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EPA Superfund
Record of Decision Amendment:

WOOLFOLK CHEMICAL WORKS, INC.
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FORT VALLEY, GA
08/30/2004

FINAL

WOOLFOLK CHEMICAL WORKS SITE, OU#3
AMENDED RECORD OF DECISION

August 27, 2004

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DECLARATION FOR THE

OU3 AMENDED RECORD OF DECISION

DECLARATION FOR THE OU3 AMENDED RECORD OF DECISION

SITE NAME AND ADDRESS

Woolfolk Chemical Works Site
Operable Unit 3, On-Facility Contamination
Fort Valley, Peach County, Georgia

STATEMENT OF PURPOSE

This Decision Document amends the Selected Remedy in the August 1998 Record of Decision (ROD) for Operable Unit 3 (OU#) of the Woolfolk Chemical Works (WCW) Site, Fort Valley, Peach County, Georgia. The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthonzation Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record (AR) for OU#3. Based on the lowering of the federal Maximum Contaminant Level (MCL) for arsenic and the results of the remedial design (RD) investigation, EPA now estimates the volume of contaminated material beneath the cap at 40,000 cubic yards (cy). This is an increase of nearly five times the original estimate. Similarly, the August 1998 ROD estimated the volume of contaminated soil outside of the capped area to be 31,500 cy. However, EPA now estimates a total volume of 77,000 cy exceeding the unpaved criteria of 20 parts per million (ppm) arsenic of which 24,000 cy exceeds the paved criteria (317 ppm arsenic).

This remedial action is taken to protect human health and the environment from the threat posed by OU#3 on-facility contamination. The State of Georgia, as represented by the Georgia Environmental Protection Division (GAEPD), has been the support agency during the remedial investigation/feasibility study (RI/FS) for OU#3. In accordance with 40 CFR § 300.430, as the support agency, GAEPD has provided input during this process. That State of Georgia has concurred with the amended remedy for OU#3.

ASSESSMENT OF THE SITE

The response action selected in this Amended Record of Decision (AROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of contaminants from OU4 into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This OU is the third of five (5) planned at the WCW Site. The selected remedy for OU#3 involves cleanup of the former WCW property and will address four (4) primary areas of concern on and within close proximity to the former WCW facility. 1) soil, 2) the capped area, 3) manufacturing buildings; and, 4) the facility's storm water sewer system. OU#l's remedy addresses groundwater. The remedy for OU#2 addressed nearby properties designated for a redevelopment property in a ROD signed in September 1995 OU#4's selected remedy includes the remaining cleanup actions near the WCW facility property including: surface soils (approximately 40 parcels), attic dust in residential homes (approximately 60 residences), and the portion of the ditch that drains away from the Site along Preston Street to Spillers Street OU#5 includes the portion of the drainage ditch that extends from the Spillers Street outfall or discharge pipe to the upper tributary of Big Indian Creek.

The scope of this AROD is limited to OU#3. This AROD is the same as the August 1998 ROD, except for the estimated volume of contaminated materials and the remedy selected for the existing capped area.

The U.S. Environmental Protection Agency (EPA) lowered the federal groundwater MCL for arsenic from 50 parts per billion (ppb) to 10 ppb. Since contaminated subsurface soil has the potential to release contaminant into the groundwater, the reduction of the groundwater MCL for arsenic requires a lower soil remediation level to ensure protectiveness of groundwater at the WCW Site. The subsurface soil remediation level was reduced from 113 parts per million (ppm) to 23 ppm at the Site to ensure protectweness of the groundwater. Because of analytical uncertainty in field screening techniques and inadequacy of sue characterization, 20 ppm has been identified as the site-wide remediation level for arsenic in soils.

The August 1998 ROD estimated that 8,000 cy of contaminated material was located beneath the existing cap, of which 4,000 cy would require treatment due to high levels of contamination. However, EPA now estimates that nearly 40,000 cy of contaminated soil exists beneath the cap. Due to this large increase in volume of contaminated material, the estimated cost to excavate, treat, and dispose of the material offsite exceeds $25.5 million, which is not cost effective. EPA has, therefore, changed the selected remedy for the existing cap to incorporate removal of the majority of the contaminated material in the capped area, excavating generally to an average depth of 15 feet below the existing grades, and deeper where required and practicable, as explained in further detail in this AROD. The excavation will be backfilled with soils from other areas of the Site that exceed only the unpaved criteria for arsenic of 20 ppm and/or clean offsite borrow soil (including OU4 residential soil). The areas will be recapped after it has been brought up to grade. In addition, a subsurface containment system will be installed around the capped area to isolate the remaining contaminated material from the groundwater. This is also the stated preferred remedy of both the state and local community.

For those areas that will not be paved, the soil remediation levels are based on the lower values of either the risk-based levels and groundwater protection levels for **unpaved soils**. For scenarios that include surface paving, the soil remediation levels are based on the lower values of either the risk-based exposure levels for a construction worker and groundwater protection levels for **paved soils**.

The major components of the selected remedy for this OU are as follows:

On-Facility Soils
The remedy for the on-facility soils which are not under the cap remains the same as the selected remedy in the 1998 ROD The remedy components include:

- excavation, ex-situ solidification/stabilization (S/S) treatment, and offsite disposal of soils contaminated above the remediation levels for paved areas (arsenic concentrations above 317 ppm),
- consolidation and paving with asphalt/concrete all areas with soils contaminated above the action levels established for unpaved soils (arsenic concentrations between 20 ppm and 317 ppm); and
- institutional controls to prohibit residential use of the property and require maintenance of the paving

Existing Cap
The remedy for the contaminated material under the existing cap has changed from the 1998 ROD because the total estimated volume has increased significantly and a portion of this contaminated material will

require excavation, treatment, and disposal. The remaining material under the cap will be left in place and shall be isolated by a subsurface containment system and new RCRA compliant cap. The remedy components include:

- removal of existing cap;
- excavation of the highly contaminated soils in the capped area to an average depth of 15 feet below the ground surface (Actual excavations may range from 4 feet to 25 feet deep depending on contaminant levels. Any additional excavation needed to achieve remediation levels (317 ppm arsenic) will be conducted to the extent practicable);
- In areas where groundwater is encountered or further excavation becomes technically impracticable or cost prohibitive before remediation levels are achieved, engineering or institutional controls will be implemented to address the remaining contaminants
- onsite treatment (S/S) and offsite disposal of soils contaminated above the remediation levels for paved areas (317 ppm arsenic);
- grading of capped area with excavated contaminated soils below the paved remediation levels or uncontaminated borrow soil;
- install a subsurface containment system completely around the capped area;
- reconstruction of a cap over the area; and
- establishment of institutional controls to prohibit residential use of the property and require maintenance of the cap This remedy may result in the leaving of hazardous substances on the WCW Site, therefore, institutional controls and additional site reviews may be required

Remedial action conducted in accordance with a Record of Decision (ROD) under the NCP are presumed to be in compliance with GAEPD's Hazardous Site Response Act (HSRA) Type 5 of the Risk Reduction Standards of Rule 391-3-19-.07(10).

Facility Buildings
The remedy for the facility buildings remains the same as the remedy selected in the 1998 ROD.

Storm Sewers
The remedy for the storm sewers remains the same as the remedy selected in the 1998 ROD.

STATUTORY DETERMINATIONS

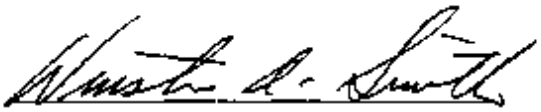
The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate, and is cost-effective. This remedy satisfies the preference for treatment that reduces toxicity, mobility, or volume as a principal element. Finally, it is determined that this remedy utilizes a permanent solution and alternative treatment technology to the maximum extent possible.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five (5) years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this OU.

- Chemicals of concern and their respective concentrations
- Baseline risk represented by chemicals of concern
- Cleanup levels established for chemicals of concern and the basis for those levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land use assumptions. Note that groundwater is assessed under Operable Unit 1 and that potential future beneficial uses of groundwater are not discussed in this AROD.
- Potential land use that will be available at the OU as a result of the selected remedy
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected
- Key factors that led to the selection of the remedy



WINSTON A. SMITH
DIRECTOR
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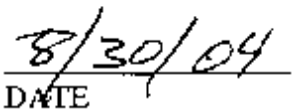


DATE

DECISION SUMMARY

DECISION SUMMARY

AMENDED RECORD OF DECISION
OPERABLE UNIT #3
WOOLFOLK CHEMICAL WORKS SITE
FORT VALLEY, GEORGIA

1.0 SITE NAME, LOCATION, AND DESCRIPTION

The approximately 31-acre Woolfolk Chemical Works (WCW) Site in Fort Valley, Georgia includes the 18-acre former WCW facility and the surrounding 13 acres where contamination has spread.

Figure 1-1 shows the Site's location and general layout. Operable Unit (OU) #3 is located in an area with mixed commercial and residential land uses. Residences are located to the west, south and east. Several businesses and light industries are located along the north, northwest, and east ends of the former plant.

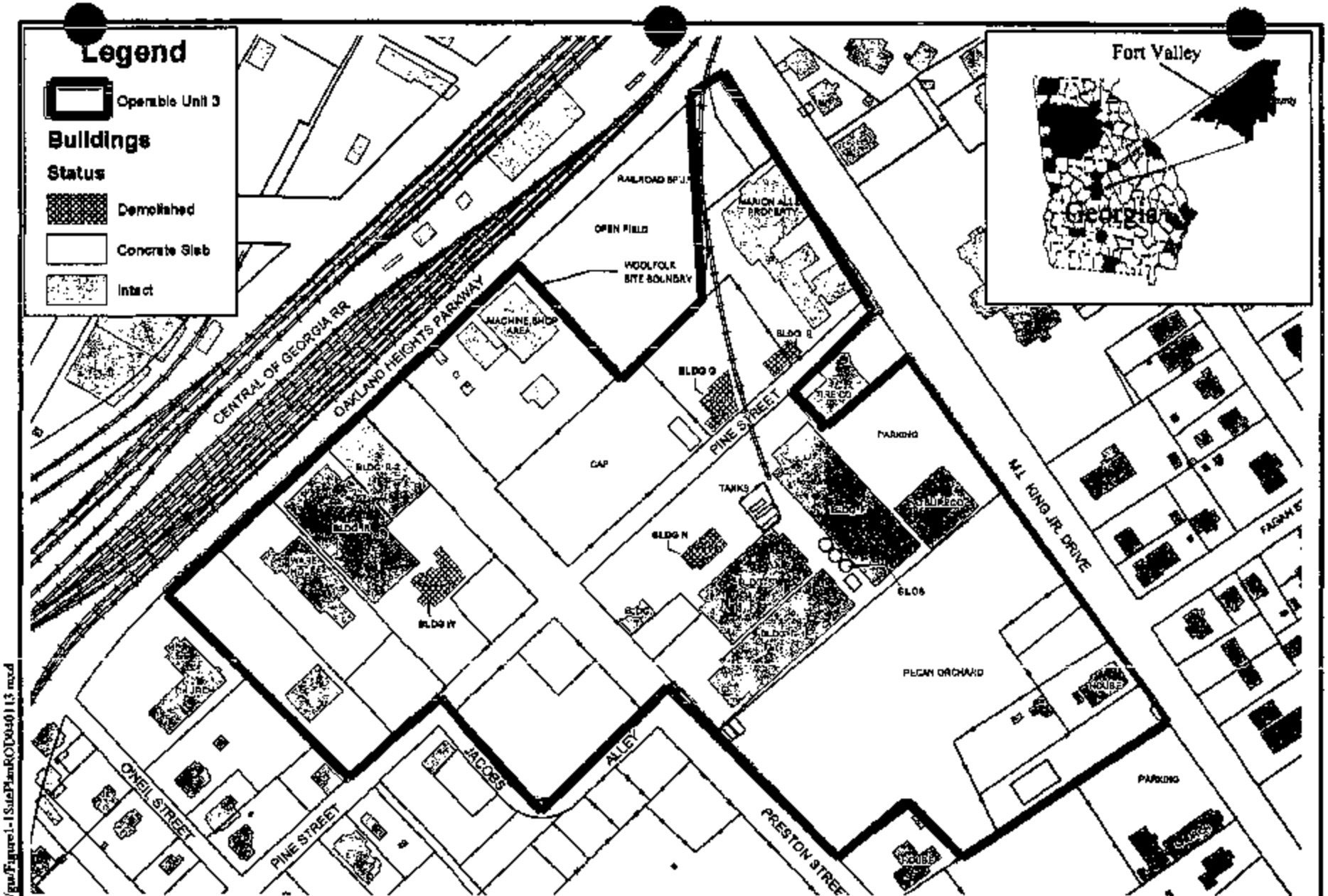
Numerous buildings and several above ground storage tank:; exist on OU3. Facilities/structures include the Sevin Plant (Building S-l), Liquids Plant (Building F), Buildings R, R-2, and S; former warehouses; the former shower and locker facility (Building T); the Dixon warehouse building; the Marion Allen Building; Antonine's Machine Shop; the former SureCo, Inc office building, a tank farm; and three (3) virgin clay silos A chain-link fence encloses most of OU3 and access is restricted by a series of gates OU3 is graveled or paved around the buildings and tank areas and is grassy in open, undeveloped areas. A stand of pecan trees exists at the southeast portion of OU3 Building E was demolished pursuant to a 1993 Unilateral Administrative Order (UAO) The Dust Plant (Building W), the Nitrogen Oxide (NO) Granular Plant (Building N), and the Lime-Sulfur Building (Building G) were demolished and the debris was removed from OU3 in November and December of 2001.

