihood of release,* an observed release can be documented by two methods, direct observation and chemical analysis. It does not state that only one method should be used to document an observed release. Because sufficient information was available to document both types of observed release to Pine Creek, EPA appropriately included both as part of the documentation record.

4.1.3.5.1 Observed Release by Direct Observation

AERL objected to EPA's evaluation of an observed release based on the presence of slag in Pine Creek contending that "EP [Extraction Procedure] Toxicity and water solubility test data show that the slag is virtually" insoluble. AERL stated that although EPA photographs show that slag is in contact with Pine Creek, there is no information that verifies that any hazardous substances have been or could be released from the slag into the surface water. Specifically, AERL stated the following:

- In tests on slag simulating real world conditions, the solubility of the total metals bound within the slag ranged from 0.0% for mercury to 0.3% for silver and lead.

- In EP toxicity extracts, which subject the slag to conditions far more conducive to leaching than actual conditions in Pine Creek, solubility ranged from 0.1% for copper to 6.4% for cadmium.

In response, the HRS documentation record supports an observed release by direct observation at the ISR site. According to HRS Section 2.3, *Likelihood of release,* the scorer should "[e]stablish an observed release either by direct observation of the release of a hazardous substance into the media being evaluated (for example, surface water) or by chemical analysis of samples appropriate to the pathway being evaluated." HRS Section 4.1.2.1.1, *Observed release,* further states that an observed release by direct observation can be established if:

> *A material that contains one or more hazardous substances* has been seen entering surface water through migration or is *known to have entered surface water through direct deposition*, or
>
> A source area has been flooded at a time that hazardous substances were present, and one or more hazardous substances were in contact with the flood waters . . . (Emphasis added) [Section 4.1.2.1.1 of the HRS]

On page 40 of the HRS documentation record, an observed release by direct observation was documented because the slag pile and the dump, which are evaluated as waste piles in Source 1, have been observed to be in direct contact with Pine Creek. In fact, "[t]he natural bed of Pine Creek has been diverted about 400 feet to the north through the buildup of slag along the stream bed. Pine Creek remains in contact with the slag pile for about 0.5 mile until Pine Creek exits the mouth of Pine Canyon." (page 38 of HRS documentation record) Samples collected from these piles have been documented to contain hazardous substances. Sample AC-SC-05, collected from the slag pile contains arsenic at 494 ppm, cadmium at 28.1 ppm, copper at 648 ppm, lead at 3,590 ppm, mercury at 3.2 ppm, silver at 16.5 ppm, and zinc at 1,320 ppm. Likewise, sample AC-SC-03, collected from the dump contains arsenic at 56.5 ppm, cadmium at 9.0 ppm, copper at 239 ppm, lead at 700 ppm, and mercury at 0.79 pm. Thus, the evaluation of an observed release by direct observation at the ISR site has met the criteria established in the HRS.

With regard to AERL's comments that the EP toxicity and water solubility tests that it performed on the slag pile show that the slag pile is not releasing to Pine Creek, the HRS does not require such evaluations for the scoring of an observed release by direct observation. To document an observed release by direct observation, the HRS requires that a material containing a hazardous substance be seen entering surface water or is known to have entered surface water through direct deposition, or a source has been flooded at a time a hazardous substance was present. As stated above, the slag pile is in direct contact with Pine Creek and, thus, is sufficient to establish an observed release by direct observation. Further, as discussed in the following section of this support document, 4.1.3.5.2, an observed release by chemical analysis was also documented for this site. Thus, the hazardous substances in the wastes deposited at this site are being released to the environment.

4.1.3.5.2 Observed Release by Chemical Analysis

AERL contended that EPA's observed release by chemical analysis is based on samples collected from inappropriate locations that do not represent other influences on Pine Creek and were not collected within an appropriate time frame.

