RESPONSE ACTION DOCUMENT

Wastebeds 1-8 Site
Subsite of the Onondaga Lake Site
Interim Remedial Measure
Onondaga County, New York

New York State Department of Environmental Conservation
and United States Environmental Protection Agency, Region II

August 2011

I. PURPOSE

The purpose of this document is to authorize a response action[1] for controlling contaminated groundwater and seeps, addressing contaminated sediments, stabilizing the shoreline along Onondaga Lake, and addressing contaminated soils within the lakeshore area as part of an interim remedial measure (IRM)[2] for the Solvay Wastebeds 1-8 Site (Site), located in Onondaga County, New York (see Figure 1 for a Site map)[3]. In June 2010, a Focused Feasibility Study (FFS) was prepared by O'Brien & Gere on behalf of Honeywell International, Inc. (Honeywell) in support of the IRM for the Site.[4] The FFS and a Proposed Response Action Document (PRAD) were made available for public comment from December 27, 2010 through February 10, 2011. The New York State Department of Environmental Conservation (NYSDEC) conducted a public meeting on January 13, 2011 in the Town of Geddes to discuss the proposed response action and to receive public comments on the FFS and the PRAD (as part of the citizen participation program for this IRM).

The objectives of the IRM at the Site are to mitigate, to the extent practicable, the following:

- Direct contact with and ingestion of exposed Solvay waste and other contaminated soil along the eastern shore;
- Discharge of Ninemile Creek Sand and Gravel (NMCSG) unit and eastern shore groundwater to Onondaga Lake and Ninemile Creek;
- Discharge of shallow and intermediate groundwater to Ditch A;
- Direct contact with and discharge of Ninemile Creek bank seep water, and eastern and northern shore seep water to Onondaga Lake and Ninemile Creek;
- Erosion of Solvay waste from the eastern shore to Onondaga Lake;
- Erosion of Solvay waste along the surf zone of Onondaga Lake Sediment Management Unit (SMU) -4 due to wind and wave action;

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1 This response action is a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675 (CERCLA).

2 The use of the term "Interim Remedial Measure" throughout this document is not intended to mean that this removal action is a "remedial action" as that term is defined in the federal law CERCLA. An IRM is an activity that is necessary to address either emergency or non-emergency site conditions, which in the short-term, needs to be undertaken to prevent, mitigate or remedy environmental damage or the consequences of environmental damage attributable to a site. An IRM is equivalent to a non-time critical removal under the CERCLA removal program pursuant to 40 C.F.R § 300. 415(b)(2).

3 Figures referenced in this document can be found in Appendix A, attached hereto.

4 Non-time critical removal actions typically are supported by an engineering evaluation/cost analysis (EE/CA), whereas feasibility studies support the selection of remedial actions. In this instance, the FFS was initiated prior to the determination that a non-time critical removal action was appropriate, therefore the FFS document (as supplemented to conform to EE/CA requirements) was relied upon in determining the appropriate removal action.

- Erosion of Solvay waste substrate and sediment from the lower reach of Ditch A to Onondaga Lake; and
- Discharge of seep water from the upper reach of Ditch A to Ninemile Creek.

Conditions at the Site meet the criteria for a removal action under CERCLA, as documented in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP).

The Site is a subsite of the Onondaga Lake Site, which is on the National Priorities List (NPL)[5]. There are no nationally significant or precedent-setting issues associated with this action.

The index in Appendix C, attached hereto, identifies the items that are included in the Administrative Record upon which the selection of the response action is based.

The New York State Department of Health was consulted on the planned response action, and it concurs with the selected response action (see Appendix D, attached hereto).

II. SITE CONDITIONS AND BACKGROUND

This Response Action Document identifies the selected response action for the Site[6].

A. <u>Site Description</u>

1. Background

The Wastebeds 1-8 Site is located in the Town of Geddes, Onondaga County, New York on the southwest side of Onondaga Lake. The area subject to the IRM consists of the mouth of Ditch A, the low lying area adjacent to Onondaga Lake, the "cliff" portion facing to the northwest, and an area adjacent to Ninemile Creek (see Figure 2).

The wastebeds were constructed over a portion of the Geddes marsh, which was

5 On December 16, 1994, Onondaga Lake and its tributaries and the upland hazardous waste sites which have contributed or are contributing contamination to the lake (sub-sites) were added to EPA's NPL. NYSDEC and EPA have, to date, organized the work for the Onondaga Lake NPL site into 11 subsites. The Wastebeds 1-8 site is one of the subsites at the Onondaga Lake NPL site.

6 The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) ID number for the Onondaga Lake Site is NYD986913580. The Wastebeds 1-8 Site is being tracked in EPA's CERCLIS data base as Operable Unit #22 of the Onondaga Lake NPL Site.

reclaimed from Onondaga Lake when the lake was lowered in 1822 (Blasland, Bouck and Lee, 1989). The wastebeds are composed of perimeter dikes that were constructed of wooden piles and bulkheads, or earth, depending on the location. These dikes were used to contain waste materials (primarily Solvay waste) which consist largely of calcium carbonate, gypsum, sodium chloride (salt), and calcium chloride. These wastes were generated at the former Solvay Process Company Main Plant as part of soda ash production using the Solvay Process method. Soda ash production began at the plant in 1884 and continued until 1986.

The Solvay Process Company operated a coke plant from 1892 through 1923. A phenol production plant operated from 1942 to 1946 (PTI, 1992). Compounds associated with these and other operations may have been disposed of in Wastebeds 1-8 with the Solvay waste slurry or by alternate means.

Wastebeds 1-6 were in use before 1926 and may have been in use by 1916 or earlier, although no definitive construction dates or disposal records are available. Ninemile Creek was rerouted to the north to permit the construction of Wastebeds 5 and 6. Wastebeds 7 and 8 were not utilized until after 1939 and remained in use until 1943 (BBL, 1989). The location of each wastebed is presented in Figure 2.

The area encompassed by the Site was deeded to the people of New York State in 1953 and is currently owned by the State of New York and Onondaga County (C&S, 1986). More than one mile of Interstate Route 690 is located on the southwestern portion of the Site. In addition, approximately 80 acres of the Site are currently used by the State of New York for State Fair parking. The parcel owned by Onondaga County is required by the deed to be maintained as parkland. Onondaga County has plans to construct a public bike path as part of the Onondaga Lake Canalways Trail in the proximity of the IRM areas (Camp, Dresser & McKee [CDM], 2009).

In 2004, Honeywell and NYSDEC entered into an Order on Consent (Index #D-7-0002-02-08) to conduct a Preliminary Site Assessment and Remedial Investigation (RI)/Feasibility Study (FS), which included a provision for an IRM.

2. Release or Threatened Release into the Environment of a Hazardous Substance or Pollutant or Contaminant

Based on RI data collected from 2005 through 2009, the following chemical parameters of interest (CPOIs) were identified at the Site: benzene; toluene; ethylbenzene; xylene; polycyclic aromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); phenols; and various inorganics including mercury. The RI results for the media that are the subject of this IRM are further discussed in Section 2.4 of the FFS[7] *(O'Brien & Gere, 2010).* This document can be found in the document repositories maintained in the NYSDEC Region 7 Syracuse, New

7 The draft RI report is currently being revised.

York office, Onondaga County Public Library Syracuse Branch at the Galleries, Solvay Public Library, Atlantic States Legal Foundation, and the NYSDEC Albany, New York Central Office.

3. National Priorities List Status

This Site is a subsite of the Onondaga Lake NPL Site.

4. Maps, Pictures, and Other Graphic Representation

Figure 3 shows the area of the Wastebeds 1-8 Site that is subject to the Wastebeds 1-8 IRM.

B. Other Actions to Date

1. Previous actions

Previous actions include sampling as part of the Wastebeds 1-8 Preliminary Site Assessment and RI.

2. Current actions

The RI is ongoing. It is anticipated that an FS report and Proposed Plan for the Site will be released to the public in 2014.

III. THREATS TO PUBLIC HEALTH, OR WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A Streamlined Risk Evaluation (SRE) was prepared for the portion of the Wastebeds 1-8 Site that will be subject to the IRM. The objective of the SRE was to provide a concise evaluation of potential risks to human and ecological receptors, assuming no removal or clean-up actions are taken at the Site, as it relates to exposure to the contaminated Site media being addressed by this IRM and the contribution these media may have to unacceptable risks at the Site. A summary of the human health and ecological evaluations are provided below.

Human Health Evaluation

The intended future use of the portion of the Site affected by the IRM is for habitat enhancements, including wetland improvements. In addition, the area may be accessed by recreational users of the bike trail and Onondaga Lake (e.g., biking along a bike trail). Although unlikely, it is possible that the groundwater could be used as a drinking water source, which would impact a residential receptor. Also, potentially, a future construction worker may work in the area. A complete baseline human health risk assessment (HHRA) that provides a detailed, Site-specific evaluation of the risks associated with the entire Wastebeds 1-8 Site was finalized in April 2011. That Site-wide HHRA considered a number of current and future exposure

scenarios for different receptors, including a trespasser, utility worker, commercial worker, all-terrain-vehicle (ATV) rider, construction worker, state fair attendee, ditch maintenance worker, fisherperson, and resident. Of those receptors, only the older child trespasser, construction worker, ATV rider, fisherperson, ditch maintenance worker and resident are expected to come in contact with the contaminated media being addressed by this IRM.

The SRE provides an assessment of the potential threats to human health and the environment prior to any response action being taken by comparing the maximum concentrations of contaminants in the Site media that will be addressed by the IRM to health-protective screening criteria that are appropriate for the receptors who would be expected to come in contact with this material to establish chemicals of potential concern (COPCs). The SRE then compared the COPCs to the chemicals of concern (COCs) identified in the HHRA for Geddes Brook/Ninemile Creek and the Onondaga Lake Bottom Subsite to determine which constituents from Wastebeds 1-8 may be contributing to unacceptable risks and hazards in the Lake and Ninemile Creek.

Based on the screening, there is a potential threat to human health and the environment from exposure to multiple COPCs found in the eastern shore groundwater and seeps, Ninemile Creek seeps, surface Solvay waste along the eastern shore, Solvay waste substrate and sediment in the lower reach of Ditch A, and surface water in the lower reach of Ditch A. Some of the COPCs identified in the SRE were also identified as risk drivers in the lake and Geddes Brook/ Ninemile Creek based on consumption of fish. Specifically, the SRE identified arsenic as a COPC in groundwater, Solvay waste, and seep water. Mercury and PCBs were also identified as COPCs in groundwater and Solvay waste.[8] In the HHRA for the Lake Bottom Subsite, it was determined that arsenic, mercury (as methyl mercury), and PCBs were primary risk drivers associated with the consumption of fish from the lake (TAMS, 2002a). For the lake, EPA acceptable risk thresholds were exceeded for both potential cancer and non-cancer risks (i.e. potential cancer risks exceed the 10^{-4} to 10^{-6} risk range and potential non-cancer risks exceeded a hazard index [HI] of 1). In the HHRA for Geddes Brook/Ninemile Creek, it was determined that mercury (as methyl mercury) and PCBs were primary risk drivers associated with the consumption of fish from Geddes Brook/Ninemile Creek (TAMS/EarthTech, 2003a). For Geddes Brook/Ninemile Creek, EPA acceptable risk thresholds were exceeded for non-cancer risks (i.e. potential non-cancer risks exceeded a HI of 1). The IRM is expected to reduce impacts to the Lake Bottom and Ninemile Creek from contaminants that presented unacceptable risks and hazards in the risk assessments for those subsites.

Ecological Evaluation

In a manner similar to how potential human health threats from the Site were evaluated, the SRE compared the chemicals of potential ecological concern (COPECs) to the COCs identified in the baseline ecological risk assessment (BERA) for Geddes Brook/Ninemile Creek and Onondaga Lake Bottom Subsites to determine which constituents from Wastebeds 1-8 may be contributing to unacceptable risk to ecological receptors in the Lake and Ninemile Creek. Copper, lead,

8 It should be noted that arsenic, PCBs and mercury were also identified as COCs in groundwater, seep water, and soil in the HHRA for the Wastebeds 1-8 site.

mercury, and zinc levels in Site groundwater that discharges to Onondaga Lake exceeded their respective screening criteria by more than two orders of magnitude. These COPECs were identified as surface water COCs in the Onondaga Lake BERA (TAMS, 2002b). Mercury levels in Site groundwater that discharges to Ninemile Creek exceeded screening criteria by more than two orders of magnitude. Mercury was also identified as a surface water COC in the Geddes Brook/Ninemile Creek BERA (TAMS/EarthTech, 2003b).

In the top two feet of Solvay waste on the lake shoreline and in the surf zone, chromium exceeded its screening criterion by more than two orders of magnitude. Chromium was identified as a COC in sediment in the Onondaga Lake BERA.

Lead in seep water which discharges towards Ninemile Creek was at a level which is approximately 6 times higher than its screening criterion. Lead was also identified as a COC in the Geddes Brook/ Ninemile Creek BERA.

Key results of the Geddes Brook/Ninemile Creek and Onondaga Lake BERAs indicate that comparisons of measured tissue concentrations and modeled doses of chemicals to toxicity reference values show exceedances of hazard quotients for site-related chemicals throughout the range of the point estimates of risk. Site-specific sediment toxicity data indicate that sediments are toxic to benthic macroinvertebrates on both an acute (short-term) and chronic (long-term) basis. Many of the contaminants in Ninemile Creek and the Lake are persistent and, therefore, the risks associated with these contaminants are unlikely to decrease significantly in the absence of remediation. On the basis of these comparisons, it has been determined through the Onondaga Lake and Geddes Brook/Ninemile Creek BERAs that all receptors of concern are at risk. Contaminants and stressors in the Lake and Geddes Brook/Ninemile Creek have either impacted or potentially impacted every trophic level examined in the Onondaga Lake and Geddes Brook/Ninemile Creek BERAs (NYSDEC and EPA, 2005; NYSDEC and EPA, 2009).

Conclusions

The identification of COPCs and COPECs indicate that there is a potential threat to human health and the environment. Many of these COPCs and COPECs are also identified as COCs in the Geddes Brook/Ninemile Creek and Onondaga Lake HHRAs and BERAs. Contaminated Solvay waste, groundwater and surface water from the Site have the potential to directly impact sediment, surface water and fish in the lake. Therefore, response actions at the portion of the Site being evaluated by the FFS are warranted based on the following factors acknowledged in 40 CFR Section 300.415 (b)(2):

- Potential threat of exposure to nearby human populations, animals, and the food chain from site-related contaminants.
- Unacceptable potential risks due to elevated levels of Site-related contaminants in drinking water supplies, soils, sediment, surface water, and ground water.
- Actual or potential contamination of sensitive ecosystems.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Response Action Document, may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. SELECTED ACTION AND ESTIMATED COSTS

A. Selected Action

1. Selected Action Description

The Selected Action, the layout of which is shown in Figure 3, includes the following components:

Vegetative Cover with Lakeshore Groundwater Collection

The action will include a seep collection system, approximately 4,200 feet in length, installed at the elevation where seeps are observed (approximately at the 370 ft elevation contour) along the eastern shore and a 6,250-linear ft trench along the lakeshore, with a 850-linear ft trench installed inland, inboard of the 2.3 connected acre wetland proposed for this area in the Onondaga Lake Habitat Plan (Parsons, 2009). A vegetative cover will be placed on the remaining 14.4-acre area along the eastern lakeshore. The groundwater collection system will include a shallow groundwater collection trench, passive wells to collect groundwater from the intermediate unit, collection sumps and conveyance piping, and a monitoring system. A separate seep collection system will be installed along the area where the seeps are present.

The trench alignment depicted in this response action would accommodate the compensatory mitigation wetlands proposed for this area of 9.3 acres, including 2.3 acres of lake-connected wetlands. The trench alignment and the sizes and locations of the compensatory mitigation wetlands are approximate and may be modified during the remedial design to accommodate additional mitigation requirements for the Onondaga Lake NPL site. Although envisioned as part of the future use of this area, the wetlands are not part of this response action. Further discussion of these compensatory wetlands is included in the draft Onondaga Lake Habitat Plan (Parsons, 2009).

Hydraulic Control of the Former NMCSG Unit Discharge

The groundwater within the NMCSG unit contains elevated levels of benzene, toluene, xylene and phenol. In order to prevent the migration of contaminated groundwater to Ninemile Creek and/or to Onondaga Lake, groundwater discharging through the former NMCSG unit will be collected using recovery

wells, or, if appropriate, controlled via a trench system and passive wells similar to that which will be employed for the eastern shoreline. At the Onondaga Lake discharge of the NMCSG unit, up to five 4-inch diameter wells will be installed to a depth of approximately 45 feet below ground surface. Well pumps will discharge the recovered groundwater to the eastern shore collection system via High Density Polyethylene (HDPE) piping. The distance of the conveyance piping will be approximately 500 feet. At the NMCSG unit discharge to Ninemile Creek, two 4-inch diameter wells will be installed to a depth of 75 feet below ground surface. Well pumps will discharge the recovered groundwater to the eastern shore collection system via approximately 500 linear feet of HDPE piping. An estimated flow of 7 gallons per minute (gpm) is anticipated to come from these wells. The means for collecting the groundwater (e.g., wells, trench) will be determined during remedial design.

Hydraulic Control of Seeps along the Northern Shore

Seep collection along the northern shore will address four observed seeps from drainage pipes and two localized areas of groundwater seeps along the northern shore. These seeps contain elevated levels of naphthalene which, if not collected, could migrate to Onondaga Lake. The observed seeps from the drainage pipes will be eliminated by physically plugging the drainage pipes and abandoning the associated weir boxes. The seeps will be collected through use of a perforated collection pipe embedded in a gravel apron installed at grade in the area of the seeps (see Figure 4). The collection system will be connected to a manhole and pumped to the eastern shore collection. A geomembrane and vegetative cover will be placed over the collection area to minimize infiltration of surface runoff into the seep collection system.

Hydraulic Control of Seeps along Ninemile Creek

Seeps have also been observed along the banks of the wastebeds facing Ninemile Creek. The seeps extend approximately 1,800 feet along the bank. The seeps may contribute to calcite formation and erosion of Solvay waste in the area which could migrate through surface flow to Ninemile Creek and/or a small ponded area adjacent to the Creek. To control the seeps, a collection trench will extend northwest from the ponded area for approximately 1,800 linear feet along the 370 ft elevation contour (see Figure 3). A gravel drainage layer will be installed on top of the existing seeps and along, and connected to, the collection trench to capture seeps from varying locations near the 370 ft elevation contour. This drainage layer will be covered with a geomembrane and topsoil and restored with vegetation. An estimated combined volume of 12 gpm could be conveyed from this system. Similar to the NMCSG conveyance system, the collected water will be transported to the eastern shore collection system via HDPE piping.

Conveyance and Treatment of Collected Water

The water collected from all of the seep collection systems and the NMCSG unit collection system will be conveyed to the eastern shore collection system and pumping station situated at the southern end of the eastern shore collection system adjacent to Ditch A. Collected seep water and groundwater will be treated at the Willis Avenue groundwater treatment plant and then conveyed to the Onondaga County Metropolitan Wastewater Treatment Plant for additional treatment prior to discharge to Onondaga Lake.

Shoreline Stabilization of Solvay Waste along the Surf Zone

Shoreline stabilization material will be placed along approximately 1,450 linear feet of the northern shore (the shore bordering Onondaga Lake SMU-4). The shore stabilization will be graded gravel with live fascines, live staking and branch layering that will be placed within the surf zone (approximately at elevation 360 ft to 365 ft) to stabilize the substrate in order to reduce resuspension of Solvay waste attributable to wind and wave action.[9] The graded gravel will improve habitat through stabilization of the shore Solvay waste and promotion of submerged macrophyte growth (see Figure 5). Additionally, live crib walls (or other technologies which may be considered in the IRM design and which will meet the same objectives) will be installed along approximately 460 linear ft of the northern shore along Onondaga Lake SMU-4. The live crib wall would be composed of 6-inch square timbers and built to a width of 8 ft and a height of approximately 5.5 ft (see Figure 6). The sides and top of the walls would be vegetated.

Ditch A Sediment Removal and Pipe Rehabilitation

The lower reach of Ditch A (approximately 380 linear feet from the mouth and then inland) will be excavated to remove Solvay waste and contaminated sediment to a minimum depth of 2 feet. Solvay waste and sediment will also be removed from the conveyance pipes beneath Route 690 and beneath the State Fair Parking lot access road. Ditch A will be lined with a low permeability cover/habitat cover to prevent any remaining contaminated substrate from adversely affecting the surface water or habitat. Pipes that convey water from Ditch A to Ninemile Creek at the western end of Ditch A will be rehabilitated to prevent groundwater and/or seep water from entering the ditch and migrating to Ninemile Creek. Based on information to be collected during IRM design, additional portions of Ditch A (including adjacent seeps) may also be remediated.

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9 Based on the wind/wave analysis, the surf zone (and corresponding wave height) extends to a water depth of approximately 2.5 feet for waves associated with the 10-year storm event, which was the return event selected as the basis of design for defining the treatment area (Parsons, 2009).

2. Contribution to Remedial Performance

The control of contaminated groundwater and seeps, addressing contaminated sediments, stabilizing the shoreline along Onondaga Lake, and addressing contaminated soils within the lakeshore area as part of the IRM will facilitate the cleanup of Onondaga Lake and Ninemile Creek via elimination or control of Wastebeds 1-8 contaminant sources. It is anticipated that the Wastebeds 1-8 IRM will be incorporated into the final remedy for the Site, and the IRM is not believed to be inconsistent with future remedial actions which may be needed at the Site.

3. Description of Alternative Technologies

Not applicable.

4. Engineering Evaluation/Cost Analysis

An FFS (which is equivalent to an EE/CA[10]) was prepared to analyze different removal actions, cover systems, and groundwater collection locations. The FFS was prepared in conformance with the guidelines in Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA (EPA/450-R-93-057, August 1993).

A PRAD, which identified EPA and NYSDEC's preferred response action and the basis for that preference, and the FFS were made available to the public in both the Administrative Record and information repositories maintained in the NYSDEC Syracuse and Albany, New York offices, the Onondaga County Public Library, 447 South Salina Street, Syracuse, New York, the Solvay Public Library, 615 Woods Road, Solvay, New York, and at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. The documents were also made available on NYSDEC's website at www.dec.ny.gov/chemical/37558.html. On December 27, 2010, a notice of availability for these documents was published in the Syracuse *Post Standard* and e-mailed to interested community members via NYSDEC's Onondaga Lake News Listserv. A public comment period was held from December 27, 2010 to February 10, 2011. On January 13, 2011, NYSDEC conducted a public meeting at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds, to present the findings of the FFS, answer questions from the public about the Site and the response actions under consideration, and present the preferred response action. Approximately forty people, consisting of residents, representatives of the media, representatives of Honeywell, and local government officials, attended the public meeting. Public comments have been addressed in the Responsiveness Summary (see Appendix E, attached hereto).

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10 As mentioned above, an EE/CA is a study conducted as part of the removal process to collect necessary data to determine the type and extent of contamination at a site and evaluate response actions to address this contamination.

5. Applicable or Relevant and Appropriate Requirements and Other Environmental Criteria

Applicable or Relevant and Appropriate Requirements (ARARs) and Criteria, Advisories, and Guidance to be Considered (TBCs) related to this response action will be complied with during implementation of the Wastebeds 1-8 IRM. The ARARs/TBCs include, but are not limited to:

- 6 NYCRR 701 - Classifications - Surface Waters and Ground Waters
- 6 NYCRR Part 703 - Class GA Groundwater Quality Standards
- NYS TOGS 1.1.1 – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations
- 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
- NYSDEC Technical Guidance for Screening Contaminated Sediment (1999)
- 6 NYCRR 663 - Freshwater Wetland Permit Requirements
- Clean Water Act Section 404, 33 CFR Parts 320 - 330
- Clean Water Act Section 404, 40 CFR Parts 230 – 231
- Executive Order 11990 - Protection of Wetlands
- Executive Order 11988 – Floodplain Management
- Policy on Flood Plains and Wetland Assessments for CERCLA Actions (OSWER Directive 9280.0-02)
- National Historic Preservation Act, 36 CFR 800- Preservation of Historic Properties Owned by a Federal Agency
- National Historic Preservation Act, 36 CFR Part 65 - National Historic Landmarks Program
- New York State Historic Preservation Act of 1980, 9 NYCRR Parts 426 – 428
- 33 U.S.C. 1341 - Clean Water Act Section 401, State Water Quality Certification Program
- 6 NYCRR 608 - Use and Protection Of Waters
- 16 USC 661 - Fish and Wildlife Coordination Act
- 33 CFR Parts 330 - Nationwide Permit Program
- 40 CFR Part 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices
- 6 NYCRR 360 - Solid Waste Management Facilities
- 29 CFR Part 1910.120 - Occupational Safety and Health Standards - Hazardous Waste Operations and Emergency Response
- 29 CFR Part 1926 - Safety and Health Regulations for Construction

The environmental benefits of the Selected Action may be enhanced by consideration, during the design, of technologies and practices that are sustainable

in accordance with EPA Region 2's Clean and Green policy[11] and NYSDEC's Division of Environmental Remediation Program Policy *Green Remediation* (DER-31)[12]. This will include consideration of green remediation technologies and practices.

6. Project Schedule

The design of the Selected Action is ongoing. It is expected that remedial construction will commence in 2012 and be completed in 2014.

B. <u>Estimated Costs</u>

The estimated capital, annual future Site control costs, and present-worth cost for the Wastebeds 1-8 IRM are presented below. The estimated cost is $23,801,000.

Capital Cost	Annual O&M Cost (1-5 years)	Periodic O&M Cost (year 5)	Total Present-Worth Cost
$17,122,000	$1,499,000	$748,000	$23,801,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Should the IRM be delayed or not taken, the Site will continue to pose a potential health risk to human health or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

Pursuant to CERCLA, the current owner and operator of a facility from which there is a release of hazardous substances which causes the incurrence of response costs shall be liable for the costs incurred by the United States. CERCLA also provides that persons who previously owned or operated a facility at the time of disposal of hazardous substances are similarly liable. NYSDEC anticipates that the response action will be implemented and funded by Honeywell, the responsible party.

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11 See http://epa.gov/region2/superfund/green_remediation

12 See http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

IX. AUTHORIZATION

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal action.

This decision document, which selects a response action for the Wastebeds 1-8 IRM, located in Onondaga County, New York, was developed in accordance with CERCLA, and is not inconsistent with the NCP. The decision documented in this Response Action Document is based on the Administrative Record for the IRM.

NYSDEC and EPA's selected response action includes controlling contaminated groundwater and seeps, addressing contaminated sediments, stabilizing the shoreline along Onondaga Lake, and addressing contaminated soils within the lakeshore area. This response action will be protective of human health and the environment, both in the short and long-term, and will meet federal and state ARARs/TBCs, to the extent practicable. The volume of contaminants will be reduced through collection and treatment of the groundwater and is readily implementable. The response action includes a groundwater collection trench which will be a hydraulic containment system for the Solvay waste and constituents within the waste. The response action is complimentary with the anticipated ecological and recreational land use of this area, which includes wetlands, county parkland, and ecologically compatible recreation such as bird watching. Construction of a vegetated cover system will allow for a more varied habitat around the planned wetlands. It also allows for the intended end-use of this area for inland and connected wetlands which would enhance the environmental benefit of this area.

As discussed in the Proposed Response Action Document (see Appendix E-1), NYSDEC and EPA believe that the selected response action provides the best balance of tradeoffs among the response actions with respect to the three evaluation criteria (effectiveness, implementability, and cost). NYSDEC and EPA also believe that the selected response action will be protective of human health and the environment, will comply with ARARs/TBCs to the extent practicable, will be cost-effective, and will utilize permanent solutions and response action treatment technologies or resource recovery technologies to the maximum extent practicable.

August 10, 2011

Dale A. Desnoyers, Director
Division of Environmental Remediation
New York State Department of Environmental Conservation

Date

August 10, 2011

Walter E. Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency

Date

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TAMS/Earth Tech, New York, New York and YEC, Valley Cottage, New York. July 2003.

TAMS/Earth Tech. 2003b. *Geddes Brook/Ninemile Creek Baseline Ecological Risk Assessment*. TAMS/Earth Tech, New York, New York and YEC, Valley Cottage, New York. July 2003.

APPENDIX A

Figures

This document was developed in color. Reproduction in B/W may not represent the data as intended.

ADAPTED FROM: SYRACUSE WEST, NY USGS QUADRANGLE

PATH: I:\Honeywell.1163\41861.Wastebeds-1-8-S\Doc\DWG\MXD\FFS\SITE_LOC.mxd

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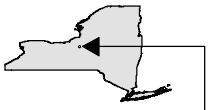


QUADRANGLE LOCATION

HONEYWELL
WASTEBEDS 1 - 8
GEDDES, NEW YORK

SITE LOCATION

N

0 1,000 2,000 4,000 6,000 8,000

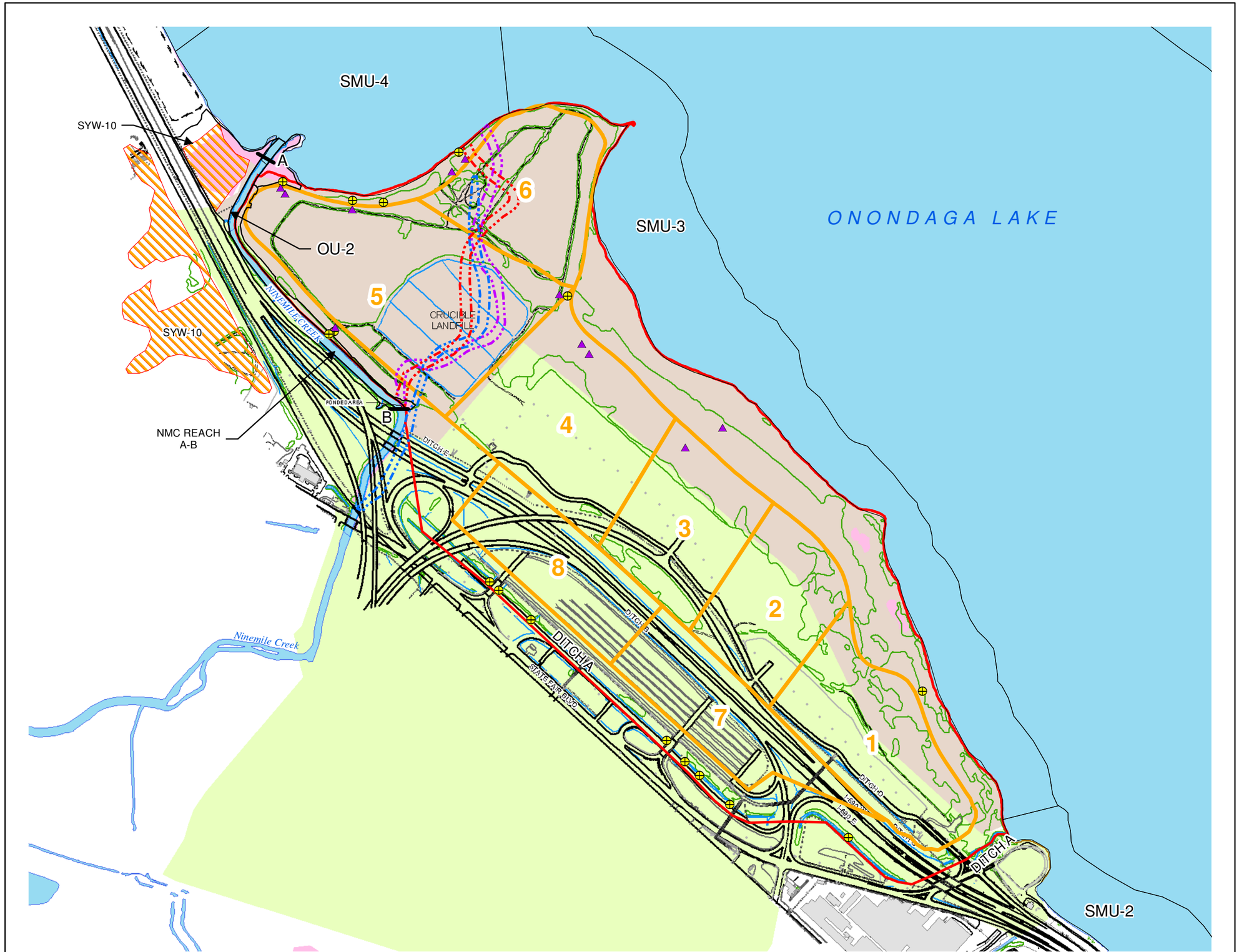
Feet

1:24,000

JUNE 2010
1163.41861

O'BRIEN & GERE

FIGURE 2



N

LEGEND

- WEIR BOX
- PIPE
- DELINEATED WETLANDS
- NYS FRESHWATER WETLAND
- APPROXIMATE WASTEBED BOUNDARY
- WASTEBEDS 1-8 SITE

PROPERTY BOUNDARY

- STATE OF NEW YORK
- COUNTY OF ONONDAGA

FORMER NINEMILE CREEK CHANNEL

- USGS TOPO MAP 1898
- THOMSEN ASSOCIATES 1982
- ALLIED DRAWING 1937

HONEYWELL
WASTEBEDS 1 - 8
GEDDES, NEW YORK

SITE PLAN

0 400 800 1,600
Feet

APRIL 2010
1163.41861

O'BRIEN & GERE

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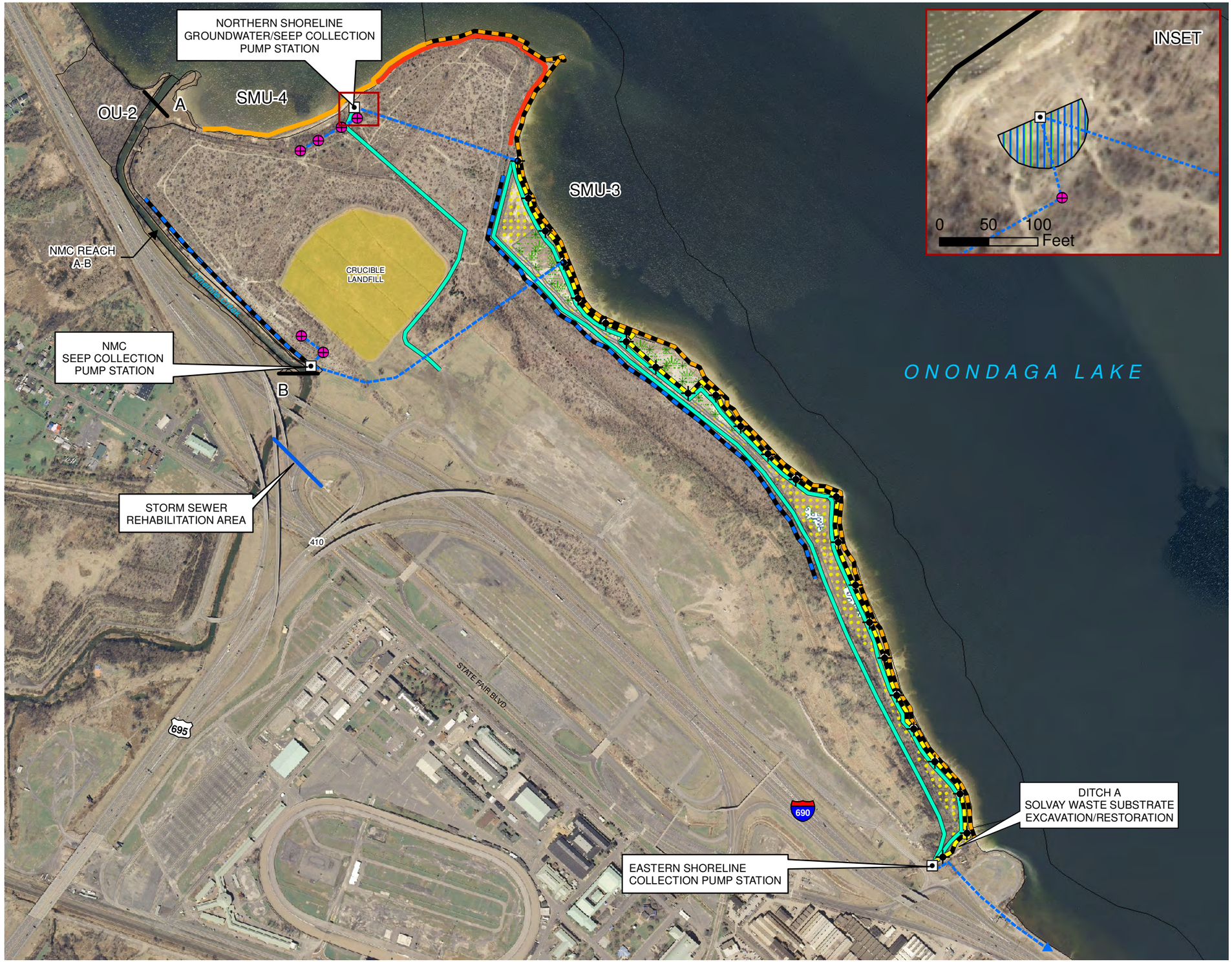
FIGURE 3



This document was developed in color. Reproduction in B/W may not represent the data as intended.