Businesses currently operating on the property of the former WCW facility include Antonine's Machine Shop and the Marion Allen Insurance and Realty Company. There are no other operations currently active there Canadyne Georgia Corporation (CGC) owns a one-acre parcel (the capped area) but does not maintain an active business at OU3 or the rest of the Site.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Production, formulation, and packaging of pesticides, herbicides, and insecticides (including arsenic and lead-based products) began on OU3 in 1910. Production was expanded during the 1950s to include dichlorodiphenyl-trichlorethane (DDT), lindane, toxaphene, and other chlorinated pesticides. In 1977, a subsidiary of Reichold Limited, now known as CGC, purchased the stock of Woolfolk Chemical Works, Inc. and the property and became the owner of the facility.

In the early 1980s, the Georgia Environmental Protection Division (GaEPD) investigated the Site in response to complaints from local citizens. The company was discharging waste products to a drainage corridor heading away from the facility. CGC sold the property and, as a part of that agreement, began a removal action to remediate the lead-arsenic plant and surrounding soils. In 1986-87, CGC, demolished the lead-arsenic plant, buried the contaminated material, and constructed a cap over the area. CGC retains ownership of the capped area. Contamination reports from this removal effort indicated a more extensive problem than originally expected.



Site Plan
Woolfolk Chemical Works Site OU3
Fort Valley, Georgia

Figure 1 - 1

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In 1984, CGC sold most of the assets to SureCo, Inc. However, CGC retained ownership of the central manufacturing area SureCo, Inc. formulated, packaged, and warehoused various organic pesticides used primarily in the lawn and garden market and by peach growers until late 1999.

The Site was put onto the National Priorities List (NPL) in August 1990 CGC entered into an Administrative Order on Consent (AOC) in April 1990 to implement a Remedial Investigation/Feasibility Study (RI/FS), which was used to develop the original Record of Decision (ROD) for OU3. The RI and the baseline risk assessment (BRA) indicated that there were 48 contaminants of potential concern (COPCs). However, the majority of the risk was driven by arsenic contamination. The RI also indicated that the contamination had spread from the 18-acre facility onto the surrounding residential properties. In December 1993, the U.S. Environmental Protection Agency (EPA) issued a UAO to implement a Removal Action at the Site. In March 1994, a ROD addressing the contaminated groundwater at the Site was issued.

The Removal Action resulted in the remediation of 26 residential properties, including the excavation and disposal of 22,900 tons of soil and debris. The drainage corridor was found to be significantly contaminated by arsenic and pesticides CGC was ordered to conduct a Removal Action in the most contaminated one-half mile area of the corridor. This action resulted in the removal and appropriate disposal of 26,000 tons of arsenic-contaminated soils and debris. Furthermore, CGC was also ordered to complete the demolition of a building used to package silvex [2(2,4,5-trichlorophenoxy) propionic acid (2,4,5-TP)], which contains dioxin. Approximately 45 cubic yards (cy) of demolition debris were shipped for incineration in Coffeeville, Kansas. Finally, house dust in eight (8) homes was found to have excessive arsenic levels. The cleanup of these homes was completed in July 1997, with monitoring activities in the homes conducted on a quarterly basis until June 1998.

CGC also purchased 17 residential properties and converted them to commercial use. EPA issued a second ROD in September 1995, which integrated the remediation and redevelopment of these properties into a library, an adult education center, and a welcome center for the City of Fort Valley. Construction of the library began in October 1996 and was completed in 1998. The welcome center for the city has been renovated and is open.

The initial OU3 ROD was signed on August 6, 1998. The ROD addressed the soils and buildings on the former WCW plant property, the capped area containing materials from earlier cleanup activities, and the storm water drainage system (i.e , Preston Street portion). In addition, a groundwater pump and treat system was installed for OU1 and was completed in 1998.

One of the potentially responsible parties (PRPs) indicated in a letter dated October 19, 1998 that it could not comply with an UAO issued to them, ordering them to implement the remedy in the OU3 ROD. Among other reasons, the PRP argued that it lacked the financial resources necessary to implement the ROD. The PRP also indicated that the volume of material in the capped area to be addressed in the ROD for OU3 was underestimated.

EPA proceeded with a Fund-Lead remedial design (RD) using an EPA contractor. In addition, sampling experts from the EPA Science and Ecosystem Support Division (SESD) and from GaEPD collected subsurface soil samples from the capped area to better determine the nature and extent of the contamination underneath the cap. Based on the data collected from this sampling effort, EPA estimated that the volume of contaminated soils under the cap could be as much as 40,000 cy, which was much larger than the estimate: contained in the original FS of 8,000 cy (4,000 cy of contaminated material and 4,000 cy of debris and sludge). As part of the RD, additional sampling was conducted in the spring of 2000 to further determine the volume of contaminated material in the capped area and contaminated soil outside of the capped area.

In January 2001, EPA lowered the Federal groundwater maximum contaminant level (MCL) for arsenic from 50 parts per billion (ppb) to 10 ppb. The reduction of the groundwater MCL for arsenic required that the soil remediation level be revised to ensure protectiveness of groundwater at the WCW Site. The subsurface soil remediation level was reduced from 113 parts per million (ppm) to 23 ppm to ensure protectiveness of the groundwater. Additional soil sampling was conducted during the RD investigation to determine the additional volume of soils that would have to be addressed.

Based on the lowering of the MCL for arsenic and the results of the RD investigation, EPA now estimates the volume of contaminated material in the capped area to be about 36,000 cy (exceeding the paved criteria) and 40,000 cy (exceeding the unpaved criteria), which is an increase of nearly 10 times the original estimate of 4,000 cy of contaminated material. Similarly, the original FS estimated the volume of contaminated soil outside of the capped area to be about 31,500 cy. However, EPA now estimates this volume to be 23,500 cy (exceeding the paved criteria) and 47,000 cy (exceeding the unpaved criteria). To meet the revised arsenic MCL groundwater protection requirements, EPA found that this volume increased from 47,000 cy to 77,000 cy.

The volume estimates evolved as follows:

Original FS
Onsite Soils - 31,563 cy > unpaved remediation levels (of these soils, 11,789 cy > the paved remediation levels)

Capped Area - 8,000 cy > unpaved remediation levels (of these soils, 4,000 cy were debris and sludge)

Note: Between the Original FS and the RD Phase I Sampling, EPA conducted a separate pre-RD investigation which resulted in a recalculation of the estimated volume of soil exceeding the unpaved remediation levels to approximately 40,000 cy.

RD (Phase I Sampling)
Onsite Soils - 47,000 cy > unpaved remediation levels (of these soils, 24,000 cy > the paved remediation levels)

Capped Area - 40,000 cy > unpaved remediation levels (of these soils, 36,000 cy > the paved remediation levels)

RD (Phase II Sampling initiated by change in the arsenic MCL)
Onsite Soils - 77,000 cy > unpaved remediation levels (of these soils, 24,000 cy > the paved remediation levels)

Capped Area - 40,000 cy > unpaved remediation levels (of these soils, 36,000 cy > the paved remediation levels)

During November and December 2001, EPA's Emergency Response and Removal Branch (ERRB) demolished Buildings W, N, and G The demolition debris was disposed at an offsite landfill.

Pursuant to an EPA order, CGC designed and installed a system to extract and treat the contaminated groundwater at or near the Site in 1997-1998. The system began operation in 1998 In 2001, EPA required CGC to conduct a comprehensive groundwater study to evaluate the effectiveness of the treatment system and to fully determine the nature and extent of groundwater contamination. The results from the 2001

groundwater study identified a contaminated groundwater plume moving off the OU3 property near Preston Street. In late March 2002, CGC informed EPA by letter that because of a lack of resources and the inability to obtain financing, effective August 30, 2002, it would no longer be able to comply with the UAO and would cease all operations of the groundwater extraction system. The groundwater extraction system has not been in operation since August 30, 2002. However, EPA is planning to recommission and restart the treatment system in 2004.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA has made significant efforts to ensure that interested parties have been kept informed and given an opportunity to provide input on activities at the WCW Site. EPA has been working with the community surrounding the WCW Site since 1990. In September 1990, press releases informing the community that the Site was added to the National Priorities List (NPL) were issued. Subsequent interviews were held that fall to develop a Community Relations Plan (CRP) In October 1990, the AR was sent to the information repository located at the Thomas Public Library, 214 Persons Street, Fort Valley, Georgia.. The CRP, which was finalized in November 1990, has been placed in the AR. In January 1991, EPA held a public meeting to discuss the start of the RI/FS.

In July 1993, EPA issued a press release and fact sheet on the findings of the RI study regarding soil contamination and health precautions recommended by the Agency for Toxic Substances and Disease Registry (ATSDR). On August 2-3, 1993, EPA conducted door-to-door visits to the potentially affected residents to further distribute the fact sheet and extend an invitation to the availability session. The availability session, held on August 3, 1993, discussed the results of the RI study and ATSDR's recommendations for health precautions. Fifty people attended the session which was hosted by EPA, GaEPD, and ATSDR Representatives of CGC were also present.

The FS Addendum (FSA) and Proposed Plan OU3 were released to the public on May 13, 1997 and added to the AR. The notice of availability of these documents and the rest of the AR was published on May 13, 1997, in various local publications. A public comment period was held from May 14, 1997, to August 8, 1997. In addition, a public meeting was held on June 12, 1997. At this meeting, representatives from EPA and the GAEPD answered questions about issues at the Site and the remedial alternatives under consideration. Responses to the significant comments received during this comment period were presented in the responsiveness summary in the August 1998 ROD.

As a result of the proposed change in the federal groundwater MCL for arsenic, from 50 ppb to 10 ppb, and the additional volume of contamination found during the RD investigation, EPA revised the FS and Proposed Plan. The revised FS and Proposed Plan were released to the public on July 3, 2003. The revised FS and Proposed Plan were made available in the AR on July 10, 2003. A public comment period was held from July 10, 2003 to September 10, 2003. In addition, a public meeting was held on July 10, 2003. Responses to the comments received during this comment period are presented in the responsiveness summary in Part III of this AROD.

EPA has been working with the community since 1990 and has made significant efforts to insure that interested parties have been kept informed and given an opportunity to provide input on activities performed at the WCW Site. However, through the removal and remedial process, citizens of Fort Valley, as represented by the Woolfolk Citizens Response Group (WCRG), a Technical Assistance Group (TAG) partially funded by EPA, have expressed the concern that EPA is providing inadequate information to the public. Although EPA has made the administrative record available in the public repository and has provided the monies for the TAG grant, it was suggested that these actions are not enough to promote a full

understanding of the Superfund process. In order to further the exchange of information between EPA and the community, EPA developed a Community Information Exchange Group. This group of community-selected representatives had met several times in 1995 in a public forum to discuss activities occurring at the WCW Site.

A second community group (The Alliance Group) was organized to provide a forum for all involved to discuss and address cleanup issues and future land use, so that the Woolfolk Site remediation results in a safe place to live, protects the environment and where possible, aids the local economy. The Alliance Group consists of local citizens and representatives from: The City of Fort Valley, Peach County, Fort Valley Utilities Commission, WCRG, businesses (Canadyne-Georgia Corporation, Holcomb Tire Corporation, SureCo Inc), and Federal and State Agencies [Agency for Toxic Substances and Disease Registry (ATSDR) Georgia Division of Public Health, Georgia Environmental Protection Division (EPD), Environmental Protection Agency Region 4 (EPA), and EPA Office of Research and Development (ORD), Cincinnati, Ohio]. The Alliance Group members generally meet every four (4) to six (6) weeks at the Peach County Courthouse or Fort Valley City Hall. The series of meetings has allowed in-depth discussions of the remedial alternatives and provided information to both EPA and the community relating to activities at OU3 prior to the beginning of the formal proposed plan process.

The Proposed Plans for OU3 and OU4 were released on July 10, 2003 for public comment. These documents were made available to the public as part of the Administrative Records (ARs) located in the EPA Region 4 Docket Room and at the information repository, located at the Thomas Public Library in Fort Valley, Georgia. The Notice of Availability of these documents was published in the Fort Valley Leader Tribune on July 8 and July 9, 2003 and in the Macon Telegraph and News on July 9, 2003. A public comment period was held from July 10, 2003 to August 10, 2003 and then extended to September 10, 2003. A public meeting for OU4 was held on July 10, 2003. At this meeting, representatives of EPA answered questions about the Site and the remedial alternatives under consideration for OU3 and OU4. A transcript of the public meeting, part of the Administrative Records for OU3 and OU4, can be reviewed at the information repository at the Thomas Public Library in Fort Valley, Georgia and at the Region 4 EPA Record Center in Atlanta, Georgia. In addition, a Responsiveness Summary that provides EPA comments on questions raised by the public is included as Part III of this ROD.