In response, EPA evaluated an observed release by chemical analysis to Pine Creek and this evaluation is in accordance with HRS Section 2.3, *Likelihood of release*. According to HRS Section 2.3, "[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site." The HRS documentation record shows on pages 40 through 43 analytical data for background and release samples documenting observed release hazardous substances in Pine Creek. All hazardous substances used to document an observed release[16] were three times the background level for

[16]Background surface water sample AC-SW-01 document arsenic copper, lead, and zinc below their respective detection limits of 10, 25, 3, and 20 μg/L. Release sample AC-SW-07 document arsenic, copper, lead, and zinc at their respective concentrations of 47.3, 517, 197, and 502 μg/L. All concentrations in the release samples were significantly above the background level.

Background sediment sample AC-SE-01 document arsenic, cadmium, copper, lead, and zinc at their respective concentrations of 8.8, 1.4, 11.9, 72.0, and 51.17 mg/kg. Mercury was listed as undetected at 0.17 mg/kg in AC-SE-01. Release sample AC-SE-

substances detected in the background samples, or were above the background detection limit for substances not detected in the background sample. On pages 44 through 45 of the documentation record, the history of the ISR copper smelting processes, the waste generated, and hazardous substances released are described in the attribution of the releases to ISR.

Background Sample Locations

AERL commented that surface water and sediment samples AC-SW-01 and AC-SE-01 taken in Swensons Canyon, are not appropriate for background, rather; samples AC-SW/SE-02, -03, or -04, which were collected in Pine Creek upstream of the ISR site should have been used as "background." AERL contended that Swensons Canyon does not include the influences that affect Pine Creek, such as Kennecott's Utah Pollution Discharge Elimination System (UPDES**)** discharge and naturally occurring metals from the Bingham ore body, and that "EPA has inappropriately attributed to the IS&R site influences on surface water quality in Pine Creek which originate from sources other than the Site."

AERL stated the following:

> In fact, it appears to ARCO that obtaining sample SW-01 as a "background sample," was an after thought on the part of UDEQ. The UDEQ sampling plan (HRS Ref. 17, pp. 170016 and 170029) shows no samples planned for Swensons Canyon and indicates the upstream sample in Pine Creek (later renumbered to SW-02) was the planned upstream location. . . . Neither UDEQ nor EPA has any idea how much of a difference in metals concentrations between the upstream sample taken on September 15-21, 1995 is attributable to precipitation events, seasonal flow changes, fluctuations in volume or character of Kennecott's upstream discharge or the turbidity of the water sampled rather than to presumed impacts from the ISR site.

AERL further argued that surface water analytical data collected by UDEQ in 1995 contradict EPA's claim that an observed release to Pine Creek has occurred. AERL explained that in HRS References 7, 8, and 9, surface water and sediment samples SW/SE05 and SW/SE-06 were collected downstream of the slag pile that is alleged to be releasing hazardous substances to Pine Creek, yet when these samples are compared to AC-SW-04, which was collected upstream in Pine Creek, the criteria for an observed release by chemical analysis are not met.

In response, EPA has provided an appropriate background level for establishing an observed release from the ISR site to Pine Creek. The HRS does not provide specific instructions on the collection of background samples nor does it stipulate the collection of a sample for establishing background level. HRS Section

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05 document arsenic, cadmium, copper, lead, mercury, and zinc at their respective concentrations of 43.5, 5.2, 166, 390, 0.57, and 259 mg/kg. Release sample AC-SE-06 document arsenic, copper, lead, mercury, and zinc, at their respective concentrations of 30.7, 176, 265, 0.19, and 235 mg/kg. Release sample AC-SE-07, document arsenic, cadmium, copper, lead, mercury, and zinc at their respective concentrations of 131, 5.2, 2,244, 355, 0.24, and 1,080 mg/kg. Finally release sample AC-SE-08 document arsenic, cadmium, copper, lead and zinc at their respective concentrations of 67.8, 4.2, 1,133, 227, and 614 mg/kg. All concentrations were significantly above the background level.

4.1.2.1.1, *Observed release*, requires only that *when* background samples are used to establish an observed release to surface water by chemical analysis, "[l]imit comparisons to similar types of samples and background concentrations - for example, compare surface water samples to surface water background concentrations." As discussed above, HRS Section 2.3, *Likelihood of release*, also says to establish an observed release based on "evidence of a hazardous substance in the media significantly above background level (emphasis added)." Thus, although the HRS refers to background concentrations, it does not require background samples immediately upstream of the site.