N

LEGEND

- MANHOLE
- NMCSG RECOVERY WELL
- PUMP STATION
- CONVEYANCE PIPE
- ACCESS ROAD
- CRIB WALL
- GRADED GRAVEL AND LIVE FASCINES
- GRADED GRAVEL AND LIVE FASCINES (LAKE REMEDY)
- SEEP COLLECTION TRENCH AND APRON
- GROUNDWATER COLLECTION TRENCH
- DELINEATED WETLANDS
- MITIGATION WETLANDS (LAKE HABITAT RESTORATION)
- COVER AREA

HONEYWELL
WASTEBEDS 1-8
GEDDES, NEW YORK

RESPONSE ACTION

0 375 750 1,500
Feet

APRIL 2010
1163.41861

O'BRIEN & GERE

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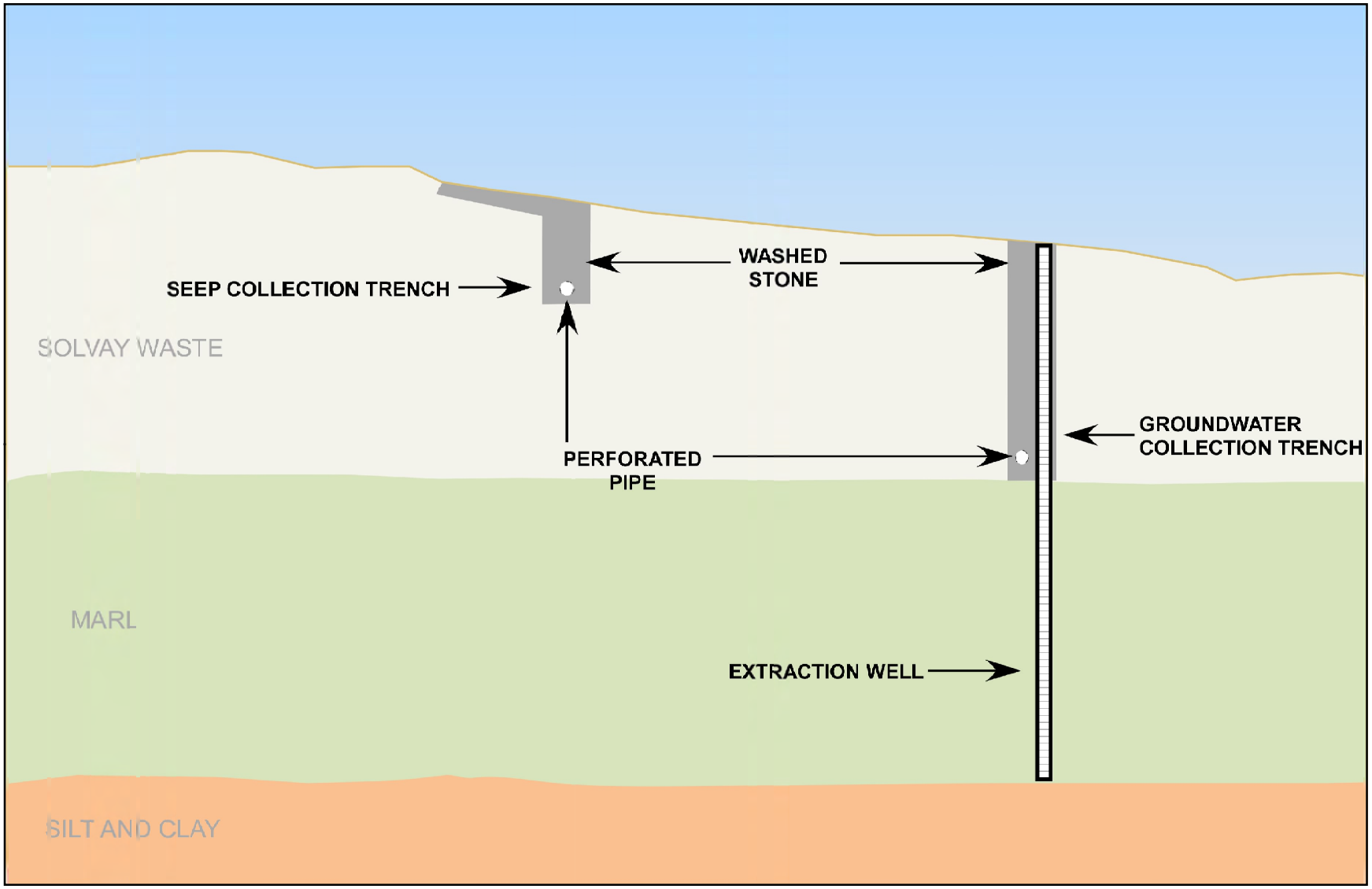

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FIGURE 4

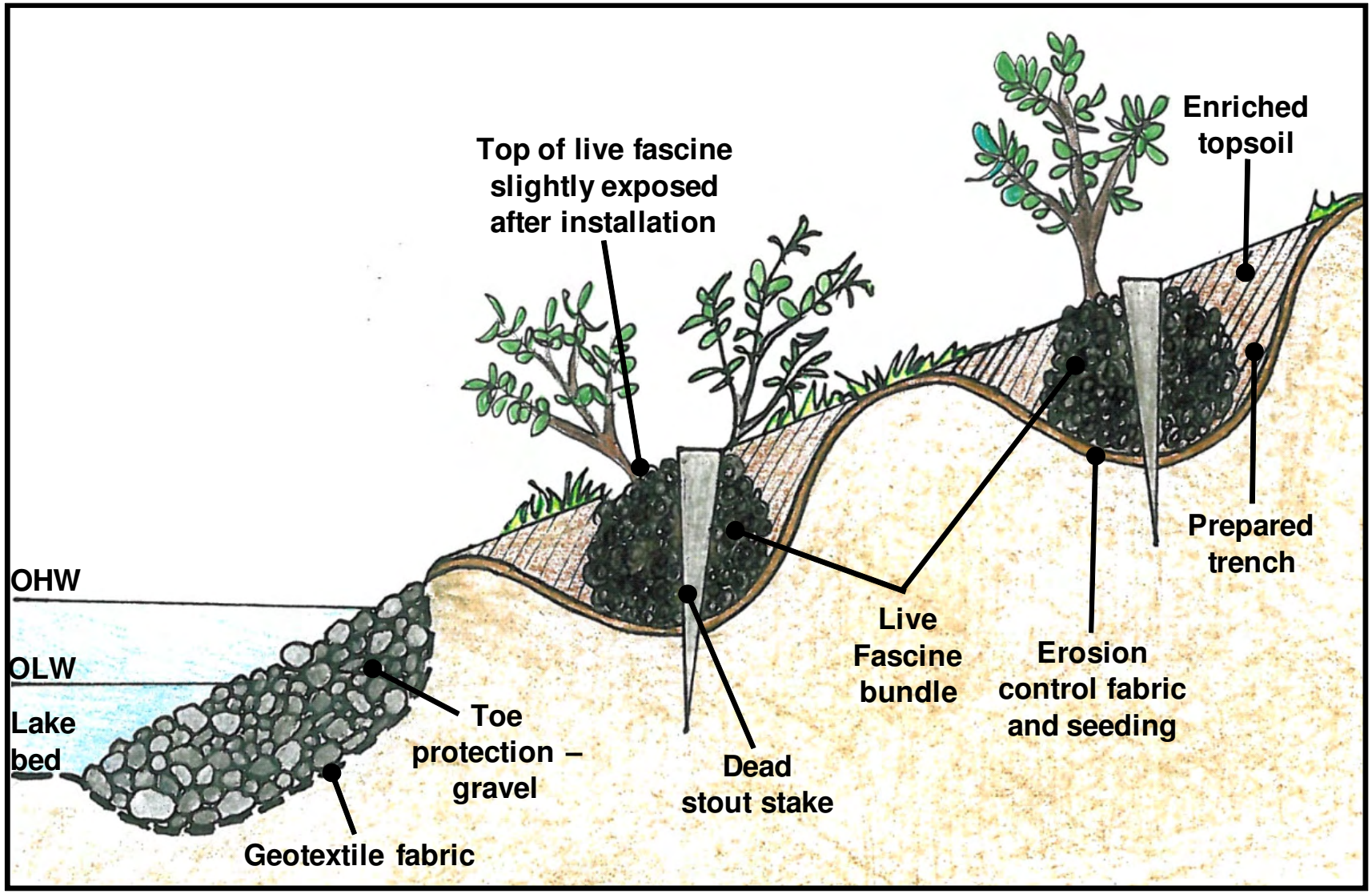
NOT TO SCALE

HONEYWELL
WASTEBEDS 1-8
GEDDES, NEW YORK

COLLECTION TRENCH CONCEPTUAL CROSS-SECTION

APRIL 2010
1163.41861

O'BRIEN & GERE



Source: Modified From: "Stream Corridor Restoration: Principles, Procesees and Practices" Federal Interagency Restoration Working Group, October 1998

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FIGURE 5

NOT TO SCALE

HONEYWELL
WASTEBEDS 1-8
GEDDES, NEW YORK

SHORELINE STABILIZATION CONCEPTUAL CROSS-SECTION

APRIL 2010
1163.41861

O'BRIEN & GERE

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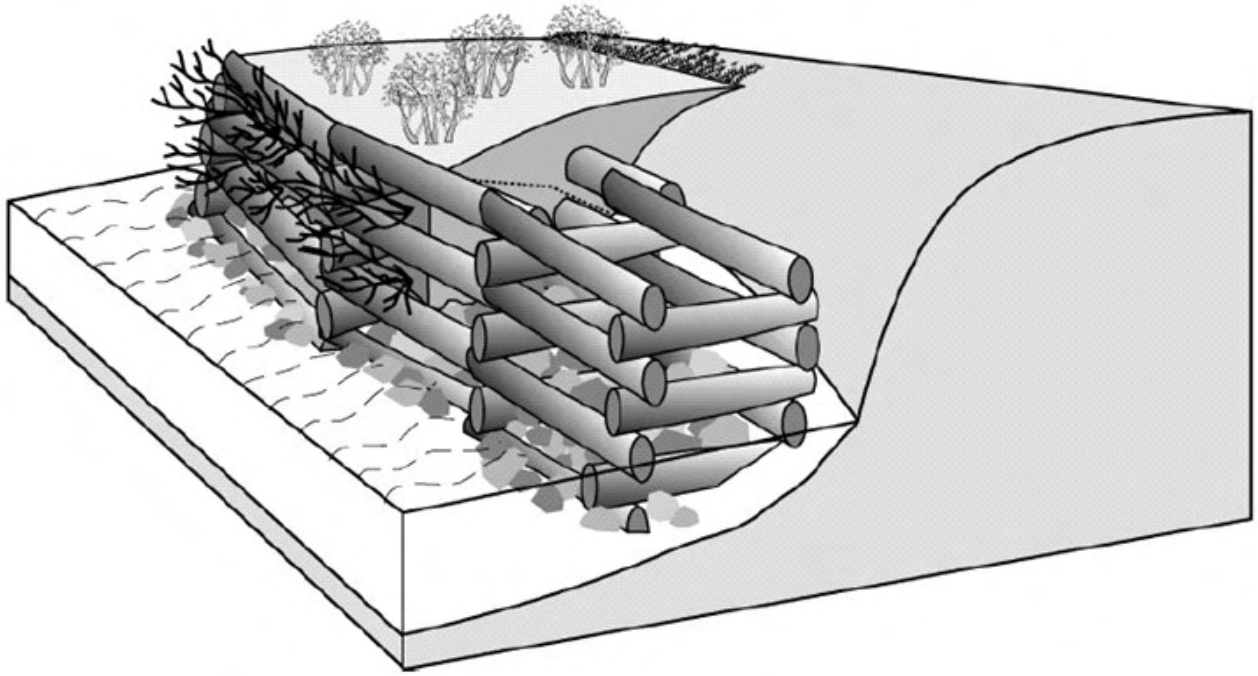

Source: Modified From: "Stream Corridor Restoration: Principles, Procesees and Practices" Federal Interagency Restoration Working Group, October 1998

FIGURE 6

NOT TO SCALE

HONEYWELL
WASTEBEDS 1-8
GEDDES, NEW YORK

CRIB WALL STABILIZATION
CONCEPTUAL CROSS-SECTION

APRIL 2010
1163.41861

O'BRIEN & GERE

APPENDIX B

Tables

Table 1
Wastebeds 1-8 IRM Cost Summary

Vegetative Cover with Lakeshore Groundwater Collection		
	Capital Cost	$17,122,000
	Periodic O&M Costs	$748,000
	Annual O&M Cost	$1,499,000
	Total Present Worth Cost	$23,801,000

Notes: From Wastebeds 1-8 Focused Feasibility Study (O'Brien& Gere, 2010). Feasibility Study level accuracy (+50% / -30%).

Capital cost included the following markups; 18% indirect costs, 20% contingency, and 11% engineering design and construction oversight.

APPENDIX C

Administrative Record Index

Administrative Record Index
Wastebeds 1-8 IRM

Documents Related to IRM Activities	Wastebeds 1-8 Consent Order (January 2004) Wastebeds 1-8 Focused Feasibility Study (June 2010) Proposed Response Action Document for the Wastebeds 1-8 Site IRM (December 2010)
Documents in Support of Streamlined Risk Evaluation	Onondaga Lake Human Health Risk Assessment (December 2002) Onondaga Lake Baseline Ecological Risk Assessment (December 2002) Geddes Brook/Ninemile Creek Human Health Risk Assessment (July 2003) Geddes Brook/Ninemile Creek Baseline Ecological Risk Assessment (July 2003) Wastebeds 1-8 Baseline Ecological Risk Assessment (March 2011) Wastebeds 1-8 Human Health Risk Assessment (April 2011)

APPENDIX D

NYSDOH Letter of Concurrence

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square 547 River Street Troy, New York 12180-2216

Richard F. Daines, M.D.
Commissioner

James W. Clyne, Jr.
Executive Deputy Commissioner

September 29, 2010

Mr. Dale Desnoyers, Director
Division of Environmental Remediation
NYS Department of Environmental Conservation
625 Broadway - 12th Floor
Albany, NY 12233-7011

Re: Proposed Response Action
Wastebed 1-8 Interim Remedial Measure
Site #734081
Syracuse (C), Onondaga County

Dear Mr. Desnoyers:

Staff reviewed the July 2010 Proposed Response Action Document for the Interim Remedial Measure (IRM) planned for the Solvay Wastebeds 1-8 Site in Onondaga County. Based on this information, I understand the proposed IRM includes the construction of a collection trench system along the lakeshore area to control the migration of contaminated groundwater toward Onondaga Lake. In addition, a soil cover will be placed over lakeshore soils and vegetated in order to re-establish habitat around planned wetlands as part of the Onondaga Lake restoration effort.

Based on this information, I concur with the proposed IRM as it will prevent human exposures to Solvay waste and contaminated soil along the lakeshore, minimize the extent of contaminated groundwater reaching Onondaga Lake, and eliminate or reduce, to the extent practicable, adverse ecological effects to the benthic and terrestrial community. If you have any questions, please contact Geoffrey Laccetti (518) 402-7860.

Sincerely,

Steven M. Bates, Acting Director
Bureau of Environmental Exposure Investigation

ec: A. Salame-Alfie, Ph.D.
K. Anders / G. Laccetti
J. Strepelis - CNYRO
K. Zimmerman - OCHD
S. Ervolina / W. Daigle - NYSDEC, Central

APPENDIX E

Responsiveness Summary

RESPONSIVENESS SUMMARY
Wastebeds 1-8 IRM

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Wastebeds 1-8 Interim Remedial Measure (IRM) and the responses of the New York State Department of Environmental Conservation (NYSDEC) and U.S. Environmental Protection Agency (EPA). All comments summarized in this document have been considered in NYSDEC and EPA's final decision in the selection of a response action to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The December 2010 Proposed Response Action Document (PRAD), which identified the response action preferred by NYSDEC and EPA, and the basis for that preference, and the Focused Feasibility Study (FFS) were made available to the public in both the Administrative Record and information repositories maintained in the NYSDEC's Albany, New York and Region 7 Syracuse, New York offices and at local information repositories at the Onondaga County Public Library, 447 South Salina Street, Syracuse, New York, the Solvay Public Library, 615 Woods Road, Solvay, New York, and at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. The documents were also made available on NYSDEC's website at www.dec.ny.gov/chemical/37558.html. On December 27, 2010, a notice of availability for these documents was published in the Syracuse *Post Standard* and e-mailed to interested community members via NYSDEC's Onondaga Lake News Listserv. A public comment period was held from December 27, 2010 to February 10, 2011. On January 13, 2011, NYSDEC conducted a public meeting at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds, to present the findings of the FFS and answer questions from the public about the Site and the response actions under consideration. Approximately forty people, consisting of residents, representatives of the media, representatives of Honeywell, and local government officials, attended the public meeting.

OVERVIEW

NYSDEC and EPA's selected IRM includes controlling contaminated groundwater and seeps, addressing contaminated sediments, stabilizing the shoreline along Onondaga Lake, and addressing contaminated soils within the lakeshore area. Responses to the comments received at the public meeting and in writing during the public comment period are summarized below. Attached to this Responsiveness Summary are the following Appendices:

Appendix E-1 - Proposed Response Action Document (December 2010)
Appendix E-2 - Public Notice published in the *Post Standard* on December 27, 2010
Appendix E-3 - Letters Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments provided at the January 13, 2011 public meeting and contained in the letters that were received during the public comment period, as well as EPA, NYSDEC, and New York State Department of Health's responses to them, are provided below:

Comment #1: A commenter asked who owns the property and will there be public access for bird watching, hiking, and other recreational activities?

Response #1: The area encompassed by the Site was deeded to the people of New York State in 1953 and is currently owned by the State of New York and Onondaga County. More than one mile of Interstate Route 690 is located on the southwestern portion of the Site. In addition, approximately 80 acres of the Site are currently used by the State of New York for State Fair parking. The parcel owned by Onondaga County is required by the deed to be maintained as parkland. Since the area owned by the County is to be maintained as parkland, it is likely that there will be public access in the future. There is a plan for the Onondaga County bike trail to cross the Site but this has not happened yet. Onondaga County should be contacted for further information on the future use of the Site.

Comment #2: A commenter asked who would be installing the wetlands.

Response #2: The wetlands will be constructed and any necessary maintenance (*e.g.*, invasive species removal, additional plantings) will be performed by Honeywell, with NYSDEC and/or EPA oversight.

Comment #3: A commenter asked about the status of the Remedial Investigation/Feasibility Study (RI/FS).

Response #3: A draft RI report has been reviewed by NYSDEC and EPA. It is anticipated that a final document will be submitted later this year. Following completion of the RI report, an FS report will be drafted. It is anticipated that the FS report will be completed in 2014.

Comment #4: A commenter asked how much excavation would be performed in Ditch A and whether it will be part of the IRM.

Response #4: Work in Ditch A will be performed under this IRM. The work in Ditch A includes excavating contaminated Solvay waste and contaminated sediment to a minimum depth of 2 feet from the lower reach of Ditch A (approximately 380 linear feet from the mouth and then inland). The depth of Solvay waste and contaminated sediment removal will be determined during the design of the IRM. Ditch A will then be lined with a low permeability cover/habitat cover to prevent any remaining contaminated substrate from adversely affecting the surface water or habitat. Solvay waste and sediment will also be removed from the conveyance pipes beneath

Route 690 and beneath the State Fair Parking lot access road. Pipes that convey water from Ditch A to Ninemile Creek at the western end of Ditch A will be rehabilitated (by cleaning and repairing or replacing the pipes) to prevent groundwater and/or seep water from entering the Ditch and migrating to Ninemile Creek.

Comment #5: A commenter asked whether the excavation under Response Action 4 (Excavation with Inland Groundwater Control) would make the shoreline area open water with a steep drop-off. The commenter also asked whether wetlands could be created as part of this response action.

Response #5: Under Response Action 4, the area (approximately 27.6 acres) would be restored as open water with a stable slope into the lake. However, the creation of open water via this response action would not be conducive to the intended future ecological land use of the area as diverse wetlands. Wetlands could be created as part of Response Action 4, but the excavated material would have to be replaced with clean fill, which would make the costs higher for little additional benefit compared to the Selected Action. Response Action 4 would also take three to five years longer to implement than would the selected response action and would likely result in a delay in remediation of Onondaga Lake.

Comment #6: A commenter stated that there was volume lost in Onondaga Lake with the installation of the Willis Avenue barrier wall and noted that the shoreline area of Wastebeds 1-8 would be used to mitigate that volume. The commenter asked how much volume would be mitigated and whether the created wetland area would equal the lost area.

Response #6: Impacts associated with the installation of a portion of the barrier wall along the Willis Avenue Site resulted in the loss of approximately 2.3 acres of lake surface area. The lake connected wetlands that will be created at the Wastebeds 1-8 Site will be 2.3 acres in size and serve as mitigation for this area.

In addition, wetland areas adjacent to the lake on the Wastebed B/Harbor Brook Site will also be affected by the installation of a barrier wall and other remediation activities. These impacts will be compensated for by the creation of a wetland complex on the low lying portion of Wastebeds 1-8 adjacent to Onondaga Lake. The compensatory mitigation will consist of creating aquatic habitat and wetlands adjacent to the lake. The current design is based on a 2:1 mitigation ratio for wetlands located inboard of the barrier wall due to permanent loss in those areas, and a 1:1 mitigation ratio for wetlands located outboard of the wall. Two small wetland areas near the Wastebeds 1-8 shoreline will also be mitigated at a 1:1 ratio by the Wastebeds 1-8 IRM.

Comment #7: A commenter asked since the IRM work is primarily around the edges of the Site, which leaves the majority of the Solvay waste in place, is there a presumption that the Wastebeds 1-8 are stable and not moving.

Response #7: Solvay waste has not been placed within Wastebeds 1-8 since 1943. The IRM does not address the majority of the Site, including the main portion of Solvay waste within Wastebeds 1-8. This will be addressed as part of the Site-wide FS. Potential stability issues, if

any, would be evaluated as appropriate during the Site-wide FS and/or this IRM or final remedy designs.

Comment #8: A commenter asked about the anticipated longevity of the shoreline stabilization and the length of the monitoring.

Response #8: The IRM will be designed so that material that is placed along the shoreline will be stable for the long-term. Monitoring will be outlined in an Operation, Maintenance and Monitoring (OM&M) plan for the IRM and incorporated into the long-term OM&M for the Site. If any problems are identified as part of the monitoring, the necessary repairs will be made.

Comment #9: A commenter asked if the implementation of the IRM would result in complete remediation at the toe of slope or whether additional work will be needed.

Response #9: The IRM will facilitate the cleanup of Onondaga Lake and Ninemile Creek via elimination or control of Wastebed 1-8 contaminant sources. The IRM will be incorporated into additional remedial activities that will be evaluated during the FS for the Site. The FS will evaluate if additional action is needed to address contamination in areas where the IRM was implemented.

Comment #10: A commenter asked about the status of the lakeshore trail that will cross Wastebeds 1-8 and whether that will be a future phase of this project.

Response #10: The trail is not part of the remedial work for the Wastebeds 1-8 Site. As noted in Response #1, Onondaga County is planning to construct a trail for recreational use on the site. Onondaga County should be contacted as to the status of the bike trail.

Comment #11: A commenter asked whether there would be a retaining wall to keep contamination out of Ninemile Creek.

Response #11: A retaining wall or other barrier wall will not be installed along Ninemile Creek as part of this IRM. A collection system will be installed adjacent to Ninemile Creek to prevent the discharge of contaminated groundwater and seep water to Ninemile Creek. The collected groundwater and seep water will be treated at the Willis Avenue groundwater treatment plant and discharged to the Onondaga County Metropolitan Wastewater Treatment Plant for final treatment.

Comment #12: A commenter expressed concern that the proposed timber crib walls for the shoreline stabilization of the steep portion have a limited life expectancy and that if this is supposed to be a permanent solution to the problem, it would seem that concrete rather than timber poles should be used for the construction.

Response #12: Several technologies that incorporate vegetation were considered for stabilizing the steep portion of the shoreline, including live crib walls, which were included in the FFS report and PRAD. The selected response action presumes that timber crib walls will be used. However, other technologies may be used if it is determined during the IRM's design that they will accomplish the same goals as the timber crib walls, but have a longer life expectancy and/or provide greater stability.

Comment #13: A commenter suggested that given the small amount of material to be excavated from Ditch A, instead of constructing an on-site disposal cell, a better option would be to take it to Wastebed 13 (Sediment Consolidation Area) for disposal.

Response #13: At present, it is presumed that the on-site disposal of material will be temporary. The final disposal location for this material will be evaluated in the Feasibility Study for the Wastebeds 1-8 site. Depending on the amount of material and contamination present, the excavated material could be disposed off-site. If it is disposed on-site, it will be done in a manner in which there would be no unacceptable exposure risks from the material.

Comment #14: A commenter stated that the costs for leachate collection and treatment were only projected for five years while the final remediation is being designed. In the event that continued leachate collection and treatment is part of the final remediation, it would be helpful to have at least a preliminary estimate of how long collection and treatment would be required before levels of benzene, toluene, ethylbenzene, xylenes and other pollutants are reduced to safe levels.

Response #14: Leachate collection and treatment is anticipated to be needed for an indefinite period of time. For cost estimating purposes under this IRM, a period of 5 years was assumed. When the final remedy for the site is developed and evaluated, the costs for continued collection and treatment of the groundwater and seep water will be included in the evaluation.

Comment #15: A commenter noted that green remediation concepts are not National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria and, therefore, should not be included in the evaluation of response actions in the Focused Feasibility Study. The commenter also stated that Response Action 4 was screened out because of "Green Remediation" principles.

Response #15: It is agreed that green remediation concepts are not specified in the NCP criteria. However, the intents of NYSDEC's program policy "DER-31/Green Remediation" and EPA Region 2's "Clean and Green" policy are not to modify or replace existing remedial goals, but to employ green remediation principles and technologies to the extent practicable in an otherwise appropriately selected response action in order to reduce the demand on the environment during the cleanup process. Under both policies, environmental impacts should be considered and evaluated under all phases of the site cleanup process, from investigation through completion of remediation. Therefore, it is appropriate to consider the policies when evaluating remedial response actions in a feasibility study. Both policies make it clear, however, that they should not be interpreted to justify implementation of a "no-action" or a less comprehensive response action

because it would have a lower impact on the environment (green remediation attempts to maximize the net environmental benefit of a cleanup). In accordance with the policies, Response Action 4 was not screened out because of green remediation considerations.[1] All of the response actions were evaluated relative to effectiveness, implementability, and cost consistent with EPA's guidance for non-time-critical removal actions.

Comment #16: A commenter noted that the human health risk assessment (HHRA), which is being developed to support the Site RI/FS, does not assess risks to humans for subsistence hunting, gathering, and fishing.

Response #16: The lakeshore property on the Site is owned by Onondaga County and the property deed includes a restriction that the property be used as parkland. A comprehensive land use master plan developed in 1991 by the Metropolitan Development Foundation, the City of Syracuse, Onondaga County, and the New York State Urban Development Corporation identified the long-term land use of the Wastebeds 1 through 8 property as parkland and anticipated land-based sports and recreation facilities. A report prepared in 2003 by the Onondaga Lake Cleanup Corporation entitled *Preliminary Design Recommendations for Conducting a Demonstration Project to Assess Stabilization and Habitat Enhancement at the Lakeshore Solvay Wastebeds, Onondaga Lake, New York* described the goals for the shore area of the Site as being stabilization and habitat enhancement. It further identified stabilization and ecological goals related to enhancing the quality of the geomorphic zones along the shoreline. Cultural goals such as providing recreational opportunities at the lakeshore that are compatible with the ecological goals; providing multi-faceted, positive aesthetic experiences for the public; and providing habitat enhancement in such a way as to enhance restoration of native flora and fauna, were also identified (O'Brien and Gere, 2010). Based on these considerations, the reasonably anticipated future land use for the property is recreational. Habitat enhancement and restoration activities conducted under the Selected Action and under the Lake Bottom Subsite remedy will be consistent with the Habitat Plan for Onondaga Lake, and the reasonably anticipated future land use. Based upon the deed restriction on the property, hunting and gathering, however, would not be consistent with the anticipated future land uses of the property. Therefore, the HHRA did not assess the risks under these scenarios.

Concerning fishing, the Site HHRA does evaluate a trespasser/fisherperson as a potential current and future receptor; however, the receptor is limited to exposure to on-Site soils. For this receptor, the estimated excess cancer risk and noncancer hazard do not exceed the acceptable risk ranges and levels (O'Brien and Gere, 2011). Exposures resulting from subsistence fishing were qualitatively evaluated in the Lake Bottom and Geddes Brook/Ninemile Creek HHRAs. The potential for Geddes Brook/Ninemile Creek and Onondaga Lake to serve as a subsistence source of food was considered in the HHRAs; those documents identified unacceptable risks from fish consumption for both the general population and a potential subsistence fisher population (TAMS/EarthTech, 2002 and TAMS/EarthTech, 2003). For both Geddes Brook/Ninemile Creek and Onondaga Lake, target human-health based fish tissue concentrations for mercury based on the general population's fish consumption rate evaluated in the HHRAs (25

1 The "Alternatives" in the Focused Feasibility Study are referred to as "Response Actions" in the Proposed Response Action Document, Response Action Document, and this Responsiveness Summary.

grams/day) are similar to the mean background concentration of mercury in fish of US lakes. Target fish tissue concentrations based on the subsistence fisher consumption rate evaluated (170 grams/day) were not included as remedial goals in the RODs for Geddes Brook/Ninemile Creek and Onondaga Lake since these concentrations would not likely be achievable without a reduction in background sources (*e.g.*, atmospheric deposition) of mercury (NYSDEC and EPA, 2005 and NYSDEC and EPA, 2009).

Comment #17: A commenter stated that NYSDEC/EPA/Honeywell's response actions focus only on in-place stabilization of surficial waste via covering and reliance on fencing, signage, and institutional controls (published advisories) instead of returning the lands to prerelease or preindustrial conditions.

Response #17: The intent of the IRM is not to return the site to prerelease or preindustrial conditions, but to implement measures needed to mitigate contaminant migration from the Site to Ninemile Creek and Onondaga Lake. (See also Response #19 below.) The selected response action includes collection of groundwater and seeps (places where groundwater discharges at the surface) along the shoreline of Onondaga Lake and Ninemile Creek and stabilization of the lakeshore soils. Please also note that the selected response action does not include institutional controls, fencing, or signage.

Comment #18: A commenter noted that the selected response action relies on perpetual pumping and treatment of contaminated groundwater. The commenter suggested that treatment in this manner is inefficient and would result in large volumes of wastes requiring disposal.

Response #18: Collected groundwater and seep water will be treated at the existing Willis-Semet Groundwater Treatment Plant (GWTP). The GWTP was constructed to treat groundwater, process water, and construction water associated with the Willis Avenue/Semet Tar Beds IRM. It was designed for phased expansion to manage water generated from the remediation of multiple sites, so no new treatment facility would be needed. The Willis-Semet GWTP provides treatment of water using a metals precipitation treatment unit, filtration, pH adjustment, air stripping, and carbon adsorption. While settleable, precipitated, and filtered solids are generated from the treatment process, the volume of this material is not significant. Spent carbon is transported off-Site for regeneration or disposal. In the Site RI/FS, the continued collection and treatment of contaminated wastewater collected under the IRM will be evaluated relative to other remedial alternatives (*e.g.*, full or partial removal of Solvay waste material), which would eliminate or reduce the need for wastewater treatment.

Comment #19: Based on the concerns noted in the Comments #16, 17, and 18, a commenter proposed an additional response action that includes the excavation and full removal of Wastebeds 1-8. Two commenters recommended that excavated materials (Solvay waste) be employed for beneficial uses (*e.g.*, acid rock drainage mitigation, reinjection into Tully Brine fields to stabilize the ground surface and reduce subsurface erosion, daily waste cover at nearby municipal solid waste landfills, capping material for construction of the underwater cap for the Lake Bottom Subsite remedy, and feedstock in the manufacture of concrete). The commenters

cited benefits with this approach relative to the response actions evaluated in the PRAD. These benefits include the reduction of groundwater remediation costs and the opportunity to create naturalized, accessible, wildlife rich wetland habitat.

Response #19: As noted above and in the PRAD, contaminated shallow/intermediate groundwater surface water, seeps, and Solvay waste from the Site have the potential to directly and adversely impact sediment, surface water, and fish in Ninemile Creek and Onondaga Lake. In order to mitigate these potential threats, timely action is needed to eliminate or reduce migration of contaminants from the Site so that cleanup actions in the Lake can proceed in accordance with a court-mandated schedule. For these reasons, possible interim response actions were developed to specifically address contaminant migration potential from the Site in a timely manner. These response actions were intentionally limited to address the more immediate need--to cut off contaminant migration from the Site to Ninemile Creek and the Lake--not to address all of the contamination that may be present on the Site. Site-wide contamination is being addressed under the Site RI/FS, which is currently underway.

While Site-wide contamination is being addressed under the Site RI/FS, it should be noted that there are many technical concerns with the commenters' proposed beneficial uses for material excavated from the Site. Solvay waste is generally difficult to handle and manage. When it is wet, it is slippery, making it a physical hazard. When Solvay waste is dry, it can be dusty and difficult to excavate. The Solvay waste at the Wastebeds 1-8 site is also, in some areas, comingled with other contaminants, such as benzene, toluene, ethylbenzene, and xylene, polycyclic aromatic hydrocarbons, phenols, and heavy metals. Workers handling Solvay waste may need to take additional protective measures (e.g., wear personal protection equipment, including respirators) to minimize exposures from these contaminants. In addition, in order for the material to be usable for the suggested beneficial reuses, it would need to meet the specific criteria developed for the intended end use and not cause adverse impacts. For example, material intended to be used as daily cover in landfills would need to be able to effectively control odors and vectors. With regard to injecting excavated material into the Tully Brine fields, there is no present information that indicates that this approach would stabilize the ground surface and reduce erosion. On the other hand, injecting caustic contaminated material into unstable environments such as Tully Valley may contaminate presently clean groundwater and streams, and result in changes in local hydrology and groundwater flow patterns. Nevertheless, under the Site RI/FS, potential technologies and remedial options, including those that would entail beneficial reuse of excavated material such as those suggested by the commenters, will be assessed. If warranted, these potential technologies and remedial options would be incorporated into alternatives developed in the FS.

Comment #20: A commenter expressed an interest in collaborating with New York State to assist in the development of habitat plans to reconstruct wetlands on the Site. The commenter suggested that design charettes and other interactive methods should be used to create a suite of habitat reconstruction projects that would be reflective of the needs and vision of the community.

Response #20: The commenter's recommendations regarding Site restoration in relation to the Wastebeds 1-8 IRM will be considered during the IRM design. The level of citizen participation during the IRM design phase will depend largely on the degree of interest expressed by the

public. Any comments received from the public will be considered.