The community has been involved in the decisions regarding the reuse of OU3. Although community members would prefer that the remedy for OU3 completely remove all of the waste from the capped area, they are aware that the high costs of this alternative makes it an impractical solution. The community considers the current capped area, which is elevated by about 4 to 5 feet above the surrounding grades, an eyesore and would prefer a remedy that would lower the cap to match the surrounding grades. The community also considers the severely distressed former facility buildings a nuisance and a blight on the area that depresses the value of the surrounding properties. Therefore, they would prefer a remedy that includes the demolition of such structures.

4.0 SCOPE AND ROLE OF OPERABLE UNITS

The five (5) operable units currently underway or planned for the WCW Site under the Superfund long-term (remedial) program are:

Operable Unit 1

OU1 was created for the remediation of the Site's groundwater An attempt was made to capture and treat the contaminated groundwater plume with the construction and operation of an extraction and treatment system.

The system was designed and constructed during 1997 through 1998 and operated from 1998 through August 30, 2002. A 2001 study of the groundwater extraction and treatment system showed that the system was not effective in containing the contaminated plume. Citing a lack of financial resources, CGC shut down the extraction and treatment system on August 30, 2002. Evaluation of the system is ongoing and additional monitoring wells will be required to further delineate the extent of groundwater contamination. Additional design and system modifications are likely. EPA plans to restart the system in 2004.

Operable Unit 2

OU2 was created for the remediation and redevelopment of several residential properties contaminated by the WCW activities. A redevelopment property remedy was selected in a ROD signed September 1995 and construction was completed in 1998. A decontaminated antebellum farmhouse was remodeled into a tourist welcome center and office space for the Fort Valley Chamber of Commerce. Also, several contaminated homes were torn down to make way for a new community library. The library and welcome center have been completed and are open for business.

Operable Unit 3 (The subject of this AROD)

OU3 was created for the remediation of the WCW facility property. During November and December 2001, EPA's ERRB demolished Buildings W, N, and G. The demolition debris was disposed at an offsite landfill. Cleanup of OU3 will address the four (4) primary areas of concern on and within close proximity to the former WCW facility property: (1) soil, (2) the capped area, (3) the remaining buildings, and (4) the facility's storm water sewer system.

Operable Unit 4

OU4 was created for the remaining cleanup actions off the former WCW facility property including, surface soils (approximately 40 parcels), attic dust in residential homes (approximately 60 residences), and the portion of the ditch that drains away from the WCW facility property along Preston Street to Spillers Street

Operable Unit 5

OU5 was created for remediation of the drainage ditch that extends from the Spillers Street discharge pipe to beyond the railroad discharge into the upper tributary of Big Indian Creek. The ditch is contaminated with WCW site-related constituents. Originally, plans called for addressing the ditch as part of OU4, but additional ecological sampling and evaluation is needed before the ecological risk can be determined and cleanup alternatives developed. Therefore, OU5 was created to allow time for the needed sampling activities in the remaining portion of the ditch without delaying cleanup activity in OU4.

5.0 SITE CHARACTERISTICS

5.1 Site and Regional Settings

Please refer to the 1998 ROD for a description of the Site and regional settings.

5.2 Media Contamination

In a Baseline Risk Assessment (BRA) and subsequent addendum, discussed in Section 7.0, EPA evaluated the risks and developed performance measures associated with the contaminated soils on OU3. Using the RI data from the facility, EPA established that the chemicals of concern (COCs) for the soils are as follows:

- Inorganic Compounds: antimony, arsenic, cadmium, lead, and manganese.
- Semi-Volatile Organic Compounds: benzo(a) pyrene and hexachlorobenzene
- Pesticides: Benzene hexachlonde [(BHC) alpha, beta, delta, and gamma], chlordane, ODD, DDT, and toxaphene

5.2.1 Soil Contamination

During the RI, several pesticides (including toxaphene, DDD, DDE, DDT, dieldrin, and BHCs), arsenic, and lead were detected in both the surface (i.e., 0 to 1 foot) and subsurface (i.e., generally 1 to 8 feet) soil samples collected from locations on and off the former WCW plant property. Areas with elevated concentrations of one (1) or more of these constituents include the tank farm, capped area, Building W, Building S, west boundary of Marion Allen Insurance and Realty Company property, and the area northeast of the limehouse. Approximately 30 cy of soil beneath Building E were found to contain dioxin. This soil was not excavated during the removal action demolition activities, but was paved over and fenced to prevent exposure. The March 2000 RD investigation confirmed that the remaining dioxin concentration in the soils in this area were below the' soil action levels.

In general, the RI found that volatile and semi-volatile organic compounds were not detected as frequently as arsenic, lead, or pesticides in either the surface or subsurface soil samples. In addition, the concentrations of volatile and semi-volatile organic compounds were lower than the other constituents. The March 2000 RD investigation confirmed these findings.

5.2.2 Existing Cap

The existing cap was constructed in 1987 to contain contaminated soil, lime-sulphur sludges, and building debris from the 1986 CGC remediation of a lead-arsenate building. Angle boring samples were taken during the RI to determine the nature and extent of the material beneath the cap. Several pesticides (DDT, DDE, chlordanes, BHCs, heptachlor, and toxaphene), arsenic, and lead were detected in samples collected from below the cap.

In the fall of 1996, CGC also collected samples via horizontal borings to further characterize the capped material. Discrete samples were analyzed for pesticides, volatile organics, and semi-volatile organics compounds. A variety of contaminants were found ranging in depths from 7 to 25 feet below the cap surface. Although CGC did not follow EPA and GAEPD recommendations regarding the sampling effort, the results, which indicated high levels of contamination, were confirmed during the RD investigation.

Based on the lowering of the MCL for arsenic and the results of the RD investigation, EPA now estimates the volume of contaminated material in the capped area to be about 36,000 cy (exceeding the paved remediation level) and 40,000 cy (exceeding the unpaved remediation level), which is an increase of nearly five times the original estimate of 8,000 cy of contaminated material.

5.2.5 Structure Contamination

The RI found that several of the on-facility buildings were contaminated by the Site activities. Building E was demolished during the 1993 removal action and the debris disposed offsite. The RD investigation, conducted in March 2000, included sampling (wipe samples and wood core samples) from 15 of the on-facility buildings. The data indicated that the wipe samples from Buildings F, S, S-l, N, and W exceeded the remediation level for several pesticides. In addition, the soil beneath the slabs of Buildings F, G, S, and R exceeded the arsenic paved remediation levels. Buildings G, N, and W were demolished and the debris was removed from OU3 during the November/December 2001 removal action.

5.2.4 Surface Water and Sediment Contamination

The RI sampling results indicated that surface/storm water flowing offsite contained only trace levels of DDT, benzoic acid, and pentachlorophenol.

The RI results of sediment sampling from the former WCW facility indicated that pesticide concentrations, with the exception of toxaphene, are generally higher on the facility than downstream (intersection of Preston and Spruce streets). Toxaphene concentrations were detected at levels up to 12 milligrams per kilogram (mg/kg) downstream and were detected in three (3) out of four (4) samples throughout the storm water conveyance system. The inorganic constituent results of the sediment samples indicated that arsenic levels were generally higher on the facility than upstream or downstream.

As part of the 1993 removal action, EPA and CGC further characterized contamination in the drainage corridor leading south of the facility The 1993 removal action addressed the short-term potential for exposure to contaminated material by removing this material from an area approximately a half-mile in length along the drainage corridor. Further characterization of this downstream ditch will be addressed during the RI conducted for OU5.

5.2.5 Air Contamination

A total of 24 chemicals were detected in onsite air samples taken during RI sampling, including six (6) volatile organics, four (4) semi-volatile organics, 12 pesticides/herbicides, and two (2) inorganics (lead and arsenic).

5.2.6 Groundwater Contamination

Groundwater contamination is outlined in the ROD for OU1 The groundwater contamination levels for each of the aquifers at the Site are presented in Table 6-1 of the OU1 ROD. The performance standards (levels required to attain groundwater remediation) are established in Table 6-9 of the OU1 ROD. A comparison of these two (2) tables provides a view of the contamination at the Site.

6.0 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Soil

OU3 is located in an area with mixed commercial and residential land uses. Residences are located to the west, south and east, with homes to the southeast adjoining a peach orchard. Several businesses are located along the north, northwest, and east ends of the former plant. With exception of the capped area, a similar mix of future land use is anticipated for the OU3 properties, as residents and businesses will continue to inhabit the adjacent properties after remediation activities. In addition, based on discussions with city officials, anticipated future land use for OU3 itself may include a commercial and/or recreational uses, and citizens associated with this environmental justice site have expressed interest in developing residential areas to the west and south of OU3.

A Brownfields Grant for redeveloping the former WCW property has been issued to the City of Fort Valley by EPA. In addition, the City of Fort Valley, under a separate Superfund redevelopment grant issued by EPA, has approached Georgia Technical Institute of Technology to evaluate both current and future land use scenarios and to provide a design that integrates future land use with redevelopment under the Brownfields initiative. The redevelopment plans will be coordinated with the OU3 cleanup plans to ensure the protection of human health and the environment.

Groundwater

Currently the City of Fort Valley, Georgia operates several municipal wells that supply drinking water to local residents. These wells are tapped into the Tuscaloosan Aquifer underlying the WCW Site. Future similar use of the groundwater resources by the City of Fort Valley is expected. In addition, the GAEPD considers the groundwater in the Upper Cretaceous Aquifer as a valuable resource and has designated the aquifer as Class, I aquifer. This aquifer has been impacted primarily by the contaminated material located in the unlined disposal area in OU3 referred to as the capped area. The contaminated material buried in the capped area continues to be a source of groundwater contamination. The proposed remedy will isolate this source of groundwater contamination thereby helping to reduce the levels of contamination in the groundwater.

7.0 SUMMARY OF SITE RISKS

Please refer to the 1998 ROD for a discussion regarding the site risks

7.5.1 Groundwater Protection Soil Remediation Levels

Based on a recommendation from the National Academy of Sciences, EPA lowered the federal groundwater MCL for arsenic from 50 ppb to 10 ppb. Since contaminated subsurface soil has the potential to release contaminant into the groundwater, the reduction of the groundwater MCL for arsenic required that a revised soils remediation level be generated to ensure protectiveness of groundwater at the WCW Site. The subsurface soil remediation level for arsenic was reduced from 113 to 23 ppm at the Site to ensure protectiveness of the groundwater. EPA revised the FS to reflect the changes to the subsurface soil remediation level of arsenic. Because of analytical uncertainty in field screening techniques and inadequacy of site characterization, 20 ppm has been identified as the site-wide remediation level for arsenic in soils. Note that 20 ppm is protective of direct contact exposure and protection of groundwater.

For those areas that do not include paving, the soil remediation levels are the lower of the risk-based levels and groundwater protection levels for unpaved soils (**see Table 7-1**). For scenarios that include paving, it is assumed that the soil may still be contacted periodically by a construction worker who would need to access utility lines, therefore, the remediation levels are a combination of groundwater protection levels for paved soils presented in the revised FS and risk-based exposure levels for a construction worker, whichever are lower (see Table 7-1).

Table 7-1 Soil Remediation Levels

Chemical	Unpaved Soils (mg/kg)	Basis	Paved Soils (mg/kg)	Basis
Antimony	31*	Risk-HSRA (2)	76	Risk-EPA
Arsenic	20	GW-EPA/Risk-HSRA(l)	317**	Risk-EPA
Cadmium	1.5	GW-EPA	512	Risk-EPA
Lead	261*	Risk-HSRA (2)	930*	Risk-HSRA (4)
α-BHC	0.31	Risk-EPA	0.31	Risk-EPA
β-BHC	4.5	Risk-EPA	4.5	Risk-EPA

Chemical	Unpaved Soils (mg/kg)	Basis	Paved Soils (mg/kg)	Basis
β-BHC	5.1*	Risk-HSRA (2)	22.6	Risk-EPA
γ-BHC (Lindane)	7.0*	Risk-HSRA (2)	9.7	Risk-EPA
Chlordane	26*	Risk-HSRA (2)	36	Risk-EPA
DDD	37	Risk-EPA	37	Risk-EPA
DDT	27*	Risk-HSRA (2)	168*	Risk-HSRA (4)
Dieldrin	0.56*	Risk-HSRA (2)	3.1*	Risk-HSRA (4)
Hexachlorobenzene	0.330****	GW-EPA	13.2*	Risk-HSRA (4)
Toxaphene	8.3*	Risk-HSRA (2)	52*	Risk-HSRA (4)
Benzo(a) pyrene	1.3*	Risk-HSRA (2)	7.8*	Risk-HSRA (4)
Pentachlorophenol	76*	Risk-HSRA (2)	477*	Risk-HSRA (4)
2,3,7,8-TCDD TEQ	0.001	***	0.001	***

Notes
GW - Groundwater protection goal
TEQ - Toxicity equivalent
* - Changed from the Amended Proposed Plan to meet Georgia HSRA Standards
** - If remediation levels cannot be achieved, a default to HSRA Type 5 classification may be required to ensure protection
*** - EPA Region 4 Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites, OSWER Directive 9200 4-26
****- Previous remediation level of 0.13 mg/kg has been changed to the Contract Required Quantitation Limit (Detection Limit) of 0.330 mg/kg
(1) - Type 1 HSRA Standard (GA EPD Standardized Exposure Assumptions and Defined Risk Levels For Residential Properties)
(2) - Type 2 HSRA Standard (GA EPD Site-Specific Risk Assessment For Residential Properties)
(4) - Type 4 HSRA Standard (GA EPD Site-Specific Risk Assessment For Non-Residential Properties)

8.0 REMEDIAL ACTION OBJECTIVES

The CERCLA and National Contingency Plan (NCP) define remedial action objectives (RAOs) that are applicable to all Superfund sites. They relate to the statutory requirements for the development of remedial actions. Site-specific RAOs relate to potential exposure routes and specific contaminated media, such as soil, and are used to identify target areas of remediation and contaminant concentrations. They require an understanding of the contaminants in their respective media and are based upon the evaluation of risk to human health and the environment, protection of groundwater, information gathered during the RI, applicable guidance documents, and federal and state applicable or relevant and appropriate requirements (ARARs). RAOs are as specific as possible without unduly limiting the range of alternatives that can be developed for detailed evaluation. EPA set these RAOs because the groundwater is classified as drinking water and because the future land use will be a mixture of residential and commercial.