EPA discusses the selection of the surface water background locations on page 40 of the HRS documentation record as follows:

> Background samples AC-SW-01 and AC-SE-01 were collected from the mouth of Swensons Canyon, the drainage located immediately over the ridge north of the ISR site. Due to the *similar elevations* of their respective headwaters, the drainages are subject to *similar seasonal flow and particle movement*. Due to the *similar elevations and aspect* of the Pine Canyon and Swenson Canyon slopes, samples AC-SW-01 and AC-SE-01 provided background conditions for land less affected by mining at the ISR facility. (emphasis added)

Although page 29 of Reference 17, a work plan for the collection of samples at the site, says that sediment and surface water samples AC-SE/SW-01 were to be collected in Pine Creek, it also states on page 29 that these samples were to be collected "[u]pstream Pine Creek, *if water is present*. . . (Emphasis added)."

The work plan was accounting for the physical characteristics of the surface water pathway that may influence the collection of background samples. Page 38 of the HRS documentation record provides the following description of the variability of the Pine Creek drainage:

> Pine Creek is intermittent at its headwaters and becomes perennial below the former Carr Fork mill facility location, approximately 2 miles upstream from the ISR site. Shortly beyond Pine Canyon, Pine Creek disappears underground and joins general ground water flow of the Tooele Valley northward toward the Great Salt Lake. The total length of Pine Creek, which is estimated from the Bingham Canyon 7.5 minute topographic map is about 5 miles. Surface water flows in Pine Creek about 1.75 miles from site sources in contact with surface water until perennial flow disappears.

Samples AC-SW-02, -03, or -04, as suggested by AERL were not used as background samples for this site. As shown in Tables 4 and 5 of Reference 7 of the HRS documentation record, Samples AC-SE/SW-02 were collected from Pine Canyon Tunnel Portal; AC-SE/SW-03 were collected from the Kennecott Trout Pond Head; and samples AC-SE/SW-04 were collected from Pine Creek at the Kennecott Property Line. These samples are not located outside the influence of the site and/or are located on another mining property (page 2 of Reference 12 of the HRS documentation record). The samples suggested by AERL as background are not appropriate background samples because they are representative of the extent of the contamination at ISR (page 29 of Reference 17 of HRS documentation record).

A background sample from Swensons Creek was preferable to a sample from Pine Creek not only because of the difficulty associated with the intermittency of Pine Creek at its headwater, but also because the entire length of Pine Creek is located on land that is subject to contamination from the ISR site. According to Reference 7 of the HRS documentation record, Pine Creek contains both natural and man-made inflows along its channel (pages 6 to 7 of Reference 17 of HRS documentation record). Additionally, emissions from the ISR stacks may have affected Pine Creek and its adjacent wetlands. According to page 30 of Reference 7, the high mountains at the head of Pine Canyon effectively intercepted stack emissions from the ISR smelter. The southeasterly winds circulated emissions around the canyon with an estimated eighty percent of the heavier particles falling to the ground within a one-mile radius of the smelter stacks and the remaining approximately twenty percent of heavier particles falling within a five mile radius of the stacks (page 30 of Reference 7 of HRS documentation record). All of Pine Creek is within a 2.5-mile radius of the ISR stacks (References 4, *U.S. Geological Survey, Tooele, Utah Quadrangle 7.5' Series Topographic Map*, of HRS documentation record; Figure 2 of HRS documentation record). Thus, the background location in Swensons Creek provides concentrations of hazardous substances that provide a defensible reference point that can be used to evaluate whether or not a release from ISR has occurred and also because Pine Creek is subject to contamination attributable to the site.

With specific regard to AERL's comment that background samples AC-SW-01/-SE-01 are not representative of Kennecott's influence on Pine Creek, EPA has attributed a release of hazardous substances, in part, to the ISR site. Even if EPA was to disregard the evaluation of the observed release by chemical analysis, an observed release by direct observation is sufficient to score this site. As discussed in Section 4.1.3.5.1 of this support document, EPA evaluated an observed release by direct observation for this site because the slag pile and the dump, which are evaluated as part of Source 1, are in direct contact with Pine Creek.