Comment #21: A commenter stated that restoration of the beds and banks is the only means in which to return the beds and banks to safe future use. However, Response Actions 1-3 would change the use of beds and banks of the lake, as these response actions include the placement of graded gravel to stabilize the substrate to reduce re-suspension of Solvay waste due to wind and wave action. This unilateral proposed change in the use of this area would be unacceptable.

Response #21: No changes to the beds and banks of the lake would occur under the no-action response action, Response Action 1, other than the actions that would be implemented pursuant to the Lake Bottom subsite remedy (*i.e.*, shoreline stabilization in SMU 3). Under Response Actions 2, 3, and 4, additional shoreline stabilization would be implemented along a portion of the Onondaga Lake SMU-4 shoreline, and crib walls would be installed along portions of the Onondaga Lake SMU-3 and SMU-4 shoreline area. As is noted in Response #2, habitat enhancement/restoration is consistent with the reasonably anticipated future land uses for the property. Therefore, the placement of shoreline stabilization material and installation of crib walls would be consistent with the planned uses of the Site.

Comment #22: A commenter noted that the HHRA is neither final nor complete. The Risk Assessment Guidance for Superfund tables described in the document are not available and are still draft.

Response #22: The HHRA, which was developed to support the RI/FS for the Site, was completed in April 2011 and was approved by NYSDEC on June 13, 2011. However, a separate risk assessment, the streamlined risk evaluation (SRE), was conducted to evaluate potential risks to human and ecological receptors from exposure to contaminated Site media being addressed under the IRM. The SRE also considered the potential contribution from these contaminated media to unacceptable risks in Onondaga Lake and Ninemile Creek. It should also be noted that the HHRA is consistent with the SRE findings and that the selected response action will reduce potential exposures to receptors (*e.g.*, older child trespasser, ATV rider) who may come in contact with the Site media addressed in this IRM and for whom unacceptable risks and hazards were identified in the HHRA.

Comment #23: A commenter noted that the since the components of Response Actions 2 and 3 differ only slightly, they are not different response actions. Specifically, the difference between Response Actions 2 and 3 hinge on an additional acre of vegetative cover and addition of a trench collection system.

Response #23: It is acknowledged that Response Actions 2 and 3 are similar in many respects; however, there are also important differences between them. The major differences between the two response actions include the type of cover system which would be employed and the alignment of the eastern shore groundwater collection trench. Under Response Action 2, the groundwater collection trench would be installed along the 370 ft elevation contour and a low permeability vegetative cover would be constructed on the downgradient side of the collection

trench. Under Response Action 3, the groundwater collection trench would be installed primarily along the eastern shore in close proximity to the Lake and a vegetative cover without a low permeability component would be constructed on the upgradient side of the trench. Although both response actions would be protective of human health and the environment, the alignment of the trench in Response Action 3 would contain more contaminated groundwater within the limits of the groundwater collection trench than would the groundwater collection system under Response Action 2. Also, the vegetated cover system called for under Response Action 3 allows for a more varied habitat around the planned wetlands than would the low-permeable cover system under Response Action 2. For these reasons, Response Action 3 was considered to be preferable to Response Action 2.

Comment #24: A commenter stated that any vegetative cover that is accessible by the public must be engineered so that no contaminants of interest are taken-up or concentrated in plant tissues likely to be used by subsistence gatherers. The commenter also stated only fencing would provide protection to such populations. The commenter also stated that the types of covers, volumes, and subsequent cost estimates required to meet these performance standards are not evaluated in the FFS report.

Response #24: The vegetative soil cover will consist of a soil layer of an appropriate thickness to sustain plant growth. Since only clean material will be used to construct the vegetative cover, no potential uptake of contaminants by plants is anticipated.

Comment #25: A commenter stated that the hydrogeologic information provided in the FFS report is inadequate because of several deficiencies:

(a) The authors of the FFS report were unable to compile a complete map of the potentiometric surface in each of the hydrostratigraphic units. Only a partial map for the shallow system is provided (Appendix K1; Figure 1);
(b) The cross sections (Figures 4, 5, and 6) are not very useful. Synoptic static water levels for the wells are omitted;
(c) The hydrostratigraphic units are not delineated and the rationale for discriminating between the units is not provided;
(d) It also appears that wells may have multiple completion depths, instead of being nested, which is standard practice; and
(e) The groundwater flow modeling effort is highly questionable and does not include any of the supporting documentation necessary to understand underlying assumptions and exactly what was done. Also, the different trench placements for the different alternatives are not modeled making the alternatives even more undifferentiable.

Response #25:

(a) In the FFS Report, a groundwater flow model was used to evaluate the effectiveness of groundwater collection system options. As part of the evaluation, groundwater elevation contours and groundwater flow paths were depicted on figures representing the various model simulations developed as part of that evaluation. These figures were included in Appendix K of the FFS report. However, more detailed evaluations of site conditions will be undertaken during the IRM design.

(b) Please note that synoptic static groundwater levels were included for many of the wells on the cross sections in Figures 4, 5, and 6.
(c) The hydrogeologic units are identified in the cross-sections and detailed descriptions of each are provided in the FFS report.
(d) Each well at the Site is installed in its own borehole. This may not have been clear on the cross section figures that show two to five different screening intervals along a common vertical line, the line representing a well cluster.
(e) The design of the groundwater model is discussed in detail in Appendix K. This includes a discussion of the model size, model thickness, grid spacing, the number of layers, constant head boundaries, hydraulic parameters, etc. Please note that, as discussed in Appendix K, the two different alignments for the eastern shoreline groundwater collection system were modeled.

Comment #26: A commenter stated that the effectiveness of the proposed use of wick drains is questionable. Vertical wick drains have been used successfully since the 1970's to facilitate dewatering of fine tailings and expedite consolidation. The flow through the drain primarily results from the increase in pore water pressure rather than capillary action. Since the tailings or wastebeds have been settling for quite some time, consolidation is likely nearly finalized and discharge from the wick drain is more of function of the unsaturated thickness, making the problem more transient-state than conceptualized. Something along the lines of UNSAT-H is necessary for accurate modeling. The commenter also states that other problems with the wick drains include freezing, which is likely to cause excursions of contaminants of interest into the lake. Brief analysis of model runs (Appendix K Figures 1 and 2) indicate that there is a high potential for the wick wells to not capture flows at depth. Figure 2 which depicts cross sectional flow of a single wick drain under "steady-state conditions", indicates that convergent flow towards the drains is minimal at depth. Figure 6 depicts a map view of the wick drains on 40 foot centers and it appears that the probability of an excursion exists, even if everything is functioning as assumed (steady state Q from wells, homogeneous, isotropic, etc.). Had a similar map been generated for a horizontal slice taken at depth of greater than 15-20 feet, the degree of convergent flow and ability to capture the plume would be minimal.

Response #26: The selected response action for the IRM assumes the use of passive wells for the collection of intermediate depth groundwater. The appropriate spacing of the passive wells would be determined during remedial design. Although the use of wick drains is not envisioned at this time, they could be evaluated during the design if appropriate.

It is important to note that the potential use of wick drains at the site was not tied to the degree of consolidation of subsurface materials. Instead, the wick drains would be used to provide a pathway for groundwater (under the upward hydraulic gradient) at depth to move vertically upward into the collection trench. Freezing would not likely be an issue since the top of the wick drain would be several feet below the ground surface.

Comment #27: A commenter stated that much of the information contained in the FFS report's appendices are not germane to the study and should be removed.

Response #27: The information in the appendices is relevant and is presented in support of the evaluations and conclusions in the FFS report. Specifically, Appendix A includes the results of various prior investigations undertaken at the Site to characterize Site soil, groundwater, seeps, surface water, and sediment. A geotechnical investigation, material compatibility testing, and a groundwater microcosm study were conducted to aid in remedial technology evaluation. The results of these studies were provided in Appendices B, C, and D. Evaluations of the vertical stratification and hydraulic conductivity of the intermediate groundwater aquifer were provided in Appendices E and F, respectively. Intermittent seeps are located on the Site at various times of the year. Documentation of reconnaissance of Site seeps is reported in Appendix G. A streamlined risk evaluation was conducted to identify potential human health and ecological risks from contaminated site media and is provided in Appendix H. Estimated groundwater flow rates from the shallow and intermediate groundwater aquifers were identified and presented in Appendix I. Supporting information for the calculation of areas and volumes for various components of Response Actions 2, 3, and 4 is provided in Appendix J. Appendix K includes a groundwater collection system evaluation for the Eastern Shore and a recovery well evaluation for the Ninemile Creek Sand and Gravel unit. A summary of the collection trench geotechnical stability evaluations for the Site is included in Appendix L.

Comment #28: A commenter notes that the FFS report states, "the shallow and intermediate site groundwater discharging to Onondaga Lake and Ninemile Creek is a result of recharge from precipitation infiltrating through the wastebeds. There is no off-Site source of shallow and intermediate groundwater." The commenter states that while current recharge through the wastes may dominate the shallow system, the area has benefited from the recharge of clean water from Ninemile Creek, as well as clean infiltration prior to emplacement of the wastebeds. If it is determined that wastes are to be capped or removed, recharge from Ninemile Creek will dominate the system again.

Response #28: Remedial alternatives for the Site will be developed and evaluated under the Site RI/FS. If appropriate, changes in groundwater flow that would result from the implementation of a remedial alternative would be evaluated in the FS.

Comment #29: A commenter stated that contaminant transport and fate within the deeper hydrostratigraphic unit must be evaluated prior to implementing any of the evaluated response actions. The commenter also stated that implementation of the IRM could limit remedial options for deep groundwater at the Site.

Response #29: In the FFS report, it was determined that there is a potential threat to human health and the environment from contaminant migration from eastern shore shallow and intermediate groundwater, as well as from seeps, surface Solvay waste along the eastern shore, and surface water/sediment/Solvay waste in the lower reach of Ditch A. It was concluded, therefore, that an IRM is needed to address migration of contaminants from these media. While there is also contamination in the deep groundwater aquifer at the Site, and there is a potential for deep groundwater to flow to the Lake, the presence of dense brine under the lake may limit the movement of deep groundwater flow to the Lake. The potential impact of the deep groundwater contamination, potential remedial alternatives, and the possible effects of the IRM on those

alternatives will be considered in the Site RI/FS.

Comment #30: A commenter stated that no data or estimates of groundwater or surface water fluxes are provided, nor is there a comparative analysis of such fluxes for each response action.

Response #30: Shallow and intermediate groundwater discharge rates from the Ninemile Creek, the Northern and Eastern Shore, and the Ditch A hydrogeologic zones were calculated from a groundwater model and are presented in Appendix I of the FFS report. Groundwater modeling was also conducted to estimate discharge rates for the different Eastern Shore groundwater collection system alignments and types of covers. Appendix K discusses the groundwater modeling conducted for this effort.

Comment #31: A commenter stated that the discussion in the FFS report that evaluates "Overall Protection of Human Health and the Environment" erroneously concludes that Response Action 4 would provide similar protectiveness as would Response Actions 2 and 3.

Response #31: Response Action 4 would provide a higher reduction in toxicity, mobility, and volume of waste than would Response Actions 2 and 3 through removal of Solvay waste from the eastern shore. Response Actions 2 and 3 would be as protective of human health and the environment as Response Action 4 as long as the engineering controls under these response actions function properly. However, Response Action 4 would take approximately four years longer to implement than would Response Actions 2 and 3 and would likely result in a delay in the implementation of the remedy for Onondaga Lake. Due to the extensive excavation included in Response Action 4, potential impacts to the surrounding community related to transportation of material would be substantially greater under Response Action 4 than under Response Actions 2 and 3. With respect to the cost criterion, the present-worth cost for Response Action 4 is estimated at $113 million, whereas the present-worth costs for Response Actions 2 and 3 are each approximately $23 million. Response Action 3 also allows for the intended end-use of the shoreline area for inland and lake-connected wetlands, which would enhance the environmental benefit of the area. Based on these considerations, Response Action 3 was considered preferable to Response Action 4.

Comment #32: A commenter stated that the discussion in the FFS report that evaluates "Short-Term Effectiveness" should not include potential impacts to the surrounding community related to transportation of material, as they do not pertain to effectiveness.

Response #32: The assessment of impacts to the community during the construction period of the remedy as part of the evaluation of "Short-Term Effectiveness" is consistent with EPA guidance on evaluating remedial alternatives or response actions (*e.g.*, OSWER Directive 9355.3-01, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Interim Final, October 1988).

Comment #33: A commenter stated that Figure 8 in the FFS report is overly generalized and

does not depict flow westward of Ninemile Creek. The commenter asks where and when is Ninemile Creek losing or gaining? The commenter suggests that the groundwater flow to the south is likely more complicated since Ninemile Creek is absent. This complexity is likely a reason that the potentiometric surface is not fully mapped, states the commenter.

Response #33: Ninemile Creek is a gaining stream (*i.e.*, groundwater flows upward, discharging into the Creek) in the reach of the Creek adjacent to the Site. Shallow and intermediate groundwater flow to the south would flow towards Onondaga Lake or other surface water drainage features (*e.g.*, Ditch A). Shallow groundwater on the Site also flows downward to the intermediate aquifer. Intermediate groundwater on the Site may flow downward to the deep groundwater zone where the silt and clay confining layer is absent. See also Response #25(a).

References

NYSDEC and EPA. 2005. Record of Decision, Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site. July 2005.

NYSDEC and EPA. 2009. Record of Decision, Operable Unit 2 of the Geddes Brook/Ninemile Creek Site, Operable Unit of the Onondaga Lake Bottom Subsite, Onondaga Lake Superfund Site. October 2009.

O'Brien and Gere. 2008, Remedial Investigation Report, Wastebeds 1 through 8. April 2008.

O'Brien and Gere. 2010 Focused Feasibility Study, Wastebeds 1 through 8. June 2010.

O'Brien and Gere. 2011. Revised Human Health Risk Assessment, Wastebeds 1 through 8 Site. April 2011.

TAMS/EarthTech. 2002. Onondaga Lake Human Health Risk Assessment. December 2002.

TAMS/EarthTech. 2003. Geddes Brook/Ninemile Creek Human Health Risk Assessment. July 2003.

Appendix E-1
December 2010 Proposed Response Action Document

Appendix E-2
December 27, 2010 Public Notice

THE NEW YORK STATE DEPARTMENT Of ENVIRONMENTAL CONSERVATION INVITES PUBLIC COMMENT ON THE RESPONSE ACTIONS FOR THE WASTEBEDS '·8 SITE AND WASTEBED B/HARBOR BROOK SITE IRMs The New York State Department!. of Environmental Conservation (NYSDEC) and the ll_S Environmental Protection Agency (EPA) will hold • public meeting at 7:00 PM and open house from 6:00 . 7:00 PM on January 13. 2010 at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds, Syracuse, New York 10 discuss the Proposed Response Action Documents (PRADs) for the Wastebeds 1-8 Site and Wastebed B/Harbor Brook site lilleom Remedial Measures (IRMs). The Wastebeds '·8 site and Wastebed B/Harbor Brook site are subsites of the Onondaga Lake Superfund Site. The PRADs describe the reo sponse actions considered under the IRMS' associated with Wastebeds '·8 and Wastebed B/Harbor Brook and identify the preferred response aetions with the rationale for these preferences The NYSDEC and EPA are issuing the PRADs to encourage and reo ceive input and com·ments from the public The primary objectives of these actions are to control the sources 01 contamination at the Site. 10 minimize the migration of contaminants, lind 10 minimize any current and potential future human health and environmental impacts.The main features of the preferred response action for Wastebeds '·8 include constructing 1l groundwater collection trench system along the eastern lakeshore area to control the contaminated shallow and I ntermediate groundwater that Is moving toward the lake, achieving hydraulle control of groundwater within the former Ninemile Creek Channel Sand and Gravel unit, constructing groundwater collection trench to intercept the groundwater that seeps out along the face of the wastebeds, removing contaminated sediment Irom Ditch A, and placing a soIl cover over the remaining eastern lakeshore soils and lacing gravel and vegetation along the shoreline to stabilize the remaining wastebed material found along the lake shore Collected seep water and groundwater would be treated at the Willis Avenue GWTP and discharged to METRO The main features of the preferred response iiCtion for Wastebed B/Harbor Brook include installing a subsurface barrier wall and groundwater collection system to the east of Lower Harbor Brook and rerouting the Lower Harbor Brook channel. Collected groundwater would be treated at the Willis Avenue GWTP and discharged to METRO The excavated area, including the new Harbor Brook channel and the adjacent wetlands, would be restored and/or mitigated, as appropriate, consistent with the lakewide habitat restoration plan. Changes to the preferred remedy/preferred response or a change from the preferred response to another response may be made if public comments or additIOnal data indicate that such a change will result in a more appro·priate action. The linal decision regarding the selected response Will be made after the NYSDEC and EPA have taken Into consideration all public comments. The NYSDEC and EPA are soliciting public commer1t on all 01 the response action options associated with the Wastebeds 1-8 site and Wastebed B/Harbor Brook site IRMs because NYSDEC and EPA may select a response action other than the preferred response action. The ad·ministrative record file, which contains the information upon which the selection 01 the reo sponse action will be based, is available at the following locations Information is also available on DEC's website at www.dec.ny.gov/chemical/37558.html. Onondaga County Public Library, 447 South Salina Street, Syracuse, New York 13202 315-435-1800 Atlantic States Legal Foundation 658 West Onondaga Street Syracuse, New York 13204 315-475-1170 Please call for hours of availability Solvay Public Library 61S Woods Road Solvay, NY 13209 Phone: (315) 468-2441 NYSDEC 61 SErie Boulevard, West Syracuse, New York 13204-2400 315-426-7400 Please call for an appointment NYSDEC, DER 625 Broadway, 12th Floor Albany, New York 12233-7013 518-402-9676 Please call for an appointment Written comments associated with the PRADs received during the public comment period, which ends on February 10, 2011. as well as oral comments received at the public meeting, will be addressed in the decision document which WI. formalize the selection of the response action AU wntten comments associated with the PRADs should be addressed to: Mr Tracy A. Smith, Project Manager NYS Department of Environmental Conservation 62S Broadway, 12th Floor Albany, NY 12233·7013 DERweb@gw.dec.state.ny.us (Indicate "Wastebeds 1-8 IRM Comments' or Wastebed B/Harbor Brook IRM Comments" in the subject line 01 the e-mail)

Appendix E-3
Letters Submitted During the Public Comment Period

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February 10, 2011

VIA ELECTRONIC MAIL to
DERweb@gw.dec.state.ny.us

RE: COMMENTS ON PROPOSED RESPONSE ACTION DOCUMENT
Interim Remedial Measure Wastebeds 1-8 Site
Subsite of the Onondaga Lake Site Onondaga County, New York

Tracy A. Smith
New York State Department of Environmental Conservation
625 Broadway
2th floor Albany
New York 12233-7013

Dear Mr. Smith:

I am writing on behalf of the Onondaga Nation, for whom I am General Counsel, to express the Nation's concerns about the Proposed Interim Remedial Measure for Wastebeds 1-8. Specifically, I am writing to request that you evaluate and include in your decision document a discussion of the Onondaga Nation's proposed remedial action alternative for this site, prepared on behalf of the Onondaga Nation by Dr. Fred Kirschner of AESE, Inc., and attached hereto.

As discussed in more detail in the attached document, Onondaga's Alternative consists of four main phases. In summary Onondaga's Alternative consists of excavation and full removal of Wastebeds 1-8. Historic liability of the material is severed and the materials would be employed for beneficial uses (e.g. acid rock drainage mitigation, reinjection into Tully Brine fields to stabilize ground surface and reduce subsurface erosion, daily waste cover at nearby MSWLFs, etc.). Groundwater and surface water would be managed for short duration only. Institutional controls applied during construction only. This approach is loosely modeled after EPA's remedy for OU4 of the Tar Creek Superfund Site, Oklahoma where mine wastes known as "chat" is being

beneficially reused.

The Onondaga Nation continues to be concerned that decisions made in an incremental fashion will have the cumulative effect of falling far short of restoring the full suite of ecosystem functions that once were provided by Onondaga Lake. While restoration is certainly not the primary goal of the CERCLA remediation process, the decisions reached will absolutely affect the cost and feasibility of the restoration projects which will follow. The work to cut off the flow of groundwater to the Lake is certainly a critical step in allowing the remediation of the Lake itself. However, the habitat augmentation measures included in this PRAD are based on the presumption that the waste material will stay in place, and on a severely restricted view of the possible options for long term restoration of the site.

The shore of Onondaga Lake is one of the few sites where it is feasible to consider restoring natural shoreline habitat by conducting large scale waste removal. Despite the perception of all too many Syracuse residents and visitors, the "white cliffs" are not a natural or necessary feature of the Onondaga Lake shoreline. The persistent lack of attention to the protection of subsistence and traditional uses in the habitat augmentation process will ultimately have serious consequences and may preclude the restoration of critical ecosystem functions. I urge you to closely review the options presented in the attached document with the goal of understanding and incorporating a more efficient and effective approach to the remediation of these wastebeds.

If you have any questions about these comments please don't hesitate to contact me or Thane Joyal of my office, or Dr. Kirschner directly.

Sincerely,

Joseph J. Heath

Enc.

cc: Onondaga Nation Council of Chiefs
John McAuliffe, Honeywell International

The Onondaga Nation's Proposed Remedial Action Alternative for Solvay Wastebeds1-8 Site Operable Unit of the Onondaga Lake Superfund Site, Onondaga County, New York

Prepared by AESE Inc.

For

The Onondaga Nation

September 8, 2010

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TABLES

Table 1. Alternatives Scoring Matrix. Alternative No. 1-3 evaluated in the PRAD. Alternative No. 4 (Full Removal) proffered by the Onondaga Nation

Appendices

Appendix A. October 12, 2009 memo from Dr. F. E. Kirschner Senior Scientist to Joseph J. Heath, Esq. Counsel for the Onondaga Nation entitled ***"Rapid review of "Focused Feasibility Study Wastebeds 1-8, Geddes, New York", Honeywell, September 2009"***

Appendix B April 20, 2010 memo from Dr. F. E. Kirschner and Dr. B. Harper to Joseph J. Heath, Esq. Counsel for the Onondaga Nation entitled: ***"Rapid review of Human Health Risk Assessment Wastebeds 1 through 8 Site, Geddes, New York, Prepared O'Brien & Gere for Honeywell, February 2010"***

Appendix C Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as ''Chat''(Federal Register Vol ume 71; No. 64; Page16729)

1.0 Introduction

Honeywell and NYDEC developed and evaluated four alternatives during the RI/FS process (Honeywell, 2009). All four alternatives had major shortfalls with respect to protection of human health of Onondaga Nation's citizens, as well as other subsistence populations[1] for the reasonably foreseeable future land use (RFFLU) as well as with other criteria used to evaluate alternatives under the National Contingency Plan (40 CFR 300.430(e)(9), (f)). The Onondaga Nation provided comments to NYDEC on these concerns, and recommended the list of alternatives be expanded to enable a RFFLU that would enable unrestricted use of the area (Appendix A) including subsistence hunting, fishing, and gathering.[2]

During the RI/FS, Honeywell screened-out Alternative Number 4, the most aggressive and most expensive alternative based on "Green Remediation Techniques", assumptions that large removals would cause immediate construction-related human health and safety concerns, and that

> ***"The excavation of 27 acres of Solvay waste (440,000 CY) from the eastern shoreline results in impacts to the environment with respect to significant energy and resource consumption as it relates to excavation and transportation of material."***

The Onondaga Nation commented that none of these criteria are germane to evaluation of alternatives under the National Contingency Plan (40 CFR 300.430(e)(9), (f)).

The Onondaga Nation also commented that the Human Health Risk Assessment (HHRA) had not been finalized prior to this analysis and that the HHRA needs to be performed assuming subsistence uses. Specifically:

> ***"The human health risk assessment (HHRA) is not final, is not complete, and does not assess risk to humans for the reasonably foreseeable future land uses (RFFLU). …."*** (Onondaga Nation, 2009).

The HHRA was finalized in February 2010 (Honeywell, 2010). The Onondaga Nation commented that HHRA still did not adequately assess risk to subsistence populations (Appendix B) and further pointed-out that if people were using Onondaga Lake at state-recommended levels, that all other lands would need to be free and clear of contamination. Specifically:

---

[1] Other subsistence users include but are limited to the Hmong, Ukrainians, Bosnians, as well as others.
[2] Such uses would entail a full cleanup to pre-release/pre-contaminated conditions and would enable citizens to preserve the area for all future land uses.

> ***For example, the risk from Lake OU (an Exposure Area omitted from evaluation) fully usurps the allowable risk allocation (even if it is assumed that institutional controls (ICs) are fully effective at constraining uses[3]). Technically, this means that a receptor, who uses the lake at IC rates[4] cannot receive a single molecule of any COC [contaminant of concern], since his/her risk is already in excess of regulatory thresholds. Further, this means that since Honeywell has elected to leave contamination in the lake that fully usurps the allowable risk allocation, all OUs in the uplands would need to be remediated to pre-release conditions (i.e. pre-release background/baseline) in order to reduce site-wide excess risk to acceptable levels.*** (Appendix B; Onondaga Nation, 2010)

The Draft Proposed Response Action Document (PRAD) for Wastebeds 1-8 (NYDEC, 2010) identifies Alternative No. 3 as NYDEC and EPA's preferred alternative. As discussed above, the Preferred Alternative, as well as all other alternatives have major shortfalls with respect to protection of human health of Onondaga citizens and other subsistence users for the reasonably foreseeable land use as well as with other criteria used to evaluate alternatives under the NCP (40 CFR 300.430(e)(9), (f))

A Remedial Action Alternative, which includes three options is proffered by the Onondaga Nation, below.

This alternative differs greatly from NYDEC/EPA/Honeywell's Proposed Remedial Action Alternatives in five important aspects:

1. This Alternative is designed to remove OU-wide materials. NYDEC/EPA/Honeywell's alternatives focus only on in-place stabilization of surficial was via covering and reliance on Institutional Controls (signage, fencing, or published advisories).[5]

2. This Alternative is designed to be protective of the Onondaga Nation's current and future residents for the Nation's designated Future Land Use. NYDEC/EPA/Honeywell's alternatives do not consider the Onondaga Nation's

[3] Dietary-based institutional controls (ICs) are only optional to the person or persons and are not effective especially for populations who have to make the everyday decision "should I eat this today, because it could cause cancer or health implications in my later years or "should I eat this today, otherwise my family and I could starve".

[4] The recommended daily rate of consumption of fish under the IC is several orders of magnitude below actual consumption rates of subsistence fisherman.

[5] The effectiveness of institutional controls is currently under debate by practicing professionals.

Future Land Use, nor do they consider the aforementioned other subsistence users.

3. This Alternative is designed to address the ground water and surface water problems, via removal. NYDEC/EPA/Honeywell's alternatives rely on perpetual capture, pump, and treat and its associated uncertainties at breaking these pathways. Also treatment in this manner is inefficient and results in large volumes of wastes requiring disposal.

An outline of the proposed alternative is described followed by a detailed discussion of tasks. Finally, the alternative as well as NYDEC/EPA/Honeywell's alternatives are evaluated or screened against the nine criteria of the NCP as well as other pertinent criteria.

2.0 Outline for Onondaga Nation's Alternative

Onondaga's Alternative consists of four main phases. In summary Onondaga's Alternative consists of excavation and full removal of Wastebeds 1-8. Historic liability of the material is severed and the materials would be employed for beneficial uses (e.g. acid rock drainage mitigation, reinjection into Tulley Brine fields to stabilize ground surface and reduce subsurface erosion, daily waste cover at nearby MSWLFs, etc.). Groundwater and surface water would be managed for short duration only. Institutional controls applied during construction only. This approach is loosely modeled after EPA's remedy for OU4 of the Tar Creek Superfund Site, Oklahoma where mine wastes known as "chat" is being beneficially reused.

The basic elements of each phase are:

Phase I

1. Research the beneficial reuse of the wastebed material assuming all liability has been detached from the materials. This would include but not be limited to its use in:

    a. acid rock drainage mitigation,

    b. reinjection into Tulley Brine fields to stabilize ground surface and reduce subsurface erosion, and

    c. daily waste cover at nearby MSWLFs

Phase II

1. Research to sever the liability of the materials when employed for beneficial uses. Ultimately this work would result in a ruling similar to the "Chat Rule" (Attachment C).

Phase III

1. Research to evaluate the marketability of the materials for specific uses. Ultimately this work would result in a ruling similar to the "Chat Rule" (Attachment C).

Phase IV

1. Secure contracts for Disposal via "Sales"

2. Staging of removal. For example 75% of all of the material is removed in 5-10 years via sales.

3. Removal. No soil cover is hauled-in and installed in the excavated areas. Soils are allowed to rebuild naturally via standard land preparation practices such as ripping, contouring, disking, and fertilizing as necessary. The Remedial Action Objective RAO is background for all of the contaminants of concern (COC).

Removals in these areas will cleanup these lands to be consistent with the Onondaga Nation's Land Uses. This means more lands will be available to its citizens for subsistence hunting and gathering, taking pressure off of other reservation lands and resources.

3.0 Comparative Analysis of Alternatives

Table 1 is a matrix comparing NYDEC/EPA/Honeywell's Alternatives 1-3 and the Onondaga Nation's Alternative (Alternative 4)

Although the volume of WB1-8 has been estimated, a detailed analysis of cost cannot be performed until Phases I through IV.2 have been completed. Based on a percentage basis of the overall project, a major portion of the project requires a lot of dirt-work. Therefore, the overall cost is fairly sensitive to unit cost values. However, if income can be generated from the beneficial use(s) of the material, ultimate costs could be comparable.

4.0 Conclusion

The Onondaga's Alternative has a highest probability of all alternatives of meeting all nine criteria of NCP for WB1-8. If implemented, these lands would be available for unrestricted uses by all.

5.0 References Cited

Honeywell, 2009, Focused Feasibility Study Report, Wastebeds 1-8, Geddes, New York.

Honeywell, 2010, Human Health Risk Assessment Wastebeds 1 through 8 Site, Geddes, New York, Prepared O'Brien & Gere for Honeywell, February 2010,

TABLE 1. Alternatives Scoring Matrix. Alternative No. 1-3 evaluated in the PRAD. Alternative No. 4 (Full Removal) proffered by the Onondaga Nation.

Site Element	1	2	3	4 (Onondaga Nation) [2, 3]
Overview Description	No Action	Low Permeability Vegetative Cover with Perpetual Inland Groundwater Collection, Perpetual Treatment and Perpetual Institutional Controls [1]	Low Permeability Vegetative Cover with additional Perpetual Inland Groundwater Collection, Perpetual Treatment and Perpetual Institutional Controls [1]	Excavation and Full Removal of Wastebeds 1-8. Historic liability of material severed and materials employed for beneficial uses (e.g. acid rock drainage mitigation, reinjection into Tulley Brine fields to stabilize ground surface and reduce subsurface erosion, daily wastecover at nearby MSWLFs). Groundwater and surface water managed for short duration. Institutional controls applied during construction only.
Surface Water Management, Runoff	No Action	Combined groundwater and seep collection system, 6,900 feet in length, installed at the 370 ft elevation contour along the eastern shore.	Same as Alternative 2, except a 6800 linear ft trench along the lakeshore, with a 4050 linear foot trench installed inland, in board of the connected 2.3 acre wetland proposed for this area in the Onondaga Lake Habitat Plan,	Necessary only during construction
Surface Water Management, Springs	No Action	Same as Surface Water Management, Runoff with Hydraulic control of **selected** seeps along the NMC and northern shores;	Same as Alt 2	Necessary only during construction
Ground Water Management	No Action	Perpetual Pump and Treat	Same as Alt 2	Same as Alt 2 except duration much shorter due to natural attenuation and removal of source(s)
Surface of Wastebeds and Shoreline Stabilization	No Action	16.7-acre **low permeability** vegetative cover along the eastern shore	A 14.4-acre vegetative cover along the eastern shore,	Natural materials or if excavation below lake level is necessary, this area could become a wetland
Beach (4)	No Action	Shore stabilization along the surf zone of SMU-4 and a portion of SMU-3 shores of Onondaga Lake. No beach likely, since materials are too coarse. Perpetual Institutional Controls to minimize direct ingestion of sediments/soils	Same as Alt 2	Beach reestablished in area for recreation and subsistence use by all or area could be a designed wetland with beach along western terminous of excavated area.
Water Treatment	No Action	Perpetual Treatment with Existing system, with Perpetula onsite sludge disposal	Same as Alt 2	Same as Alt 2 except duration much shorter and volumes much lower due to natural attenuation and removal of source(s)
Lake Sediments	No Action	No Action; Threat of recontamination if runoff events overwhelm upland system or when releases from ground water occur	Same as Alt 2	No Action and threat of recontamination has been removed
Lake Water	No Action	No Action. Threat of periodic releases to surface water is high	Same as Alt 2 except Threat reduced since secondary trench used to recover ground water	No Action and threat of releases from groundwater has been removed
Institutional Controls	No Action	Required in perpetuity	Required in perpetuity	Only required during construction
Comparative Analysis				
Probability of Meeting PRLU [5]	0	0	0	0.9
Probability that Alt is Intrinsically Protective of Human Health (without relying on ICs) [5]	0	0	0	0.9
Probability of Protecting the Environment [5]	0	0.7	0.8	0.9
Probability of Complying with ARARs [5]	0	0.4	0.5	0.9
Reduction in Toxicity, mobility, or volume through treatment [5]	None	Possible small reduction in Toxicity & Mobility (5); However; Increase in Volume (Water treatment plant Sludge). If sludge is disposed onsite and treatment is in perpetuity, volume will be immense.	Same as Alt 2, except volume even greater since more water will be treated	Probable high reduction in Toxicity & Mobility (5); Highly Probable Reduction in Volume (Probable reduction even greater if WTP Sludge is disposed at an offsite facility)

Overall Effectiveness	Does not protect human health or the environment		Reduces risk from exposure to source materials and reduces loads of COCs to Onondaga Lake. However, remedy does not greak the surface water or ground water to lake pathways Potential exposures of humans and ecological receptors to surface water in open ditches, plants, and surface materials. Perpetual operation and maintenance required to support remedy. WTP sludge volumes must also be managed.		Same as Alt 2		Protective of human health and the environment. Complies with ALL ARARs. Fully removes source breaking all pathways, and reducing the threat of recontamination. Removes incremental risks from COCs by breaking all pathways leading from the source to both human and ecological receptors. Does not rely upon ICs. Wastes are used beneficially offsite instead of onsite burial and containment. Large volumes of cover material do not need to be mined from offsite locations, reducing off-site impacts. Longterm O&M is minimized
Implementability	Not applicable		Availability of capping material may be limited; alternate sludge disposal location must be identified. [38]		Same as Alt 2		Testing to use the material in a beneficial manner may be necessary. Severance of liability similar to "Chat Rule" [2] will be necessary prior to removal. Will reduce capping material requirements compared to other alternatives. Railroad and haulroads available for transport off-site of large volumes.
Short-term Capital [5]	Low		Low		Medium		High (May be reduced if waste can be sold)
Longterm O&M [5]	Low		High (disposal of WTP sludge will increasingly be problematic over time as more OUs tie into the WTP system)		Same as Alt 2		Low
Reliance on ICs (Longterm Cost to Tribe) (26)	High		High		High		Low
Ability to Contain or Control Releases (26, 30)	None (worse than current conditions)		Very Low -Low [30, 31]		Very Low -Low [30, 31]		High (Really not applicable since source has been removed)
Time frame Required to Achieve Pre-release Baseline Conditions at OU Boundary (26, 30)	Practically Infinite [5]		Practically Infinite [5]		Practically Infinite [5]		Short [5]
Degree to which Remedy Addresses the Cause or Source of the Release	None		None		None		Fully
Screening Assessment	**RETAINED Evaluation required by NCP**		**RETAINED**		**RETAINED**		**NOT EVALUATED IN FFS**

Footnotes

1. IC's not acceptable to Onondaga Nation or the Public. Not protective of Human Health and the environment. If Fenced, not Protective of the environment.
2. Testing to use the material in a beneficial manner may be necessary. Severance of liability similar to "Chat Rule" (Attached) will be necessary prior to removal.
3. Alternative not evaluated in the FFS for WB 1-8 OU
4. Beach as used herein is safe for subsistence as well as all recreational uses by humans
5. This relative estimate is made by the Tribe's Expert. This value is unknown because Standard Engineering Practices such as Predictive Chemical Transport & Fate Modeling have NOT been employed in this project in a manner that enables technical experts to compare and contrast consequences of each alternative remedy.
6. Except for Alt 4, Relies on Broad ICs at expense of Tribe to protect Human Health ; Therefore, not intrinsically protective of HH over Long term

Appendix A. October 12, 2009 memo from Dr. F. E. Kirschner Senior Scientist to Joseph J. Heath, Esq. Counsel for the Onondaga Nation entitled ***"Rapid review of "Focused Feasibility Study Wastebeds 1-8, Geddes, New York", Honeywell, September 2009"***

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MEMORANDUM

TO: Joseph J. Heath, Esq.
Counsel for the Onondaga Nation

FROM: Dr. F. E. Kirschner, Senior Scientist

DATE: October 12, 2009

SUBJECT: Rapid review of ***"Focused Feasibility Study Wastebeds 1-8, Geddes, New York"***, Honeywell, September 2009

CC: Thane Joyal, Esq.
Dr. Harper, DABT
File

We have rapidly reviewed the aforementioned document. Below are a few General Comments followed by Specific Comments.