In consideration of the COCs and remediation levels, the RAOs for OU3 are as follows:

- prevent ingestion, inhalation, or direct contact with surface soil that contains concentrations in excess of the remediation levels;

- control migration and leaching of contaminants in surface and subsurface soil to groundwater that could result in groundwater contamination in excess of MCLs or health-based levels,

- prevent ingestion or inhalation of soil particulates in air that contains concentrations in excess of the remediation levels;

- permanently and/or significantly reduce the toxicity/mobility/volume (T/M/V) of characteristic hazardous waste with treatment, and

- control future releases of contaminants to ensure protection of human health and the environment.

9.0 DESCRIPTION OF ALTERNATIVES

The original ROD for OU3 addressed four primary areas of concern: (1) soil, (2) capped area, (3) remaining buildings, and (4) the facility's stormwater sewer system. Because subsequent site investigations and a change in the groundwater MCL for arsenic resulted in a much larger volume of soils that would need to be addressed, a set of alternatives addressing soil and capped area contamination were developed.

In formulating the alternatives, contaminants with concentrations above remediation levels, applicable technologies, and the contaminants that these technologies most effectively address were considered. The goal in developing remedial action alternatives is to provide a range of cleanup options together with sufficient information to adequately compare alternatives against each other.

The alternatives that were selected for soil/sludge/debris at OU3 include: (1) no action, (2) containment, (3) excavation/offsite disposal of highly contaminated soils and containment of remaining soils, (4) excavation of highly contaminated soils and in situ solidification/stabilization of remaining soils, and (5) total excavation of contaminated soils.

Remedial action conducted in accordance with a Record of Decision (ROD) under the NCP are presumed to be in compliance with GAEPD's Hazardous Site Response Act (HSRA) Type 5 of the Risk Reduction Standards of Rule 391-3-19-.07(10).

Except for the No Action Alternative, all the alternatives include several common elements listed below.

<u>Common Elements of Alternatives 9.2 through 9.5</u>

- Soils with concentrations greater than 20 mg/kg (unpaved) and 317 mg/kg (paved areas) will be addressed
- Approximately 150,000 cy of soil will be addressed
- Contaminated soils at the facility will be moved to and managed in the CAMU designated for OU3 in accordance with CAMU regulations
- Implementation of the remedy selected in the 1998 original ROD for remaining onsite buildings
- Implementation of the remedy selected in the original OU3 ROD for the onsite stormwater sewer system
- In areas where groundwater is encountered or further excavation becomes technically impracticable or cost prohibitive before remediation levels are achieved, engineering or institutional controls will be implemented to address the remaining contaminants

9.1 Alternative 1: No Action

Cost Summary
Estimated Capital Cost: $40,400
Estimated Annual O&M Cost: $66,900 (cost associated with maintenance, monitoring, and 5-yr review)
Estimated Present Worth Cost: $666,500
Estimated Time To Implement: <1 year

Under this alternative, no action would be taken to remedy the on-facility soil. The alternative would only involve the continued monitoring of soil, surface water quality, and groundwater quality at OU3. Approximately 20 soil, 10 groundwater, and 10 air samples would be collected from OU3 and analyzed for the COCs found every five (5) years for 30 years. Public health evaluations would be conducted every five (5) years and would allow EPA to assess the ongoing risks to human health and the environment posed by OU3. The evaluations would be based on the data collected from soil and groundwater monitoring. No institutional controls or other remedial actions would be implemented under the no-action alternative.

9.2 Alternative 2: Containment

Cost Summary
Estimated Capital Cost: $12.3 million
Estimated Annual O&M Cost: $69,200 (cost associated with maintenance, monitoring, and 5-yr review)
Estimated Present Worth Cost: $129 million
Estimated Time To Implement: 1 year

Soils
Alternative 2 consists of

- excavation, solidification/stabilization treatment, and offsite disposal (or direct offsite disposal without onsite treatment) of the highly contaminated soils (materials that significantly exceed the paved criteria in the existing capped area) outside of the existing capped area that exceed the paved criteria;
- excavation and onsite consolidation of the thin (generally on the order from 1 to 3 feet thick) layers of contaminated soil that exceed the unpaved criteria, and backfilling the shallow excavations using clean offsite soils,
- installation of a containment system around the contaminated materials and soils in the vicinity of the existing cap;
- extending the existing cap to cover the entire area bounded by the containment system; and
- Option A assumes placing asphalt pavement over the in situ and consolidated soils remaining outside the capped containment area that exceed the unpaved criteria. The excavated contaminated material would either be solidified/stabilized onsite for Subtitle D landfill disposal or hauled directly to a Subtitle C hazardous waste landfill without onsite treatment Option B of Alternative 2 involves transporting the contaminated soil directly to a Subtitle C landfill without treatment Option B assumes that the Subtitle C landfill will treat the materials and soils, as necessary, to meet the waste acceptance criteria (WAC). The containment system, the RCRA-type cap, and the underlying in situ kaolin layer would contain the contaminated materials in the existing capped area

Contaminated Soils Exceeding the Paved Criteria Outside Existing Cap Area

Contaminated soils outside of the existing capped area that exceed the paved criteria (arsenic - 317 ppm) would be excavated and removed from the Site. It is estimated that about 24,000 cy of contaminated soil

exceed the paved criteria and would be excavated. A treatability study would be performed to determine the appropriate treatment (if any) and if disposal of the waste as hazardous at a Subtitle C landfill would be required. If disposal of the waste at a Subtitle C landfill is not required, it would be sent to a Subtitle D landfill. If analytical testing indicates that contaminated soil could be disposed in a Subtitle D landfill, the soil would be stockpiled at a onsite CAMU and treated using solidification/stabilization technology. The treatment process would be designed to immobilize the contaminants and eliminate all free liquids in the materials and soils so that the treated material will meet the WAC of the Subtitle D landfill. The treatment process would consist of mixing the contaminated materials and soils with an additive such as Portland cement, fly ash, proprietary additives, etc., to meet the WAC requirements. The mix design for the solidification/stabilization technology would be based on treatability study results conducted during the design phase. In addition, the treatability testing would be necessary to develop mix designs that would meet the RCRA Toxicity Characteristic Leaching Procedure (TCLP) criteria for Subtitle D landfill disposal. The treated materials and soils would then be transported to an offsite Subtitle D landfill for disposal

Excavate and Consolidate Shallow Soils Exceeding the Unpaved Criteria

Shallow (generally on the order of 1 to 3 feet thick) contaminated soils outside of the existing capped area that exceed the unpaved criteria (arsenic - 20 ppm) would be excavated and transported for consolidation to the area surrounding the cap, where a substantial amount of the soils exceeding the paved cleanup criteria have been excavated About 40,000 cy of shallow (1-3 feet) contaminated soil exceeding the unpaved criteria are estimated to exist in areas at the outer perimeter of OU3. These soils would be excavated. Deeper excavations, to an approximate depth of 20 feet, would be required south of Building S-l, adjacent to Preston Street where a former drainage ditch ran.

Confirmation sampling would be performed within the excavated areas to ensure all contaminated soils that exceed the paved and unpaved criteria have been removed from these areas The shallow excavations would then be backfilled and graded with clean offsite borrow soils to complete remediation and establish these areas as clean without any deed restrictions. The excavated soils would be consolidated in the areas around the cap, where contaminated soils exceeding the unpaved criteria exist at depths of 10 to 20 feet. The areas of deep soil contamination would be covered with asphalt pavement and land use restrictions would be recorded in deeds

Extension of the Existing Cap

The existing cap would be retained and extended to cover the entire containment area The expanded cap will be designed to prevent rainfall infiltration and future leaching into the groundwater. In addition, capping also limits direct contact exposure to contaminated media under the cap CGC reported that the existing cap is a multi-layer soil/synthetic material cap and is in general in compliance with the guidance presented in the EPA technical guidance document, *Final Covers on Hazardous Waste Landfills and Surface Impoundments*, July 1989. The existing cap is about 170 feet by 320 feet in plan area and is approximately five (5) feet higher than the ground level of the surrounding area As reported by CGC, the cap, from top to bottom, consists of grass, 24 inches of topsoil, a filtering geotextile, 12 inches of granular drainage material, a 30-mil high-density polyethylene (HDPE) flexible membrane liner, and 24 inches of clay. The existing cap vanes from the RCRA cap requirements as follows: (1) the drainage layer permeability is slightly lower [2.6×10^{-3} centimeters per second (cm/s) versus 1×10^{-2} cm/s], (2) the geomembrane is 50% thicker (30-mil versus 20-mil), and (3) the clay permeability is slightly higher (2.5 to 6.0×10^{-7} cm/s versus 1×10^{-7} cm/s). The dimensions and properties of the existing cap would need to be verified during the RD investigation. If the existing cap is found suitable, the cap would be laterally expanded and connected to the proposed perimeter containment system. This type of cap produces a low permeability barrier sufficient to reduce surface water infiltration and vertical contaminant migration.

Land restrictions and fencing would also be employed for the capped area.

Subsurface Containment System

The subsurface containment system would either be a slurry wall, a synthetic sheet-piling wall, or a synthetic liner. The perimeter of the system would be designed to contain the majority of the contaminated soils in the existing cap area at OU3. The purpose of the containment system is to restrict lateral groundwater flow and lateral migration of contaminants.

- A slurry wall would be approximately 24 inches thick and would be physically tied into the cap at the top and seated into the underlying kaolin layer at about 40 feet below site grade (pavement level around the cap area) at the bottom Slurry walls are typically comprised of a soil-bentonite mixture and are designed to have a permeability value in the order of 1×10^{-7} cm/s or less. Other additives, such as attapulgite clay, cement, fly ash, and proprietary additives, could be added to the mix to affect the performance or physical properties of the slurry wall The mix design of the slurry wall would be developed during the remedial design phase, utilizing the results of a compatibility study, which would evaluate the performance of the wall with respect to the subsurface environment in the capped area. The mix design would be tested during the compatibility study for trench stability, adequate permeability, and long-term compatibility with the groundwater chemistry

- A synthetic sheet-pile wall would be selected if the compatibility study indicates that a slurry wall would be incompatible with the site groundwater or cannot meet the permeability requirements A synthetic sheet-pile wall is generally more expensive than a slurry wall The synthetic sheet-pile wall is typically comprised of panels of engineered thermoplastic material with interlocking vertical joints. The panels would be mechanically driven or vibrated into the ground to the proper depth or a slurry trench would be excavated and the panels lowered into the trench to the proper depth Care must be taken when installing the panels to ensure that each panel is properly aligned and not damaged during installation and that each panel joint is set correctly and is watertight.

- A synthetic liner may be selected to isolate excavated material brought into the capped area after the majority of the highly contaminated material from that area has been removed

Alternative 2 would eliminate direct contact with contaminated media, control onsite physical hazards, and restrict contaminant migration to surface water and groundwater from the containment and asphalt pavement areas. Land use deed restrictions would be necessary for the containment area and the asphalt cap areas.

Buildings

Remaining buildings at OU3 will be addressed as described in the 1998 OU3 ROD Note that Buildings E, G, N, and W on OU3 have already been demolished Building E was demolished during the 1993 removal action and Buildings G, N, and W were demolished during November and December of 2001 removal action. The resulting demolition debris was disposed at a suitable offsite landfill

Stormwater

The remedy selected in the 1998 OU3 ROD for the stormwater sewer system will be implemented, including removal and disposal of sediments, decontamination of the majority of the stormwater piping, and the removal/replacement of stormwater piping in the excavation areas.