Further, even if EPA considered sediment samples AC-SW/SE-02, AC-SE-03, and AC-SE-04 as upstream background locations, as suggested by AERL, an observed release of mercury in samples AC-SE-05 and AC-SE-07 can still be documented for this site (pages 42 and 43 of HRS documentation record; pages 149 and 170 through 172 of Reference 8 of HRS documentation record). Likewise, considering surface water samples AC-SW-02, AC-SW-03, and AC-SW-04 as background locations, an observed release of arsenic, copper, lead, and zinc can still be documented in sample AC-SW-07 for this site (page 42 of HRS documentation record; pages 145 through 146 and 160 through 162 of Reference 8 of HRS documentation record). Moreover, as stated previously HRS Section 2.3 only requires that "Some portion of the release must be attributable to the site (emphasis added)." EPA finds that there is sufficient analytical evidence to document at least partial attribution of the contamination in Pine Creek to the ISR facility. Therefore, AERL's comment on the surface water background level would have no impact on the site score.

Sample Collection Timing

AERL also objected that release samples AC-SW-07/08 were collected 6 days after samples AC-SW-02, -03, -04 (upstream locations) and 75 days prior to the collection of AC-SW-01 (in Swensons Canyon). AERL stated that EPA's guidance requires that background and release surface water samples be collected as close together in time as possible so that meaningful comparison from different locations can be conducted.

In response, the similarity of the timing of the background and release samples is not a requirement for identifying an observed release in this site-specific situation. EPA prefers background and release samples to be collected at similar times when the background samples are collected from the water body immediately upstream of the site and the substances are dissolved or subject to degradation with time. For this situation, similar sampling times helps ensure that the difference in the upstream and downstream contamination is due to site releases, not to temporal variations. For example, without similar sampling times, a contaminant could be coming in pulses from an upstream source, and have washed to the releases sample location, having already washed by the background sample location. Similarly if the substance is subject to degradation, the substance level change could be due to difference in the time the substance has had to degrade between different sample collection times. These concerns are not pertinent at the ISR site for several reasons. One is that the release substances are metals. In general, metals do not degrade with time; thus the concern over degradation rates does not apply. Secondly, the substances are in sediment samples; hence, the metals are less likely to wash downstream, because sediments are less mobile than dissolved substances.

Most importantly, however, is that the background samples are not taken directly upstream. In this case, because a reliable sample could not be collected from Pine Creek, as explained above, EPA used a sample collected from Swenson's Creek. The environment of Swenson's Creek is considered similar in elevation, seasonal flow, and particle movement to Pine Creek. As explained previously, samples AC-SW-02, -03, -04 are not appropriately used as background samples which need to be compared to release samples for this site because they are samples representing the extent of contamination attributable to the ISR site.

Release Sample Locations

AERL disputed the locations of surface water and sediment samples AC-SW-07 /-08 and AC-SE-07/-08. According to AERL, Figure 3b of Reference 7 indicates that samples AC-SW-07 and -08 are not even located within the Pine Creek drainage; instead, these samples were taken in an upland area to the north where there does not appear to be any surface water body. AERL contended that even if the field samplers knew where the samples were collected, and that these samples were simply mislocated on Figure 3b of Reference 7, the data collected from sample pair AC-SW-07/-08 reflect an inappropriate sampling point and /or a poorly collected surface water sample. It supported its contention by adding that Pine Creek loses flow into the alluvium as soon as it exits the canyon and, thus, by the time Pine Creek reaches the areas where samples AC-SW-07/-08 were supposedly collected, the flows are almost non-existent most of the year, particularly in late summer when the samples were collected. In addition, AERL asserted that the poor reproducibility of samples SW-07 and -08 indicates a high probability that some bottom sediment was entrained in the water samples during collection. According to AERL, this is a common problem when sampling in low water conditions and it causes a sample to be non-representative.
In response, EPA finds samples AC-SW-07, AS-SW-08, AC-SE-07, and AC-SE-08 appropriately located to establish an observed release to Pine Creek. AERL is incorrect in its statement that those samples are located in an upland area to the north where there does not appear to be any surface water body. As shown in Figure 2 of the HRS documentation record, Samples AC-SW-07, AC-SW-08, AC-SE-07, and AC-SE-08 are located in Pine Creek north of the dump. These sample locations are clearly labeled in Figure 1 of the HRS documentation record (Figure 3b of Reference 7 of the HRS documentation record).