General Comments

1. The alternatives were not developed around the reasonably foreseeable future land use (RFFLU) for the Operable Unit (OU) as described by OSWER Directive No. 9355.7-04. The RFFLU is central to each proposed alternative since it sets the ultimate goal of the remedy for the OU.

Webster defines "alternative" as

> *"an opportunity for deciding between two or more **courses or propositions** to be chosen".*

The presumption underlying this definition is that the courses or propositions ultimately "take one to the same place", much like an "alternate route". In the context of CERCLA, the "place" the OU and any other site strives to attain is achieving future land use (FLU): the ultimate goal of the entire RI/FS process.

Although not specifically enumerated in the NCP, it is presumed that each "Alternative" meets the ultimate goal of protection of Human Health and the Environment ***for the intended future land use***. It would be ludicrous to expect to design anything without an end-state in mind. Like building a house, at a minimum, the client must first specify the number of bedrooms (equivalent to specifying future use). The number of bedrooms dictates his/her septic system needs and other technical specifications so the house functions properly when it is completed and allows the client to use the house as it was intended.

The Onondaga Nation, a sovereign and a member of the Onondaga Lake Natural Resources Trustee Council, as well as many community members believe that Onondaga Lake and the immediate uplands are likely to be enjoyed as a sanctuary for wildlife and humans once the remedy and restoration has occurred. Housing and commercial development is unlikely. Apparently Honeywell agrees with this RFFLU and states:

> ***"…Honeywell's overall goal to provide long-lasting protection to the local community and environment, and restore the Onondaga Lake shoreline to the community."*** [Page 6 Sentence 2]

However, analysis of the process employed in this document reveals that the future land use is dictated by the alternative that is selected—not by an a priori determination of the design goal or RFFLU. For example Alternatives 3 and 4 incorporate graded gravels for the beach area to minimize erosion of the wastes. Alternative 4 involves removal of a portion of the wastes, potentially providing a beach area(s).

As stated in the Nation's August 24, 2009 memo (attached), there has been absolutely no meeting of the minds between the Onondaga Nation, the Public, the state, or Honeywell throughout this entire RI/FS process on RFFLU.

For example, the term "restoration" is misused in the attachment to mean "whatever we end-up with" instead of returning the lands to pre-release or pre-industrial conditions that represent the natural state of the lake. Another example is that the "purpose" of this FFS is not consistent with the goals described by this document (inset above)

> ***"The purpose of the FFS was to develop and evaluate IRM alternatives to mitigate groundwater flow, seep discharge, and shoreline Solvay waste erosion from the Site to Onondaga Lake, and groundwater and seep discharge from the Site to NMC."(Page 6 paragraph 2 sentence 2)***

In summary, there has been absolutely no meeting of the minds throughout this entire RI/FS process on RFFLU. As discussed above, future land use is central to the NCP and is implicit in applying the nine criteria for alternative selection. Had RFFLU been seriously contemplated early-on in the process, all of the proposed and analyzed alternatives would, by definition "taken us to the same place"—a place in which the nine criteria of the NCP are met for the RFFLU. As drafted, this FFS does not present the full range of alternatives to the public for review and comment.

2. Honeywell does not hold title to the beds and banks of Onondaga Lake. If Honeywell owns all the uplands in question and has the ability to restrict usage in perpetuity via fencing and other institutional controls, then all transport and exposure pathways from the uplands to the beds and banks must be broken. Breaking these pathways along with restoration of the beds and banks is the only means in which to return the beds and banks to safe future uses of these lands. Such uses include but are not limited to beach play as well as subsistence hunting, fishing, and gathering. Approaches described for alternatives 1-4 do not achieve these goals for the beds and banks of the lake. In fact alternatives 1-3 rely on changing the use of beds and banks of the lake:

> *"The shoreline stabilization would be graded gravel that would be placed within the surf zone to stabilize the substrate to reduce re-suspension of Solvay waste due to wind and wave action."*

This unilateral proposed change in use of this area is unacceptable.

3. The human health risk assessment (HHRA) is not final, is not complete, and does not assess risk to humans for the reasonably foreseeable future land uses (RFFLU). As discussed above, the beds, banks and uplands of this site will likely be utilized by members of the Nation as well as others for subsistence hunting, fishing, and gathering. Beach play also is likely.

The exposure factors, durations, frequencies, and exposure point concentrations described in the FFS are very dissimilar to those that describe these uses. Therefore conclusions regarding risk are erroneous.

As part of the NRDA, a location-specific, Onondaga Nation-specific model (i.e., dependency web, influence diagram) will be developed to illustrate the relationships between the resources identified in the inventory and the services those resources provide to the Nation. The model will be used to examine the traditional interaction between the Onondaga Nation and the environment and will ultimately be used to estimate Onondaga Nation-Specific Exposure Factors. The model will use baseline conditions in the assessment area. Examples of models may include work previously done for Native American Tribes or Nations. Traditional tribal subsistence multi-pathway exposure scenarios are based on eco-cultural zone delineations and descriptions, major exposure factors, regional food patterns, and unique exposure pathways. Several examples are posted at http://www.hhs.oregonstate.edu/ph/tribal-grant-main-page.

The "RAGS Tables" described in the document are not available and are still draft.

Finally, it appears that Honeywell relies on the false conclusion of baseline or pre-construction risk is negligible and does not re-run risk assessments for each alternative. Implicit in this conclusion is the assumption the exposure point concentrations (EPCs) would not be any greater than baseline conditions—an erroneous conclusion especially for a construction worker.

4. Alternatives 2 and 3 only differ very slightly and therefore are not true Alternatives. The difference between Alts 2 and 3 hinge on an additional acre of vegetative cover and addition of a trench collection system. The difference are so slight that the costs for both alternatives are similar.

5. Vegetation Covers. Any vegetation cover that is accessible by the public must be engineered so that no contaminants of interest are taken-up or concentrated in plant tissues likely used by subsistence gatherers. Institutional controls short of fencing will not work to provide protection to such populations. The types of covers, volumes, and subsequent cost estimates required to meet these performance standards are not evaluated in this FFS.

6. Characterization of the hydrogeology is inadequate. Although there a number of wells, the characterization of the hydrogeology provided in this document is inadequate. First, the authors are unable to compile a complete map of the potentiometric surface in each of the hydrostratigraphic units. Only a partial map for the shallow system is provided (Appendix K1; Figure 1). Second the x-sections (Figures 4, 5, and 6) are not very useful. Synoptic static water levels for the wells are omitted. The hydrostratigraphic units are not delineated and the rationale for discriminating between the units is not provided. It also appears that wells may have multiple completion depths, instead of being nested, which is standard practice. Third balkanizing the ground water flow system and pushing-off studies could have negative consequences—the work proposed herein could limit remedial options for the Deep flow system.

The ground water flow modeling (GWFM) effort is highly questionable and does not include any of the supporting documentation necessary to understand underlying assumptions and exactly what was done. Also the different trench placements for the different Alternatives are not modeled making the alternatives even more undifferentiable.

In summary, the provided hydrogeologic information is inadequate to allow a hydrogeologist to independently arrive at conclusions stated in the FFS.

7. The effectiveness of the proposed use of wick drains is questionable. Vertical wick drains have been used successfully since the 1970's to facilitate dewatering of fine tailings and expedite consolidation. The flow through the drain primarily results from the increase in pore water pressure rather than capillary action. Since the tailings or wastebeds have been settling for quite sometime, consolidation is likely nearly finalized and discharge from the wick drain is more of function of the unsaturated thickness, making the problem more transient-state than conceptualized. Something along the lines of UNSAT-H is necessary for accurate modeling. Other problems with the wick drains include freezing. Freezing is likely to cause excursions of COIs into the lake.

Brief analysis of model runs (Appendix K Figures 1 and 2) indicate that there is a high potential for the wick wells to not capture flows at depth. Figure 2 which depicts x-sectional flow of a single wick drain under "steady-state conditions", indicates that convergent flow towards the drains is minimal at depth. Figure 6 depicts a map view of the wick drains on 40 foot centers and it appears that the probability of an excursion exists, even if everything is functioning as assumed (steady state Q from wells, homogeneous, isotropic, etc.). Had a similar map been generated for a horizontal slice taken at depth of greater than 15-20 feet at depth, the degree of convergent flow and ability to capture the plume would be minimal.

We suspect that re-specifying the modeling with variable Ksat, variable saturation, and probability of wick failures due to freezing or other mechanisms would demonstrate that potential for excursion beyond line sink is highly likely and would not enable Honeywell to prematurely screen-out sheetpiling and other barriers.

8. "Green remediation concepts" (Page 42) are not NCP alternative section criteria. This information should be should be removed.

9. Much of the information contained in the Appendices are not germane to the FFS, and are not relied upon in the FFS. This information should be should be removed.

Specific Comments:

1. Page 2; Paragraph 2; Sentences 1 and 2

> *The shallow and intermediate site groundwater discharging to Onondaga Lake and NMC is a result of recharge from precipitation infiltrating through the wastebeds. There is no offsite source of shallow and intermediate groundwater.*

Perhaps current recharge through the wastes dominate the shallow system; however, prior to emplacement of the waste beds the area benefited from recharge of clean water from NMC as well as clean infiltration. If it is determined that wastes shall be capped or removed, recharge from NMC will dominate the system again.

2. Page 14, fifth full paragraph:

> *Silt and Clay Confining Layer*
>
> *Beneath the intermediate groundwater zone is the glaciolacustrine silt and clay layer. This lower permeability unit* ***acts as a confining layer between the intermediate groundwater zone and the deep groundwater zone****. The deep wells along the lakeshore have water elevations above the lake elevation, which indicates a strong upward flow gradient.* [Emphasis added]

The document does not provide any supporting documentation that would corroborate this assertion. If this statement is correct, it indicates that there is a potential for the deeper groundwater flow system to discharge to the lake. Contaminant transport and fate within the deeper hydrostratigraphic unit must be evaluated prior to implementing alternatives in this FFS. See General Comment No. 6.

3. Page 19, third full paragraph:

> *An IRM for this Site is intended to be consistent with, and an integral part of, the final site-wide remedy. As described in* ***Section 2.4****, shallow and intermediate groundwater discharging to Onondaga Lake, seeps having the potential to flow into NMC and Onondaga Lake, surface water erosion of Solvay waste at the eastern shore, wind/wave erosion of Solvay waste along the surf zone, and sediment in the lower reaches of Ditch A, and seep discharge from the upper reach of Ditch A have the potential to*

adversely affect the NMC OU-2 and Onondaga Lake remedies. For this reason, the following IRM objectives have been developed for this FFS:

Like the Onondaga Nation, it appears that Honeywell is concerned with the contribution of COIs from this OU to the Lake OU; however, no data or estimates of fluxes are provided, nor is there a comparative analysis of such fluxes for each alternative.

4. Page 28, Entire Section 3.6 "**Assembly of IRM Alternatives"**

The entire section does not consider or evaluate design criteria that is required to meet the RFFLU as described above.

5. Page 38, **4.2.1 Overall Protection of Human Health and the Environment** last paragraph:

> *"Protectiveness of human health and the environment would be provided in Alternative 4 through the use of a groundwater collection trench and excavation of Solvay waste material outboard of the collection trench. Alternative 4 would provide similar protectiveness relative to groundwater and Solvay waste that would potentially impact the Onondaga Lake remedy.* ***While Alternative 4 would provide similar protectiveness*** *as Alternatives 2 and 3, the effort to remove 27 acres of Solvay waste along the eastern shore would be significantly greater than that required to achieve the protectiveness afforded by Alternatives 2 and 3. The removal and disposal at the SCA of 27.6 acres of Solvay waste included in Alternative 4 is also more energy intensive than implementation of Alternatives 2 and due to the significantly greater excavation, dewatering, and transportation needs.* ***Thus Alternative while protective of the Onondaga Lake and NMC OU-2 remedies, would have a greater environmental impact than Alternatives 2 and 3, overall.*** *In summary, Alternatives 2, 3, and 4 would be protective of human health and the environment.*

For reasons discussed above, the Onondaga Nation does not believe that any of the proposed alternatives are necessarily protective of humans for the RFFLU. However, Alternative 4 seems more promising than Alternatives 1-3 in the beds and banks portion of the site. It also would provide to means to minimize releases of solid wastes and leachate directly to the lake via removal of near-shore solid wastes . Therefore, the conclusion that "***Alternative 4 would provide similar protectiveness"*** is erroneous. Taken to an extreme the logic behind the conclusion that in the short-term "***Thus Alternative while protective of the Onondaga Lake and NMC OU-2 remedies, would***

have a greater environmental impact than Alternatives 2 and 3, overall" would lead one to conclude that the No Action Alternative would be more appropriate (This is one reason that criteria such as "clean and green" concepts are not included as one of the nine criteria within the NCP alternative selection process.).

6. Page 39; entire Section **4.2.3 Long-term Effectiveness and Permanence**

The conclusion that the Alternatives are equally protective is erroneous here as well—Alternative 4 will not suffer from erosion caused by a large storm to the degree as the other Alternatives.

7. Page 40; entire Section **4.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

The conclusion that the Alternatives are equally protective is erroneous here as well—Alternative 4 is associated with a greater reduction in mobility via reduction of footprint for leaching and subsequent transport.

8. Page 40; entire **Section 4.2.5 Short-term Effectiveness**

> *"There are no short-term effects relative to Alternative 1. Alternatives 2, 3 and 4 would be constructed using proper protective equipment to manage risks to onsite workers, and proper precautions and monitoring to be protective of the general public and the environment.* ***Due to the extensive excavation included in Alternative 4, potential impacts to the surrounding community related to transportation of material would be substantially greater than for Alternatives 2 and 3. In addition, due to the extensive excavation included in Alternative 4, it is more energy intensive as compared to Alternatives 2 and 3."*** [Emphasis added]

For reasons discussed above, the Onondaga Nation does not believe that any of the proposed alternatives are necessarily effective at proving protection to humans for the RFFLU. The discussion on the shortfalls of the hydrogeologic characterization as well as the proposed method of extracting the shallow ground water indicates that the proposed technology is likely to not be effective. However, momentarily overlooking these concerns, the highlighted discussion doe not pertain to effectiveness and should be removed.

9. Figures 4, 5, and 6.

See general comment No. 6

10. Figure 8.

This figure is overly generalized and does not depict flow westward of NMC A key question is where and when is NMC loosing or gaining. The groundwater flow to the south is likely more complicated since NMC is absent. This complexity is likely a reason the potentiometric surface is not fully mapped. See general comment No. 6.

Attachment: August 24, 2009 memo from Joseph Heath, esq. to Mr. Don Hesler Division of Environmental Remediation New York State Department of Environmental Conservation regarding **ONONDAGA LAKE: REMEDIAL DESIGN ELEMENTS FOR HABITAT RESTORATION**

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August 24, 2009 **VIA Electronic Mail to**
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Mr. Don Hesler
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

RE: ONONDAGA LAKE: REMEDIAL DESIGN ELEMENTS FOR HABITAT RESTORATION

Dear Mr. Hesler:

I am writing on behalf of the Onondaga Nation, for whom I am General Counsel, to express the Nation's continued concern about the "Habitat Restoration Plan"for Onondaga Lake including the recently drafted "Remedial Design Elements for Habitat Restoration." The Nation is submitting these comments as part of its ongoing consultation with the NYSDEC on the remediation of Onondaga Lake under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA").

For a variety of reasons the remediation process for Onondaga Lake is substantially further along in most respects than the CERCLA Natural Resource Damage Assessment and Restoration process ("NRDAR"). As a result, the Natural Resource Trustees for Onondaga Lake did not have an opportunity to participate fully during the remedy selection and subsequent processes including the preparation of this current Draft Habitat Plan. The Nation is taking this opportunity to memorialize its concerns about the CERCLA remediation aspect of this process, separate and apart from its role as a Trustee for Natural Resources, in the hope that the restoration and remediation processes can be harmonized for more efficient and effective decision-making.

The Nation's view of this current draft plan is that it is inherently flawed, as it is based upon a remedy which is neither permanent nor protective of human health and the environment. This is not a new disagreement: the Nation has expressed deep concern

about the CERCLA remedy chosen for the Lake since the plan was first presented at the Onondaga Nation Longhouse in November of 2004. Therefore you must understand that the creation of "habitat" on top or adjacent to contaminated sediments does not impress the Nation as a positive step forward at this point in time, making it extremely difficult to make constructive comments. The single most effective thing the Department could do to improve this habitat plan is to put it on hold and undertake a thorough process of consultation and coordination with the Nation and the other NRD Trustees. The inefficiency and distrust created by this disjoin between the CERCLA remediation process and the CERCLA Natural Resource Damage Assessment Process will only magnify as time goes forward.

The Nation recognizes that the responsible party and NYSDEC have put tremendous effort into this document. Moreover, it is probable that some of the outcomes of the activities described herein will have a positive effect. In respect, therefore, of that effort, and in an effort to contribute constructively to this process, the Nation offers the following broad suggestions.

This Plan Does Not Provide for Restoration

Webster's dictionary defines "restore" as "to bring back to or put back to a former or original state". The goal of the habitat restoration plan is described in the document as follows:

> *This section provides a summary of historic and current habitat conditions in Onondaga Lake and adjacent Honeywell sites based on a review of literature sources. It is important to understand past and* ***present habitat*** *conditions because they provide a foundation for the goals outlined in this plan. The aim of this restoration project is to return impacted areas of the lake and adjoining areas to* ***a representative natural state*** *based on these findings." (Page 26, Section 2; Paragraph 1; emphasis added)*

On the surface, the stated goal appears somewhat consistent with the Nation's goal or vision for the lake. However, the document fails to define conditions that characterize the target "representative natural state". The Nation believes that pre-release or pre-industrial conditions represent the natural state of the lake; not current, near-current, or some intermediate state between pre-release and current conditions. To make matters worse, it appears that the term "restoration" is being used in the document to describe engineering practices that would be used to design for the future uses of the Lake. See

page 16. This is substantially different from restoration, whose goal is to "bring back to or put back to a former or original state."

Onondaga Lake and its watershed has been a valued resource for the Onondaga Nation from time immemorial. Historical regular use and habitation of the lake and its watershed by citizens of the Nation, has been documented through numerous historical accounts and in the Nation's oral history. The Onondaga Nation has never forfeited nor relinquished any or part of its rights to hunting, fishing, gathering, and residing within its aboriginal territory, including Onondaga Lake.

This document falls far short of restoring the traditional uses of Onondaga Lake by the Onondaga Nation. Traditional uses of resources by the Onondaga Nation were not adequately modeled in the baseline human health risk assessment performed in the RI/FS for Onondaga Lake that is the basis of the remedy outlined in the Record of Decision. As part of its participation in the NRDAR process, the Onondaga Nation will be reconstructing traditional uses and Onondaga-specific traditional exposure factors to facilitate the determination of requisite cleanup levels of abiotic and biotic media. In short, to achieve those goals, restoration to a pre-release representative natural state is required in order for the Onondaga Nation to be able to enjoy and use resources of the lake and watershed at traditional rates once again. Anything short of this creates an attractive nuisance and concomitant health concerns for our citizens, as well as the plants and animals in which we rely on. This plan should not be described as a "restoration plan", rather it is at best an "interim restoration plan".

Revise the Document for Accuracy

I would strongly caution that the document substantially overstates the nature and degree of the Nation's participation in the development of this document. It would be accurate to say that the Trustees for Onondaga Lake, including the Onondaga Nation, observed many Habitat Workgroup Meetings. It would not be correct to state or imply that the Nation concurred in any fashion with the Consent Decree memorializing the Record of Decision for Onondaga Lake, as the Nation's effort to intervene in that litigation was summarily rejected. The reference on page 17 should be deleted. Further, as a point of clarity, it is disrespectful to describe the Nation as a "local interest group." See page 8.

The information contained in the plan regarding the historic condition of the Lake is different from the Nation's understanding of this history. One key component of a true restoration process will be coming to an agreement about that historic condition and on the goals for restoration. The Habitat Technical Working Group that was used in the

preparation of this document is not the decision making entity for establishing restoration goals. Rather the CERCLA NRD Trustees for Onondaga Lake will be making these decisions. The document must indicate its limitations.

This highlights an important problem with the timing of this document. The CERCLA NRD Trustees are just in the initial phases of working with the responsible party to develop a plan for assessing the damage to Onondaga Lake. This process includes identifying data gaps which must be addressed in order to undertake restoration planning. This document goes forward in the absence of data on key populations, such as the amphibian and reptile communities, and native fish populations. Again, the document should acknowledge these limitations.

Another key problem with the document as presented is that it contains erroneous conclusions. For example, on page 29 it states that "The total surface area of the lake remained the same; however, many of the wetland areas around the lake were filled in by continued development (Ferrante, 2005)." A closer review of this paper indicates that the author stated not that the total surface area of the lake remained the same; but rather that the ELEVATION of the water had no net change (dropped 2 feet due to the barge canal, raised two feet by the Phoenix Dam). Historic maps clearly indicate that the surface area of the lake has decreased. Similarly, the representations in Table 2.1 as to Lake level cite to research by an archeologist whose findings in this regard have been discredited and should not be relied upon (Pratt 2003). These inaccuracies should be corrected.

Correct the Description of the Onondaga Nation's Relationship to Onondaga Lake

In the section History of Onondaga Lake, the document makes reference that, "the Onondaga Nation has frequently stated the historical and cultural significance of the Onondaga Lake and its' shores". It then goes on to describe post-colonization history of Onondaga Lake in detail. We would like to propose the inclusion of the following language, to more adequately include the pre-colonial history of the lake:

> *"Onondaga Lake is the spiritual, cultural and historic center of the Haudenosaunee Confederacy. Over one thousand years ago, the Peacemaker brought the Mohawk, Oneida, Onondaga, Cayuga, and Seneca Nations together on the shores of Onondaga Lake. At the lakeshore, these Nations accepted the message of peace, laid down their arms, and formed the Haudenosaunee Confederacy. The Confederacy was the first representative democracy in the West, and inspired the founders of the United States.*

> *Onondaga Lake is sacred to the Haudenosaunee. The Onondaga Nation has resided on the Lake and throughout its watershed since time immemorial, building homes and communities, fishing, hunting, trapping, collecting plants and medicine, planting agricultural crops, performing ceremonies with the natural world dependent on the Lake, and burying ancestors – the mothers, fathers and children of the Onondaga Nation. The Onondaga Nation views its relationship to this area as a place where they will forever come from and will return to; they will continue to work for the healing of the Lake."*

Conclusion

The Onondaga Nation appreciates the efforts by the NYSDEC for consultation on the remediation of Onondaga Lake. Despite our substantial disagreement with the characterization of this as a "restoration plan", we acknowledge that this document clearly reflects a tremendous amount of effort. Even more effort will be required to develop a plan for true restoration. The more the remediation process is coordinated with the NRDAR process, the more effective and efficiently our mutual efforts will be. We look forward to continuing to participate in these efforts both as consultation partners and as Trustees.

Sincerely,

Joseph J. Heath

cc: Onondaga Nation Council of Chiefs
George Shanahan, USEPA
John McAuliffe, Honeywell International
Kenneth P. Lynch, NYSDEC

Appendix B. April 20, 2010 memo from Dr. F. E. Kirschner and Dr. B. Harper to Joseph J. Heath, Esq. Counsel for the Onondaga Nation entitled: ***"Rapid review of Human Health Risk Assessment Wastebeds 1 through 8 Site, Geddes, New York, Prepared O'Brien & Gere for Honeywell, February 2010"***

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MEMORANDUM

TO: Joe Heath, Esq. General Counsel
Onondaga Nation

FROM: Dr. F. E. Kirschner, Senior Scientist

Dr. Barbara Harper, Toxicologist, DABT

DATE: April 20, 2010

SUBJECT: Rapid review of ***"Human Health Risk Assessment Wastebeds 1 through 8 Site, Geddes, New York, Prepared O'Brien & Gere for Honeywell, February 2010"***

CC: Onondaga Nation Council of Chiefs
Thane Joyal, Esq.
Beynan Ransom, Technical Advisor
File

The Onondaga Nation has performed a very rapid review of the aforementioned document. Typically, the Nation Prepares Specific comments that follow General Comments. However, upon review, the Nation has identified that likely risk scenarios as well as entire exposure pathways were omitted. Since these omissions are so egregious, the Nation ceased a more in-depth review upon discovery. Therefore, only General Comments are provided below (Specific comments will be provided once these major problems have been rectified in a following draft)

General Comments

1. This BHHRA demonstrates the Nations voiced concerns that this site has been overly balkanized making it very difficult to assess OU-risk let alone cumulative risk to ecological receptors and humans who use these resources across several, if not all OUs. For example, the risk from Lake OU (an EA omitted from evaluation) fully usurps the allowable risk allocation (even if it is assumed that institutional controls (ICs) are fully effective at constraining uses[1]). Technically, this means that a receptor, who uses the lake at IC rates[2] cannot receive a single molecule of any COC, since his/her risk is already in excess of regulatory thresholds. Further, this means that since Honeywell has elected to leave contamination in the lake that fully usurps the allowable risk allocation, all OUs in the uplands would need to be remediated to pre-release conditions (i.e. pre-release background/baseline) in order to reduce site-wide excess risk to acceptable levels.

> *"As such, remedial efforts at Wastebeds 1-8 are closely linked to both the lake and Ninemile Creek sites. The Record of Decision (ROD) for the Onondaga Lake Bottom Site (NYSDEC and USEPA July 2005)* ***acknowledges that controlling contamination from upland sites is integral to the overall remediation of Onondaga Lake and that there is a need to coordinate remedial efforts that could impact lake remediation efforts****."* [First paragraph of the executive summary; emphasis added]

Although this document acknowledges the uplands and the lake are inextricably linked, it assess risk as if they were two wholly separate sites.

2. The HHRA further balkanizes this OU into Exposure Areas (EA)[3] that are far too small. An EA is the area in which a human or animal would likely use over his/her lifetime—not some geographic feature.

3. Along with concerns identified in General Comment No. 1, risk is grossly understated for all scenarios (receptor groups) due to omission of the dietary pathways associated with the Lake OU as well as the subsistence use of plants/animals on the land surface of WB-1-8-OU. According to the Executive Summary ***"…the Site is zoned industrial, deeded for "park purposes or other public use,…".*** Parks are part of the commons exploited by all and especially subsistence local populations including, but not limited to Hmong, Eastern Europeans, and Native Americans. These subsistence populations rely much

[1] Dietary-based institutional controls (ICs) are only optional to the person or persons and are not effective especially for populations who have to make the everyday decision "should I eat this today, because it could cause cancer or health implications in my later years or "should I eat this today, otherwise my family and I could starve".

[2] The recommended daily rate of consumption of fish under the IC is several orders of magnitude below actual consumption rates of subsistence fisherman.

[3] The HHRA erroneously employs the term Exposure Unit interchangeably with the term Exposure Area (EA).

more heavily on natural resources than members of the General Public that are portrayed in this document.

In order to develop a scenario for the Nation, it will be necessary to revise the exposure factors and durations of exposure to reflect subsistence use of water-way resources. The nation is currently developing Onondaga-Specific Exposure Factors and HHR Scenario under the CERCLA Natural Resources Damages Assessment. However, in the meantime, we recommend employing exposure factors described by Harper et al (2000; Attached) as a conservative estimate. The scenario should include a 70 year lifetime duration consuming water, fish, and vegetation from the lake, as well exposures to terrestrial media during sweatlodge and other daily uses. Another reference that includes Scenarios for several native American Tribes and includes a discussion on "how to develop" a Tribal-specific Scenario is ***HARPER ET. AL. 2007, Regional Tribal Exposure Scenarios Based on Major Ecological Zones and Traditional Subsistence Lifestyles.*** This large document can be found at: http://www.hhs.oregonstate.edu/ph/tribal-grant-main-page.

Finally, the Scenarios already developed are not believable. A fisherman scenario for fishermen that do not eat fish? These erroneous omissions of obvious pathways are readily observed in the wire-frame Conceptual Site Model as well.

In light of the previous comments, conclusions regarding conservatism and uncertainties in the risk estimates are unfounded.

4. The Table in the executive Summary entitled : *Summary of Current/Future Exposure Scenario Cancer Risks and Non-cancer Hazards,* is confusing. Do the values in this table represent risk (via HI) or ratio of risk to the acceptable range? It appears that the latter is correct since many of the values exceed acceptable thresholds for risk.

5. There are different factors for "mutigenic [sic, misspelled in table] mode of action" with no explanation why exposure factors should be different. The use of the early childhood adjustment for PAH carcinogenicity is not clear. Ingestion rates seem to vary from medium to medium with no explanation.

6. The equations for pro-rated vinyl chloride are not explained and seem unnecessary if all it is age-adjusted intake rates.

7. Using the scenarios as presented would result in a partial PHA (and a bad one), not a baseline risk assessment. Baseline risk assessments need to evaluate all pathways and all reasonably foreseeable land uses. The contractor completely misses the purpose of a RI/FS HHRA

8. The PCB-Aroclors CSF results in lower risk estimates than for congeners.

Attachment: **The Spokane Tribe's Multipathway Subsistence Exposure Scenario and Screening Level RME**

Risk Analysis, Vol. 22, No. 3, 2002

The Spokane Tribe's Multipathway Subsistence Exposure Scenario and Screening Level RME

Barbara L. Harper,[1]* Brian Flett,[2] Stuart Harris,[3] Corn Abeyta,[1] and Fred Kirschner[1]

Exposure scenarios are a critical part of risk assessment; however, representative scenarios are not generally available for tribal communities where a traditional subsistence lifestyle and diet are relevant and actively encouraged. This article presents portions of a multipathway exposure scenario developed by AESE, Inc. in conjunction with the Spokane Tribal Cultural Resources Program. The scenario serves as the basis for a screening-level reasonable maximum exposure (RME) developed for the Midnite Uranium Mine Superfund site. The process used in developing this scenario balances the need to characterize exposures without revealing proprietary information. The scenario and resulting RME reflect the subsistence use of original and existing natural resources by a hypothetical but representative family living on the reservation at or near the mine site. The representative family lives in a house in a sparsely populated conifer forest, tends a home garden, partakes in a high rate of subsistence activities (hunting, gathering, fishing), uses a sweat lodge daily, has a regular schedule of other cultural activities, and has members employed in outdoor monitoring of natural and cultural resources. The scenario includes two largely subsistence diets based on fish or game, both of which include native plants and home-grown produce. Data gaps and sources of uncertainty are identified. Additional information that risk assessors and agencies need to understand before doing any kind of risk assessment or public health assessment in tribal situations is presented.

KEY WORDS: Native American; subsistence diet; multipathway; exposure scenario

1. INTRODUCTION

Exposure assessment has been termed the "wasteland of risk assessment"[4] because so much information is lacking with regard to exposure patterns and rates, and this is especially true for specific populations such as Native American communities. The need to address a tribe's subsistence exposure is based on fundamental considerations of the tribe, as a people, and the role the reservation and its natural resources play in supporting them. The United States recognizes that Indian reservations were, and are, intended to provide permanent homelands for members of the particular tribes. As such, those members possess the inherent right to use reservation natural resources for subsistence, religious, and other cultural purposes. The Spokane

[1] AESE, Inc., Valleyford, WA.
[2] Spokane Tribe of Indians, Wellpinit, WA.
[3] Confederated Tribes of the Umatilla Indian Reservation, Pendleton, OR.
[4] Carol Henry, American Chemistry Council, quoted in Wakeland, 2001 *EHP 108*(12): A559.
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Tribe's effort to preserve its culture and environmental quality has, on numerous occasions, been formally memorialized by pronouncements of the tribe's official governing body. The immediate impetus for developing this tribal scenario is the Midnite Uranium Mine Superfund Site, an inactive open-pit uranium mine located on the Spokane Reservation, that has contaminated various media with radionuclides and heavy metals. The exposure scenario described herein is an effort to ensure the proper evaluation of risk to Spokane Tribal members who engage in traditional practices in areas affected by the mine. While this scenario attempts to include as many activities related to Spokane cultural practices as possible, there undoubtedly exist unintended omissions and instances of understated exposure. It is important for readers to understand that this scenario is designed to reflect traditional lifestyles whose practice has been and remain the long-term intent of the tribal council, rather than a current snapshot of statistical cross-sectional surveys. While the latter may be more "quantitative," such surveys would not provide the level of protection needed for safe practice of traditional ways.

The scenario relies on existing ethnographic information about traditional Spokane lifestyles identified by the tribe as accurate[1–3] as well as confirmatory interviews with elders. The Spokane Tribe has determined that information regarding cultural activities, gathering areas, and resources is a cultural resource, and restricts access to that information (Spokane Tribal Resolution 1996-0018); therefore, details regarding specific species, locations, uses, or activities that are deemed proprietary have been omitted.

The scenario also serves as the basis for a screening-level reasonable maximum exposure (RME) developed for the Midnite Uranium Mine Superfund site. This article presents portions of a multipathway exposure scenario developed by AESE, Inc.[4] in conjunction with the Spokane Tribal Cultural Resources Program. It includes dietary factors specific to the Spokane Tribe and builds on previous work,[5] refines some of the exposure factors used in earlier work, and demonstrates how a complex scenario can be used to develop a screening-level RME under CERCLA. It should be noted that the term "subsistence" has been used in this article as a short-hand term that encompasses a broader range of activities than those necessary to sustaining human life such as eating and drinking. It includes other cultural and religious practices as well, such as medicinal and ceremonial uses of natural resources.

Our experience in developing tribal subsistence-based exposure scenarios has led to a set of technical, ethical, and procedural rules:

- To be most useful to regulators and others seeking to protect the health of subsistence users, the information should be developed with an eye toward satisfying appropriate court rules for admissibility of expert testimony. While both state and federal courts have such rules, Federal Rule of Evidence 702, on which many state court rules are modeled, is the most widely applied and interpreted. Rule 702 permits "a witness qualified as an expert by knowledge, skill, experience, training, or education" to testify when his or her "scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue." In response to two U.S. Supreme Court cases holding trial judges responsible for excluding unreliable expert testimony, Rule 702 recently was qualified by amendment. To be admissible, the rule now requires federal courts to find: "(1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." The subsistence scenario incorporates information from a variety of disciplines, including cultural and traditional environmental knowledge. To prevent a challenge to the admissibility of the subsistence scenario as being unreliable, we wish to ensure that the subsistence scenario has been developed as much as possible using

general scientific criteria adopted from the *Daubert* case:[5]

- That each parameter can be tested or verified (documented, modeled, measured, or elicited from acknowledged experts), and that each assumption has been systematically validated. Risk assessors can rely on ethnographic data, verbal representations from subsistence practitioners, and so on. We relied on (1) open peer-reviewed literature on exposures through different but analogous pathways and caloric content of foods, (2) ethnographic documents and reports concerning traditional lifestyles and practices, and (3) statements from tribally recognized cultural experts. This latter expertise derives from their traditional environmental knowledge, and is based on confidential information, so we cannot verify it in the sense of reanalyzing raw numerical data, but we can verify the expertise of the cultural experts who summarized their knowledge of resources and activity patterns for us.
- That another risk assessor could repeat the same steps and would construct essentially the same scenario, because the approach for developing an exposure scenario is fairly standardized.
- That the scenario is accepted by colleagues as reasonable and factual rather than eccentric, unreliable, or mere opinion, or that it meets the "general acceptance" test set forth in *Frye v. United States*, 293 F. 1013 (App. D.C. 1923), the predecessor case to *Daubert*. We satisfy this criteria by obtaining peer review from qualified colleagues ("the relevant scientific community") even beyond the editorial peer-review process. Does this mean that exposure scenarios for over 500 tribes must be peer reviewed and published in *Risk Analysis* in order to be admissible in court should they be challenged during a CERCLA or NEPA process? We believe that if a standardized process is followed and the scenario is reviewed by an advisory board of qualified peers that actual publication is not necessary, even though publication in a peer-reviewed journal is a commonly accepted standard for peer review.