9.3 Alternative 3: Excavate/Offsite Disposal of Highly Contaminated Soils and Containment of Remaining Contaminated Soils

Cost Summary
Estimated Capital Cost: $15.0 million
Estimated Annual O&M Cost: $66,900 (cost associated with maintenance, monitoring, and 5-yr review)
Estimated Present Worth Cost. $156 million
Estimated Time To Implement. 1 year

Soils Alternative 3 is the same as Alternative 2, except that the existing cap would be removed and a large quantity of highly contaminated materials (materials that significantly exceed the paved criteria) in the cap area would be excavated and disposed of offsite Alternative 3 consists of:

- removal of the existing cap,
- excavation and offsite disposal of the highly contaminated materials exceeding the paved remediation levels within the existing cap area to an average depth of approximately 15 feet (based on pre-RD analytical data, actual excavations may range from 4 feet to 25 feet deep depending on contaminant concentrations) below site grade or the pavement level surrounding the cap (if additional excavation is needed to achieve appropriate remediation levels, it will be conducted to the extent practicable)
- excavation and offsite disposal of the contaminated soils that exceed the paved criteria outside of the existing cap area;
- excavation and onsite consolidation in a CAMU of thin (generally on the order from 1 to 3 feet thick) layers of contaminated soil that exceed the unpaved criteria and backfilling the shallow excavations with clean offsite soils,
- backfilling the capped area excavations with less contaminated soil, constructing a new low-profile (i.e., the top of the cap will approximately match the surrounding grades) cap over the area, and installing a subsurface containment system (i.e., isolation wall or cell) around the remaining contamination to be left within the capped area, and
- Option A assumes placing asphalt pavement over the soil consolidation area outside of the capped area The excavated contaminated materials and soils would either be solidified/stabilized onsite for Subtitle D landfill disposal or hauled directly to a Subtitle C hazardous waste landfill without onsite treatment. Option B of Alternative 3 involves transporting the contaminated soil directly to a Subtitle C landfill without treatment. Option B assumes that the Subtitle C landfill will treat the materials and soils, as necessary, to meet the WAC The containment system, the RCRA cap, and the underlying in situ kaolin layer would contain the contaminated materials in the cap area.

The only difference between Alternative 3 and Alternative 2 is that an estimated additional 25,000 cy of highly contaminated material beneath the existing cap would be excavated and disposed of under Alternative 3. Highly contaminated materials are defined as those materials that significantly exceed the paved criteria in the existing cap area Removal of this highly contaminated material would further reduce the risk of human exposure and contamination migration. Removing the highly contaminated materials from beneath the existing cap would also provide space for the disposal of excavated soils, including those soils from OU4 that exceed the unpaved criteria. The at-grade surface of the cap could either be grassed or paved to improve its appearance. Land use deed restrictions would be necessary for the capped areas.

MatCon modified asphalt is an alternative to the conventional RCRA cap EPA is presently evaluating MatCon as part of the Superfund Innovative Technology Evaluation (SITE) Program. MatCon is a proprietary dense asphalt mixture currently being used to cover hazardous waste landfills The MatCon cap

is reported to have a permeability of about 10^{-8} cm/s and does not crack under small amounts of differential settlement typically encountered in hazardous waste landfills. The MatCon cap at OU3 is expected to be on the order of four (4) inches thick. This thin MatCon cap would provide additional space for soil disposal within the capped area

Buildings
Please refer to the description under Alternative 2

Stormwater
Please refer to the description under Alternative 2

9.4 Alternative 4: Excavation of Highly Contaminated Soils and In Situ Solidification/Stabilization of Remaining Contaminated Soils

Cost Summary
Estimated Capital Cost: $21.0 million
Estimated Annual O&M Cost: $67,200
Estimated Present Worth Cost: $21.7 million
Estimated Time To Implement: 1 year

Soils
Alternative 4 is similar to Alternative 3 except for the fact that after the highly contaminated soils have been excavated from the capped area, the remaining contaminated soils in the capped area would be treated in situ using solidification/stabilization technology. The excavation would then be backfilled and a clay cap would be placed over the former capped area There would be no need for a subsurface barrier wall using Alternative 4.

Alternative 4 involves

- removing the existing cap,
- excavating the highly contaminated materials and soils within the existing capped area to an average depth of approximately 15 feet (actual excavation will range from 4 feet to 25 feet) below site grade (if additional excavation is needed to achieve appropriate remediation levels, it will be conducted to the extent practicable).
- excavating the contaminated soil outside of the existing capped area that exceeds the paved criteria,
- excavating the contaminated soil outside of the existing capped area that exceeds the unpaved criteria to a depth of five (5) feet to accommodate the vertical space requirements for the new clay cap,
- in situ solidifying/stabilizing to the entire depth of remaining contaminated materials and soils, and
- Option A assumes constructing a low permeability 2-foot-thick clay cover over the stabilized/ solidified material. Clean offsite borrow soils that exceed the paved criteria would be necessary for backfill to balance the site earthwork. The excavated contaminated materials and soils would either be solidified/stabilized onsite for disposal at a Subtitle D landfill or hauled directly to a Subtitle C hazardous waste landfill without treatment. Option B of Alternative 4 involves transporting the contaminated soil directly to a Subtitle C landfill without treatment and would be necessary if the waste is determined to be hazardous. Option B assumes that the Subtitle C landfill will treat the materials and soils, as necessary, to meet the WAC.

It is assumed that the in situ solidification/stabilization will increase the volume of the treated materials by 10 percent. After solidification/stabilization, the resulting excavation would be backfilled with clean offsite soils, a 2-foot-thick low-permeability clay cap would be constructed over the solidified stabilized material, and the area restored with grass or pavement to improve the appearance. Treatability testing for both onsite and in situ solidification/stabilization would be necessary to develop a mix design that would meet RCRA TCLP criteria. Land use deed restrictions would be necessary.

Buildings
Please refer to the description under Alternative 2

Stormwater
Please refer to the description under Alternative 2

9.5 Alternative 5: Total Excavation and Offsite Disposal of Contaminated Soils

Cost Summary
Estimated Capital Cost: $25.1 million
Estimated Annual O&M Cost: $50,900 (cost associated with monitoring, and 5-yr review)
Estimated Present Worth Cost: $25.6 million
Estimated Time To Implement: 1 year

Soils
Option A involves excavating all the contaminated materials and soils in OU3 and disposing of the material in a landfill. The excavated contaminated material would either be solidified/stabilized onsite for Subtitle D landfill disposal or hauled directly to a Subtitle C hazardous waste landfill without onsite treatment Option B of Alternative 5 involves transporting the contaminated soil directly to a Subtitle C landfill without treatment if the soils meet the WAC of the landfill Option B assumes that the Subtitle C landfill will treat the materials and soils, as necessary, to meet the WAC and would be necessary if the waste is determined to be hazardous Offsite clean borrow soil would be used to backfill the excavation and land use at OU3 would not be restricted

Buildings
Please refer to the description under Alternative 2.

Stormwater
Please refer to the description under Alternative 2.

10.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives are evaluated against the threshold and primary balancing criteria specified in the NCP to : insure that the selected remedial alternative will protect human health and the environment, comply with or include a waiver of ARARs, be cost-effective, utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and address the statutory preference for treatment as a principal element

10.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with

ARARs. All of the alternatives for the soils and the capped area, except Alternative 1 (No Action), would provide protection of human health and the environment by eliminating, reducing, or controlling risk through removal, treatment, engineering controls, and/or institutional controls.

10.2 Compliance with ARARs

All the alternatives for the soils and capped area, except Alternative 1, would comply with ARARs. Alternative 1 is not protective of human health and the environment and would not comply with ARARs. Therefore, it will be eliminated from further consideration under the remaining seven (7) criteria.

10.3 Long-Term Effectiveness and Permanence

Each alternative was assessed for the long-term effectiveness and permanence it presents, along with the degree of certainty that the alternative will prove successful. Factors considered as appropriate included the

- magnitude of residual risk remaining from untreated waste or treatment residuals remaining at the conclusion of the remedial activities. The characteristics of the residuals are considered to the degree that they remain hazardous, taking into account their T/M/V and propensity to bioaccumulate..

- adequacy and reliability of controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste. This factor addresses the uncertainties associated with land disposal for providing long-term protection from residuals, the assessment of the potential need to replace technical components of the alternative, and the potential exposure pathways and risks posed should the remedial action need replacement.

Alternative 5 provides the most long-term effectiveness and permanence because all of the contamination above the remediation levels would be excavated, treated, and disposed in an offsite landfill. Alternatives 3 and 4 provide similar levels of protection and are more effective and permanent than Alternative 2, because they include excavation, treatment, and offsite disposal of a large quantity of highly contaminated materials and soils in the existing capped area [one (1) of the principal threats at OU3]. Alternative 4 utilizes solidification/stabilization to treat the remaining contamination below the average depth of 15 feet in the capped area. Alternative 3 uses isolation via a containment system. In Alternative 2, the containment system would be relied on to contain or isolate all of the contaminated material currently underneath the capped area Alternatives 2, 3, and 4 leave some soil contaminated above the remediation levels. All four (4) alternatives include institutional controls designed to prevent direct contact exposure and contaminant migration However, monitoring would be required to ensure long-term effectiveness and permanence.

Alternatives 3, 4, and 5 would allow more flexibility for future redevelopment of OU3 by leaving the capped area level with the ground surface after the remediation is complete. The area is currently zoned for residential and commercial/industrial use. However, the City of Fort Valley is considering commercial and recreational uses as part of future redevelopment.

10.4 Reducing Toxicity, Mobility, or Volume Through Treatment

The degree to which each alternative employs recycling or treatment that reduces T/M/V was assessed, including how treatment is used to address the principal threats posed by OU3. Factors considered as appropriate included the following:

- treatment or recycling processes that the alternative employs and the materials to be treated,
- amount of hazardous substances, pollutants, or contaminants that will be destroyed, treated, or recycled,
- degree of expected reduction of M/T/V of the waste due to treatment or recycling and the specification of which reduction(s) are occurring,
- degree to which the treatment is irreversible,
- type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility, and propensity to bioaccumulate such hazardous substances and their constituents, and
- degree to which treatment reduces the inherent hazards posed by principal threats at OU3.

Alternative 5 is considered the most effective in reducing the mobility through treatment because all of the contaminated materials and soils would be excavated, treated, and disposed in an offsite landfill. Alternatives 2, 3, and 4 are similar in the overall reduction of M/T/V, but the treatment criterion is met differently in each alternative.

Alternatives 3 and 4 reduce the mobility of a larger area of the principal threats (approximately 15 feet vertical average) of highly contaminated material from the capped area through excavation, treatment, and offsite disposal when compared to Alternative 2

The mobility of the remaining contaminated soils under Alternatives 2 and 3 would be reduced by isolating the contaminated materials inside a subsurface containment system and placing a cap or paving over them in the consolidation areas to prevent or minimize surface water percolation. Alternative 4 reduces the mobility of contaminated soils remaining through in situ solidification/stabilization treatment. Under Alternative 4, the mobility of the contaminated material remaining would be significantly reduced. However, the volume of material would actually increase due to the solidification/stabilization process.

Outside of the capped area, the mobility of contaminated material will be reduced under all alternatives. However, under Alternative 2, none of the highly contaminated material under the current capped area would be removed. As a result, a higher volume of very contaminated material would remain onsite in Alternative 2 compared to Alternatives 3, 4, and 5.

10.5 Short-Term Effectiveness

The short-term effectiveness of each alternative was assessed considering the

- short-term risks that might be posed to the community during implementation of an alternative,
- potential impacts on workers during the remedial action and the effectiveness and reliability of protective measures,
- potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation, and
- time until protection is achieved

Alternative 2 would present less short-term risk than Alternatives 3, 4, and 5 because no materials would be excavated from the existing capped area. The short-term effects of Alternatives 3 and 4 on workers and community are similar Equipment, materials, and techniques designed to control dust and runoff would be required for all of the alternatives. It is estimated that Alternative 2 would require the least amount of time to complete. Alternatives 3 and 4 would take longer than Alternative 2, but not as long as Alternative 5. Alternative 5 would present the greatest risk from a short-term prospective, because it would take longer to implement and it would require more trucks to remove all of the contaminated materials/soils from OU3.

10.6 Implementability

The ease or difficulty of implementing each alternative was assessed by considering the following types of factors as appropriate'

- Technical feasibility, including technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of the remedy.

- Administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (e.g., offsite disposal)

- Availability of services and materials, including the availability of adequate offsite treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists and provisions to ensure any necessary additional resources; and availability of prospective technologies.

All of the alternatives use conventional construction techniques and materials required to implement the alternatives are readily available. All of the alternatives require some level of excavation and some solidification/stabilization Alternative 5 is the simplest because it requires the least technology. Alternative 2 would be the next simplest because it only requires the addition of a subsurface containment system and an expansion of the current cap. Alternative 3 would be more difficult to implement than Alternative 2 because of the excavation and backfilling of the capped area Alternative 4 would be the most difficult of the alternatives considered, because of the in situ stabilization.

10.7 Cost

Cost estimates for each alternative are based on conceptual engineering and design. The types of costs that were assessed included:

- capital costs, including both direct and indirect costs;
- annual operation and maintenance (O&M);
- and net present worth of capital and O&M costs

The present worth of each alternative provides the basis for the cost comparison. The present worth cost represents the amount of money that, if invested in the initial year of the remedial action at a given rate, would provide the funds required to make future payments to cover all costs associated with the remedial action over its planned life.

The present worth analysis was performed on all remedial alternatives using a seven (7) percent discount rate over a period of 30 years.