With specific regard to AERL's comments that the locations of samples AC-SW-07, AC-SW-08, AC-SE-07,

and AC-SE-08 are inappropriate because Pine Creek loses flow as it flows into the alluvium and that the locations have almost nonexistent flow most of the year, EPA has clearly shown that Pine Creek is an intermittent stream up to the locations of these samples. As an intermittent creek, the flow in Pine Creek is subject to variation. This observation is supported by the following description on page 38 of the HRS documentation record:

> Pine Creek is intermittent at its headwaters and becomes perennial below the former Carr Fork mill facility location, approximately 2 miles upstream from the ISR site. Shortly beyond Pine Canyon, Pine Creek disappears underground and joins general ground water flow of the Tooele Valley northward toward the Great Salt Lake.

Thus, there was sufficient flow in Pine Creek at the time of the investigation for the collection of surface water samples (page 24 of Reference 7). The *Field Activities Report* included as Appendix B of Reference 7 of the HRS documentation record also states on pages B-2 and B-3 that surface water and sediment samples were collected from Pine Creek. The *Chain of Custody, Laboratory Assignment and Shipping Information* included as Appendix C of Reference 7 of the HRS documentation record verifies that these surface water samples were sent to the U.S. EPA Laboratory at the Denver Federal Center. As evidenced by the resulting analytical results, there is sufficient documentation that the samples collected in Pine Creek were indeed surface water samples. Moreover, AERL has not provided evidence to show that there was no flow in Pine Creek when the samples were collected.

Concerning AERL's comment that the samples AC-SW-07 and AC-SW-08 were poorly collected such that there is a high probability that some bottom sediment was entrained into the sample during collection, this comment is pure speculation on the part of AERL, which has also provided no evidence to support its claim of entrainment of sediments into surface water samples AC-SW-07 and AC-SW-08. Discussion on the reproducibility of Samples AC-SW-07 and AC-SW-08 is contained in Section 4.1.3.3.3 of this support document.

Attribution

AERL also indicated that even if the observed release samples AC-SW-07/-08 and AC-SE-07/-08 were simply mislocated on the map, the location selected, the intersection of Pine Creek and an irrigation ditch, is not an appropriate sampling point. AERL commented that this location receives flow from several other watersheds, for example Pass Canyon, which may contain other sources of metals such as natural mineralization and/or old mine workings. AERL further explained that to the extent there is any analytical evidence of an observed release, the source of the "observed release" is located between samples SE-06 and SE-07/08, which is an area that receives inflows from other watersheds. AERL concluded, neither UDEQ nor EPA has characterized other inputs to Pine Creek and both can only "guess what might be causing the supposed increases in metals levels in sample SE-07/08."

In response, EPA has appropriately attributed an observed release by chemical analysis to Pine Creek from the ISR site. According to HRS Section 2.3, to establish an observed release by chemical analysis, it is only necessary to establish that "**[S]ome** portion of the release must be attributable to the site" (emphasis added).

In this case, EPA has clearly established that at least some portion of the release is originating from the site in that the Agency has also identified an observed release by direct observation for this site; that is, hazardous substances were directly placed into Pine Creek. In addition, Source 1, which is adjacent to Pine Creek, is not contained against surface water and is associated with the same substances as in the observed release by chemical analysis (pages 15 and 40 through 43 of the HRS documentation record). This also supports that the release by chemical analysis is, in part, attributable to this site.