- The scenario must be both scientifically relevant and reliable, and culturally relevant and reliable. The process must be culturally sensitive, respectful, draw on traditional environmental knowledge (such as the observational expertise of elders), and must be developed from within the tribe by a toxicologist/risk assessor in partnership with tribal cultural and technical experts. Collaboration with the Cultural Resources Program provided the cultural assurance.
- Policy-level approval must be obtained. The process must meet Institutional Review Board rules or their equivalent for conducting human research (which we believe includes cultural or anthropological research)

[5] See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) (holding trial courts responsible for excluding unreliable scientific expert testimony); *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999) (holding trial courts responsible for excluding unreliable nonscientific expert testimony). An authoritative discussion of *Daubert* and the reliability tests for expert testimony is contained in the Federal Rules of Evidence Advisory Committee Notes, which accompany Rule 702. They include a "nonexclusive" list of considerations for reliability of scientific expert testimony under *Daubert*:

(1) whether the expert's technique or theory can be or has been tested—that is, whether the expert's theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability;
(2) whether the technique or theory has been subject to peer review and publication;
(3) the known or potential rate of error of the technique or theory when applied;
(4) the existence and maintenance of standards and controls; and
(5) whether the technique or theory has been generally accepted in the scientific community.

Kumho found that depending on the particular circumstances of the case, these factors may also apply to nonscientific testimony. Other factors considered by post-*Daubert* courts include: whether the expert's opinions were developed independent of litigation or for the purpose of testifying; whether there exists too great an analytical gap between data and opinion; whether obvious alternative explanations have been accounted for; and whether the same level of intellectual rigor is applied in the testimony as would be required in field practice. In addition to reliability, courts will require a testifying expert to be "qualified," and the testimony must be relevant and helpful to the trier of fact. Thus, the emphasis is on testimony being relevant and reliable more than on whether there is a strict litmus test of generating a theory and statistically testing a null hypothesis.

such as informed consent, benefit to the tribal community, disclosure of the risk of adverse consequences, and confidentiality. Repeated conversations with tribal program managers and/or policymakers ensured that there was an understanding of the way that the risk information was to be used, the potential adverse consequences of developing a scenario from a risk acceptance perspective or precedent, and related concerns.

- Identifying resources and activities on a base map overlain by ecological habitats, and constructing a dependency web (culturally relevant natural history diagrams)[6] as a pictorial representation of the ethnohabitat proved helpful. A subsistence food pyramid is another useful tool.

2. THE SPOKANE TRIBE AND ITS ECOCULTURAL LANDSCAPE

The Spokane Indians are part of the Interior Salish group, which has inhabited northeastern Washington and northern Idaho since time immemorial.[1] The Spokane Reservation lies at the confluence of the Spokane and Columbia Rivers in northeastern Washington. Salmon was the most important commodity in the early economy of the tribe. Since the construction of Columbia River dams the anadromous salmon are no longer available. Instead, Kokanee (landlocked sockeye salmon) and resident trout and other species have been substituted. Abundant game also supports an alternative game diet, along with a wide variety of roots, berries, and other plants. Because the reservation is still fairly pristine and undeveloped, it provides enough resources for some members to continue a traditional subsistence dietary lifestyle, and for all members to obtain traditional foods.

The ecology of the reservation area is characteristic of the arid montane areas of the northern Columbia Basin transitioning into the Okanagon highlands to the north. Annual precipitation is approximately 16 inches. The Spokane lands include the two major rivers (the Columbia River and one of its tributaries, the Spokane River) including the waters to their far banks, and various other large and small tributaries, springs, ponds, and wetlands. Mount Spokane is a central feature of the reservation landscape. A Douglas fir zone exists at the highest elevations, with Ponderosa pine and Western juniper zones with a variety of understories at lower elevations, and grassland-sagebrush shrub steppe and riparian areas along the waterways.[7–9] Areas affected by activities at the Midnite Mine include the mined area on Mount Spokane and adjacent upland habitats, several seeps and springs with riparian habitats, and a major creek (Blue Creek) that empties into the Spokane River arm of Lake Roosevelt, the reservoir created in the Columbia River by the Grand Coulee Dam.[10]

The Spokane traditional lifestyle is governed by ecological seasons and the activities that people undertake in response. A significant portion of the population follows this lifestyle in full or in part. Hunting, fishing, and gathering are essential to support nutritional, cultural, spiritual, and medicinal needs of tribal members. Hunting and gathering on the reservation is allowed based on the needs of the family. Typically, all family members work in the field on a regular basis to keep the extended family unit stocked with a wide variety of plants and wildlife. While in the field, tribal members live off the land by consuming surface and spring water, wild plants, and wildlife. In addition to the time spent in hunting, fishing, or gathering, time is also spent cleaning, processing, and preserving hides, drying vegetal food or medicines, and making a wide variety of items. The Spokane people use over 200 varieties of plants.[11] Huckleberries are gathered, as are a wide variety of roots, shoots, moss, leaves, stems, cambium, seeds, and flowers. Most natural resources have several human uses[12,13] as well as providing multiple ecological functions and services. A more complete description of edible plants, ethnographic information, plant technology, ethnobotany, and ethnopharmacology is found in AESE.[4]

3. GENERALIZED LIFESTYLE OF A REPRESENTATIVE COMPOSITE SPOKANE TRIBAL FAMILY

This section describes a family-based exposure scenario founded on traditional Spokane lifestyles and diets (one fish-based diet and one game-based diet). This hypothetical but representative family lives in a house in a sparsely populated conifer forest, tends a home garden, pursues a high rate of subsistence activities and a regular schedule of other cultural activities. The lifestyle is moderately active, with daily sweat lodge use and outdoor employment.

The family composition was determined with the guidance of the Spokane Tribal Culture Program and current tribal demographics. Each family includes an infant/child (age 0–2 years) who breastfeeds for two years and crawls and plays; a child (age 2–6), a youth (age 7–16) who attends school, plays outdoors near the residence, and is learning traditional practices; two adult workers (one male, one female, age 17–55; the female breastfeeds the infant) who work outdoors on reclamation and environmental and cultural activities and also engage in subsistence activities, and an elder (age 56–75) who is partly at home and partly outdoors teaching and demonstrating traditional cultural practices. All members (except the infant) partake in family sweat lodge use and in cultural activities throughout the year. In actuality, a family typically includes members who are employed conventionally and members who are full-time subsistence providers.

3.1. Residence

A conventional suburban scenario would identify a person living at home and growing a garden. The subsistence family is superficially similar to this, but they live in a more open house, spend more time outdoors in cultural and subsistence activities, eat both garden and native foods, and are fully interactive with the environment. The family spends its entire lifetime on the reservation, rather than the suburban default assumption of 30 years. The house has no landscaping other than the natural Ponderosa and understory, some naturally bare soil, a gravel driveway, no air conditioning, and a wood-burning stove in the winter for heat. Each house has its own well for domestic use and a garden irrigated with groundwater and/or surface water. Each house has a nearby sweat lodge. The amount of indoor dust is not known, but is likely to be higher than in suburban communities with manicured lawns, air conditioning, and paved streets.

3.2. Generalized Daily Activity Patterns of Each Family Member

Due to space limitations, the average daily activity pattern is not described for each age range and each gender, but in the full scenario, such information would be included in this section.[6] While activities of Spokane males and females are different, they likely result in a similar frequency and duration of environmental contact, so the genders may be separated or combined. The daily activity patterns can also be combined into entire lifetimes for the evaluation of cumulative risk.

3.3. Sweat Lodge Use (Ages 2–75)

The daily use of the sweat lodge is an integral part of the lifestyle that starts at age two. Sweat lodge construction has been described in the open literature.[14,15] Although the details vary among tribes and among individual families, sweat lodges are generally round structures (6 feet in diameter for single-family use). A nearby fire is used to heat rocks that are brought into the sweat lodge. Water (4L) is poured over the rocks to form steam (a confined hemispheric space with complete evaporation of the water, which is available for inhalation and dermal exposure over the entire skin area). Water is ingested (1L is included in the total drinking water ingestion rate) and medicinal plants are used (not specifically included).

3.4. Cultural Activities

All persons participate in day-long outdoor group cultural activities once a month, such as pow-wows, horse races, and seasonal ceremonial as well as private family cultural activities. These activities tend to be large gatherings with a greater rate of dust resuspension and particulate inhalation. Individuals also tend to be more active during the ceremonies, resulting in greater inhalation and water ingestion rates. These activities are folded into the higher soil ingestion, water ingestion, and inhalation rates rather than being estimated on a single-event basis.

3.5. Diet

The Spokane food pyramid looks markedly different from the USDA food pyramid. Caloric needs are generally cited in the range of 2,000 to 4,000 kcal per day for adult males, depending on the level of activity. We use 2,500 kcal/day for the Spokane Tribe, based on a moderately active outdoor lifestyle and renowned athletic prowess (as did Scholz[3]). The original diet of the Spokane Indians was based on salmon and included large and small game, roots, berries, and many other plants.[2,3,11] Hunn[16] estimated that 45% of the native Columbia Plateau dietary calories came from protein (fish and game), with higher estimates

for upriver tribes such as the Spokane.[3] Historically, the Spokane Tribe consumed roughly 1,000 to 1,500 grams of salmon and other fish per day.[2,3] The most robust upper bound estimate of original (predam) salmon intake by the Spokane Tribe is the Walker estimate (cited in Reference 3) of 1,200 pounds per year of salmon per adult, or 1,426 gpd (about 3 pounds/day), yielding 2,566 kcal/day before migration (i.e., if caught in the estuary) and $2566 \times 0.64 = 1643$ kcal/day after migration from the ocean to the Spokane area. With the construction of the Grand Coulee Dam, the anadromous salmon runs were destroyed, so there was a shift to big game and to Kokanee and resident trout. Because the intent of this scenario is to evaluate exposures that traditional members currently receive and that more members will receive as they regain a traditional diet, two diets were evaluated: a high fish diet and a high game diet. Eighty percent of each diet is native, augmented with vegetables grown in a household garden. The current realistic high fish diet based on availability, percentage of the diet, and caloric content consists primarily of fish (885 g/d, somewhat lower than historical levels), supplemented by big game, aquatic amphibian/crustacean/mollusks, small mammals, and upland game birds. The high game diet reverses the fish-game quantities, and both diets include identical amounts of native and domestic plants. Both forms of the diet are approximately 40% protein, 25% fat, and 35% carbohydrate (given the limited data available for native foods), which is comparable to other hunter-gatherer diets.[17] Until recently, this diet was even higher in fish-derived protein, and was stable for at least 5,000 years (based on archaeological evidence of salmon runs). The carbohydrates are largely unprocessed and include many roots but little grain. The fats are from fish, game, nuts, and seeds.

3.6. Drinking Water

Daily replacement water needs are approximately 2L/100 pounds body weight (more during exercise or pregnancy).[6] Athletic activity can result in a loss of 1.5 L/hour; replacement volumes are recommended as 1 to 1.5 ml/kcal of energy expended.[18] Harris and Harper[5] estimated an average water ingestion rate of 3 L/day for adults, based on total fluid intake for the Confederated Tribes of the Umatilla Indian Reservation. However, that number did not account for all uses. This scenario includes adult water ingestion of 1L while at home (from the household water supply), 1L taken from home to the worksite, 1L consumed from worksite sources, and 1L from the household or spring to rehydrate during use of the sweat lodge, for a total of 4 L/d.

[6] U.S. Air Force at http://www.capnhq.gov/nhq/cp/ encampments/AETC.htm#AETC.; Coyle at http://www.veggie.org/veggie/fluid.exercise.shtml).

3.7. Soil Ingestion

Soil ingestion by young children (0–6 years) is assumed to be 400 mg/day for 365 days/year. This is higher than the prior EPA default value of 200 mg/day.[19] It reflects both indoor dust and continuous outdoor activities analogous to gardening or camping,[20] but is less than a single-incident sports or construction ingestion rate.[21,22,23] For adults, the soil ingestion value is also 400 mg/day, reflecting an unspecified upper percentile.[21] This value also better reflects the environmental setting, the typical residential situation, gardening and gathering activities, the preparation and consumption of native and garden plants, the consumption of other natural foods, and a variety of additional outdoor activities (work, play, cultural activities). However, it may still substantially underestimate the amount of soil and sediment on garden produce and gathered plant foods. In particular, episodic events such as gathering in wetlands or road work could result in 1 gram of soil ingested per event,[21,22,23] which may be over and above the 400 mg ingested daily. If there is geophagy (eating dirt for micronutrients or salt), the ingestion would be higher yet. In fact, the intentional presence of some Mother Earth in food may be beneficial medically[23] and spiritually.

3.8. Inhalation Rate

We believe that an inhalation rate of 30 m^3/d is more accurate for the Spokanes' active, outdoor lifestyle than the EPA default rate of 20 m^3/d.[21] EPA[21] reviewed several extensive studies that examined ventilation rates based on direct management and activity diaries in developing the default rate of 20 m^3/day. EPA recognizes that special populations, such as athletes or outdoor workers, have higher average rates and recommends

Table I. The Spokane Subsistence Composite RME Scenario

Medium	Description (Not All Routes of Exposure are Listed)
Groundwater	Each family has their own well for drinking/household, watering the garden, sweat lodge
Surface water	Each family uses surface water (seep and creek) for domestic and garden use, washing locally gathered materials, and the worker uses surface water during fieldwork and sweat lodge
Air	Indoor radon, sweat lodge radon, outdoor radon daughters, inhalation of resuspended dust, inhalation of aerosols
Soil	Direct ingestion, deposition on plants, as-gathered conditions, and indirect (uptake from soil to plant)
Sediment	Duplicates the soil; gathering may include high rates of sediment exposure that may be underestimated
Sweat lodge	Daily for 2 hours, using groundwater (springs) or surface water
Pathway	**Description (Not All Routes of Exposure are Listed)**
Inhalation	$30\,m^3/d$ to accommodate indoor and outdoor activities; the inhalation rate for strenuous outdoor activities may actually be underestimated (can be discussed as a source of uncertainty)
Drinking water	4 L/d; this is duplicated for surface and groundwater if both are contaminated; fluid replacement needs for strenuous activity may be underestimated
Other water uses	Garden irrigation, dermal and inhalation while showering, other standard routes of exposure
Sweat lodge	Steam, inhalation, immersion
Soil ingestion	400 mg/d (100 mg/d from indoor sources and 300 mg/d from outside sources); outdoor sources may vary in concentration; indoor dust is equal to local outside soil; this is duplicated if sediment is included; episodic events 1 gram each
Other	Other factors are as reported previously (dermal, etc.; Harris and Harper, 1997)

High Fish Diet—About 2500–3000 kcal/d (Moderate Adult Level)		High Game Diet—About 2500–3000 kcal/d (Moderate Adult Level)	
Fish (10% of which is organ meat with 10x concentrations; sockeye and mixed trout are used for calorie estimates)	885 g/d = 1300 kcal	Big game (10% of which is organ meat with 10x concentrations; deer and elk are used for caloric estimates, not beef)	885 g/d = 1000 kcal
Big game	100 g/d = 110 kcal	Fish	75 g/d = 180 kcal
Local small game, fowl	50g/d = 75 kcal (or 25g birds, 25g rabbits)	Local small game, fowl	50 g/d = 75 kcal (or 25g birds, 25g rabbits)
Aquatic foods (mussels and crayfish are nutritionally similar)	175 g/d = 120 kcal	Aquatic foods	175 g/d = 120 kcal
Vegetal calories	1600 gpd = about 1000 kcal (mixed species)	Vegetal calories	1600 gpd = about 1000 kcal (mixed species)
10% garden (above ground)		10% garden (above ground)	
10% garden (below ground)		10% garden (below ground)	
40% gathered terrestrial below ground		40% gathered terrestrial below ground	
20% gathered terrestrial above ground		20% gathered terrestrial above ground	
20% aquatic		20% aquatic	
Other calories (medicines, etc.)	Not determined	Other calories (medicines, etc.)	Not determined
Dairy (children only)	0.5 L/d milk	Dairy (children only)	0.5 L/d milk

Note: The best estimate of original (predam) salmon intake by the Spokane Tribe is the Walker estimate (cited in Scholz *et al.*, 1985) of 1,200 pounds per year of salmon per adult, or 1,426 gpd (about 3 pounds), yielding 2,566 kcal before migration and $2566 \times 0.64 = 1643$ kcal after migration from the ocean to the Spokane area. The current 885 gpd is based on a combination of calories estimates, availability, interviews, and dietary balance. The current Spokane diet relies on Kokanee (landlocked sockeye) and trout (bull or Dolly Varden, rainbow), suckers, whitefish, other species. Salmon and steelhead are obtained whenever possible. Mussels and crayfish were also eaten regularly.

Both fish and game are eaten fresh, smoked, or dried, but there are few data on calories or contaminant concentrations according to method of preparation. No contaminant loss during preparation is assumed, since contaminants could become more concentrated as well as being lost with fat loss.

The dietary data are not adequate to distinguish fruit, berries, greens, roots, bulbs, fungi/moss, seeds/nuts, medicines, or sweeteners on a caloric basis, nor domesticated from wild plants. If data for uptake from soil/sediment or dust/sediment load for a native species becomes available, the intake of that species will be estimated. The proportion of above and below ground plants is based on reliance on tubers and bulbs, using USDA caloric information on domesticated plants from the same plant families. Intake of other plants (medicines, rose hips, etc.) occurs but was not determined.

Dairy may be underestimated (cheese, milk), and eggs are not specifically included, but should be included depending on the information supplied by tribal members.

While many animal species are similar with respect to how much nutrition they provide to people, their contaminant concentration will vary according to their habitat and ecological niche, as well as their location and size of home range. This is estimated through the ecological food web or actual sampling data.

All the exposure factors are constant through the year (i.e., they apply 365 days/year).

calculating their inhalation rates using the following median hourly intakes for various activity levels (in m^3/hr): resting = 0.4, sedentary = 0.5, light activity = 1, moderate activity = 1.6, heavy activity = 3.2. For outdoor workers, a median rate is 1.3, with an upper percentile of 3.3, depending on the ratio of light, moderate, and heavy activities during the observation time. "Inhalation rates may be higher among outdoor workers/athletes because levels of activity outdoors may be higher, therefore, this subpopulation group may be more susceptible to air pollutants and are considered a 'high risk' subgroup."[21] Using this EPA guidance, a median rate of 26.2 m^3/d is obtained from eight hours sleeping, two hours sedentary, six hours light activity, six hours moderate activity, and two hours heavy activity. This represents minimal heavy activity (construction, climbing hills, etc.), and is a median rather than a reasonable maximum. The California Air Resources Board[25] also reviewed daily breathing rates based on activity levels and concluded that 20 m^3/d represents an 85th percentile of typical American adult lifestyle (eight hours sleeping and 16 hours of light to moderate activity), a lifestyle that is less active than an outdoor lifestyle in a topography that includes steep slopes, as on the Spokane Reservation.

4. A SCREENING-LEVEL COMPOSITE RME

Due to the number of age groups, daily activities, and limited EPA funds for determining both media-specific exposure point concentrations as well as developing and subsequently running the risk model, EPA requested that the tribe condense the scenario into a screening-level composite RME application for use in the Midnite Mine risk assessment (Table I). The principle of developing a screening scenario is to reduce the number of calculations by combining (not eliminating) pathways and age groups, and maximizing exposure factors to a reasonable degree. The screening-level risk assessment then generally employs the composite RME and the upper 95th percentile exposure point concentrations in each medium, wherever they occur throughout the site, so that any location, activity, diet, or water source has the chance to drive risk. This means that the result of the screening-level risk assessment is not strictly location, pathway, age, or activity specific. It only indicates whether unacceptable sitewide risk is possible and shows the spatial aspects of the risk profile if plotted on a base map. In the future, EPA or the tribe will need to use the full scenario and location-specific exposure point concentrations to assess risk attributable to location, pathway, age, or activity. Such information will be required to evaluate the remedial alternative during the feasibility study and to quantify residual risk once remediation has been completed.

The full scenario was condensed as follows. The daily time allocation is 12 hrs/d indoors, 2 hours in the sweat lodge, 7 hours outdoors working, playing, and other nonsubsistence activities, and 3 hours of subsistence activities in *each* contaminated area where these activities might occur. This will result in more than a 24-hour day, but is necessary to reduce the number of calculations. Alternately, the person can live and subsist at the single most contaminated location. Soil ingestion remains at 400 mg/d for 365 days/year (100 mg from indoor sources and 300 from outdoor sources; for multiple contaminated subsites, each contributes 300 mg, which could result in more than 400 mg/d; alternately, the single most contaminated soil location can serve as the sole source of soil-based exposure). For application to other areas, such as wetlands, 1 gram per visit may be used.[21,22] Drinking water

Table II. Examples of Differences in Exposure Factors for a 70 kg Adult

Parameter	Default Value[1]	Subsistence Value[2]
Drinking water ingestion	2 L/day	4 L/d (includes 1L during sweat lodge use)
Soil ingestion	200 mg/d (children) 50 mg/d (adult)	400 mg/d for all ages
Inhalation rate	20 m^3/d	Varies by average activity level; 30 m^3/d.
Meat & fish ingestion[3]	21.1 g/d (general population) and 70–170 (subsistence); 17.5 g/d (general population) and 142.4 g/d (subsistence)	885–1000 g/d fish and 100 g/d meat (high fish diet), or 885 g/d meat and 75 g/d fish (high game diet); 50 g/d small game for each, 175 g/d shellfish for each; no dairy for adults is included in this total
Vegetable ingestion	Fruit and vegetable totals: 539 g/d; grain: 287 g/d[4]	1600 g/d; fraction obtained locally = 1, both gathered and home-grown
Exposure frequency	Varies according to climate and activity	365 d/yr unless documented otherwise
Exposure duration	30 yrs (assumes retirement elsewhere) or less (average time spent in a home)	70 yrs (a full lifetime)

[1] EPA *Exposure Factors Handbook*, in totals per day assuming 70 kg body weight.
[2] These values apply only to the Spokane Tribe unless verified specifically for other tribes. Dietary factors are specific to the Spokane Tribe. Total caloric intake is assumed to be the same for both scenarios but in fact may be higher for the more athletic outdoor lifestyle.
[3] *Exposure Factors Handbook*, Volume II, Section 10.10 recommends using 21.1 g/d total fish and shellfish as the mean value for the general population and 70 g/d for Native American subsistence populations (mean value) or 170 g/d (95th percentile). EPA Office of Water (Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health 2000, EPA-822-B-00-004 and Water Quality Standards for Indian Country at www.epa.gov/ost/standards/tribal/tribalfact.html) uses 17.5 g/d as the 90th percentile for the general population and 142.4 g/d for subsistence populations as the 99th percentile, all in uncooked weight. These values are all for adults and are all based on current cross-sectional surveys that likely omit traditional tribal members. The Spokane value reflects existing documentation on historical subsistence consumption rates with caloric evaluation, confirmatory interviews with the tribal cultural staff, and tribal policy goals for regaining traditional healthy cultural lifestyles, not on dietary surveys.
[4] *Exposure Factors Handbook*, Volume II (mean values).

remains at 4 L/d, which is derived from the most contaminated source (this is duplicated for surface and groundwater if both are contaminated). This results in an upper bound sitewide risk estimate. Risks for an actual individual who specializes in certain activities (i.e., the hunter or the fisher), spends more time in fewer locations or a single location, or fully utilizes a contaminated medium such as groundwater, could be as high as but no higher than this upper bound estimate. Subsequent analyses using either the complete scenario or the composite RME can examine particular pathways and locations, or can be used to support risk management decisions such as remedial goals, subsistence soil and water remedial screening levels, or tribal regulatory standards.

Table II shows some of the major differences between EPA default exposure factors and our subsistence scenario. We are not presenting a sensitivity analysis in this article because the relative contribution of various exposure factors will depend on the concentration of contaminants in various media and their physical parameters, and specific human activity patterns at the contaminated site. This will be the subject of another article. However, we expect that the major factors for subsistence lifestyles or lifestyles with high environmental contact rates will be soil ingestion, drinking water, exposure duration, and diet. We should note that the dietary factors in the *Exposure Factors Handbook* reflect major categories of the diet rather than a necessarily complete diet—adding average caloric content for the categories identified in the *Handbook* totals about 2000 kcal/d for the general population, which is lower than actual national average caloric intakes by up to one-third. That other third of the diet is not likely to come from the contaminated site, so from an exposure perspective this does not detract from suburban dietary exposure estimates. The subsistence diet in this article, however, yields a full day's calories (~2500 kcal). If one tried to construct a subsistence diet solely from the *Handbook*, the caloric intake would fall short of an adequate amount even if the intake factors for Native Americans were used. One could erroneously equate "subsistence" with a modern diet supplemented with fish, game, and wild plants using

intake rates that are given in the *Handbook*. This could be due to several factors: whether reservation dwellers were specifically sampled during the three-day recall surveys (versus urban or suburban dwellers who happened to be Native American), the difference between current reservation conditions (with USDA commodity foods) and a truly subsistence lifestyle, socioeconomic factors, and so on. Thus, developing a subsistence exposure scenario with a traditional diet and cultural practices specific to reservation living needs to rely primarily on ethnographic data and cultural information, and only secondarily on national dietary survey data.

5. DATA GAPS AND SOURCES OF UNCERTAINTY ASSOCIATED WITH THE SCREENING-LEVEL RME

An incomplete list of data gaps and uncertainties are briefly discussed below. The relative error caused by each uncertainty cannot be ascertained at this time. We believe that the overall uncertainty and variability are greater in tribal communities than in suburban communities due to the greater number of risk factors and the potential for several risk factors to cluster in particular communities and individuals. Because tribal members could be at greater risk due to both greater exposure and greater sensitivity, an additional safety factor or precautionary approach may be warranted in these types of situations.

5.1. Mobile Versus Stationary RME

The typical suburban RME for members of the general population is a house-bound individual with a local garden, or a residential farmer who is largely self-sufficient. In these cases, the house and garden are assumed to be located at the contaminated site and available for unrestricted use. The subsistence family also lives where the contamination occurs if this is physically possible, but may spend more time away from the immediate residence during subsistence activities. However, a subsistence RME should not assume that exposure is diluted by spending significant amounts of time in uncontaminated areas. For large sites with variable contaminant concentrations, problems arise when trying to perform a single risk assessment to evaluate multiple hot spots (as not-to-exceed concentrations), even if the risk assessment assumes that the person moves around from hot spot to hot spot or if all subsistence activities are assumed to occur where the upper 95th concentration limit occurs. Additionally, the problem of spatially integrating widespread contamination still remains because, conceptually, 10 acres of contamination poses a greater risk than one acre with the same contaminant concentration. Temporally, persistent contaminants pose a longer risk, and therefore a greater total risk, than degradable contaminants. Unfortunately, the present regulatory framework does not use spatial or temporal risk metrics (such as risk acre-years, or dose per community gene pool across several generations) to account for this cumulative exposure over time and space and people.

5.2. Special Activities

There are special circumstances when some people may be highly exposed that have not been included in the complete scenario or the screening-level RME. For instance, some men hunt or fish for the general community, and many people provide roots and fish and game to elders in addition to their own families. Gathering of some plants (e.g., cattails, water potatoes, reeds, and rushes) is a very muddy activity and rivershore or lakeshore activities may underestimate sediment exposure (soil ingestion can be 1 gram per event[21,22,23]). Washing, peeling, weaving rushes, and other activities results in additional exposure. For example, basketmakers clean and wash their materials, incur cuts on their hands, and hold materials in their mouth. Flintknappers may receive additional exposure through obtaining and working with their materials. In addition, there are potential pathways that are not specifically identified but that might contribute additional exposure, such as contaminated firewood used for smoking food, plants used for teas, flavoring, smudging, or medicine, contact with contaminated animal parts (paints, bone ornaments, clothing), sitting on the ground for long periods of time while processing or during ceremonial activities, and so on. Even though the composite activity patterns are intended to reflect reasonable maximum exposures, there is a potential for underestimating some pathways (i.e., this is not a worst-case scenario).

5.3. Community Exposure Burdens

An entire community exposure burden estimate or population dose estimate may be needed that

includes people who do not reside in but occasionally visit the contaminated area (this includes inadvertent intruders onto the site). If a resource is contaminated, the entire community is exposed. The assumption that protecting the RME adequately protects everyone else may result in a failure to provide all the information that the tribe's governing body needs for informing its members. There may be sensitive individuals (children, elders, the sick, the occupationally exposed) who, arguably, may or may not be protected by using standard reference doses and other factors. Also, tribal leaders often make decisions at the community rather than the individual level (i.e., the survival of the individual may not be as important as the survival of the family or community, so the community is also an appropriate unit of analysis). Therefore, decisions where everyone is exposed to a low level of contamination may be different from and more stringent than decisions where a few individuals are at high risk or decisions where risks are distributed over time, space, or populations rather than localized. We believe this to be an important but understated element of real risk and risk-based decision making (not to be dismissed as perceived risk, or cultural amplification of real risk, or a risk management determination). The nature and extent of community exposure can be estimated over time and space by estimating the number of people and the number of generations that could live in each area or concentration isopleth and be exposed (a community chemical effective dose equivalent). The total number of generations and the number of people per generation need to be described in terms of the total number of people exposed, total dose for the community (or the gene pool), proportion of each generation exposed, and so on. Even more broadly, the total dose for a small community's combined gene pool or neuronal pool could be estimated. Finally, the proportion of each generation that is affected, rather than simply the number of people (in a small population), can be determined.

5.4. Background Exposure and Communitywide Exposure from Other Sources

Under the National Contingency Plan and subsequent EPA guidance, EPA is charged with evaluating incremental risk to humans caused by a release from the subject site. This means that when evaluating a Superfund site, EPA is not charged with evaluating risk associated with high concentrations of naturally occurring substances, such as arsenic, measured in background soil, water, or food, if the concentrations were not increased by on-site activity, nor risk associated with releases of contaminants from another site. When there is background contamination (however that is defined), or widespread low-level contamination, this contamination contributes to cumulative exposure to many or all people in the community. From a human health standpoint, the origin of the contaminant is irrelevant. However, from a liability-based regulatory standpoint such as CERCLA, the origin is paramount. In the case of the Spokane scenario, it is known that Columbia River fish are contaminated with PCBs and metals (there are existing fish advisories for Lake Roosevelt and for an upriver portion of the Spokane River), but cleanup at the mine site is proceeding as if this contamination is not present or that people are not exposed to it. When an entire community is exposed to nonsite contaminants, we believe that this should be included as part of the total risk burden, and that the clean-up goals for the incremental risk posed by the site itself may need to be modified (see, for instance, OSWER Environmental Justice Action Agenda, EPA 540/R-95/023, which states that "OSWER supports Agency-wide efforts to develop scientifically valid standards to measure cumulative risk."). Other EPA approaches are more cumulative in nature, such as the Guidance on Cumulative Risk Assessment (http://www.epa.gov/ORD/spc/cumrisk2.htm); Toward Integrated Environmental Decision Making (EPA-SAB-EC-00-011; http://www.epa.gov/science1/ecirp011.pdf); and various permitting programs based on total toxicant burdens in a watershed or airshed. As another example, the EPA approach to arsenic or other substances in drinking water is to require treatment to safe levels even if these are lower than natural background levels.

5.5. Individual Exposure Factors

The exposure assessment literature is lacking relevant information for subsistence activities. For instance, gardening or camping are typically used by risk assessors as an analogue for hunting and gathering activities, athletic physiological factors are used as an analogue for more vigorous outdoor activities, sports nutrition information is used in checking diet, and so on. Several pathways are simply unknown, such as the use of medicinal plants

(further, certain of these pathways need to be included in a way that does not violate confidentiality). We believe that some factors, particularly soil ingestion, are still underestimated. The amount of exposure obtained as a person consumes wild foods (often without being able to wash them first as is assumed in a typical suburban scenario) is unknown, as is the amount of soil remaining on gathered vegetation even if it is washed, because environmental samples are generally not analyzed in an as-gathered or as-consumed condition.

5.6. Ecological Food Web as an Input to Human Exposure

At present, the tribe does not know if the ecological risk assessments being prepared by EPA for the Midnite Mine will provide the appropriate information for estimating human subsistence dietary information. Existing ecological and human health risk models are generally incompatible. Ecological models typically have more species but fewer pathways, while human health models have many more pathways but generally less trophic-level capability. The lack of transfer factors (soil to plant, and dispersion through the food web) may also pose a problem. EPA is attempting to address this nationally; it is especially important to include tribal considerations during these discussions.

5.7. Seasonality and Acute Exposures

Some of the original activity patterns over the annual seasonal cycle have been modified in modern times, but the ecological cycles have not. Therefore, people must still gather plants according to when they are ripe, hunt according to game and fowl patterns, and fish when the spawning runs occur. The Spokane Tribe Cultural Resources Program confirmed that although specific activities change from one season to the next throughout the year, these activities are replaced by other activities with a similar environmental contact rate. This scenario assumes that exposure is fairly homogeneous because even in winter months materials are gathered, cleaned, and used, and native foods are eaten (i.e., all factors are applied 365 days per year). However, it is possible that excessive acute exposures occur, over and above the annually averaged exposure rates included in this scenario.

5.8. Co-Risk Factors

Many co-risk factors cluster in tribal communities, including poverty, higher rates of existing health conditions (such as diabetes), poorer access to health care, inadequate infrastructure, 500 years of cumulative psychological stress, employment in occupations with more chemical exposures, and so on. Data on other factors such as enzyme polymorphisms related to detoxification or disease susceptibility are simply absent. Each of these factors is known to influence the health response to chemicals, although data are lacking about their combined effect as well as their prevalence in any particular tribal community.

6. CONCLUSION

Although the scenario discussed in this article greatly improves the accuracy of risk-based decision making in Indian Country, much still remains to be done in order for tribes to achieve the same proportional degree of risk reduction that suburban communities have enjoyed for many decades. Existing human-health-based regulatory standards were not developed with subsistence in mind, so tribes are always less protected because they are always more exposed. This is not meant to indict standards as intentionally ignoring certain populations, simply that there are situations and populations that did not receive attention when the regulations were written many years ago. The inequity of this situation has not been fully explored, but is the topic of current research. Additionally, this scenario is not generalizable to other tribes, particularly the diet section, although the soil and drinking water exposure factors may prove to be fairly similar for many tribal settings.

The true worth of any risk assessment is measured by whether its results are used, even if the ultimate decision is based more on other factors such as economics, technical feasibility, or precaution. One of the goals of a project manager is to achieve a stable decision, or one that is durable over time, even if this is not explicitly stated. Decision stability is not merely due to compromise or consensus, but also to whether a community's expectations are met regarding the specific metrics and impacts to be assessed. Decisionmakers or community leaders have certain information needs that can help design a truly useful risk assessment, even if the assessment takes form somewhat differ-

ently from the norm. We believe that deliberately incorporating community concerns into both the risk assessment and the risk management decision makes decisions more stable and robust, not less scientific. It is a matter of opinion whether responding to community issues within the risk assessment itself, rather than deferring these items until a later risk management phase, improves the assessment and makes it more useful by tailoring it to the specific situation, or merely results in inconsistency by making results less useful for comparing risks between sites.