Alternative 2 is the least expensive alternative. Alternative 3 is more expensive than Alternative 2, but less expensive than Alternative 4, while providing a similar level of protectiveness to Alternative 4 and a greater level of protection than Alternative 2. Alternative 5 is the most expensive.

10.8 Agency Acceptance

GAEPD staff has concluded that the existing cap has failed and may have been improperly installed. Therefore, Alternatives 1 and 2 are the least preferred alternatives. Alternatives 3, 4, and 5 are acceptable to GAEPD.

10.9 Community Acceptance

The community prefers Alternative 5 for the remediation of OU3. However, the community is aware that the high cost of this alternative makes it an impractical solution. Based on comments made by citizens at the public meeting held on July 10, 2003, and in comments submitted during the comment period, EPA believes that the community concurs with Alternative 3 and requests that it be implemented as soon as possible.

11.0 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable [NCP 300.430(a)(l)(m)(A)]. Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile, which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

Because of the potential for wind entrainment and/or surface runoff and the nature of much of OU3, surface soils with elevated levels of contaminants are considered principal threats. Except for Alternative 1 (No Action), all the alternatives will achieve substantial risk reduction by removing the source materials constituting principal threats at OU3

12.0 AMENDED SELECTED REMEDY

12.1 Remedy Description

Alternative 3 is the Selected Remedy for the soil and cap. This alternative is selected because it will provide substantial risk reduction by removing a major portion of the highly contaminated (exceeding the paved remediation levels) material in the capped area, improving overall protection and long-term effectiveness/ performance. The excavation resulting from the removal of the highly contaminated material will provide additional space for disposal of soils with lower contamination levels (exceeding the unpaved remediation levels) within the capped containment area. The excavation of the soils exceeding the unpaved remediation levels will in turn provide space for the disposal of less contaminated soil from OU4. The level of contamination within the contained and paved areas will be less than Alternative 2. Alternative 3 is substantially less expensive than Alternatives 4 and 5. As indicated above, there are no changes to the remedies for the buildings and storm sewers selected in the 1998 ROD.

The changes from the original 1998 ROD are as follows

- The soil remediation levels are presented in Table 7-1. The unpaved soil remediation level for arsenic was reduced from 113 ppm to 23 ppm as a result of the reduction in the arsenic MCL in groundwater from 50 ppb to 10 ppb. Because of analytical uncertainty in field screening techniques and inadequacy of site characterization, 20 ppm has been identified as the site-wide remediation level for arsenic in soils. Note that 20 ppm is protective of direct contact exposure and protection of groundwater.

- The volume of known contaminated and unstable materials increased from 8,000 cy to 40,000 cy in the capped area. EPA investigations, completed after the 1998 ROD was issued, discovered the additional contamination. Originally, all 8,000 cy of the contaminated and unstable materials were proposed to be removed from OU3. As already indicated in this AROD, about 25,000 cy of the 40,000 cy will be removed.

- The volume of known contaminated soils exceeding the remediation levels increased from approximately 32,000 cy (12,000 cy of this soil also exceeded the paved remediation levels) to approximately 77,000 cy (24,000 cy of this soil exceeded the paved remediation levels). As discussed previously, the estimated volume increased for two (2) reasons. First, during the RD investigation, EPA determined that there was significantly more contaminated soil exceeding the remediation level than earlier estimated. Second, when the arsenic MCL for groundwater was reduced, the remediation level had to be reduced to ensure that the remedy was sufficiently protective. The soils with contamination exceeding the paved remediation levels will be treated and removed from OU3. The soils with contamination exceeding the unpaved remediation levels will be consolidated under pavement or cap in a CAMU.

- Due to the increased volume of contaminated soils in both the capped area and the rest of OU3, the cost estimate for excavation, treatment, and offsite disposal increased from $9,029,000 to $15,652,700. Therefore, only a portion of the contaminated soil under the existing cap will be excavated, treated, and disposed of offsite.

Alternative 3 consists of:

- removal of the existing cap,
- excavation and offsite disposal of highly contaminated materials exceeding the paved remediation levels within the existing capped area to an average depth of approximately 15 feet (actual excavations may range from 4 to 25 feet deep depending on contaminant level) below site grade, which would be equal to a volume of about 25,000 cy (if additional excavation is needed to achieve appropriate remediation levels, it will be conducted to the extent practicable),
- excavation and offsite disposal of the contaminated soils that exceed the paved criteria outside of the existing cap area;
- excavation and onsite consolidation in a CAMU of the thin (generally on the order of 1 to 3 feet thick) surficial soils with contamination exceeding the unpaved remediation levels, and backfilling the shallow excavations with clean offsite soils;
- backfilling the cap area excavation with less contaminated soils (exceeding the unpaved remediation levels), constructing a new low-profile (i.e., the top of the cap will be approximately level with the surrounding ground surface) RCRA cap or an approved equivalent over the area, and installing a subsurface containment system around the capped area, and

- placing asphalt pavement over the contaminated in situ and CAMU consolidated soils remaining outside the capped containment area with contamination exceeding the unpaved remediation levels The excavated soils with contamination exceeding the paved remediation levels would be solidified/ stabilized onsite for Subtitle D landfill disposal. If the treated waste is not accepted by the Subtitle D landfills, the waste would be hauled directly to a Subtitle C hazardous waste landfill disposal without onsite treatment.

After the existing cap is removed and the highly contaminated materials are excavated from the capped area, the most contaminated soils that exceed the unpaved remediation levels (soils exceeding the paved remediation levels would have been removed) would be used to backfill the cap excavation. These less contaminated soils would be securely contained by a cap, containment system, and underlying in situ kaolin layer. Less contaminated soils, including excavated OU4 soils, that still exceed the unpaved remediation levels, would be used to backfill excavations around the capped area, where some deep contaminated soils exceeding the unpaved remediation levels could not be practically removed. These areas of consolidated soils would be covered with asphalt pavement in CAMUs. Soils from OU4 with arsenic concentrations below 20 ppm would also be used to backfill the areas where all the soils exceeding both the paved and unpaved remediation levels have been removed. These clean areas would have no land use restrictions.

Contaminated soil to be excavated and disposed offsite would in most cases require treatment onsite for disposal in a Subtitle D landfill. The disposal cost for a Subtitle D landfill is considerably less expensive than for a Subtitle C hazardous waste landfill. During the RD, treatability studies would be performed to determine a mix design that would meet Subtitle D landfill requirements If the requirements can not be achieved, Subtitle C landfill disposal would be necessary.

Remedial action conducted in accordance with a Record of Decision (ROD) under the NCP are presumed to be in compliance with GAEPD's Hazardous Site Response Act (HSRA) Type 5 of the Risk Reduction Standards of Rule 391-3-19-07(10).

The subsurface containment system will provide lateral containment in the cap area. During the RD, a treatability study may be performed to determine the type of containment system to be used (i.e., slurry wall, sheetpile wall, synthetic liner). If either the slurry wall or sheetpile wall is chosen, it would be tied into the cap at the ground surface and extend downward to penetrate into the underlying in situ kaolin layer.

MatCon modified asphalt is an alternative to use of a RCRA cap EPA is presently evaluating MatCon as part of the Superfund Innovative Technology Evaluation (SITE) Program. MatCon is a proprietary dense asphalt mixture currently being used to cover hazardous waste landfills. MatCon is reported to have a permeability of about 10^{-8} cm/sec and does not crack under small amounts of differential settlement typically encountered in hazardous waste landfills. A MatCon cap at OU3 would be on the order of 4 inches thick. This thin MatCon cap would provide additional space for disposal in the capped area.

12.2 Amended Selected Remedy Cost

The cost estimate for the selected remedy is shown on Table 12-1 and includes costs associated with soil excavation, ex-situ solidification/stabilization, disposal, cap construction, and containment system construction. The cost for Alternative 3 is estimated to be $15,652,700.

The cost summary table is based on the best available information regarding the anticipated scope of the remedial action. Changes in the cost elements may occur as new information and data are collected during the RD phase Major changes may be documented in the form of a memorandum to the Administrative

Record File, an Explanation of Significant Differences (ESD), or a ROD Amendment The projected cost estimate is expected to be within +50 percent or -30 percent of the actual project cost.

12.3 Expected Outcome of the Selected Remedy

Implementation of the selected remedy will significantly reduce risks associated with property use and eliminate OU3 as a source of multi-media contamination for the surrounding area. The selected remedy will result in a capped area and three (3) paved areas, all CAMUs with land use restrictions. The rest of OU3 will be clean with unrestricted land use.

TABLE 12-1

Alternative 3A
EXCAVATION/DISPOSAL/CONTAINMENT (SUBTITLE D DISPOSAL/SLURRY WALL/RCRA COMPOSITE CAP)

COST ESTIMATE SUMMARY

Site Woolfolk Chemical Works Site OU-3
Location Fort Valley, Georgia
Phase Feasibility Study (-30% to +50%)
Base Year 2002
Date July 24, 2002

Description Alternative 3A involves removal of the existing cap, excavation of wastes within the cap area that exceed the paved criteria to a depth of 15', excavation of onsite soils outside of the existing cap area that exceed the paved criteria, onsite solidification/stabilization (S/S) of excavated soils and disposal at a Subtitle D facility, excavation of onsite soils outside of the cap area that exceed the unpaved criteria, transportation of these soils to a containment area, paving over the containment areas, backfilling excavation areas, construction of a new Resource Conservation and Recovery Act (RCRA) composite cap over the containment area, and installation of a slurry wall around the capped wastes. Other capital costs associated with this alternative include removal and installation of security fence, demolition of four buildings and debris disposal, cleanout and inspection of onsite storm sewers, installation of monitoring wells, and proprietary controls (deed restrictions). Annual O&M costs include maintenance of the cap and lawn, and media monitoring. Periodic costs include Five-Year Review reports that document site conditions and effectiveness of this alternative.

CAPITAL COSTS

DESCRIPTION	WORKSHEET	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Equipment Mobilization	CW-16	1	LS	$1,694	$1,694	
Miscellaneous Requirements	CW-15	1	LS	$47,979	$47,979	
Onsite Storm Sewer Cleanout and Inspection	CW-46	1	LS	$127,501	$127,501	
Building Demolition and Debris Disposal	CW-47	1	LS	$807,988	$807,988	
Security Fence Removal	CW-5	1	LS	$9,295	$9,295	
Excavate and Stockpile Cap	CW-17	1	LS	$77,682	$77,682	
Excavate Contaminated Material Below Cap to Depth of 15 Feet	CW-18	1	LS	$243,504	$243,504	
Excavation Outside Cap Area Exceeding Paved Criteria	CW-40	1	LS	$92,415	$92,415	
Ex-Situ Solidification/Stabilization, and Disposal of S/S Soil at a Subtitle D Facility	CW-19	1	LS	$6,167,245	$6,167,245	
Excavation Outside Cap Area and Transfer of Contaminated Soil to Consolidation Areas	CW-32	1	LS	$315,836	$315,836	
Grading and Backfilling Site with Clean Fill	CW-21	1	LS	$703,450	$703,450	
Construct New RCRA Composite Cap over Existing Cap Area	CW-22	1	LS	$251,119	$251,119	
Paving over Contaminated Soils Outside Cap Area But Within Consolidation Areas	CW-12	1	LS	$312,077	$312,077	
Containment Wall Installation (Slurry Wall)	CW-41	1	LS	$288,941	$288,941	
Security Fence Installation	CW-5	1	LS	$41,770	$41,770	
Groundwater Monitoring Well Installation	CW-1	1	LS	$22,160	$22,160	
Equipment Demobilization	CW-16	1	LS	$1,694	$1,694	
SUBTOTAL					$9,512,350	
Contingency (Scope and Bid)		35%			$3,329,323	20% Scope, 15% Bid (Mid value of the recommended range)
SUBTOTAL					$12,841,673	
Project Management		5%			$642,084	Percentage from Exhibit 5-8 was used
Remedial Design		6%			$770,500	Percentage from Exhibit 5-8 was used
Construction Management		6%			$770,500	Percentage from Exhibit 5-8 was used
Proprietary Controls	NA	1	EA	$800	$800	EPA cost, assumes 8 hours of legal time, $100/hour
Public Meeting	NA	1	LS	$1,000	$1,000	EPA cost for one public meeting during implementation
TOTAL					$15,026,557	
TOTAL CAPITAL COST					$15,026,600	

TABLE 12-1 (continued)

Alternative 3A
EXCAVATION/DISPOSAL/CONTAINMENT (SUBTITLE D DISPOSAL/SLURRY WALL/RCRA COMPOSITE CAP)

COST ESTIMATE SUMMARY

Site	Woolfolk Chemical Works Site OU-3	**Description**	Alternative 3A involves removal of the existing cap, excavation of wastes within the cap area that exceed the paved criteria to a depth of 15', excavation of onsite soils outside of the existing cap area that exceed the paved criteria, onsite solidification/stabilization (S/S) of excavated soils and disposal at a Subtitle D facility, excavation of onsite soils outside of the cap area that exceed the unpaved criteria, transportation of these soils to a containment area, paving over the containment areas, backfilling excavation areas, construction of a new Resource Conservation and Recovery Act (RCRA) composite cap over the containment area, and installation of a slurry wall around the capped wastes. Other capital costs associated with this alternative include removal and installation of security fence, demolition of four buildings and debris disposal, cleanout and inspection of onsite storm sewers, installation of monitoring wells, and proprietary controls (deed restrictions). Annual O&M costs include maintenance of the cap and lawn, and media monitoring. Periodic costs include Five-Year Review reports that document site conditions and effectiveness of this alternative.
Location	Fort Valley, Georgia		
Phase	Feasibility Study (-30% to +50%)		
Base Year	2002		
Date	July 24, 2002		

ANNUAL O&M COSTS.