As discussed in Section 4.1.3.5.1 of this support document and on page 40 of the HRS documentation record, an observed release by direct observation to Pine Creek was evaluated for the ISR site. Page 40 of the HRS documentation record states that slag from copper and lead smelting was observed in direct contact with Pine Creek at area 5 and at the dump. In addition, page 23 of Reference 23 states that "Pine Creek has been diverted from its original bed approximately 400 feet north by accretion of the slag dump over the 60 years." (EPA notes that the HRS does not require attribution for an observed release by direct observation (See HRS Section 2.3, *Likelihood of release*)).

Regarding AERL's comment that the source of the observed release to Pine Creek is between sample locations AC-SE-06 and AC-SE-07/-08, EPA agrees with this comment and notes that the Dump, which is evaluated as part of Source 1 and is also in direct contact with Pine Creek, is located between these two sampling locations.

Concerning AERL's comment that inflows from other sources may be the cause of the contamination in samples AC-SW-07/-08 and AC-SE-07/-08, EPA disagrees. According to the topographic map (Reference 4 of the HRS documentation record), streams that flow into Pine Creek include Swensons Creek, from which EPA collected a background sample, and possibly the creek in Pass Canyon. The samples from Swensons Creek, equally affected by natural mineralization as Pass Canyon, showed metals contamination less than three times the levels in Pine Creek. Pass Canyon, if it did reach Pine Creek, which is doubtful because the change in elevation diminishes much more slowly as it comes out of the mountain than does Swenson's Creek, would probably contribute no more contamination than Swensons Creek. Moreover, the commenter did not specify what sources were likely contributing to the contamination. In contrast, the large hazardous waste quantity used to score this site, which disturbed almost 600 acres of land with smelter tailings, waste dumps, slag piles, and heavy emissions was based on only one of the five sources evaluated at the site. Moreover, the commenter acknowledged the presence of unevaluated sources at the site, including the Carr Fork Tailings Dike.

EPA notes that even if it were to drop the identification of an observed release by chemical analysis, the likelihood of release to surface water value of 550 would remain, given that there is also an observed release by direct observation. As discussed in Section 2.3 of the HRS, *Likelihood of release*, a 550 is assigned whenever the criteria for an observed release are met.

4.1.3.6 Soil Exposure Pathway

AERL commented that the soil exposure pathway score should be 29.8 rather that 100 as assigned because EPA inappropriately scored the residents of Lincoln as "living within the former IS&R facility boundary." It also claimed that as a result, EPA did not evaluate the nearby population threat and provided information to do so.

4.1.3.6.1 Residential Population Threat

AERL objected to the soil exposure pathway residential population threat on the basis of hazardous waste quantity for the areas of observed contamination and targets evaluated.

Areas of Observed Contamination

AERL contended that instead of Source 3, EPA used Source 1 "to score the residential soil exposure pathway despite the fact that the residents of Lincoln live on a distinct area of contaminated soils (i.e., Source 3) approximately one-half mile away from the fenced waste piles that constitute EPA's Source 1." It stated that the location of the residential soils included in Source 1 should have been characterized as a "discrete area of contaminated soils in Lincoln rather than attempting to create a site of over 3 square miles by connecting that area with Source 1."

AERL complained that some sample locations between the ISR facility boundary and the Town of Lincoln do not exceed three times background concentrations and therefore do not constitute observed contamination. AERL cited Table 1 of its comments which contains data from soil samples collected between 1985 and 1999 at locations between the tailings impoundment on the ISR site and the Town of Lincoln.

AERL also stated that the area of Source 3 is defined by sampling locations AC-SO-01, -SO-04, and -SO-07, which yield an area of 2,738,600 square feet, an assigned value of 80.5 from HRS Table 2-5, and an assigned hazardous waste quantity of 1 from HRS Table 2-6. According to AERL, these changes would yield a waste characteristics value of 18, not 100 as derived by EPA.