We would also like to raise the bar for risk ethics. The traumatic history of federal actions against tribes is still recent history for many tribal nations and tribal members experience remnants of federal extermination and assimilation policies literally every day. This is a strong and discomforting statement, but it is a reality risk assessors and project managers must recognize if they work on tribal risk issues. It might even be said that tribes are still at war, a war that is being fought in the courts on a daily basis to preserve their rights, jurisdiction, resources, religion, homeland, and way of life. We do not want risk assessors to underestimate how serious this is to tribal members and tribal staff. Many or most tribal members can name ancestors who died defending their rights and homelands, and the current generation of tribal scientists honors this by vigilantly protecting the rights and resources on which their culture and identity and existence depend. Mistrust of the federal government and its risk assessment tools can be extremely high and pervasive. Particularly in tribal communities, risk assessors or public health assessors typically run afoul of tribal perspectives because they do not understand the community and its history. There is a tendency to want to get the details right first, then step back and look at the implementation or consequences (i.e., to keep risk assessment separate from risk management). We do not intend to introduce bias into the risk assessment that might come from knowing so much about the community that unconscious judgments are made about how to tailor the assessment (for instance, making a subconscious determination that remediation might take dollars away from other visibly urgent needs). We simply want the assessor to be more aware of the subjects of his or her assessment from the start so as to avoid pitfalls, missteps, and negative community reactions. Currently, tribes and regulators still operate from two different decision paradigms. We wish to recognize the tremendous progress made in recent years by various federal agencies in increasing the attention paid to these issues, but we recognize how much remains to be done.

DISCLAIMER

This exposure scenario has been approved for publication by the Spokane Tribal Council and for use in the Midnite Mine risk assessments. It should not be viewed as a release or waiver of any claims or rights concerning the protection of human health and the environment, the injury of natural resources, or any other claim or right.

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Appendix C. Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as ‘‘Chat’’(Federal Register Vol ume 71; No. 64; Page16729)

OARM–2006–0249, by one of the following methods:

• Federal Docket Management System (FDMS): *http://www.regulations.gov*. Follow the on-line instructions for submitting comments.

• Mail: John O'Brien, Office of Human Resources/Office of Administration and Resources Management, Mail Code: 3631M, Room 1136–EPA–East, United States Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; e-mail address: *obrien.johnt@epa.gov*.

• Hand Delivery: Office of Environmental Information Docket, Environmental Protection Agency, EPA West Building, Room B102, 1301 Constitution Ave., NW., Washington, DC 20460. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OARM–2006–0249. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through FDMS or e-mail. FDMS is an ''anonymous access'' system. This means that the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to the EPA without going through FDMS, your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. The EPA recommends that you include your name and other contact information in the body of your electronic comment with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in FDMS at *http://www.regulations.gov*. Although listed in the index, some information is not publicly available, *i.e.*, CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in FDMS or in hard copy at the Office of Environmental Information Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Office of Environmental Information Docket is (202) 566–1752.

FOR FURTHER INFORMATION CONTACT: For further information, please contact John O'Brien at (202) 564–7876, Office of Human Resources/Office of Administration and Resources Management, Mail Code 3631M, Room 1136 EPA-East, United States Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; e-mail address: *obrien.johnt@epa.gov*. You may also contact William Ocampo at (202) 564–0987 or Robert Stevens at (202) 564–5703, Office of Research and Development, Mail Code 8102R, United States Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; e-mail addresses: *ocampo.william@epa.gov* and *stevens.robert@epa.gov.*

SUPPLEMENTARY INFORMATION: This document concerns the EPA's authority under 42 U.S.C. 209 to (1) establish fellowships in environmental protection research and appoint fellows to conduct this research and (2) appoint environmental protection special consultants to advise on environmental protection research. The provisions proposed here are identical to those contained in the Direct Final Rule located in the ''Rules and Regulations'' section of this **Federal Register** publication. Please refer to the preamble and regulatory text of the direct final action for further information and the actual text of the revisions. Additionally, all information regarding Statutory and Executive Orders for this proposed rule can be found in the Statutory and Executive Order Review section of the direct final action.

Dated: March 27, 2006.

Stephen L. Johnson,

Administrator.

[FR Doc. 06–3205 Filed 4–3–06; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 278

[EPA–HQ–RCRA–2006–0097; FRL–8050–8]

RIN 2050–AG27

Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as ''Chat''

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA or Agency) is proposing mandatory criteria for the environmentally protective use of chat for transportation construction projects carried out in whole or in part with Federal funds, and a certification requirement. Chat used in transportation projects must be encapsulated in hot mix asphalt concrete or Portland cement concrete unless the use of chat is otherwise authorized by a State or Federal response action undertaken pursuant to applicable Federal or State environmental laws. Such response actions are undertaken with consideration of risk assessments developed in accordance with State and Federal laws, regulations, and guidance. EPA is also proposing to establish recommended criteria as guidance on the environmentally protective use of chat for non-transportation cement and concrete projects. The chat covered by this proposal is from the lead and zinc mining area of Oklahoma, Kansas and Missouri, known as the Tri-State Mining District.

DATES: Submit comments on or before May 4, 2006.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–RCRA–2006–0097, by one of the following methods:

• *http://www.regulations.gov:* Follow the online instructions for submitting comments.

• *E-mail:* Comments may be sent by electronic mail (e-mail) to *rcra-docket@epa.gov,* Attention Docket ID No. EPA–HQ–RCRA–2006–0097. In contrast to EPA's electronic public docket, EPA's e-mail system is not an ''anonymous access'' system. If you send an e-mail comment directly to the Docket without going through EPA's electronic public docket, EPA's e-mail system automatically captures your e-mail address. E-mail addresses that are automatically captured by EPA's e-mail system are included as part of the

comment that is placed in the official public docket, and made available in EPA's electronic public docket.

• *Fax:* Comments may be faxed to 202–566–0272.

• *Mail:* Send two copies of your comments to Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as Chat, Environmental Protection Agency, Mailcode: 5305T, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

• *Hand Delivery:* Deliver two copies of your comments to the Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as Chat Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC 20460. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–RCRA–2006–0097. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov,* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.* For additional instructions on submitting comments, go to the **SUPPLEMENTARY INFORMATION** section of this document.

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, *e.g.*, CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as Chat Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The Docket telephone number is (202) 566–0270. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as Chat Docket is (202) 566–0270.

FOR FURTHER INFORMATION CONTACT: Stephen Hoffman, Office of Solid Waste (5306W), U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460–0002, telephone (703) 308–8413, e-mail address *hoffman.stephen@epa.gov.* For more information on this rulemaking, please visit *http://www.epa.gov/epaoswer/other/mining/chat/.*

SUPPLEMENTARY INFORMATION:

I. Does This Action Apply To Me?

These proposed criteria may affect the following entities: Aggregate, asphalt, cement, and concrete facilities, likely limited to the tri-state mining area. Other types of entities not listed could also be affected. To determine whether your facility, company, business, organization, etc., is affected by this action, you should examine the applicability criteria in Section I.B.6 of this preamble. If you have any questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

II. What Should I Consider as I Prepare My Comments for EPA?

1. *Tips for Preparing Your Comments.* When submitting comments, remember to:

• Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).

• Follow directions—The agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.

• Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.

• Describe any assumptions and provide any technical information and/or data that you used.

• If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.

• Provide specific examples to illustrate your concerns, and suggest alternatives.

• Explain your views as clearly as possible.

• Make sure to submit your comments by the comment period deadline identified.

2. *Docket Copying Costs.* The first 100 copies are free. Thereafter, the charge for making copies of Docket materials is 15 cents per page.

III. How Should I Submit CBI to the Agency?

Do not submit information that you consider to be CBI electronically through *http://www.regulations.gov* or by e-mail. Send or deliver information identified as CBI only to the following address: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, Attention Docket ID No. EPA–HQ–RCRA–2006–0097. You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD ROM, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is CBI). Information so marked will not be disclosed, except in accordance with procedures set forth in 40 CFR Part 2.

In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket and EPA's electronic public docket. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and EPA's electronic public docket without prior

notice. If you have any questions about CBI or the procedures for claiming CBI, please contact: LaShan Haynes, Office of Solid Waste (5305W), U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460–0002, telephone (703) 605–0516, e-mail address *haynes.lashan@epa.gov.*

The contents of the **SUPPLEMENTARY INFORMATION** are listed in the following outline:

I. Background Information
A. What Is the Statutory Authority for This Action?
B. What Action Is EPA Taking?
1. What Is Chat?
2. What Is the Areal Scope for This Action?
3. Are There Any Current Regulations or Criteria for the Management or Use of Chat?
4. Physical and Chemical Characteristics of Chat.
5. What Are the Environmental and Health Effects Associated with Pollutants Released From Raw Chat?
6. Who Is Affected by This Action?
C. What Was the Process EPA Used in Developing This Action?
II. Summary of the Proposed Rule
A. What Criteria Are EPA Establishing for the Use of Chat?
1. Transportation Construction Uses
a. What is our proposed action?
b. What is the rationale for the Proposed Rule?
c. Is the EPA soliciting comments on specific issues?
2. Non-Transportation Uses—Cement and Concrete Projects
a. What is our proposed approach?
b. What is the rationale for the Proposed Rule?
c. Is the EPA soliciting comments on specific issues?
B. Relationship of Proposed Criteria to Other State and Federal Regulations and Guidance
C. How Does This Proposal Affect Chat Sales From Lands Administered by the U.S. Bureau of Indian Affairs or Directly from Tribal Lands?
D. How Does This Proposal Affect CERCLA Liability, Records of Decision, and Removal Decisions?
III. Impacts of the Proposed Rule
A. What Are the Potential Environmental and Public Health Impacts From the Use of Chat?
B. What Are the Economic Impacts?
IV. Executive Orders and Laws Addressed in This Action
A. Executive Order 12866: Regulatory Planning and Review
B. Paperwork Reduction Act
C. Regulatory Flexibility Act
D. Unfunded Mandates Reform Act of 1995
E. Executive Order 13132: Federalism
F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use
I. National Technology Transfer and Advancement Act
J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

For the purposes of this action, the Agency defines the following terms as follows:

• *Encapsulated*—incorporated into hot mix asphalt concrete or Portland cement concrete (PCC).

• *Hot mix asphalt*—a hot mixture of asphalt binder and size-graded aggregate, which can be compacted into a uniform dense mass.

• *Pozzolanic*—a silica and lime containing material which, in the presence of moisture, forms a strong cement.

• *State or Federal remediation action*—State or federal response action undertaken pursuant to applicable federal or state environmental laws. Such response actions are undertaken with consideration of risk assessments developed in accordance with state and or federal laws, regulations, and guidance.

• *Raw chat*—unmodified lead-zinc ore milling waste.

• *Washed chat*—lead-zinc ore milling waste that has been wet-screened to remove the fine-grained fraction and which is sized so as not to pass through a number 40 sieve (0.425 mm opening size) or smaller.

• *Sized chat*—lead-zinc ore milling waste that has been wet-screened (washed) or dry sieved to remove the fine-grained fraction smaller than a number 40 sieve (0.425 mm opening size).

• *Non-transportation cement and concrete projects are:*

—Construction uses of cement and concrete for non-residential structural uses limited to weight bearing purposes such as foundations, slabs, and concrete wall panels. Other uses include commercial/industrial parking and sidewalk areas. Uses do not include the residential use of cement or concrete (*e.g.,* concrete counter tops).

• *Transportation construction uses* [1] are:

—*Asphalt concrete*—pavement consists of a combination of layers, which include an asphalt surface constructed over an asphalt base and an asphalt subbase. The entire pavement structure is constructed over the subgrade. Pavements, bases, and subbases must be constructed using hot mix asphalt.

—*Portland cement concrete*—(PCC) pavements consisting of a PCC slab that is usually supported by a granular (made of compacted aggregate) or stabilized base and a subbase. In some cases, the PCC slab may be overlaid with a layer of asphalt concrete. Uses include bridge supports, bridge decking, abutments, highway sound barriers, jersey walls, and non-residential side walks adjacent to highways.

—*Flowable fill*—refers to a cementitious slurry consisting of a mixture of fine aggregate or filler, water, and cementitious materials which is used primarily as a backfill in lieu of compacted earth. This mixture is capable of filling all voids in irregular excavations, is self leveling, and hardens in a matter of a few hours without the need of compaction in layers. Most applications for flowable fill involve unconfined compressive strengths of 2.1 MPa (300 lb/in^2) or less.

—*Stabilized base*—refers to a class of paving materials that are mixtures of one or more sources of aggregate and cementitious materials blended with a sufficient amount of water that result in the mixture having a moist nonplastic consistency that can be compacted to form a dense mass and gain strength. The class of base and subbase materials is not meant to include stabilization of soils or aggregates using asphalt cement or emulsified asphalt.

—*Granular bases*—are typically constructed by spreading aggregates in thin layers of 150 mm (6 inches) to 200 mm (8 inches) and compacting each layer by rolling over it with heavy compaction equipment. The aggregate base layers serve a variety of purposes, including reducing the stress applied to the subgrade layer and providing drainage for the pavement structure. The granular subbase forms the lowest (bottom) layer of the pavement structure and acts as the principal foundation for the subsequent road profile.

—*Embankment*—refers to a volume of earthen material that is placed and compacted for the purpose of raising the grade of a roadway above the level of the existing surrounding ground surface.

• *Unencapsulated*—material that is not incorporated into hot mix asphalt concrete or Portland cement concrete.

[1] User Guidelines for Waste and By-Product Materials in Pavement Construction Publication No. FHWA–RD–97–148 April 1998, U.S. Department of Transportation, Federal Highway Administration.

Abbreviations and Acronyms Used in This Document

CAA—Clean Air Act (42 USCA 7401).
CERCLA—Comprehensive Environmental Response Compensation and Liability Act (42 USCA 9601).
CFR—Code of Federal Regulations.
CWA—Clean Water Act (33 USCA 1251).
EPA—Environmental Protection Agency.
FHWA—Federal Highway Administration.
FR—Federal Register.
ICR—Information Collection Request.
MCL—Maximum Contaminant Level (Safe Drinking Water Act).
NPL—National Priorities List.
ppmv—parts per million by volume.
ppmw—parts per million by weight.
Pub. L.—Public Law.
RCRA—Resource Conservation and Recovery Act (42 USCA 6901).
SMCL—Secondary Maximum Contaminant Level (Safe Drinking Water Act).
SPLP—Synthetic Precipitation Leaching Procedure (SW 846 Method 1312).
TCLP—Toxicity Characteristic Leaching Procedure (SW 846 Method 1311).
U.S.C.—United States Code.
DOT—United States Department of Transportation.

I. Background Information

A. What Is the Statutory Authority for This Action?

Through Title VI, Section 6018 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005 (H.R. 3 or ''the Act''), Congress amended Subtitle F of the Solid Waste Disposal Act (42 U.S.C. 6961 *et seq.*) by adding Sec. 6006. This provision requires the Agency to develop environmentally protective criteria (including an evaluation of whether to establish a numerical standard for concentration of lead and other hazardous substances) for the safe use of granular mine tailings from the Tar Creek, Oklahoma Mining District, known as 'chat,' in cement and concrete projects and in transportation construction projects that are carried out, in whole or in part, using Federal funds. Section 6006(a)(4) requires that any use of the granular mine tailings in a transportation project that is carried out, in whole or in part, using Federal funds, meet EPA's established criteria.

In establishing these criteria, Congress directed EPA to consider the current and previous uses of granular mine tailings as an aggregate for asphalt and any environmental and public health risks from the removal, transportation, and use in transportation projects of granular mine tailings; *i.e.*, chat. The Act also directs EPA to solicit and consider comments from the public, and to consult with the Secretary of Transportation and the heads of other Federal agencies in establishing the criteria.

B. What Action Is EPA Taking?

In today's action, we are proposing, and requesting comment on, criteria requiring encapsulation in hot mix asphalt concrete or Portland cement concrete, for granular mine tailings, known as 'chat,' from the Tri-State lead and zinc mining area of Oklahoma, Kansas and Missouri, used in transportation construction projects that are carried out, in whole or in part, using Federal funds. EPA is also proposing that the requirement of encapsulation in asphalt concrete or Portland cement concrete would not apply if the use of chat is otherwise authorized by a State or federal response action undertaken pursuant to applicable federal or state environmental laws. Such response actions are undertaken with consideration of risk assessments developed in accordance with state and federal laws, regulations, and guidance. For example, unencapsulated uses of chat may be authorized in a State or federal remediation action. EPA is proposing that these criteria would apply to the use of chat derived from the Tri-State area, wherever the use occurs, including outside of the Tri-state area. Section 6006(a)(4) mandates that transportation construction projects, carried out in whole or in part, using Federal funds, must comply with these criteria.

The Agency is also proposing recommended criteria as guidance on the encapsulation of chat in non-transportation uses, to identify those uses that EPA believes are environmentally protective. Such uses would be limited to those where the Agency has reasonable assurances that such uses inherently limit direct exposure. It should be pointed out that the Agency has reviewed the literature and conducted interviews with Oklahoma, Kansas, and Missouri regulatory officials and Tribes and has determined that there is no evidence that chat is currently being used in non-transportation construction projects.

1. What Is Chat?

Chat is the waste material that was formed in the course of milling operations employed to recover lead and zinc from metal-bearing ore minerals in the Tri-State mining district of Southwest Missouri, Southeast Kansas and Northeast Oklahoma. Chat is primarily composed of chert, a very hard rock. The primary properties that make chat useful in asphalt and concrete are grain size distribution, durability, non-polishing, and low absorption.

2. What Is the Areal Scope for This Action?

The Act directed EPA to develop criteria for chat from the Tar Creek, Oklahoma Mining District. There is no definition of the term ''Tar Creek Oklahoma Mining District.'' Available literature references the ''Tar Creek Superfund site,'' which is in Oklahoma, but the term ''mining district'' is only used in reference to the ''Tri-State Mining District.'' For purposes of today's action, the Agency is proposing the areal scope to include chat originating from the Tri-State mining district of Ottawa County, Oklahoma, Cherokee County of southeast Kansas and Jasper and Newton Counties of southwest Missouri, regardless of where it is used.

In 1979, the U.S. Bureau of Mines completed a study to identify all mined areas and mine-related hazards which confirmed that lead-zinc mining covers a portion of each of the States of Kansas, Missouri, and Oklahoma. This area is the same area known as the Tri-State mining district.

Chat located in the Tri-State historical mining district is a product of similar mineralization processes that sets it aside from related lead-zinc mineralization districts elsewhere in the United States. The Tri-State mineralization is specifically associated with wall rock alteration into dolomite and microcrystalline silica (chert). The term chat is derived from the word 'chert,' which is from the cherty wallrock found in this mining district. The lead/zinc ore and its related waste, chat, in this district also have a well defined lead to zinc ratio.

During close to one hundred years of activity ending in 1970, the Tri-State mining district has been the source of a major share of all the lead and zinc mined in the United States. Surface piles of chat, as well as underground mining areas, extend uninterrupted across the Oklahoma-Kansas state line. In communications with Kansas, Missouri, and Oklahoma environmental regulatory agencies and the departments of transportation and Tribes, government experts confirmed that there is no real factual distinction between chat derived from these three areas, and agreed that it would be reasonable to apply today's proposal to

the areal extent of the Tri-State mining district. Therefore, in today's action, the Agency is proposing criteria that extends to all chat generated and currently located in the following counties: Ottawa county, Oklahoma, Cherokee county, Kansas, and Newton and Jasper counties in Missouri.

Given the ambiguity in the term ''Tar Creek Oklahoma Mining District,'' the Agency is soliciting comment on whether it should limit the scope of today's action to chat only located in Oklahoma. There is also some uncertainty regarding the exact boundary of the Tri-State mining district. The Agency is therefore soliciting comments on whether additional counties, such as Lawrence and Barry Counties in southwest Missouri, should be added to the scope.

3. Are There Any Current Regulations or Criteria for the Management or Use of Chat?

During the preparation of this proposal, the Agency assessed existing regulations in Oklahoma, Kansas, and Missouri for hot mix asphalt plants, and cement plants to determine whether residual chat wastes from those operations are adequately managed. (See memorandum entitled: ''Evaluation of State Regulations'' in the docket.) Those regulations set standards for point and fugitive air emission sources and also set requirements for water discharges from point and non-point discharges. Each State also has fugitive dust and point source particulate emission permitting requirements for both hot mix asphalt plants and ready mix concrete plants.

• Kansas air quality regulations require a Class II point source particulate operating permit for hot mix asphalt and ready mix concrete plants (K.A.R. 28–19–500). Operators must comply with all applicable air quality regulations whether or not addressed in the permit. Missouri requires an operating permit for all facilities with the potential to emit any point source particulate matter of 25 tons per year or more, or particulate matter with a diameter less than or equal to 10 micrometers (PM_{10}) in the amount of 10 tons per year or more (10 CSR 10–6.065). Missouri regulations require operators to comply with the State's air quality control requirements, including restrictions on point source particulate emissions beyond the premises of origin (10 CSR 10–6.170). Oklahoma requires a point source air pollution control operating permit for new minor facilities (OAC 252:100–7) and all facilities with the potential to emit 100 tons per year, or more, of any criteria pollutant (which includes particulate matter), or 10 tons per year of any hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants (OAC 252:100–8). Oklahoma regulations require that operators not exceed ambient air quality standards (OAC 252:100–29).

• In Oklahoma and Missouri, stormwater runoff is regulated through stormwater discharge permits (OAC 252:606–5–5, 10 CSR 20–6.200). Oklahoma's Pollutant Discharge Elimination System Standards incorporate the National Pollutant Discharge Elimination System (NPDES) standards. Oklahoma also has a general permit for stationary and mobile concrete batch plants. In Kansas, stormwater discharges are regulated under the State's water quality regulations (K.A.R. 28–16). The regulations prohibit degradation of surface and groundwater and set effluent limitations for aquatic, livestock, and domestic uses. Kansas has not finalized its General Permit for Stormwater Discharges Associated from Industrial Activity; however, facility operators are required to file a Notice of Intent to discharge under the NPDES requesting coverage under the State's general water pollution control permit. Operators are also required to develop and implement a Stormwater Pollution Prevention plan. Permittees are obligated to comply with the general permit which sets effluent limitations and monitoring requirements.

• The Agency also assessed existing regulations in Oklahoma, Kansas, and Missouri for chat washing facilities to determine whether residual chat wastes from those operations are adequately managed. The Agency found that the States do not have regulations specific to chat washing facilities. However, these facilities are covered under the States' general fugitive air and general non-point source discharge regulations. These state general permits require that fugitive dusts and runoff be controlled in a fashion so that dusts do not leave the property line or the boundary of the construction activity. Additionally, the Bureau of Indian Affairs (BIA) is establishing air and water standards for chat washing facilities for chat originating on Tribal lands and lands administered by BIA. BIA's requirements include that the chat washing facility manage waste water discharges so that they do not exceed state standards, that fugitive dusts be controlled, and that fines are handled and disposed of so that they do not contaminate ground water.

• BIA is requiring all purchasers of chat from Tribal lands, or lands administered by BIA, to certify that the chat will be used in accordance with authorized uses set forth in EPA fact sheets and other guidance. (See report titled, *Chat Sales Treatability Study Workplan for the Sale of Indian-owned Chat within the Tar Creek Superfund Site, Ottawa County, Oklahoma,* June 23, 2005.) BIA also requires that trucks transporting chat from Tribal lands be covered to prevent blowing dust from the chat.

• The Oklahoma Department of Environmental Quality (ODEQ) has determined that the following transportation uses of chat are inappropriate: Use in residential driveways and use as gravel or unencapsulated surface material in parking lots, alleyways, or roadways (See *A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report, August 2005* [2]). The ODEQ report also identified the following non-transportation uses of raw chat that are deemed inappropriate:

—Fill material in yards, playgrounds, parks, and ball fields.
—Playground sand or surface material in play areas.
—Vegetable gardening in locations with contaminated chat.
—Surface material for vehicular traffic (*e.g.*, roadways, alleyways, driveways, or parking lots).
—Sanding of icy roads.
—Sandblasting with sand from tailings ponds or other chat sources.
—Bedding material under a slab in a building that has underfloor air conditioning or heating ducts.
—Development of land for residential use (*e.g.*, for houses or for children's play areas, such as parks or playgrounds) where visible chat is present or where the Pb concentration in the soil is equal to or greater than 500 mg/kg unless the direct human contact health threat is eliminated by engineering controls (*e.g.*, removing the contaminated soil or capping the contaminated soil with at least 18 inches of clean soil).

[2] The University of Oklahoma 2005 study entitled, A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application, was reviewed internally by Drs. Tom Landers, Robert Knox, and Joakim Laguros and externally reviewed by various Oklahoma Department of Environmental Quality personnel. This report was designed to meet USEPA 1994 Data Quality Objectives which assure proper study design, sample collection and sample analyses. A separate Sampling and Analysis Plan was prepared for this effort which includes a QA/QC plan which was managed by a OU Quality Assurance Officer. Samples were collected and analyzed in accordance with EPA methods and lab results were verified by outside laboratories.

• EPA Region 6 issued a Tar Creek Mining Waste Fact Sheet on June 28, 2002 that identified the following as acceptable uses of chat: (1) Applications that bind (encapsulate) the chat into a durable product (*e.g.*, concrete and asphalt), (2) applications that use the chat as a material for manufacturing a safe product where all waste byproducts are properly disposed, and (3) applications that use the chat as sub-grade or base material for highways (concrete and asphalt) designed and constructed to sustain heavy vehicular traffic. This fact sheet also incorporated the ODEQ list of unacceptable uses of chat. The Region 6 fact sheet is available at *http://www.epa.gov/Arkansas/6sf/pdffiles/tar_creek_june_2002_waste.pdf.*

• EPA Region 7 issued a Mine Waste Fact Sheet in 2003 that identified uses of chat that are not likely to present a threat to human health or the environment. Those uses are: (1) Applications that bind material into a durable product; these would include its use as an aggregate in batch plants preparing asphalt and concrete, (2) applications below paving on asphalt or concrete roads and parking lots, (3) applications that cover the material with clean material, particularly in areas that are not likely to ever be used for residential or public area development, and (4) applications that use the material as a raw product for manufacturing a safe product. The fact sheet also lists mine waste (chat) uses that may present a threat to human health or the environment which are similar to those listed by ODEQ and the Region 6 fact sheet. However, the Region 7 fact sheet also lists use as an agricultural soil amendment to adjust soil alkalinity as a use that may present a threat to human health or the environment. The Region 7 fact sheet is available at *http://www.epa.gov/Region7/news_events/factsheets/fs_minewaste_moks_0203.pdf.*

A copy of these regulations/reports/fact sheets are available in the Docket to today's rulemaking.

Based on the review of the States' regulations, EPA concludes that today's proposal does not need to establish additional criteria to address any environmental concerns arising from hot mix asphalt and batch concrete facilities or from chat washing facilities. The Agency believes that potential fugitive dust emissions and stormwater runoff from chat piles are adequately addressed by existing State regulations. Additionally, as stated previously, BIA requires covers on trucks transporting chat from Tribal lands to prevent blowing of chat dust. However, the Agency seeks information and comment on the adequacy of state and BIA requirements and solicits comment on requiring truck covers for transportation of chat. To address potential leaching to groundwater and runoff to surface streams, the Agency solicits comment on whether to require storage to be designed to control run-on and run-off, leachate to ground water, fugitive dusts, and that chat be stored in a building, or on a concrete, clay, or synthetic lined pad, or covered, if storage exceeds 90 days.[3]

Furthermore, as discussed later in the preamble, the Agency expects that most chat used will be used within the Tri-state area because of transportation costs. Thus, the Agency has only evaluated the air and water rules in Oklahoma, Missouri and Kansas. However, there is nothing in this rule that would limit its use in these three states. Therefore, the Agency solicits comment on whether it should adopt general criteria for the management of chat in today's rule if the chat is managed in other states or whether other states would have similar types of controls that Oklahoma, Missouri and Kansas have in place.

Today's action would require that chat used in Federally funded transportation projects be encapsulated in hot mix asphalt or concrete, unless the use is otherwise authorized by a State or federal response action. Such response actions are undertaken with consideration of risk assessments developed in accordance with state and federal laws, regulations, and guidance. This mandatory criteria is more restrictive than the guidances issued by Regions 6 and 7 since it is the Agency's current belief that the use of unencapsulated chat should be restricted to state or federal remediation actions, where a regulatory agency exerts oversight. This position was taken because the data generally lead EPA to believe that unencapsulated uses are not protective of human health and the environment. However, because state and federal remediation actions are based on site specific determinations that take into account a wide variety of factors at the site, EPA believes that such assessments provide sufficient safeguards that would ensure that any unencapsulated uses of chat authorized through this mechanism would be protective of human health and the environment.

[3] While the Agency is not proposing that chat be sized before it is encapsulated, we are aware that chat is sized before it is beneficially used in certain instances. In these instances, we would expect that any residuals that are generated would be handled in connection with the remediation plans at the site.

4. Physical and Chemical Characteristics of Chat

Some of the important physical properties of chat include hardness, soundness (durability), gradation, shape and surface texture. Bulk raw chat includes both large and small particle sizes.

Physical Characteristics

In a University of Oklahoma (OU) study *(A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report (August 2005))*, the specific gravity of the raw chat was found to be 2.67, which is similar to some commonly used aggregates such as limestone and sandstone.

According to an ODEQ study (''Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma,'' Revised June 2003), chat consists of materials ranging in diameter from 15.875 mm (⅝ inch) to less than 0.075 mm (the size fraction that passes the No. 200 sieve).

Since raw chat is a crushed material from mining operations, raw chat particles have fractured faces. Raw chat also has numerous voids in the loose aggregate form. The more angular the aggregate the higher the amount of voids. The uncompacted void content or the fine aggregate angularity of raw chat was found to be 46%. Raw chat has higher fine aggregate angularity than required by most state DOTs.

Raw chat is harder than some other aggregates such as limestone. The L.A. abrasion value (determined by the Test for Resistance to Degradation of Aggregate by Abrasion and Impact in the Los Angeles Abrasion Machine) of raw chat was found to be 18% which is lower than that of limestone (23%) used in the OU study.

Cubical shape is a desirable property of a good aggregate. The coarse aggregate in raw chat (particles retained on a 4.75 mm (#4) sieve) has less than 5% flat or elongated particles. Therefore, chat is viewed as a desirable aggregate material.

State DOTs specify minimum aggregate durability indices of approximately 40%. In the OU study, the aggregate durability index of raw chat was found to be 78%. The insoluble residue of raw chat was found to be 98%. The minimum requirement for insoluble residue is 40%.

State DOTs also specify aggregate requirements for hot mix asphalt and Portland cement concrete. Most State DOTs, including Kansas, Oklahoma and Missouri, have adopted aggregate standards developed by the American

Association of State Highway and Transportation Officials (AASHTO). According to AASHTO, the 0.075 mm (#200) sieve size is the dividing line between sand-size particles and the finer silts and clays. These finer particles often adhere to larger sand and gravel particles and can adversely affect the quality of hot mix asphalt cement and Portland cement concrete. The AASHTO standards for Fine Aggregate for Bituminous Paving Mixtures (M 29–03) and Fine Aggregate for Portland Cement Concrete (M 6–03) specify limits for the amount of aggregate, on a percent mass basis, in hot mix asphalt cement and Portland cement concrete according to aggregate size and gradation. The aggregate sizes included in the AASHTO standards range from .075 mm to 9.5 mm which is within the range of particles found in raw chat. The AASHTO standards do not preclude the use of fine chat particles in hot mix asphalt or Portland cement concrete. Depending on the designated grading, AASHTO limits particles finer than sieve size #50 in the range of 7 to 60% for aggregate in asphalt. Fine aggregate for use in concrete is limited by the States of Oklahoma and Missouri to 5 to 30% for particles less than sieve size #50, while the values are 7 to 30% in Kansas.

Chemical Characteristics

Two studies [Dames and Moore, 1993 and 1995; ''Sampling and Metal Analysis of Chat Piles in the Tar Creek Superfund sites for the Oklahoma Department of Environmental Quality,'' 2002; Datin and Cates; ''Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma, Revised June 2003,'' ODEQ] provide data on metals concentrations in washed and unwashed (or raw) chat. The Dames and Moore study indicated total lead concentrations in the raw chat ranged from 100 mg/kg to 1,660 mg/kg, while the Datin and Cates study noted that lead concentrations from piles located throughout the Tri-State area had mean total lead concentrations of 476 to 971 mg/kg. The Site Characterization report [AATA International, Inc. December 2005; Draft: Remedial Investigation Report for Tar Creek OU4 RI/FS Program] notes, however, that the concentration of lead in the raw chat ranged from 210 mg/kg to 4,980 mg/kg with an average of 1,461 mg/kg; cadmium ranged from 43.1 mg/kg to 199.0 mg/kg with an average of 94.0 mg/kg; and zinc ranged from 10,200 mg/kg to 40,300 mg/kg with an average of 23,790 mg/kg.

These studies also showed that as chat sizes become smaller, the metals content increases. The Datin and Cates report, ''Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma, Revised June 2003,'' noted TCLP testing of all dry sieve sizes greater than 40 do not exceed 5mg/l and could be classified as non-hazardous under RCRA.[4] This same study also shows that total metals testing of wet screened material (larger fractions) resulting from chat washing have lead concentrations which range from 116 to 642 mg/kg, while TCLP testing of the same materials have lead concentrations of 1.028 to 3.938 mg/l (also well below 5mg/l). Therefore, the data show that either dry physical sieving of raw chat or chat washing generate chat aggregate (greater than sieve size 40) with considerably lower metals concentrations than raw chat.

5. What Are the Environmental and Health Effects Associated With Pollutants Released From Raw Chat?

The Tri-State mining district includes four National Priority List (NPL) Superfund sites that became contaminated from the mining, milling, and transportation of ore and the management practices for chat. These sites are located in Tar Creek in Ottawa County, Oklahoma, Cherokee County in southeast Kansas, and Jasper and Newton Counties in southwest Missouri. Cleanup activities related to the millions of tons of mining waste that were deposited on the surface of the ground at these sites have been designated as Operable Units (OUs). OUs are groupings of individual waste units at NPL sites based primarily on geographic areas and common waste sources.

Raw chat has caused threats to human health and the environment as a result of the concentrations of lead present in the chat. Evaluation of raw chat, noted above, also indicates that this waste in unencapsulated uses has the potential to leach lead into the environment at levels which may cause threats to humans (elevated blood lead concentrations in area children). Such threats have been fully documented in Records of Decision (RODs) for the OUs at these NPL sites (See Tri-State Mining District RODs in the docket to this action). Copies of Site Profiles and RODs can be searched at *http://www.epa.gov/superfund/sites/rods/index.htm.*

Lead toxicity targets the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance of the nervous system. It may also cause weakness in the fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. (Agency for Toxic Substances and Disease Registry (ATSDR) Fact Sheet for Lead, September 2005.)

Recent risk assessments conducted at the Tar Creek NPL site indicate that cadmium and zinc may not pose a human health risk. Nevertheless, breathing high levels of cadmium may severely damage the lungs and can cause death. Eating food or drinking water with high levels of cadmium may severely irritate the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels of cadmium in air, food, or water may lead to a buildup of cadmium in the kidneys and possible kidney disease. Other long-term effects are lung damage and fragile bones. (ATSDR Fact Sheet for Cadmium, June 1999.)

Zinc in the aquatic environment is of particular importance because the gills of fish are physically damaged by high concentrations of zinc (NAS1979). Harmful human health effects from zinc generally begin at levels from 10–15 times the recommended daily allowance (in the 100 to 250 mg/day range). Long-term exposure may cause anemia, pancreas damage, and reduced levels of high density lipoprotein cholesterol (the good form of cholesterol). Breathing large amounts of zinc (as dust or fumes) may cause a specific short-term disease called metal fume fever. (ATSDR Fact Sheet for Zinc, September 1995.)