DESCRIPTION	WORKSHEET	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
New RCRA Cap Maintenance	CW-38	1	LS	$8,195	$8,195	Cost is per year
Lawn Maintenance	CW-38	1	LS	$3,394	$3,394	Cost is per year
SUBTOTAL					$11,589	
Contingency (Scope and Bid)		20%			$2,318	10% Scope, 10% Bid (Low end of the recommended range)
SUBTOTAL					$13,907	
Project Management		5%			$695	Low end of recommended range was used
Technical Support		10%			$1,391	Low end of recommended range was used
TOTAL					$15,993	
TOTAL ANNUAL MAINTENANCE O&M COST					$16,000	

ANNUAL O&M COSTS

DESCRIPTION	WORKSHEET	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Media Monitoring	CW-2	1	LS	$22,443	$22,443	Cost is per annual sampling event
SUBTOTAL					$22,443	
Contingency (Scope and Bid)		20%			$4 489	10% Scope, 10% Bid (Low end of the recommended range)
SUBTOTAL					$26,932	
Project Management		5%			$1,347	The low end of the recommended range was used
Technical Support		10%			$2,693	The low end of the recommended range was used
TOTAL					$30,972	
TOTAL ANNUAL MONITORING O&M COST					$31,000	

TABLE 12-1 (continued)

Alternative 3A
EXCAVATION/DISPOSAL/CONTAINMENT (SUBTITLE D DISPOSAL/SLURRY WALL/RCRA COMPOSITE CAP)

COST ESTIMATE SUMMARY

Site	Woolfolk Chemical Works Site OU-3
Location	Fort Valley, Georgia
Phase	Feasibility Study (-30% to +50%)
Base Year	2002
Date	July 24, 2002

Description Alternative 3A involves removal of the existing cap, excavation of wastes within the cap area that exceed the paved criteria to a depth of 15', excavation of onsite soils outside of the existing cap area that exceed the paved criteria, onsite solidification/stabilization (S/S) of excavated soils and disposal at a Subtitle D facility, excavation of onsite soils outside of the cap area that exceed the unpaved criteria, transportation of these soils to a containment area, paving over the containment areas, backfilling excavation areas, construction of a new Resource Conservation and Recovery Act (RCRA) composite cap over the containment area, and installation of a slurry wall around the capped wastes Other capital costs associated with this alternative include removal and installation of security fence, demolition of four buildings and debris disposal, cleanout and inspection of onsite storm sewers, installation of monitoring wells, and proprietary controls (deed restrictions) Annual O&M costs include maintenance of the cap and lawn, and media monitoring Periodic costs include Five-Year Review reports that document site conditions and effectiveness of this alternative

PERIODIC COSTS

DESCRIPTION	WORKSHEET	QTY	UNIT(S)	UNIT COST	TOTAL	NOTES
Five-Year Review Reports	CW-3	1	LS	$14,402	$14,402	Cost is per Five-Year Review Report
SUBTOTAL					$14,402	
Contingency (Scope and Bid)		20%			$2 880	10% Scope, 10% Bid (Low end of the recommended range)
					$17,282	
Project Management		5%			$864	The low end of the recommended range was used
Technical Support		10%			$1,728	The low end of the recommended range was used
TOTAL					$19,874	
TOTAL PERIODIC COST					$19,900	

PRESENT VALUE ANALYSIS

Table PV-3A provides detailed analysis of present value

COST TYPE	YEAR(S)	TOTAL COST PER YEAR	DISCOUNT FACTOR (7%)	PRESENT VALUE	NOTES
Capital Cost	0	$15,026,600	1 0000	$15,026,600	Capital (one-time) cost
Maintenance O&M Cost	1-30	$16,000	12 4087	$198,539	Annual cost
Monitoring O&M Cost	1-30	$31,000	12 4087	$384,670	Annual cost
Five-Year Review Cost	5	$19,900	0 7130	$14,189	Periodic cost
Five-Year Review Cost	10	$19,900	0 5083	$10,115	Periodic cost
Five-Year Review Cost	15	$19,900	0 3624	$7,212	Periodic cost
Five-Year Review Cost	20	$19,900	0 2584	$5,142	Periodic cost
Five-Year Review Cost	25	$19,900	0 1842	$3,666	Periodic cost
Five-Year Review Cost	30	$19,900	0 1314	$2,615	Periodic cost
				$15,652,748	
		TOTAL PRESENT VALUE OF ALTERNATIVE 3A		$15,652,700	

Notes

Percentages used for indirect costs are based on guidance from Section 5 0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000
Total costs presented on this table are rounded to the nearest $100

Abbreviations

NA not applicable
QTY quantity
LS lump sum

13.0 STATUTORY DETERMINATIONS

Under CERCLA 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the M/T/V of hazardous wastes as a principal element and a bias against offsite disposal of untreated wastes.

The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment by removing, treating, and isolating threats from OU3 in contaminated soil, sediment, and buildings. The selected remedy provides protection to human health and the environment by eliminating, reducing, and controlling risk through treatment, engineering controls, and/or institutional controls. Certain contaminated surface and subsurface soils and a portion of the existing capped soils at OU3 will be excavated and treated (if necessary) with ex-situ stabilization/solidification prior to being disposed of offsite. The remainder of the contaminated soils will be consolidated to minimize areal extent prior to being paved. In addition, a subsurface containment system will isolate the remaining contaminated soils in the existing capped area from the groundwater. There are no short-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the selected remedy.

Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy for OU3 complies with all ARARs. The potential ARARs are presented in detail in Tables 13-1 and 13-2.

Other Criteria, Advisories, or Guidance To Be Considered (TBC) for this Remedial Action

There are no other criteria, advisories, or guidance TBC for the OU3 remedial action.

Cost-Effectiveness

In EPA's judgment, the selected remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used. "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." [NCP 300 430(f)(l)(ii)(D)]. The conclusion that the selected remedy is cost-effective was reached by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (were both protective of human health and the environment and ARAR-compliant). Their overall effectiveness was evaluated by assessing three (3) of the five (5) balancing criteria in combination (long-term effectiveness and permanence, reduction in M/T/V through treatment; and short-term effectiveness). The overall effectiveness of the alternatives was then compared to costs to determine cost effectiveness The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and, hence, this alternative represents a reasonable value for the money to be spent

Table 13-1
Summary of Potential Federal Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Contaminant-Specific			
Clean Air Act National Primary and Secondary Ambient Air Quality Standards	42 USC § 7409 40 CFR Part 50	 Air quality levels that protect public health	Monitoring
Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste	 40 CFR Parts 262-265 and Parts 124, 270, and 271	 Defines those solid mining-related wastes that are subject to regulation as hazardous wastes under 40 CFR Parts 262-265, 124, 270, and 271	 Sample collection and analysis
Clean Water Act NPDES Dredge and Fill Requirements [Section 404(b)(1)]	33 USC § 1251-1376 40 CFR Part 122 40 CFR Part 230	 General permits for discharge from construction Action to prohibit discharge of dredged or fill material into wetland without permit	Review permit requirement during design phase Review permit requirements during design phase
Location-Specific			
National Historic Preservation Act	16 USC § 470, 36 CFR Part 800	Requires federal agencies to take into account the effect of any federally-assisted undertaking or licensing on any district, site, building, structure, or object that is included in, or eligible for, inclusion in the National Register of Historic Places (NRHP)	Survey of adjacent properties to determine status
Archeological and Historic Preservation Act	16 USC § 469, 40 CFR § 6 301(c)	Establishes procedures to preserve historical and archeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program	Survey of adjacent properties to determine status

Table 13-1 (continued)
Summary of Potential Federal Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Floodplain Management Executive Order	Executive Order 11988	Action to avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values of the floodplain	Determination of location of 100-year floodplain
Wetlands Management Executive Order	Executive Order 11990	Action to minimize the destruction, loss or degradation of wetlands	Activities limited to residential, commercial properties and/or manmade structures
Protection of Wetlands and Floodplains	40 CFR Part 6, Appendix A	Contains EPA's regulations for implementing Executive Orders 11988 and 11990	Same as for two executive orders listed above
Historic Sites, Buildings and Antiquities Act	16 USC §§ 461-467, 40 CFR § 6 301(a)	Requires federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks	Survey of adjacent properties to determine status
Endangered Species Act	16 USC §§ 1531, 40 CFR Part 6 302, 50 CFR Part 402	Requires action to conserve endangered species within critical habitat upon which species depend, includes consultation with the Department of the Interior	Review of previously completed wildlife survey
Fish and Wildlife Coordination Act	16 USC §§ 661-666c	Any federal agency which proposes or authorizes a modification to a stream, or water body which may affect fish and wildlife must consult with the Fish and Wildlife Service This act requires protection of fish and wildlife resources	No water body modification is anticipated, no additional action required
Migratory Bird Treaty Act of 1973	16 USC §§ 703	Established a prohibition, unless permitted, to pursue, hunt, capture, kill, or take any migratory bird or attempt any of these actions Also protects migratory birds in their environments	No impact to migratory birds is anticipated

Table 13-1 (continued)
Summary of Potential Federal Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Emergency Wetlands Resources Act of 1986	16 USC §§ 3901	Requires the Secretary to establish a National Wetlands Priority Plan and report to Congress on the loss of wetlands including the role federal agencies have in the loss of these wetlands	No impact to wetlands is anticipated
U S Fish and Wildlife Service Mitigation Policy	NPI#89-02	Provides for the policy to develop consistent and effective recommendations to protect and conserve natural resources Also allows federal and private developers to incorporate mitigation measures into the early stages of planning	No impact to natural resources is anticipated
National Environmental Policy Act of 1969	16 USC §§ 4331 40 CFR Part 1501	Requires federal agencies to prepare comprehensive environmental impact statements for every recommendation on proposals for legislation and federal actions which might significantly affect the quality of the environment	No adverse effect on environment is anticipated
Resource Conservation and Recovery Act	40 CFR Part 264	Requires hazardous waste facilities to be (1) located at least 200 feet from a fault and (2) designed to withstand a 100-year flood if located in the 100-year floodplain	Will be considered during design
Action-Specific			
Hazardous Materials Transportation Act Hazardous Materials Transportation Regulations	49 CFR Parts 10, 171-177	Regulates transportation of hazardous materials, including mining wastes that are not exempt under the Bevill Amendment	Adherence to all appropriate transportation regulations

Table 13-1 (continued)
Summary of Potential Federal Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Resource Conservation and Recovery Act			
Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and thereby constitute prohibited open dumps	Review during design
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards that apply to persons transporting hazardous waste within the U S if the transportation requires a manifest under 40 CFR Part 262	Adherence to all appropriate transportation regulations
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste	Review during design
Clean Water Act	33 USC § 1342		
NPDES	40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States	Review permit requirements during design phase
Dredge and Fill Requirements [Section 404(b)(1)]	40 CFR Part 230	Action to prohibit discharge of dredged or fill material into wetland without permit	
Occupational Safety and Health Administration Requirements	29 CFR 1910	Establishes requirements for workers at remedial action sites Any remedial action on-site must be performed in accordance with applicable OSHA standards	Development and adherence to a site health and safety plan

Table 13-2
Summary of Potential State Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Contaminant-Specific			
Hazardous Sites Response	GA Chapter 391-3-19	Establishes policies, procedures, requirements, and standards to implement the Georgia Hazardous Site Response Act (O C G A 12-8-90) In particular, Chapter 391-3-19- 07 establishes the risk reduction standards	Review during project implementation
Air Quality Control	GA Chapter 391-3-1	Establishes the policies, procedures, requirements, and standards to implement the Georgia Air Quality Control Law (O C G A Section 12-9-1) States that no person shall construct or operate any facility from which air contaminants may be emitted in such a manner as to fail to comply with any applicable standards of performance or any other requirement for a hazardous air pollutant established by EPA	Monitoring
Location -Specific			
Erosion and Sedimentation Control	GA Chapter 391-3-7	Establishes the requirements for obtaining a permit before any land disturbing activity is undertaken A plan must be developed before any land disturbance In addition, any land disturbing activity proposed within a 100-year floodplain must not adversely affect adjacent upstream or downstream properties by causing flooding, erosion, or sedimentation	Review permit requirements during design phase
Rules for Environmental Planning Criteria	GA Chapter 391-3-16	Establishes criteria for the protection of groundwater recharge areas and wetlands.	Review applicability of criteria during design phase