In response, EPA correctly used Sources 1, 3, 4, and 5, which were identified as areas of observed contamination (AOCs) B, A, C, and D, to evaluate the soil exposure pathway (pages 51 and 55 of HRS documentation record). Although soil exposure human targets are only associated with AOC A (Source 3), all AOCs are eligible and were used for the evaluation of the HWQ factor value for the soil exposure pathway. AERL is incorrect in its assertion that only Source 1 was used. As explained below, the contaminated soils in Lincoln comprise AOC A for the soil exposure pathway, which is also Source 3 of the surface water migration pathway. Source 1 is AOC B; it is not part of AOC A.

According to HRS Section 5.1.2.2, *Hazardous waste quantity,* when evaluating the soil exposure pathway, the scorer should, as specified in HRS Section 2.4.2.1, *Source hazardous waste quantity,* "assign a source hazardous waste quantity value to **each** area of observed contamination . . .[emphasis added]"(Sections 2.4.2.1 and 5.1.2.2 of the HRS). According to HRS Section 5.0.1, *General considerations,* and explained previously in Section 4.1.3.4.2 of this support document, an area of observed contamination is based on locations where samples show observed contamination. This section further defines observed contamination as locations where analytical evidence indicates that "[a] hazardous substance attributable to the site is present at a concentration significantly above background levels for the site . . . and [t]his hazardous substance, if not present at the surface, is covered by 2 feet or less of cover material . . . ." (Section 5.0.1 of the HRS).

EPA identifies four AOCs for the soil exposure pathway that comply with the above criteria and were eligible to be used in the calculation of the hazardous waste quantity for the soil exposure pathway: AOC A (Source 3), AOC B (Source 1), AOC C (Source 4), and AOC D (Source 5) (pages 51 through 55 and 59 of the HRS documentation record).

The only AOC for which a hazardous waste quantity value greater than zero was assigned is AOC B (Source 1). AOC B was assigned a hazardous waste quantity of 184,356.9 as recorded on page 37 of the HRS documentation record. A hazardous waste quantity of "unknown but greater than zero" was assigned for the other AOCs: AOC A, the contaminated soils in Lincoln, Utah (Source 3); AOC C, discrete piles in the former ISR facility (Source 4); and AOC D, Landfills (Source 5) (page 37 of the HRS documentation record). The hazardous waste quantity for the soil exposure pathway was based on the sum of these values. Because the only **quantitative** AOC hazardous waste quantity was assigned to AOC B, the soil exposure pathway hazardous waste quantity factor is equal to the hazardous waste quantity for this AOC[17]. As required under HRS Sections 2.4.2, 5.01, and 5.1.2.2, EPA appropriately based the hazardous waste quantity for the soil exposure pathway on the sum of the hazardous waste quantities for all sources that met the criteria for an AOC.

With respect to AERL's comment that the "residents of Lincoln live on a distinct area of contaminated soils . . . one-half mile away from the fenced waste piles that constitute EPA's Source 1," the ISR site is not defined by facility boundaries but, rather, by the extent of the release. The contaminated soils in Lincoln have been found to be attributable to a release from ISR as recorded on pages 44 through 45 of the HRS documentation record. AERL is incorrect in its assumption that EPA evaluated the "residents of Lincoln" as if they resided within the boundaries of the ISR facility. AERL is confusing the evaluation of the resident population threat targets with the evaluation of the hazardous waste quantity for the soil exposure pathway. The hazardous waste quantity for the soil exposure pathway is not restricted only to the sources that are within 200 feet of residences and terrestrial sensitive environments evaluated for the resident population threat. See above discussion for requirements for determining the hazardous waste quantity for the soil exposure pathway. However, in evaluating targets under the resident population threat of the soil exposure pathway, only targets

[17]A quantitative hazardous waste quantity of 184,356.9 was assigned to Source 1, and all other sources were determined to have a hazardous waste quantity of unknown but greater than zero (pages 37, 55, and 59 of HRS documentation record.

on the property and within 200 feet of a sample on an AOC are evaluated. This is the case with Source 3 only (pages 60 through 61 of HRS documentation record; page 8 of Reference 7 of HRS documentation record).