6. Who Is Affected by This Action?

When promulgated, the proposed criteria will affect users of chat used in transportation construction projects that are carried out, in whole or in part, using federal funds. In addition, unencapsulated chat can be used provided it is part of and otherwise authorized by a State or federal response action undertaken pursuant to applicable federal or state environmental laws. Such response actions are undertaken with consideration of risk assessments developed in accordance with state and federal laws, regulations, and guidance. The Agency is also proposing

[4] Since chat is a mining waste covered by the Bevill Amendment to the Solid Waste Disposal Act, it is not subject to the hazardous waste regulations under RCRA Subtitle C. However, we are using the TCLP leachate value for lead simply as a comparative measure.

recommended criteria as guidance that will be applicable to the use of chat in non-residential non-transportation uses.

C. What Was the Process EPA Used To Develop This Action?

The Agency initially reviewed information concerning the environmental effects of the improper placement and disposal of chat found in the Records of Decision cited above for the four NPL sites located in the Tri-State mining district (Tar Creek, Jasper County, Cherokee County, Newton County). The Agency then reviewed reports which identified current or past uses of chat, primarily studies prepared to support Governor Keating's Taskforce (Governor Frank Keating's Tar Creek Superfund Task Force, Chat Usage Subcommittee Final Report, September 2000) and research on chat uses conducted by the University of Oklahoma (*A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report August 2005*). The Agency interviewed the principal authors of the University of Oklahoma studies to further evaluate their findings and representatives of the Departments of Transportation in Oklahoma, Kansas, and Missouri. The Agency met with the U.S. Department of Transportation, Federal Highway Administration to discuss the use of aggregate substitutes in road surfaces and relied on the joint EPA/FHWA document of the use of wastes in highway construction [User Guidelines for Waste and Byproduct Material in Pavement Construction, FHWA, 1997 (*http://www.rmrc.unh.edu/Partners/UserGuide/begin.htm*)]. Additionally, EPA met with the BIA to discuss BIA requirements for the sale of chat on Tribal lands. The Agency also conducted a series of interviews with the environmental regulatory agencies in the three states to further identify acceptable versus unacceptable uses of chat. Moreover, the Agency conducted interviews with companies currently washing and selling chat and with asphalt and cement companies which either were currently using or had used chat. EPA visited the Tri-State area to observe the condition of chat piles and confirm the location of chat washing and asphalt companies in the area. The Agency has communicated with the tribal members in the Tri-State area to inform them about this action and seek information about current uses and has met the requirements of Executive Order 13175. In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and tribal governments, EPA specifically solicits any additional comment on this proposed rule from tribal officials.

II. Summary of the Proposed Rule

A. What Criteria Are EPA Establishing for the Use of Chat?

EPA views chat uses in two basic categories: Unencapsulated and encapsulated. Unencapsulated uses of chat have contributed to human health and environmental risks resulting in EPA placing four sites on the NPL. Additionally, the use of unencapsulated chat in driveways and as fill material has contributed to lead contamination of soils in residential property that has resulted in elevated blood lead concentrations in area children. Therefore, EPA cannot establish specific criteria for individual unencapsulated uses of chat that are safe and environmentally protective. However, EPA has established a criterion that such uses will be safe and environmentally protective if they are part of, and otherwise authorized by a State or federal response action undertaken pursuant to applicable federal or state environmental laws. Such response actions are undertaken with consideration of risk assessments developed in accordance with state and federal laws, regulations, and guidance. By contrast, uses that encapsulate chat limit the release of the constituents of concern. Therefore, encapsulation of chat forms the basic criterion in today's proposal.

1. Transportation Construction Uses

Transportation construction uses of chat are transportation construction projects funded, wholly or in part, with federal funds. The Agency has evaluated all the transportation construction uses defined previously and has concluded that the only transportation construction uses that are safe and environmentally protective are uses which encapsulate chat in hot mix asphalt concrete or in Portland cement concrete.

a. What is our proposed action?

Today's action, if finalized as proposed, would require that chat used in transportation construction projects funded, wholly or in part, with Federal funds be encapsulated in asphalt concrete or Portland cement concrete, unless the use is authorized by a State or Federal response action undertaken pursuant to applicable Federal or State environmental laws.

In addition, for all chat used in transportation construction projects funded in whole or in part using Federal funds that is not subject to the U.S. Department of Interior, Bureau of Indian Affairs Chat Use Certification requirements described in Section I.B.3. above, the Agency is proposing a certification requirement similar to that required by BIA. Specifically, EPA proposes that the acquirer of the chat would submit a signed, written certification that the chat will be used in accordance with EPA's criteria. The certification will also include the location of origin of the chat and the amount of chat acquired.

EPA proposes that the certification be provided to the environmental regulatory agency in the State where the chat is acquired, except for chat acquired on lands administered by the BIA which is subject to the BIA certification requirements. The Agency also proposes that if the acquirer sells or otherwise transfers the chat, the new owner of the chat must also submit a signed, written certification as described in this section. Finally, the Agency proposes that the acquirer, or any other person that receives a copy of the certification, maintain a copy of the certification in its files for three years following transmittal to the State environmental regulatory agency.

Today's action does not, in itself, modify or limit any existing state or Federal policies (including EPA Regions 6 and 7 guidances on chat use), positions, or decisions, nor any existing agreements or contracts among private or governmental entities. Because this action is a proposed rulemaking, provisions of the proposal, as well as EPA's assumptions and rationale leading to them, are subject to public notice and comment. Therefore, until a final rule governing these materials is issued, EPA's policies, positions or decisions regarding the use of chat remain unchanged.

b. What is the rationale for the Proposed Rule?

The Agency is basing this action on our review of various studies and data that show that certain encapsulated uses of chat are reasonably expected to be environmentally safe.

i. Asphalt

There are a number of factors which lead us to conclude that the encapsulation of chat into hot mix asphalt is safe and environmentally protective:

- Several studies have been conducted on the use of chat in hot mix asphalt. The most comprehensive study was conducted by the University of Oklahoma (OU) School of Civil Engineering and Environmental Science. OU published their findings in

a report titled, *A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report (August 2005*). OU tested the durability and leaching potential of a variety of mixtures of hot mix asphalt with raw chat for road surfaces and for road bases. In addition, OU milled (sawed) samples to simulate weathering. The Agency relied on these findings as one of the principal sources of data supporting the use of chat in hot mix asphalt. This study confirms an earlier study conducted by the U.S. Army Corps of Engineers (Tar Creek Superfund Site, Ottawa County, Oklahoma, Final Summary Report: Chat-Asphalt Paved Road Study U.S. Army Corps of Engineers—Tulsa District, February 2000).

• Comparison of the Synthetic Precipitation Leaching Procedure (SPLP) results of milled (weathered) chat asphalt samples in the OU study with the National Primary and Secondary Drinking Water Standards (*http://www.epa.gov/safewater/mcl.html*), without dilution and attenuation, show that milled surface and road base mixtures did not exceed the primary drinking water standard for lead (0.015 mg/l) or cadmium (0.005 mg/l). The OU results also show that milled asphalt road bases and surfaces did not exceed the secondary drinking water standard for zinc (5 mg/l).[5]

• The TCLP test was designed as a screening test to simulate leaching of materials in a municipal solid waste landfill. The SPLP test is also a screening test, and was designed to simulate leaching of materials when exposed to acid rain. It is highly unlikely that road surfaces would be exposed to leaching conditions found in municipal solid waste landfills. Therefore, the Agency believes that of these two tests, the SPLP tests on raw chat asphalt samples is likely to better mimic the leaching potential of such mixtures when they are to be used in road construction.

• The OU study tested unweathered and milled samples. The Agency believes milled samples represent worst case scenarios because milling exposes more surface area to leaching.

• In a dissertation submitted to the University of New Hampshire titled ''Contributions to Predicting Contaminant Leaching from Secondary Material Used in Roads,'' Defne S. Apul, September 2004, the author noted that if pavement is built on highly adsorbing soils, the concentrations of contaminants reaching groundwater are more than several orders of magnitude lower than the MCLs. Moreover, the Agency considered in its Report on Potential Risks that it is highly unlikely that leachate would be ingested directly by humans.

The report entitled ''Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma, Revised June 2003,'' ODEQ, also evaluated leachate from asphalt containing chat removed from the Will Rogers Turnpike located near Quapaw, Oklahoma. This evaluation was conducted to determine if asphalt that used chat as an aggregate removed at the end of its useful life posed threats from metals leaching into the environment. TCLP results for lead ranged from less than 0.050 mg/l to 0.221 mg/l. There are no SPLP test data in this report. Based on best professional judgement and review of TCLP versus SPLP results, EPA believes that there would be a reduction in lead concentrations of approximately one order of magnitude. Therefore, we believe that SPLP results would not exceed the MCL for lead. Based on these results, EPA does not believe the disposal of chat asphalt should present risks to the environment.

The Agency therefore concludes that the use of chat in hot mix asphalt for pavement (which accounts for about 95% of the current chat usage), base, and sub base is an environmentally protective use. EPA does not believe that it is necessary to establish specifications of what constitutes ''hot mix asphalt'' because transportation construction uses are required to comply with federal and state Department of Transportation material specifications. These specifications delineate requirements which ensure that when chat is used in hot mix asphalt, the resulting product will be structurally stable.

ii. Concrete

The Agency also believes that the encapsulation of chat into Portland cement concrete is safe and environmentally protective:

• An undated University of Oklahoma Surbec-Art Environmental study[6] and a 2000 University of Oklahoma Study[7] conducted the only known assessments of the total metals and TCLP on concrete matrices mixed with raw chat. The 2000 OU results are also presented in the 2005 OU study. Following are the results from those studies.

	S1		S2		C40	
	Total (mg/kg)	TCLP (mg/l)	Total (mg/kg)	TCLP (mg/l)	Total (mg/kg)	TCLP (mg/l)
Lead	178	0.92	379	0.17	150	1
Cadmium	30 (R)	0.09	35 (R)	0.12	35	0.1
Zinc	4200	0.23	4400	0.16	4100	.....

(R) = rounded to nearest whole number.

• While not a direct measure of the leaching potential of Portland cement concrete, waste stabilization technologies and their effectiveness are well defined in the Agency's Final Best Demonstrated Available Technology (BDAT) Background Document for Universal Standards, Volume A, July 1994 and Proposed Best Demonstrated Available Technology (BDAT) Background Document for Toxicity Characteristic Metal Wastes D004–D011, July 1995. One of those technologies is stabilization, such as encapsulation in a cement matrix, to reduce the mobility of the metal in the waste. The metals are chemically bound into a solid matrix that resists leaching when water or a

[5] Several hot mix asphalt samples were also tested in the OU study using the toxicity characteristic leaching procedure (TCLP). For surface samples, TCLP average concentrations for lead ranged from <0.005 to a high of 0.46 mg/l. TCLP average concentrations for cadmium ranged from <0.010 to 0.223 mg/l and zinc concentration averages ranged from 11.3 to 28.53 mg/l. Road base samples usually have higher metals concentrations than do surface samples. For road base samples, average TCLP lead concentrations ranged from 0.069 to 2.008 mg/l, while average TCLP cadmium concentrations ranged from 0.011 to 0.087 mg/l and average TCLP zinc concentrations ranged from 19.9 to 41.33 mg/l.

[6] ''Preliminary Report on the Findings of Environmental and Engineering Tests Performed on Mine Residual Materials from Ottawa County, Oklahoma.''

[7] ''Development of Holistic Remediation Alternatives for the Catholic 40 and Beaver Creek.''

mild acid comes into contact with the waste. The Agency evaluated contaminant levels in unstabilized versus stabilized wastes to determine the reduction in mobility of metals, including lead and cadmium, when those wastes were stabilized in a cement matrix. These results indicate that stabilization with cement generally reduced lead and cadmium mobility by two to three orders of magnitude (See Table A4 of the July 1994 document cited above).

• Although chat was not specifically discussed in the BDAT Background Documents, the data and information contained in the technical background documents cited in the previous bullet leads us to believe that chat added to concrete will bind a significant amount of metals and therefore limit the leaching potential of chat concrete. While limited leaching of metals from concrete may still occur, we believe metals in chat can be encapsulated in an environmentally protective manner for the following reasons:

—As shown in the table above, TCLP levels from raw chat contained in concrete, as measured in the undated and 2000 OU studies, for lead (0.17 to 1.0 mg/l) and cadmium (0.01 to 0.12 mg/l) are within the TCLP levels from the 2005 OU study for weathered (milled) hot mix asphalt (<0.005 to 2.008 mg/l for lead and <0.010 to 0.223 mg/l for cadmium).

—The Agency does not have SPLP data for concrete. In hot mix asphalt, the SPLP concentrations for both lead and cadmium were <0.01 mg/l, significantly below the TCLP levels for the same constituents. Should additional environmental release studies of chat used in concrete be performed, use of SPLP would be preferred over TCLP, since SPLP would better replicate the environmental conditions of the chat reuse.

—Because the Agency believes that it is highly unlikely that the leachate would be directly ingested by humans, applying a dilution and attenuation factor would lead to even lower metals concentrations.

• In a dissertation submitted to the University of New Hampshire titled ''Contributions to Predicting Contaminant Leaching from Secondary Material Used in Roads,'' Defne S. Apul, September 2004, the author noted that if pavement is built on highly adsorbing soils, the concentrations of contaminants reaching groundwater are more than several orders of magnitude lower than the MCLs. Moreover, the Agency considered in its Report on Potential Risks that it is highly unlikely that leachate would be ingested directly by humans.

• The Agency evaluated highway design specifications; *i.e.*, layering of compacted material (Apul) and the movement of water through concrete (hydraulic conductivity),[8] and concludes that such designs in general retard the movement of rainwater through concrete and into groundwater.

• The University of Oklahoma (OU) 2005 study summarized previous uses of raw chat in concrete and also noted that in the past chat had been used for concrete pavement. During interviews with the Ottawa County Roads Department (Memo to File: Interviews with the Ottawa County, Oklahoma Roads Department found in the docket to today's action), it was noted that chat had been used in concrete pavement, although that use had stopped at least 15 years ago. The discontinuance of the use of chat in concrete in the Tri-State area is likely due to the fact that cheaper sand is locally available, that chat used as a silica substitute is difficult to grind, and that such use may have resulted in the past with poorer quality material.

iii. Unencapsulated Uses of Chat

As already noted, the Agency is concerned that unencapsulated uses of chat allow leachate to form which may contain metals concentrations that could cause environmental threats. Unencapsulated chat has contributed to the contamination at four NPL sites, and use of chat in driveways and as fill material has contributed to lead contamination of soils in residential property which resulted in elevated blood lead concentrations in area children (See Tri-State Mining District RODs which are available in the docket to today's action). EPA expects that using this material in an unencapsulated manner would generally pose unacceptable risks. (See Section III. A. below, ''What Are the Environmental and Health Impacts?'') One exception is use of unencapsulated chat that is otherwise authorized by a State or Federal response action undertaken pursuant to applicable Federal or State environmental laws. Such remedial actions are undertaken after site specific risk evaluations are completed which account for the full variety of conditions at the site, such as existing contamination, in assessing risks to human health and the environment. For example, Region 7 assessed the protectiveness of using unencapsulated chat as road base for a proposed highway bypass within the Tar Creek Superfund Site boundary and, as a result of a site specific assessment, determined that such use, compared to other alternatives, was a more protective action (USEPA Region 7, Engineering/Cost Analysis—Highway 71, Jasper County, Missouri, August 2000).

In today's action, EPA is also proposing a certification requirement because the Agency believes it is important that the acquirer of chat that is not part of demolished asphalt or concrete certify that the chat will be used in accordance with authorized uses which are environmentally protective. This certification will assure that chat is not used in a manner likely to cause substantial environmental contamination that would necessitate federal or state clean up actions. The Agency is proposing this action to be consistent with the BIA Chat Use Certification requirements.

c. Is the EPA soliciting comments on specific issues?

The Agency is soliciting comments on all aspects of today's proposal. In particular:

• The Agency has defined the term ''Tar Creek Mining District'' to include chat piles located in the Tri-State Mining District—that is, Ottawa County, Oklahoma, Cherokee County in Southeast Kansas and Jasper and Newton Counties in Southwest Missouri. The Agency is soliciting comment on whether it should limit the scope of today's action to chat currently located in Oklahoma. Also, the Agency is soliciting comment on whether additional counties, such as Lawrence and Barry Counties in southwest Missouri, should be added to the scope.

• In today's notice, EPA has tentatively concluded that the use of chat in concrete (both hot mix asphalt concrete and Portland cement concrete) in transportation projects is environmentally protective. EPA solicits comments on whether users of chat encapsulated concrete should be required to conduct leach testing prior to use. If the Agency were to require leach testing, the Agency solicits comments on whether the TCLP or SPLP test method, as described in Methods 1311 and 1312 of EPA's SW–846 analytical methods, or some other leach testing procedure should be used.

• If the Agency were to require leachate testing, the Agency would need to establish specific criteria. For example, the Agency could specify that the results of testing would need to meet the Primary and Secondary Drinking Water Standards for lead, cadmium, and

[8] According to the Portland Cement Association, the hydraulic conductivity of a typical Portland cement concrete is 1×10^{-12} cm/sec.

zinc. The Agency also solicits comment on whether the leachate should be measured against the National Recommended Water Quality Criteria which address acute and chronic biological effects. In addressing this issue, commenters will need to provide the rationale for any levels suggested.

• Additionally, the Agency could develop leach test criteria with the use of a Dilution and Attenuation Factor (DAF). Test results using DAFs could reflect how contaminant concentrations may change as they move through the environment. If commenters believe that a DAF should be applied, the Agency requests comment on what DAF should be applied and what is the rationale for its use.

• While the Agency is not proposing to require that chat be sized before it is encapsulated, the Agency is soliciting comment on whether chat should be limited to particles that exceed a specific sieve size (via physical or washing methods). Based on available data, particles finer than sieve size #40 in unencapsulated raw chat tend to have a TCLP for lead of greater than 5mg/l, while larger particles in the raw chat tend to have a TCLP for lead of less than 5 mg/l. By establishing a minimum size of chat that can be used, the Agency would possibly be limiting the amount of metals in the chat, as well as the leaching potential of these uses. Specifically, the Agency seeks comment on whether the binding properties of the encapsulation are sufficient to prevent undue environmental risks associated with leaching, whether dust control practices associated with demolition adequately address the higher metal concentrations of the fine particulates, and whether subsequent recycling or disposal options could pose undue risks due to the higher metal levels in the fine particles. While it is the goal of the Agency to balance the beneficial use and reuse of materials, while also limiting the introduction back into the environment of materials with high metals loadings, we seek comment on whether it is appropriate to require the sizing of chat to limit the addition of lead bearing materials into use and their related exposure in the environment. There are a series of factors which should be considered in submitting comments on these issues:

—As identified in consultation with the Quapaw tribe, the tests conducted by the University of Oklahoma on asphalt containing ''pile run'' or raw chat, did not show problematic leaching levels. AASHTO standards for aggregate in asphalt limit fines less than sieve size #50 to 7 to 60%, depending on the grading. There are, however, no direct measurements on the use of raw chat for 100% of the aggregate in asphalt—in the University of Oklahoma study, chat comprised 30 to 80% of the aggregate.

—The limited data that exists for concrete involves raw chat, but there is no direct data on the use of chat for cement manufacturing.

—With regard to demolition, the fugitive dust controls are a routine requirement for demolition projects.

—For post demolition recycling and disposal, approximately 90% of the asphalt is recycled into new asphalt, while 70% of concrete from transportation projects is recycled as fill or base. Recycling of concrete from residential buildings is about 60% versus 88% for commercial buildings.

—Requiring sizing would result in the generation of some chat fines, which would not be used in concrete or asphalt and thus, would be a waste stream that would need to be managed. Based on the review of the States' regulations, however, EPA concludes that additional criteria would not be needed to address any environmental concerns arising from the handling and disposal of fines generated by the sizing of chat.

• Today's criterion does not include the use of chat in cold mix asphalt (CMA) or slurry seals. It is the Agency's understanding that CMA or slurry seals are typically used for temporary repairs. At least one State, Kansas, has specifications for CMA using chat; however, EPA has no information that chat is being used in CMA or slurry seals. The Agency solicits comments on the following: (1) Whether chat is being used in cold mix asphalt or slurry seals and, (2) whether the existing data would support the inclusion of chat used in cold mix asphalt or slurry seals in the criteria proposed today. The Agency also solicits data on the ability of CMA or slurry seals to bind metals.

• Another possible use of chat is in a stabilized road base. A stabilized base has the advantage of using a pozzolanic material which should reduce the mobility of the metals. However, the stabilized road base could use cement in amounts 4 to 6 percent by weight which is less than that used in concrete. While the nature of this binding may not be as great as concrete, the fact that the stabilized base is covered by an asphalt concrete or Portland cement concrete road surface reduces the level of leachate. Capillary effects along the road's edge will still cause considerable wetting of the base, and EPA solicits comment on whether the combination of stabilization and coverage by the road surface adequately limits metals releases. EPA therefore solicits comment on whether the use of chat as stabilized road base would be an environmentally protective use of chat and whether this use should be allowed in federally funded transportation projects.

• Material like chat is also sometimes used as flowable fill. While flowable fill involves the use of a pozzolanic material, the binding may not be as sound as that for concrete. Like a stabilized road base, flowable fill could use cement in amounts as little as 3 to 5 percent by weight. The EPA solicits comments on the degree to which flowable fill matches the binding characteristics of concrete or stabilization practices associated with waste management, and whether use of flowable fill would be appropriate for chat. If use as flowable fill were allowed, should leachate testing and compliance with some standard (*e.g.*, MCLs) (with or without consideration of dilution and attenuation) be required?

• Today's criterion does not include the use of unencapsulated chat as road bed beneath asphalt or concrete pavement. Use of unencapsulated chat as a free-draining subbase capped with an asphalt concrete or Portland cement concrete pavement may be an environmentally protective use. However, the Agency has no data on whether use of unencapsulated chat in this manner would prevent leaching of metals found in chat into the environment. Therefore, the Agency requests comments and supporting data on whether the use of unencapsulated chat as road bed, capped with an asphalt concrete or Portland cement concrete pavement, would be an environmentally protective use.

• In today's action, EPA is proposing that certification be provided to the environmental agency in the State where the chat is acquired. The Agency is soliciting comments on whether certification should also be provided to the environmental agency in the State where the material is ultimately used.

• Today's proposal allows the use of unencapsulated chat where it has been authorized by a State or Federal response action undertaken pursuant to applicable Federal or State environmental laws. It has also been suggested that unencapsulated uses be allowed if data are presented to EPA that demonstrate that the proposed use will be environmentally benign. EPA takes comment on this option, as well as the possibility that this function be deferred to the relevant state authority.

2. Non-Transportation Uses—Cement and Concrete Projects

Non-transportation uses of chat include its use as a raw material in the manufacture of cement, and as an aggregate in Portland cement concrete. Based on its analysis on the possible use of chat in concrete in roads (discussed above), EPA believes that health and environmental concerns would be minimal for chat used in concrete in non-transportation, non-residential construction projects and for structural purposes.

a. What is our proposed approach?

The Agency is proposing to establish a criterion that would recommend the encapsulation of chat into cement and concrete for non-transportation, non-residential uses, as defined above, such as for non-residential structural uses limited to weight bearing purposes and for commercial/industrial parking and sidewalk areas.

b. What is the rationale for the Proposed Rule?

In the past, chat had been used in the manufacture of cement and used in concrete for building foundations and roads. Ash Grove Cement, in a communication with EPA (Memo to File: Conversation with Ash Grove Cement Regarding Use of Chat, which is available in the docket to today's action), indicated that it had produced cement clinker in 2001–2003 using chat as a silica substitute. According to Ash Grove, the clinker produced with chat met American Society for Testing and Materials (ASTM) standards for clinker. However, Ash Grove is no longer producing cement with chat. The Agency also reviewed published data and conducted interviews with chat sellers and state regulators and determined that chat is not currently being used in cement manufacturing or non-transportation Portland cement concrete projects.[9]

Pursuant to section 6006(a)(1), the Agency reviewed the possible use of chat as aggregate in concrete, and as it did in its transportation evaluations, concludes that certain uses of chat in concrete are environmentally protective. The criterion being considered would recommend that chat be encapsulated in concrete and recommend that only those uses be allowed where exposure to chat concrete would be limited to workers installing and maintaining projects. To meet this goal, the Agency is recommending that non-transportation, non-residential cement and concrete projects be limited to weight bearing structural uses such as non-residential foundations, slabs, and concrete wall panels. Other uses include non-residential retaining walls, commercial/industrial parking and sidewalk areas. Uses would not include any use of cement or concrete inside or adjacent to residences (*e.g,* concrete countertops, sidewalks, driveways). This guidance is somewhat more restrictive than current guidance issued by Regions 6 and 7. The Agency is taking this more restrictive approach in limiting its criterion since there is little information the Agency can use to determine if residential uses of chat cement or concrete are environmentally protective. Depending on what the Agency finally promulgates and issues as guidance, the Agency may modify those Fact Sheets. However, EPA solicits data to demonstrate this possible use would be environmentally benign.

The Agency has reviewed OSHA standards governing worker health and safety related to the construction and demolition of non-residential non-transportation uses of cement and concrete and concludes that existing standards adequately protect those workers from dusts and metals found in chat. It should be noted that when chat is used as an aggregate in concrete, worker exposures would be limited since the metals would already be bound.

c. Is the EPA soliciting comments on specific issues?

The Agency is soliciting comments on all aspects of today's proposal. In particular:

- The Agency solicits comments on whether the available information supports the establishment of criteria in determining that the use of chat contained in cement or concrete in non-residential, non-transportation uses is environmentally protective.
- Today's action would recommend that uses be limited to non-residential non-transportation uses. The Agency is soliciting comment on whether the data support expanding the criteria to include some structural residential uses. Today's action does not include the use of chat in non-structural residential uses; *e.g.*, concrete countertops, sidewalks, and driveways. The Agency also solicits comments and supporting data on whether non-structural residential uses would be environmentally protective.
- Today's action does not require non-transportation users of encapsulated chat in cement or Portland cement concrete to conduct leach testing prior to use. The Agency is, however, soliciting comments on whether leachate testing should be conducted prior to each encapsulated use. If the Agency were to recommend leach testing, the Agency solicits comments on whether the TCLP or SPLP test method, as described in Methods 1311 and 1312 of EPA's SW–846 analytical methods, or some other leach testing procedure would be appropriate.
- If the Agency were to require leachate testing, the Agency would need to establish specific criteria, either with or without the use of a Dilution and Attenuation Factor (DAF). Test results using DAFs could reflect how contaminant concentrations may change as they move through the environment. The Agency solicits comment on what the criteria would be, whether or not a DAF should be applied, and what the rationale would be for their use.
- The Agency solicits comment on whether chat users should provide certification to the environmental agency in the state(s) where the material is acquired. The agency is further soliciting comment on whether the certification should also be provided to the environmental agency in the state(s) where the chat is ultimately used.

B. Relationship of Proposed Criteria to Other State, Tribal and Federal Regulations and Guidance

For all uses of chat in transportation construction projects carried out in whole or in part with federal funds that is affected by this action, users must meet the relevant specifications (*e.g.*, for durability, granularity) established by the relevant state departments of transportation and the Federal Highway Administration (FHWA) , prior to it being used in transportation projects. This proposal would not change that—that is, EPA is not setting different specifications and is only informing users that other agencies already have established specifications and engineering testing requirements that must continue to be met.[10]

The FHWA established minimum standards at 23 CFR 626 for Highways (including references to the AASHTO Standard Specifications for Transportation Materials and Methods

[9] The Agency is aware of proposals to use unencapsulated chat as mine backfill. The Agency has conducted a study to determine if chat mixed with cement or concrete is being used for this purpose and found that it is not. See Memo to File: Mine backfill.

[10] The Agency also explored whether the use of chat in concrete had the potential to cause alkali-silica reactions. The Agency has reviewed studies on the use of zinc slags in concrete (A.M. Dunster, *et al.*, 2005) which indicate that zinc slags with zinc concentrations from 90,000 to 120,000 ppm have successfully been incorporated in concrete without detrimental engineering effects.

of Sampling and Testing) and at 23 CFR 633 Required Contract Provisions. Aggregate requirements for Concrete include AASHTO—6 Fine Aggregate for Portland Cement Concrete and AASHTO—80 Coarse Aggregates for Portland Cement Concrete. Technical requirements for Hot Mix Asphalt include AASHTO—29 Fine Aggregate For Bituminous Paving Mixtures and ASTM D6155 Standard Specification for Nontraditional Coarse Aggregates for Bituminous Paving Mixtures. FHWA National Highway *Standard Specifications and Supplements* is divided into topic areas corresponding to the divisions used in the ''Guide Specifications for Highway Construction'' Manual published by the AASHTO and can be accessed at (*http://fhwapap04.fhwa.dot.gov/nhswp/servlet/LookUpAgency?category=Standard+Specifications+and+Supplements*).[11]

ASTM Standard C–33 restricts the amount of chert that may be mixed into Portland cement concrete when the chert has a specific gravity (ratio of its density to the density of water) less than 2.4. Chat in the Tri-State area, a form of chert, has a specific gravity greater than 2.4. Therefore, ASTM Standard C–33 would not be applicable to the use of chat in Portland cement concrete.

The Agency also considered potential risks posed by the release of fine particles, principally into the air, during road resurfacing and replacement operations. Milling (grinding prior to resurfacing) and demolition of chat-containing asphalt and Portland cement may result in the release of fine chat particles. The Agency considered two scenarios: (1) Storage or disposal of asphalt or Portland cement concrete containing chat in piles from milling and demolition activities and, (2) a continuous milling, remixing, and resurfacing process. Under the first scenario, the potential risks would be posed by leachate from piles. As noted previously, based on leach tests of asphalt containing chat removed from the Will Rogers Turnpike, EPA does not believe storage in piles or disposal of chat asphalt should present risks to the environment. EPA concludes that it is not necessary to propose additional standards to address this issue. Under both scenarios, exposure to fine particles released during milling and demolition operations would be limited to on-site workers (for the basis of this conclusion, see Section III. A). The Occupational Safety and Health Administration has established limits for worker exposure to the metals found in chat (29 CFR 1926.55—Safety and Health Regulations for Construction, Gases, Vapors, Fumes, Dusts, and Mists, available at: *http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926*). EPA has reviewed the OSHA standards (See Section III. A. below, ''What Are the Environmental and Health Impacts?'') and concludes that it is not necessary to propose additional standards to address this issue.

Oklahoma, Kansas, and Missouri currently regulates chat washing facilities to assure that those operations do not further contaminate the environment (Memo to File: Evaluation of Chat Washing, found in the docket to this action). These regulations set standards for point and fugitive air emissions, as well as for point and non-point water discharges. In addition, these regulations specifically address fine grained wastes (fines) from these operations. The Agency's review of these regulations leads us to conclude that today's proposal does not need to address these activities, since existing state regulations are deemed adequate.

Oklahoma, Kansas, and Missouri also currently regulates hot mix asphalt plant operations. The Agency reviewed these regulations to determine if the storage of chat (and potential run-on/runoff and dust impacts) at such facilities are covered by those regulations. These regulations set standards for point and fugitive air emissions, as well as standards for point and non-point water discharges. The Agency concludes that the existing state regulations are adequate and, consequently, today's proposal does not need to address them.

USEPA Regions 6 and 7 have issued guidance on chat use (Region 6 Tar Creek Mining Waste Fact Sheet, June 28, 2002 and Region 7 Mine Waste Fact Sheet, 2003). The Region 6 and 7 guidances note that acceptable uses of chat in transportation include applications that bind (encapsulate) the chat into a durable product (asphalt and concrete) and applications that use chat as a sub-base or base material for highways (asphalt and concrete). This proposal establishes criteria for chat used in transportation construction projects funded, wholly or in part, with federal funds and proposes recommended criteria as guidance for non-transportation uses of chat. As noted earlier in the preamble, the proposed mandatory criteria and guidance in today's notice is more restrictive than the guidance issued by Regions 6 and 7. Depending on what the Agency finally promulgates and issues as guidance, the Agency may modify those Fact Sheets.

C. How Does This Proposal Affect Chat Sales From Lands Administered by the U.S. Bureau of Indian Affairs or Directly From Tribal Lands?

The Bureau of Indian Affairs (BIA) signed a Memorandum of Agreement with EPA Region 6 in February 2005 which is designed to lead to the renewed sale of chat from tribal lands and from lands administered by the BIA. EPA's proposal does not prevent chat sales, nor is it intended to delay such sales. Today's proposal is consistent with BIA chat sales requirements.

The draft sales agreement prepared by BIA, a copy of which is available in the Docket for today's proposal, includes an end use certification which requires buyers of chat to certify that when they sell their chat into commerce, the buyer must use the chat in a fashion which is deemed acceptable by EPA. This proposal is consistent with the end use provision in BIA's model contract, since this proposal will require a similar end use certification for the use of chat, regardless of its source (tribal or private).

D. How Does This Proposal Affect CERCLA Liability, Records of Decision, and Removal Decisions?

If waste material, such as chat, is used in a way that creates a threat to human health or the environment, the owner of the property and the party responsible for creating the hazardous situation could be liable for a cleanup under CERCLA or a State response action.

In today's action, EPA establishes criteria for chat use in federally funded transportation projects. However, such federal funding does not include compensation for removal and disposal of chat or other hazardous substances undertaken in accordance with State or Federal response actions.

Finally, nothing in this proposal shall affect existing Records of Decision issued at EPA National Priorities List sites or Removal Decisions associated with chat nor does the proposal affect the determination of liability as noted in CERCLA Sections 104, 106, and 107 or State corrective action decisions.

[11] State highway construction specifications can be found at the following internet web sites for Oklahoma (*http://www.okladot.state.ok.us/materials/700index.htm*), Kansas (*http://www.ksdot.org/burMatrRes/specification/default.asp*), and Missouri (*http://www.modot.state.mo.us/business/standards_and_specs/highwayspecs.htm*).

III. Impacts of the Proposed Rule

A. What Are the Potential Environmental and Public Health Impacts From the Use of Chat?

As noted above, two types of uses of chat, transportation uses and non-transportation uses, are covered by today's action. This section addresses potential risks and economic impacts associated with those uses, as well as end of life issues.

The Agency evaluated existing information related to the usage of chat throughout its life cycle in order to identify likely exposure pathways and receptors associated with various scenarios and to characterize the environmental and public health effects that may result from the release of metals from the use of chat in transportation construction projects. The types of information we considered include: total metal concentrations in raw chat and road construction products containing chat; leachable concentrations for metals in raw chat and road construction products containing chat; environmental sampling data for metals in the proximity of historical chat storage and usage sites; and existing evaluations of human health and wildlife impacts associated with metal contamination likely associated with mining activities. The goals of this effort were to determine if there are sufficient data: (1) To characterize the environmental releases (potential or demonstrated) of metals from chat during use applications; and (2) to evaluate the environmental and public health impacts (potential or demonstrated) from the transportation, storage, and use of chat in transportation applications.

1. Transportation Uses and Demolition

As previously described in the preamble, chat can be managed or used directly in the environment or can be encapsulated before it is managed or used in the environment. Examples of unacceptable uses that we identified for unencapsulated chat in transportation applications are: gravel for county roads and driveways, and fill material. Transportation-related uses of encapsulated chat are primarily as aggregate for hot mix asphalt in asphalt surface mix, and for use as an aggregate in stabilized base for roadway construction. Chat was found to be allowed as an aggregate in cold mix asphalt for microsurfacing applications to an existing pavement surface; however, the Agency has no evidence that chat is used in this manner.

For encapsulated chat, we found that the reports and study data on health and environmental effects focused almost exclusively on evaluating the leaching potential for various mix formulations used to develop asphalt products containing chat (*e.g.*, hot mix asphalt). Data were available on the total metal concentrations and leaching characteristics of (1) Asphalt surface and base mix formulations prior to roadway application, (2) asphalt and stabilized base samples from roads currently in use, (3) spent asphalt samples that were broken up and stored in piles, and (4) milled asphalt samples intended to simulate weathering. Metals appear to be tightly bound in the encapsulated matrix when the total metals concentrations in asphalt samples are compared to corresponding TCLP and SPLP leachate concentrations. In particular, for asphalt surface mix and stabilized road base uses for all 4 categories above, the highest TCLP concentrations reported for lead and cadmium were below the toxicity characteristic (TC) regulatory limits (5 mg/L and 1 mg/L, respectively). In fact, when the metals were detected, in many cases, they were below the drinking water MCLs for lead and cadmium.[12] For zinc, when detected, the TCLP concentrations were found to be generally above the SMCL (5 mg/L) by up to a dilution and attenuation factor of 15. As we have noted earlier, however, we believe that use of the TCLP in evaluating the leaching potential of encapsulated uses of chat in transportation projects is inappropriate since it does not accurately reflect the environmental conditions of the management scenario. Rather, we believe the SPLP is a more representative test of the conditions expected to lead to leaching of metals from this material. In addition, where leachate testing was conducted using the TCLP and SPLP methods, in all cases, the concentrations of the metals were approximately an order-of-magnitude lower for the SPLP as compared to the TCLP. In most cases, the SPLP concentrations were below the MCLs for lead and cadmium and were always below the SMCL for zinc. As a result, based on the available data, we conclude that the use of chat in asphalt is likely to pose a negligible health risk through the groundwater pathway.

On the other hand, limited leaching data were available for encapsulated chat in Portland cement concrete (TCLP only) and no data were found for flowable fill. For Portland cement concrete, the TCLP concentrations for lead and cadmium were below the TC limits yet above the MCLs. The concentrations for zinc were below the SMCL. However, as noted above, we believe that using the TCLP to evaluate the potential for environmental release is inappropriate. While no data were identified presenting the SPLP concentrations for chat encapsulated in Portland cement concrete or flowable fill, we believe the potential groundwater impacts from the use of chat in Portland cement concrete would be negligible as the metals binding capacity of Portland cement concrete is expected to be similar to asphalt because of similar pozzolanic characteristics.

Environmental quality information presented in several studies indicated that damages to streams had been documented for the Tri-State Mining Area; however, these studies were not specific to encapsulated chat uses, but were from multiple sources of contamination associated with lead and zinc mining, including subsurface sources (flooded mine shafts), surface sources (chat piles, tailing sites), and smelting operations. SPLP analyses for chat encapsulated in hot mix asphalt (OU, 2005) show that for zinc, when detected, concentrations were below EPA's National Recommended Water Quality Criteria (*www.epa.gov/waterscience/criteria/wqcriteria.html*) for the protection of aquatic life. This study did not find lead or cadmium in any leachate using the SPLP method. While the study's detection limits for lead and cadmium were at least an order of magnitude above EPA's National Recommended Water Quality for the protection of aquatic life, we do not believe this to be a concern. The environmental conditions would need to be extremely favorable for the metals to reach surface waters at levels of concern either through run-off to nearby soils which would have subsequent attenuation before reaching surface waters, or through additional attenuation and dilution in groundwater before reaching nearby receiving waters.

The transportation and storage of chat to be used as road construction aggregate could result in local environmental releases to various media (air, groundwater, soil). Agency review of existing regulations indicate that those transport and storage concerns are adequately addressed by existing State regulations.

The milling and demolition of chat-containing asphalt and Portland cement concrete would likely involve emissions

[12] Comparisons of leachate concentrations with drinking water criteria assume that no dilution or attenuation occurs before the dissolved metals reach a drinking water well or surface water. The Agency believes this worst case scenario is highly unlikely to occur in the area of the country where chat use in asphalt is occurring.

of fine chat particles, with subsequent dispersion and deposition to nearby soils. These emissions would occur episodically and infrequently (that is, at the end of the useful life of the pavement which could be on the order of 15 years). The Agency believes that, with regard to worker safety, these potential sources of releases are adequately regulated by the States or by OSHA. However, the potential exists for these fine chat particles to be dispersed into populated areas. As these emissions would be infrequent, the Agency believes that the potential exposure to a local population would be minimal.

In particular, during the demolition and resurfacing of asphalt road surfaces, it is often the practice to score, cut, and crush the old surface layer so that it may be fed directly into mobile equipment that heats this material (or mixes it with fresh asphalt) and immediately lay down a new asphalt surface. Any fugitive dust emissions from this process would occur episodically and infrequently (that is, at the end of the useful life of the pavement which could be on the order of 15 years). Oklahoma DOT regulations limit the amount of fine aggregate in hot mix asphalt because they have adopted the AASHTO aggregate asphalt standard. Aggregate makes up approximately 80 to 90 percent of HMA by weight. The OU (2005) study show that the total concentration of lead in surface mix asphalt blends is approximately 200 to 400 mg/kg. The percent of chat aggregate in the blends were 40 to 80 percent (by weight). EPA has found no emissions data during demolition and resurfacing of asphalt roads to evaluate potential exposures to workers. While the Agency does not believe this potential exposure poses a significant risk, we are asking for information on whether such dusts may present risks and seek comment on how to address such risks.

Road surfaces using a chat concrete mixture may also be demolished at the end of their useful life (like asphalt, the useful life could be on the order of 15 years). The demolition of road surfaces containing chat would likely involve low emissions of encapsulated chat dust particles, theoretically with subsequent dispersion and deposition to nearby soils. Based on discussions with demolition contractors, it is apparent that dusts from such demolitions are regulated under the state fugitive dust regulations. Exposure to such dusts probably would be limited to workers because existing State regulations require that dusts be contained within the area of origin. As noted above, OSHA has established exposure limits for dusts and metals for workers in construction and demolition. Most if not all road concrete which is demolished is reused as fill or as road base. While the Agency also does not believe that exposure to chat concrete road demolition presents a significant risk, we are soliciting comment on whether this rule should require some form of notification to demolition workers since they may not be aware that chat had been used in the concrete.

2. Non-Transportation Uses and Demolition

Dusts during the demolition of nonresidential buildings which used chat concrete was also considered by the Agency.[13] For today's action, the Agency is assuming a use life for buildings of 30 years (based on the Internal Revenue Service allowable straight-line depreciation for non-residential real property of 31.5 years). Demolition therefore will likely occur only once every 30 years. The Agency determined that demolition practices, as noted by the National Association of Demolition Contractors, only generate dusts for periods rarely in excess of 20–30 minutes when buildings are imploded. Furthermore, the Agency has reviewed the fugitive dust demolition regulations (see above) in Oklahoma, Missouri, and Kansas and found that building demolition requires a general fugitive dust permit that mandates that demolition related dusts must be contained within the property line (most often through the use of water sprays). Based on this information, the Agency concludes that dusts from chat concrete demolition of nonresidential buildings is not likely to present a significant threat to human health.

Even if chat metal levels do not trigger OSHA requirements, other OSHA controls would still be utilized to address worker health risks from exposure to fine particulates, which indirectly addresses the issues associated with chat. In particular, demolition of concrete structures is known to produce extremely fine particles of crystalline silica. Breathing crystalline silica dust can lead to silicosis, a commonly known health hazard which has been associated historically with the inhalation of silica-containing dusts. Silicosis is a lung disease which can be progressive and disabling; it can lead to death. OSHA standards for exposure to dust, (29 CFR 1926.55) prohibit employee exposure to any material at concentrations above those specified in the ''Threshold Limit Values of Airborne Contaminants for 1970.'' OSHA has established for crystalline silica dust a Permissible Exposure Level (PEL) which is the maximum amount to which workers may be exposed during an 8-hour work shift. NIOSH has recommended an exposure limit of 0.05 mg/m^3 as a time-weighted average (TWA) for up to a 10-hour workday during a 40-hour workweek. Although the Agency has no reason to believe that chat in concrete would increase the levels of fine particulates, including crystalline silica, we believe the OSHA/NIOSH standards will provide adequate protection to workers from potential exposure to metals found in chat.

As noted earlier, the Agency concludes that dust generated during the demolition of chat concrete buildings or in the demolition of asphalt and Portland cement concrete pavement that contains chat would largely be limited to the immediate project area. The Agency has reached this conclusion based on its review (as noted above) of the Oklahoma, Missouri, and Kansas fugitive dust and particulate matter regulations, which mandate that demolition dusts be controlled within project sites. Therefore, if any risks exist due to exposure to demolition dusts from asphalt or Portland cement concrete that contains chat, they would most likely be limited to demolition workers at the site. The Occupational Safety and Health Administration (OSHA) has established worker health and safety standards specific to building demolition in 29 CFR 1926 Subpart T. These standards require an engineering survey of the building prior to demolition to identify any risks and implementation of project wide dust controls. The standards also require compliance with NIOSH respirable dust standards which essentially require the use of respirators, if standards noted in 29 CFR 1910 are exceeded. Based on the Agency's review of the OSHA standards, we conclude that these regulations provide adequate protection to onsite demolition workers and today's proposal does not include any additional worker health and safety requirements. The Agency is, however, seeking comment on whether reliance on OSHA/NIOSH standards are sufficient and seeks information on possible alternative approaches, if found necessary. The Agency is also seeking comment and information on the adequacy of existing controls for the disposal of demolition debris containing

[13] The American National Standards Institute ANSI A10.6–1983 American National Standard for Demolition Operations Safety Requirements recommends that no worker shall be permitted in any area that can be adversely affected when demolition operations are being performed.

chat or whether the Agency should establish additional criteria.

A more complete discussion of the Agency's evaluation of existing environmental and public health information associated with the use of chat is available in ''Report on Potential Risks Associated with the Use of Chat from Tri-State Mining Area in Transportation Projects.'' This document can be found in the RCRA docket established for today's proposed rulemaking.

B. What Are the Economic Impacts?

This Part summarizes projected cost impacts, economic impacts, and benefits associated with today's proposal. A brief market profile is first discussed, followed by specification of the economic baseline. Costs and economic impacts are next discussed. These estimates are presented on an annualized basis. Finally, this Part presents a qualitative discussion of potential benefits associated with today's proposed action.

1. Chat Market Profile

Chat is a byproduct of mining and milling operations that has been exempted from regulation as a ''hazardous waste'' under RCRA.[14] However, given the varying concentrations of lead (a hazardous substance) present in chat, and the risks posed to human health and the environment, it is subject to CERCLA regulations. Currently, chat in the Tri-State mining area is found in above-ground piles of varying sizes, reflecting the different types of mining operations that occurred in each area. The total quantity of chat in the Tri-State mining area is roughly 100 million tons. A relatively small percentage of this total is currently used annually in road building or other beneficial use projects.

A small, but well-established market for chat in transportation applications currently exists. The preparation and use of chat is dominated by a few small operations that purchase, process, and distribute chat to area highway departments, primarily for use as an aggregate in asphalt. Approximately 95 percent of all current chat use is for aggregate in asphalt. A wide range of different projects comprise the remaining 5 percent.[15] We have no evidence there is any current use of chat in cement or concrete.

The demand for chat as aggregate in transportation uses is price sensitive and is limited by various technical and performance standards. However, consistent demand exists as long as ready-use chat can be provided at prices that are competitive with other sources of aggregate. The key cost drivers for chat include raw material costs, processing and washing, if conducted, and transportation. The current market price for chat, and other forms of aggregate, is approximately five dollars per ton. This estimate excludes transport cost, but includes processing and washing, even though such operations are not included as part of the proposal.

A limited number of small companies act as brokers, processors and distributors (washers and haulers) of the chat in the Tri-State area. Chat haulers and washers buy chat from several owners, each typically owning only a small amount of the total quantity of chat. Chat is both privately and publicly owned, including chat piles located on land controlled by the Quapaw Tribe of Oklahoma.

Historical trends and information from regional chat suppliers suggest that the demand for chat for transportation-related uses is unlikely to change significantly over the next couple of decades. The currently viable market is well defined and transportation costs make chat economically unattractive beyond current market limits. Within the current market, rates of growth for new roads are modest (estimated at less than 2 percent per year) and population densities in areas surrounding the Superfund sites are low. We are not able to determine what, if any, impact the proposed rule may have on chat demand for use in asphalt. Significant chat use in other applications, such as concrete, does not appear to be economically viable at this time.

2. Specification of the Analytical Baseline

Proper baseline specification is an important step to the accurate assessment of incremental costs, benefits, and other economic impacts associated with today's proposal. The baseline essentially describes the world absent the rule. The incremental impacts of today's proposal are evaluated by predicting post-rule responses with respect to the established baseline(s). The baseline, as applied in this analysis, is assumed to be the point at which today's proposal is finalized.

A clear baseline for this proposal is not known. Therefore, for today's action, we have developed our analysis relative to three alternative baseline scenarios to be applied across all Tri-State sites. These are:

Baseline 1: Chat Removal and Disposal in On-Site Subsidence Pits (with continuing use of chat at approximately the same amount for transportation projects, while remediation continues);

Baseline 2: Chat Consolidation, In-Place Containment, and Revegetation (with continuing use of chat at approximately the same amount for transportation projects, while remediation continues); and,

Baseline 3: No Further Action, Except Monitoring of Water Quality (with continuing use of chat at approximately the same amount for transportation projects).

These scenarios are in no way reflective of final Superfund decisions and are used only for economic analyses performed for today's action. Today's action in no way supports or creates federal subsidies for chat use. Furthermore, the Agency wishes to restate its current policy that EPA does not compensate for the removal and disposal of hazardous substances as defined under CERCLA.

3. Cost Impacts

The value of any regulatory action is traditionally measured by the net change in social welfare that it generates. Our economic assessment conducted in support of today's proposal evaluated compliance costs only. Social costs are not assessed due to data limitations and the lack of equilibrium modeling capabilities associated with this industry. The data applied in this analysis were the most recently available at the time of the analysis. Because our data and analytical techniques were limited, the cost impact findings presented here should be considered generalized estimates.

Our cost analysis examined the potential impact of the proposal based on the use of encapsulated chat stored at all four sites in the Tri-State area. Of the chat that is currently used at the four sites, ninety-five percent of it is used in asphalt transportation applications. Our cost analysis, therefore, focused on the use of chat as aggregate in asphalt. Chat may also be used for a variety of non-asphalt transportation products. However, available data appear to indicate that non-asphalt uses of chat from the Tri-State area generally are not economically attractive at this time.

The time frame we assume for chat disposal and/or removal for purposes of this rulemaking ranges from 10 to 20

[14] See 40 CFR 261.4(b)(7).

[15] Current non-transportation uses of chat include: component in non-skid surfaces, sand blasting material, and waste water treatment filters.

years.[16] Annualized costs under all scenarios incorporate a 3 percent interest rate for consistency with relevant Superfund analyses. Finally, all analytical scenarios assume that approximately 20 percent of the chat at each site would remain on-site because it is assumed that this amount may not present an unacceptable threat to human health or the environment. This assumption is solely used for this rule's economic evaluation and is not meant to reflect or signify Agency policy or final Superfund determinations.

Under all baseline scenarios, with no change in assumed market growth, our analysis indicates that annual incremental cost (beyond projected remediation costs) impacts associated with this proposal are approximately $50,000. This estimate incorporates costs associated with certification, recordkeeping and reporting. Sampling and analysis costs are not included. The Agency has decided not to propose environmental testing at this time.

In order to estimate the potential scope of remediation cost savings that may occur should the rule stimulate expanded chat use, we conducted a sensitivity analysis based on a Geographic Information Systems (GIS) analysis. This GIS analysis suggested that current demand for asphalt within 200 miles of the Tar Creek site might accommodate up to a doubling of chat demand (from one million tons per year to about 1.9 million tons per year) over the next ten to twenty years. This sensitivity analysis found that baseline remediation cost savings may be as much as $11.8 million/year and $31.0 million/year, under Baseline Scenarios 1 and 2, respectively (assuming the 20 year clean-up scenario). These figures represent cost savings of 29 percent and 33 percent of the total annual baseline 1 and 2 projected remediation costs.

Overall, our findings indicate that today's proposal is unlikely to result in chat management cost savings without increased demand for chat use in economically viable transportation projects. Additional ''expanded use'' scenarios are examined in the economic support document prepared for this action: *Assessment of Potential Costs, Benefits, and Other Impacts of Chat Use in Transportation Projects*, January 2006. This document is available in the docket established for today's action.

[16] This time frame is established as a generalized estimate for the greatest quantity. The Agency recognizes that selected sites may be addressed in less time (See *Assessment of Potential Costs, Benefits, and Other Impacts of Chat Use in Transportation Projects*, November 2005).

4. Economic Impacts

The potential economic impacts associated with the proposed rulemaking may include moderate effects on local companies resulting from changes in the use of chat. Our analysis indicates that the impact of the proposal on chat use over the next ten to twenty years is unknown. As a result, it is difficult to determine whether the regional or local companies will experience any significant economic impacts.

5. Benefits

Today's proposal is designed to establish standards that would clarify and facilitate the increased safe use of chat in transportation applications carried out in whole or in part with federal funds. The social benefits of this proposed action fall into two categories: reduced costs associated with remediation of Tri-State mining sites and reduced human health and environmental damage in the Tri-State area related to the timely removal of chat. The extent of these benefits is largely driven by the additional quantity of chat that can be used in transportation projects and the extent to which transportation uses result in reduced risks to human health and the environment, as compared to the remediation (baseline) options.

Avoided disposal and remediation costs are dependent upon the extent of the incremental increase in chat use over the assumed remediation period. Our analysis suggests that societal benefits may occur in the form of net cost savings under the expanded market scenario.

Should the rule, as proposed, fail to stimulate any accelerated use of chat in transportation projects above the current annual rate, human health and environmental benefits would be equivalent to those expected under the relevant baseline scenario(s). However, even under the more accelerated transportation use scenarios, the extent of our current knowledge indicates that the remediation of chat piles at the Tri-State sites is likely to result in human health and environmental risk reductions similar to baseline scenarios one or two.

IV. Executive Orders and Laws Addressed in This Action

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 [58 FR 51735 (October 4, 1993], the Agency, in conjunction with the Office of Management and Budget's (OMB's) Office of Information and Regulatory Affairs (OIRA), must determine whether a regulatory action is ''significant'' and therefore subject to OMB review and the full requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a ''significant regulatory action'' because it raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order. As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations are documented in the public record. The proposed rule is unlikely to result in any significant chat management costs or cost savings. Thus, the $100 million threshold for economic significance, as established under point number one above, is not relevant to this action. In addition, this rule is not expected to adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities. Thus, this rule is not considered to be an economically significant action.

We have prepared an economic assessment in support of today's proposal. This document is entitled: *Assessment of Costs, Benefits, and Other Impacts of Chat Use in Transportation Projects*, January 2006. Findings from this document are summarized under section III. B above. Interested persons are encouraged to read and comment on all aspects of this document.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget

(OMB) under the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2218.01.

The certification, reporting, and record keeping required under this proposal is necessary to ensure safe use of the product. Certification, recordkeeping and reporting requirements under this proposal are not voluntary and are not subject to confidentiality restrictions.

The burden associated with this proposal is projected to affect a limited number of entities. These include: three state governments (Oklahoma, Missouri, Kansas), possibly one Native American tribe (Quapaw Tribe of Oklahoma), and no more than fifty sand and gravel companies located in the states of Oklahoma, Missouri, and Kansas (NAICS 4233202).

The burden on respondents is estimated at 1,000 hours per year, with a total annual cost ranging from $40,000 to $60,000, depending upon labor costs. Although not directly required in the proposal, respondents would also need to read and understand the rule. The burden associated with reviewing the regulation is estimated at 100 hours, with a total annual cost estimated at $5,000. The burden on governmental entities is expected to be minimal (see table below).

SUMMARY OF ESTIMATED BURDEN TO RESPONDENTS AND GOVERNMENT

Activity	Number of hours per project	Estimated cost per hour	Estimated number of affected projects per year	Estimated total annual burden (hours)	Estimated total annual cost
Burden to Respondents:					
Certification, Reporting, Recordkeeping	5	$40–$60	200	1,000	$40,000–$60,000
Burden to Government: Negligible.					

Note: The burden to respondents also associated with reviewing the regulation is estimated at 100 hours, with a total average annual cost estimated at $5,000. This activity is not directly required by the proposal.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

The Agency requests comment on the need for this information, the accuracy of the burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 *et seq.*, generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act, or any other statute. This analysis must be completed unless the agency is able to certify that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and small governmental jurisdictions.

The RFA provides default definitions for each type of small entity. Small entities are defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposal on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This section summarizes whether the proposal establishing criteria for use of chat that is stored in the Tri-state mining area in transportation projects that are carried out in whole or in part with federal funds may adversely impact small entities. The market for both chat and ''virgin'' aggregate in asphalt production is mature and dominated by small businesses. In order to have a significant economic impact on a substantial number of small businesses, the criteria for chat use would have to cause a significant change in the quantity of chat that is used in highway applications. Our analysis indicates that the current market area is not likely to experience any significant change in the demand for chat as a result of the proposal. That is, while many chat processors, distributors, and users of chat are small businesses, significant economic impacts on a substantial number of these entities is not expected.

Therefore, today's rule is not expected to result in a significant impact on a substantial number of small entities. The reader is encouraged to review our regulatory flexibility screening analysis prepared in support of this determination. This analysis is incorporated into the ''Assessment'' document, as referenced above.

D. Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million

or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Today's rule contains no Federal mandates (under the regulatory provisions of Title II of the UMRA) for State, local, or tribal governments or the private sector. Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA.

EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments because the requirements proposed in today's action only apply to the private sector that uses chat in transportation construction projects funded wholly or in part using federal funds.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the regulation.

This rule, as proposed, does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in the Order. The rule focuses on requirements for facilities processing and using chat in transportation projects. This rule, as proposed, does not affect the relationships between Federal and State governments. Thus, Executive Order 13132 does not apply to this rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175: Consultation and Coordination with Indian Tribal Governments (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' ''Policies that have tribal implications'' is defined in the Executive Order to include regulations that have substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

Under Executive Order 13175, EPA may not, to the extent practicable and permitted by law, issue a regulation that has tribal implications, that imposes substantial direct compliance costs, and that is not required by statute, unless, among other things, the Federal government provides the funds necessary to pay the direct compliance costs incurred by tribal governments, and EPA consults with State and local officials early in the process of developing the regulation. Similarly, to the extent practicable and permitted by law, EPA may not issue a regulation that has tribal implications and that preempts tribal law unless EPA, among other things, consults with tribal officials early in the process of developing the regulation.

EPA has concluded that this rule does not have tribal implications in that it does not have substantial direct effects as specified in the Executive Order. In particular, EPA notes that this rule does not impose substantial direct compliance costs or pre-empt tribal law. Some chat piles are located on Indian country lands. Allotted lands of the Quapaw Tribe of Oklahoma (Quapaw Tribe) are estimated to contain about half of the 29 chat piles located within the Picher Mining Field site. The Tribal government may own or operate chat processing facilities, but this is undetermined. The proposed rule, however, is not expected to significantly alter the costs or procedures associated with managing these sites. Nor is the rule expected to significantly change the demand for, and income from, chat use. Furthermore, the removal of chat piles are likely to improve the environment and human health in these areas.

Nevertheless, during the development of this proposal, Agency personnel consulted with representatives of the Quapaw tribe. In addition, a draft of the preamble and rule was provided to the Quapaw Tribe for review and comment; comments were submitted in a letter dated February 9, 2006, a copy of which is in the docket for today's rulemaking. EPA also consulted with tribal government representatives on the Tri-State Natural Resource Damage Partnership during a meeting on October 25, 2005 in Pittsburg, Kansas. At the meeting, Tribal representatives generally supported the proposal. In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and tribal governments, EPA specifically solicits any additional comment on this proposed rule from tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045: ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. Today's proposed rule is not subject to the

Executive Order because it is not economically significant as defined under point one of the Order, and because the Agency does not have reason to believe the environmental health or safety risks addressed by this action present a disproportionate risk to children.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This rule is not subject to Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)). This rule, as proposed, will not seriously disrupt energy supply, distribution patterns, prices, imports or exports. Furthermore, this rule is not an economically significant action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This proposal does not require the application of technical standards (*e.g.*, materials specification, sampling, analyses). As such, the National Technology Transfer and Advancement Act does not pertain to this action.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, ''Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations'' (February 11, 1994) requires the Agency to complete an analysis of today's proposal with regard to equity considerations. The Order is designed to address the environmental and human health conditions of minority and low-income populations.

Our analysis indicates that chat piles in the Tri-State mining region are, in some cases, located near low-income populations. In addition, Quapaw allotted lands are located within the Picher Mining Field. Existing data on the human health and ecological impacts associated with chat suggests that these populations may be adversely affected by the presence of the chat piles. The removal of the chat from piles for transportation applications that are considered environmentally protective would likely have a positive impact on these communities. Therefore, we believe that today's proposal should not result in any adverse or disproportional health or safety effects on minority or low-income populations and, in fact, will likely improve environmental protection.

List of Subjects in 40 CFR Part 278

Environmental protection, Chat, Indians—lands, Mine tailings, Reporting and recordkeeping requirements, Waste.

Dated: March 23, 2006.

Stephen L. Johnson,

Administrator.

For the reasons set out in the preamble, in title 40, chapter I of the Code of Federal Regulations, a new part 278 is proposed to be added as follows:

PART 278—CRITERIA FOR THE MANAGEMENT OF GRANULAR MINE TAILINGS (CHAT) IN ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE IN TRANSPORTATION CONSTRUCTION PROJECTS FUNDED IN WHOLE OR IN PART BY FEDERAL FUNDS

Sec.
278.1 Definitions.
278.2 Applicability.
278.3 Criteria.
278.4 Certification and recordkeeping requirements.

Authority: 42 U.S.C. 6961 *et seq.*

§ 278.1 Definitions.

The following definitions apply in this part:

(a) *Asphalt cement concrete* means pavement consisting of a combination of layers, which include an asphalt surface constructed over an asphalt base and an asphalt subbase. The entire pavement structure is constructed over the subgrade. Pavements, bases, and subbases must be constructed using hot mix asphalt.

(b) *Chat* means waste material that was formed in the course of milling operations employed to recover lead and zinc from metal-bearing ore minerals in the Tri-State mining district of Southwest Missouri, Southeast Kansas and Northeast Oklahoma.

(c) *Encapsulation* means incorporation of chat into hot mix asphalt concrete or Portland cement concrete (PCC).

(d) *Hot mix asphalt* means a hot mixture of asphalt binder and size-graded aggregate, which can be compacted into a uniform dense mass.

(e) *Portland cement concrete (PCC)* means pavements consisting of a PCC slab that is usually supported by a granular (made of compacted aggregate) or stabilized base and a subbase.

(f) *Tri-State Mining District* means the lead-zinc mining areas of Ottawa County, Oklahoma, Cherokee County of southeast Kansas and Jasper and Newton Counties of southwest Missouri.

(g) *Federal or state remediation action* means State or federal actions undertaken pursuant to applicable federal or state environmental laws undertaken with consideration of risk assessments developed in accordance with state and federal laws, regulations, and guidance.

(h) *Transportation construction projects* means transportation construction projects which encapsulate chat in hot mix asphalt concrete or in Portland cement concrete.

§ 278.2 Applicability.

(a) These requirements apply to chat from the Tri-State Mining District used in transportation construction projects carried out in whole or in part using federal funds.

(b) [Reserved]

§ 278.3 Criteria.

(a) Chat must be encapsulated in hot mix asphalt concrete or Portland cement concrete; or

(b) Authorized for use by a State or federal response action undertaken pursuant to applicable federal or state environmental laws.

§ 278.4 Certification and recordkeeping requirements.

(a) *Certification.* For chat used under the jurisdiction of the U.S. Department of Interior, Bureau of Indian Affairs (BIA), the EPA certification below is not applicable. For all other chat, that is not part of demolished asphalt or concrete, the acquirer shall:

(1) Submit a signed, written certification to the environmental regulatory agency in the State where the chat is acquired within 30 days of the date of acquisition. The certification shall contain the following:

(i) Location of origin of the chat;

(ii) Amount of chat acquired; and

(iii) Certification statement: I certify under penalty of law that the chat used

in this transportation project will meet EPA criteria found in § 278.3.

(2) *Transfer.* If the chat is sold or otherwise transferred to another party, the acquirer shall provide a copy of the certification to the new owner of the chat. The new owner shall submit a certification according to paragraph (a)(1) of this section. The new certification supersedes all previous certifications.

(3) *Recordkeeping.* The acquirer of chat, and any other person that receives the chat, will maintain a copy of the certification for three years following transmittal to the State department(s) of the environment.

(b) [Reserved]

[FR Doc. 06–3104 Filed 4–3–06; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

44 CFR Part 67

[Docket No. FEMA–B–7459]

Proposed Flood Elevation Determinations

AGENCY: Federal Emergency Management Agency (FEMA), Department of Homeland Security.

ACTION: Proposed rule.

SUMMARY: Technical information or comments are requested on the proposed Base (1% annual-chance) Flood Elevations (BFEs) and proposed BFE modifications for the communities listed below. The BFEs and modified BFEs are the basis for the floodplain management measures that the community is required either to adopt or to show evidence of being already in effect in order to qualify or remain qualified for participation in the National Flood Insurance Program (NFIP).

DATES: The comment period is ninety (90) days following the second publication of this proposed rule in a newspaper of local circulation in each community.

ADDRESSES: The proposed BFEs for each community are available for inspection at the office of the Chief Executive Officer of each community. The respective addresses are listed in the table below.

FOR FURTHER INFORMATION CONTACT: Doug Bellomo, P.E., Hazard Identification Section, Mitigation Division, Federal Emergency Management Agency, 500 C Street SW., Washington, DC 20472, (202) 646–2903.

SUPPLEMENTARY INFORMATION: FEMA proposes to make determinations of BFEs and modified BFEs for each community listed below, in accordance with Section 110 of the Flood Disaster Protection Act of 1973, 42 U.S.C. 4104, and 44 CFR 67.4(a).

These proposed BFEs and modified BFEs, together with the floodplain management criteria required by 44 CFR 60.3, are the minimum that are required. They should not be construed to mean that the community must change any existing ordinances that are more stringent in their floodplain management requirements. The community may at any time enact stricter requirements of its own, or pursuant to policies established by other Federal, State, or regional entities. These proposed elevations are used to meet the floodplain management requirements of the NFIP and are also used to calculate the appropriate flood insurance premium rates for new buildings built after these elevations are made final, and for the contents in these buildings.

National Environmental Policy Act. This proposed rule is categorically excluded from the requirements of 44 CFR Part 10, Environmental Consideration. No environmental impact assessment has been prepared.

Regulatory Flexibility Act. The Mitigation Division Director of the Federal Emergency Management Agency certifies that this proposed rule is exempt from the requirements of the Regulatory Flexibility Act because proposed or modified BFEs are required by the Flood Disaster Protection Act of 1973, 42 U.S.C. 4104, and are required to establish and maintain community eligibility in the NFIP. No regulatory flexibility analysis has been prepared.

Regulatory Classification. This proposed rule is not a significant regulatory action under the criteria of Section 3(f) of Executive Order 12866 of September 30, 1993, Regulatory Planning and Review, 58 FR 51735.

Executive Order 13132, Federalism. This rule involves no policies that have federalism implications under Executive Order 13132.

Executive Order 12988, Civil Justice Reform. This rule meets the applicable standards of Executive Order 12988.

List of Subjects in 44 CFR Part 67

Administrative practice and procedure, Flood insurance, Reporting and recordkeeping requirements.

Accordingly, 44 CFR Part 67 is proposed to be amended as follows:

PART 67—[AMENDED]

1. The authority citation for Part 67 continues to read as follows:

Authority: 42 U.S.C. 4001 et seq.; Reorganization Plan No. 3 of 1978, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376, § 67.4

2. The tables published under the authority of § 67.4 are proposed to be amended as follows:

Flooding source(s)	Location of referenced elevation	*Elevation in feet (NGVD) +Elevation in feet (NAVD) #Depth in feet above ground		Communities affected
		Efffective	Modified	
Shoshone County, Idaho and Incorporated Areas				
Coeur d'Alene River:	At western Shoshone County boundary approximately 800 feet South of Interstate Highway 90.	None	+2149	Shoshone County Unincorporated Areas.
	At western Shoshone County boundary on the landward side of the levee at community of Cataldo.	*2150	+2155	
	Approximately 15,000 feet upstream from the western Shoshone County boundary.	None	+2164	
South Fork Coeur d'Alene River:	Approximately 1500 feet downstream of Theatre Road	*2221	2225	Shoshone County Unincorporated Areas.
	Just downstream of Elizabeth Park Road Bridge	*2343	+2343	City of Kellogg, City of Smelterville.

ATLANTIC STATES LEGAL FOUNDATION, INC.

February 10, 2011

VIA ELECTRONIC MAIL DERweb@gw.dec.state.ny.us

Tracy A. Smith
New York State Department of Environmental Conservation
625 Broadway, 12th floor
Albany, New York 12233-7013

RE: PROPOSED RESPONSE ACTION DOCUMENT
INTERIM REMEDIAL MEASURE WASTEBEDS 1-8 SITE
SUBSITE OF THE ONONDAGA LAKE SITE
ONONDAGA COUNTY, NEW YORK

Dear Mr. Smith:

Wastebeds 1-8 represent one of the only chances to reconstruct a small part of the complex wetland habitat that once surrounded Onondaga Lake. The removal of waste material from the site is possible at this site because it is relatively discrete, and aside from the contamination introduced by Crucible affecting a portion of the upper layers of the waste and the residual contamination at the base from the production of dichlorobenzenes, the majority of Wastebeds 1-8 is composed of Solvay waste.

The question of whether Solvay waste can be beneficially reused has, to date, not been adequately addressed. Therefore it is premature to either embrace or reject it. Atlantic States believes that the Solvay waste deposits at Wastebeds 1-8 should be treated as a resource, and not a waste, and a beneficial use determination should be performed to determine whether, and to what degree, this material could be used at another location. For example, could it be

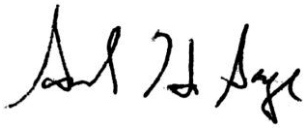
used as a capping material for the construction of the cap for portions of the Lake Bottom OU? Other possibilities are to neutralize acid mine drainage or as feedstock in the manufacture of concrete. Given its unique textural composition, clearly care needs to be taken to identify a use best suited to its properties.

Wastebeds 1-8, or the "white cliffs" as they are known, are a dramatic reminder of the thoughtless environmental degradation that characterized Onondaga Lake during most of the previous century. Their continued presence will always be a reminder of this grim history.

Adequate land exists around the NYS Fairgrounds to compensate for the loss of this area for Fairgrounds parking were this material to be removed and the wetlands reconstructed. The removal of waste from the site would present an unparalleled opportunity to create naturalized, accessible, wildlife rich wetland habitat. Groundwater remediation costs would be dramatically reduced by the removal of the overburden waste, because the removal of the source of groundwater contamination would substantially reduce the need for long term operation and maintenance of complex barrier structures.

Atlantic States would like to partner with NYS to assist in the development of habitat plans to reconstruct wetlands on the site. Design charettes and other interactive methods should be used to create a suite of habitat reconstruction projects that would be reflective of the needs and vision of the community. We welcome the opportunity to explore these ideas further with you.

Sincerely,



Samuel H. Sage
President

From: Bill Morse <wdmorse@verizon.net>
To: <DERweb@gw.dec.state.ny.us>
CC: "Muniak, Charles" <Charles.Muniak@yahoo.com>, Chris Somerlot <csomerlot@...
Date: 2/8/11 6:15 PM
Subject: Wastebeds 1-8 IRM Comments

Tracy A. Smith
New York State Department of Environmental Conservation
625 Broadway, 12th floor
Albany, New York 12233-7013

Dear Tracy;

I have reviewed the Wastebeds 1-8 Interim Remedial Measure Proposed Action Response Document. The recommended plan does appear to address the environmental concerns at the site, but I do have a few comments:

1. The proposal for shoreline stabilization of the steep portion of the shore includes live crib walls using timbers. Timber crib walls have a limited life expectancy. If this is supposed to be a permanent solution to the problem, it would seem that concrete rather than timber poles should be used for the construction.

2. The material excavated from Ditch A is proposed to be disposed of on-site. Given the small amount of material to be excavated, a better option would be to have the material taken to Bed 13 for disposal, instead of creating yet another disposal site.

3. Costs for leachate collection and treatment were only projected for five years, while final remediation is being designed. In the event that continued leachate collection and treatment is part of the final remediation, it would be helpful to have at least a preliminary estimate of how long collection and treatment would be required before levels of BTEX and other pollutants are reduced to safe levels.

Thank you.

William D. Morse, P.E.