According to HRS Section 5.1.3, *Targets*, the scorer is required to "[e]valuate the targets factor category for the resident population threat based on five factors: resident individual, resident population, workers, resources, and terrestrial sensitive environments." This section of the HRS further defines a residential individual as "a person living or attending school or day care on a property with an area of observed contamination *and* whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination." For the ISR site, the only resident individuals are associated with AOC A (Source 3). Although the other AOCs did not have resident individual targets, their hazardous waste quantity, as directed by HRS Section 2.4.2, *Hazardous waste quantity*, is eligible to contribute to the soil exposure hazardous waste quantity factor.

Targets

AERL commented that EPA incorrectly assigned a value of 25 under the residential threat of the soil exposure pathway for the existence of the Carr Fork Wildlife Area as a terrestrial sensitive environment.

According to AERL, there are no terrestrial sensitive environments within Lincoln, and pursuant to Section 5.1.3.5 of the HRS, the terrestrial sensitive environment should be zero.[18]

In response, EPA has correctly evaluated the resident population threat of the soil exposure pathway for the ISR site. As directed in HRS Section 5.1.3, *Targets*, the scorer should evaluate terrestrial sensitive environments located on an area of observed contamination. On pages 62 through 64 of the HRS documentation record, EPA lists 17 samples collected from AOCs B, C, and D which all lie within the Carr Fork Reclamation and Wildlife Management Area. The Carr Fork Reclamation and Wildlife Management Area does not overlap with AOC A. References 19, 20, and 27 of the HRS documentation record, undisputed by the commenter, depict the ISR site **within** the Carr Fork Reclamation and Wildlife Management Area. Thus, AERL's comment that the Carr Fork Wildlife Area is located one-half mile from the Town of Lincoln is irrelevant to the HRS scoring of this terrestrial sensitive environment.

As explained previously, the residential population threat is evaluated for the four AOCs identified for this site. The Carr Fork Reclamation and Wildlife Management Area need not exist within the Town of Lincoln (AOC A), to be scored as a terrestrial sensitive environment at this site. As directed in HRS Section 5.1.3, *Targets*, the scorer should evaluate terrestrial sensitive environments located on an area of observed contamination. HRS Section 5.1.3.5, *Terrestrial sensitive environments*, cited by AERL, tells the scorer to assign a value from HRS Table 5-5 to each terrestrial sensitive environment that meets the eligibility criteria of HRS Section 5.1.3, *Targets*. Table 5-5 of the HRS provides for an assigned value of 25 for state lands

[18]AERL then calculated a targets factor value of 244 rather than 269 as calculated by EPA. AERL then stated that it calculated a resident population threat score of 2,415,600 rather than 14,795,000 as derived by EPA.

designated for wildlife game management. As shown, EPA's evaluation of this state designated terrestrial sensitive environment is in accordance with the criteria set forth in the HRS.

4.1.3.6.2 Nearby Population Threat

AERL contended that a correct evaluation of the soil exposure pathway would use the waste within the ISR facility to score the nearby population threat. AERL provided information that it considered useful in scoring the nearby population threat of the soil exposure pathway. In its comments, AERL reiterated that because the site has been effectively reclaimed, is accessible via an improved road, and has some public recreation usage, it is eligible for evaluation under the nearby population threat of the soil exposure pathway.

In response, EPA did not evaluate the nearby population threat of the soil exposure pathway at this site because the score for the resident population threat, which considers people living on and with 200 feet of an AOC on their property, was sufficient to assign the maximum value of 100 for the soil exposure pathway. Therefore, even if EPA had evaluated the nearby population threat, it would not have contributed to or increased the soil exposure pathway score (pages 6 to 7, 60, 61, 62, and 64 of the HRS documentation record). Also, evaluation of the nearby population threat does not negate the resident population threat score because these two scores are added together. (HRS Table 5-1; HRS Section 5.3) . AERL's comments on particular factors under the nearby population threat are therefore not relevant to the HRS score.

4.1.4 Conclusion

The original HRS score for this site was 58.31. Based on the above response to comments, the score remains unchanged. The final scores for the International Smelting & Refining site are:

Ground Water:	Not Scored
Surface Water:	60.00
Soil Exposure	100.00
Air	Not Scored
HRS Site Score	58.31