Table 13-2 (continued)
Summary of Potential State Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Game and Fish	O C G A Section 27	Wildlife species identified as endangered or threatened will be protected from harm, and that the disturbance, mutilation, or destruction of wildlife homes is prohibited	Review of previously completed wildlife survey
Endangered Wildlife & Windflower Preservation Acts of 1973	GA Code 12-6-172	Protection of endangered or threatened species that are state listed and not federally listed, or are more stringently listed by the state act than the federal act	Review of previously completed wildlife survey
Criteria for Siting Solid Waste Handling Facility	GA Chapter 391-3-4- 05	Provides criteria that must be met for a site proposed as a solid waste handling facility Defines requirements and restrictions for sites proposed for 100-year floodplain areas, wetlands, fault areas, seismic impact zones, and significant groundwater recharge areas	Will be considered during design
Action-Specific			
Hazardous Waste Management	GA Chapter 391-3-11	Establishes policies, requirements and standards to implement the Georgia Hazardous Waste Management Act (O C G A 12-8-60) Promulgated for the purpose of protecting and enhancing the quality of the State's environment and protecting the public health, safety, and well-being of its citizens Subparagraphs within this rule include 391-3-10- 04 (notification of hazardous waste activities), 391-3-10- 07 (identification and listing of hazardous waste), and 391-3-10- 11 (hazardous waste facility permits)	Monitoring, sample collection and analysis Review permit applicability during design phase
Transportation of Hazardous Materials	GA Chapter 672-10	Establishes the requirements for the transportation of hazardous materials and obtaining permits for such transportation	Adherence to all appropriate transportation regulations

Table 13-2 (continued)
Summary of Potential State Applicable or Relevant and Appropriate Requirements
Woolfolk OU3 Site

Standard, Requirement Criteria, or Limitation	Citation	Description	Action to be Taken to Attain Requirement
Air Quality Control	GA Chapter 391-3-1	Establishes policies, requirements, and standards to implement the Georgia Hazardous Waste management Act (O C G A Section 12-9-1) States that no person shall construct or operate any facility from which air contaminants are or may be emitted in such a manner as to fail to comply with any applicable standards of performance or any other requirement for a hazardous air pollutant established by EPA Establishes a system for classifying air pollution sources and assures compliance with emission control standards Sets forth ambient air quality standards which establishes certain maximum limits on parameters of air quality considered desirable for the preservation and enhancement of the quality of the State's air resources	Monitoring

Notes

CFR Code of Federal Regulations
NPDES National Pollutant Discharge Elimination System
OCGA Official Code of Georgia
USC United States Code

The estimated present worth cost of the selected remedy is $15,652,700. Using excavated soils from OU4 as backfill at OU3 can result in a cost- and logistics-efficient operation. Under other circumstances, the contaminated residential soils from OU4 would be excavated (although they would probably not require treatment) and would be transported to an offsite landfill. However, in this case, the soil that will be removed from the residences (after sampling to ensure that the concentration is below 20 ppm arsenic and would not cause unacceptable leaching into the groundwater) could be used as subsurface backfill in the unpaved areas of OU3. Based on the data available, none of the residential properties will have an average arsenic concentration above 30 ppm and could, therefore, be used as backfill in areas to be paved over without testing. Using residential soil as backfill for the excavated areas in OU3 would save transportation and landfill disposal cost for the OU4 surface soils. In addition, this same action would save the cost of purchasing and transporting backfill soils for OU3. Using the estimated volume of soils from the residences in OU4 as backfill could save as much as $4,000,000 in OU4 costs (landfill fees and additional transportation mileage) and as much as $400,000 in OU3 costs (clean fill purchase and additional transportation), while providing equal or greater protection to human health and/or the environment.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at OU3.

Preference for Treatment as a Principal Element

The statutory preference for treatment will be met because the selected remedy treats the most contaminated soil, which is the principal threat posed by OU3, prior to its disposal offsite.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five (5) years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

This AROD is the same as the August 1998 ROD, except for the estimated volume of contaminated materials and the preferred remedy for the existing cap. In addition, several of the soil performance standards have been lowered to be consistent with GA HSRA residential standards for soil The new remediation levels fall within EPA's carcinogenic risk range and/or meet EPA's industrial action level for soil at the Site This is also a change from the remediation levels presented in the July 10, 2003 Proposed Plan.

15.0 REFERENCES

CDM Federal Programs Corporation. 2002. *Final Remedial Investigation Report for Operable Unit 4, Remedial Investigation/Feasibility Study. Woolfolk Chemical Works Site, OU4, Fort Valley, Peach County, Georgia*, October.

CH2M HILL. 1992 *Final Remedial Investigation Report, Operable Unit 1, Woolfolk Chemical Works Site, Fort Valley, Georgia*, November

USACE (U.S. Army Corps of Engineers) 2002 *Residential Attic Dust Contamination Assessment Study at Fort Valley, Georgia* (Woolfolk Chemical Works, Inc.).

USGS (U.S. Geological Survey) 1972a. Perry West Quadrangle, Georgia, 7. 5-minute series topographic map. Photo revised 1984.

USGS 1972b Marshallville Quadrangle, Georgia, 7. 5-minute series topographic map Photo inspected 1981

USGS 1973 Fort Valley West Quadrangle, Georgia, 7 5-minute series topographic map. Photo revised 1985.

USGS 1974 Fort Valley East Quadrangle, Georgia, 7 5- minute series topographic map.

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
WOOLFOLK CHEMICAL WORKS SITE
OPERABLE UNIT #3: CONTAMINATION
FORT VALLEY, PEACH COUNTY, GEORGIA

The U.S. Environmental Protection Agency (EPA) held a public comment period from July 10, 2003 through September 10, 2003 for interested parties to give input on EPA's Proposed Plan for Remedial Action at the Woolfolk Chemical Works Superfund Site (WCW Site or Site) in Fort Valley, Peach County, Georgia. A public meeting was conducted by EPA on July 10, 2003, at the Pettigrew Center located at Fort Valley State University in Fort Valley, Georgia. At the meeting EPA presented the Proposed Plans for the WCW Sire's Operable Unit #3 (OU3) and Operable Unit #4 (OU4), which were based on the results of the Remedial Investigation and Feasibility Study (RI/FS).

A responsiveness summary is required to document how EPA addressed citizen comments and concerns about the Site, as raised during the public comment period. All comments summarized in this document have been factored into the final decision about the remedial action for OU3.

This responsiveness summary is divided into the following sections, and covers questions, concerns, and comments regarding OU3, or both OU3 and OU4

I. **Overview** - This section discusses the recommended alternative for remedial action and the public reaction to this alternative.

II. **Background on Community Involvement and Concerns**: This section provides a brief history of community interest and concerns regarding the Site

III. **Summary of Major Questions and Comments Received During the Public Comment Period and EPA's Responses**: This section presents comments submitted during the public comment period and provides the responses to these comments

IV. **Concerns to be Addressed in the Future**: This section discusses community concerns of which EPA should be aware during future actions

I. Overview

The preferred remedial alternative was presented to the public in a Proposed Plan released on June 30, 2003. A public meeting was held July 10, 2003 with about 71 people attending. EPA held a 30-day comment period from July 10, 2003 to August 10, 2003 and extended it to September 10, 2003 upon request from a potentially responsible party. EPA announced the public meeting and comment period in the Fort Valley Leader-Tribune and the Macon Telegraph prior to the start of the comment period EPA also mailed out the proposed plan to approximately 605 people on the WCW Site mailing list

The Proposed Plan addressed several areas of concern and proposed EPA's preferred alternative for each These areas included the contaminated soils within the OU3 Site, contaminated sediments within the OU3 stormsewers, and contamination within the OU3 buildings and structures.

People making comments for the record at the public meeting did not express opposition to the Proposed Plan. Most of the commentors were trying to gain a better understanding of the material presented by EPA.

Commentors generally posed their issues, ideas, and concerns in question format that included such topics as the CERCLA Superfund process, the contents of the cap area, the possibility of aquifer contamination, the difference between soil cleanup goals of 317 ppm versus 20 ppm, the location of streets relative to the designated consolidation/excavation areas, the details of the more recent emergency removal action, the distribution of the other 48 chemicals of potential concern and their correlation to arsenic, the location of homes whose attic dust was recently removed, the availability of referenced documents, groundwater contamination concerns, water system issues, and exposure to attic dust.

II. Background on Community Involvement and Concerns

EPA has made significant efforts to insure that interested parties have been kept informed and given an opportunity to provide input on activities at the WCW Site. EPA has been working with the community surrounding the WCW facility since 1990. In September 1990, press releases which informed the community about the addition of the Site to the National Priorities List (NPL) were issued. Subsequent interviews were held that Fall to develop a Community Relations Plan (CRP). The information repository for the Site was established in October 1990, at the Thomas Public Library, 213 Persons Street, Fort Valley, Georgia. The CRP, which was finalized in November 1990, was placed in the Administrative Record (AR) for the whole Site, located in the information repository. In January 1991, EPA held a public meeting to discuss the start of the RI/FS.

In July 1993, EPA issued a press release and fact sheet on the findings of the RI regarding soil contamination in residential areas and health precautions recommended by the Agency for Toxic Substances and Disease Registry (ATSDR). On August 2-3, 1993, EPA conducted door-to-door visits to the potentially affected residents to further distribute the fact sheet and extend our invitation to an availability session. The availability session, held on August 3, 1993 discussed the results of the RI and ATSDR's recommendations for health precautions. Fifty people attended the session, which was hosted by EPA, the Georgia Environmental Protection Division (GaEPD), and ATSDR Representatives of Canadyne-Georgia Corporation (CGC) were also present

EPA's Emergency Response and Removal Branch determined the extent of contamination which needed immediate response, excavated contaminated soils from the majority of residential properties, and completed the destruction of a dioxin-contaminated building (Building E) located on WCW property. CGC conducted this work, with EPA oversight, to comply with a UAO requiring the company to relocate some affected residents and destroy and remove Building E. Approximately 3,700 cubic yards of contaminated soil were excavated and disposed of at a permitted hazardous waste landfill in Emelle, Alabama. Other soil and debris were disposed of underneath an onsite cap. Throughout this process, EPA has met with the residents individually and held numerous public meetings.

The Feasibility Study, the Proposed Plan, and other OU1 documents contained in the AR, which addressed contaminated groundwater, were released to the public on January 18, 1994. These two (2) documents were made available in both the EPA Region IV Docket Room and the information repository near the Site. The notice of availability of these documents and the AR was published on January 18, 1994 in various local publications. A public comment period was held from January 18,1994 to February 17, 1994. In addition a public meeting was held on February 1, 1994. At this meeting representatives from EPA, ATSDR, and the State of Georgia answered questions about problems at the Site and the remedial alternatives under consideration for addressing contaminated groundwater. Comments on th<; OU1 Proposed Plan were addressed in the Responsiveness Summary attached to the OU1 Record of Decision (ROD).

EPA also hosted a series of five (5) meetings with a group of 11 community members representing different views throughout the community. The group formed under the already existing TAG group and was called the Community Information Exchange Group (CIEG). The purpose of the group was to meet in a public forum and discuss activities occurring at the WCW Site. The CIEG met from March through June 1995 and concentrated on issues related to OU2 and future actions at the Site. The remedy for OU 2 addressed the redevelopment of certain properties near the WCW facility into a library and other facilities.

The Alliance Group provides a forum for all involved to discuss and address cleanup issues and future land use, so that the Woolfolk Site and remediation results in a safe place to live, protects the environment and where possible, aids the local economy. The Alliance Group generally meets every four (4) to six (6) weeks at the Peach County Courthouse or Fort Valley City Hall. The Alliance Group consists of local citizens and representatives from: The City of Fort Valley, Peach County, Fort Valley Utilities Commission, Woolfolk Citizens Response Group (WCRG), businesses (Canadyne-Georgia Corporation, Holcomb Tire Corporation, SureCo Inc.) and Federal and State Agencies [Agency for Toxic Substances and Disease Registry (ATSDR) Georgia Division of Public Health, Georgia Environmental Protection Division (EPD), Environmental Protection Agency Region 4 (EPA) and EPA Office of Research and Development (ORD), Cincinnati, Ohio].

A Feasibility Study Addendum, a Proposed Plan, and the rest of the AR for OU2 were prepared and made available to the public on July 18, 1995. These two (2) documents were made available in the AR, maintained in the EPA Region 4 Docket Room and the information repository near the Site. The notice of availability of these documents and the AR was published on July 18,1995 in various local publications. A public comment period was held from July 18, 1995 to September 15, 1995. In addition a public meeting was held on August 29, 1995. At this meeting representatives from EPA and the State of Georgia answered questions about problems at the Site and the remedial alternatives under consideration EPA addressed those comments in the responsiveness summary in Appendix A of the OU2 ROD.

A FS Addendum, a Proposed Plan, and the rest of the AR for OU3 were prepared and made available to the public on July 10, 2003 in EPA Region 4's Docket Room and in the information repository near the Site. The notice of availability of these documents and the entire AR was published on July 3, 2003 in various local publications. A public comment period was held from July 10, 2003 to September 10, 2003. In addition a public meeting was held on July 10, 2003. At this meeting representatives from EPA and the State of Georgia answered questions about problems at the Site and the remedial alternatives under consideration EPA addressed those comments in the responsiveness summary in Appendix A of the OU3 ROD.

EPA provided a fact sheet to the community in February of 1996 on the status of all cleanup activities at the WCW Site. EPA continued to work with the Woolfolk Citizens Response Group (WCRG), the recipient of an EPA TAG, and their technical advisor, throughout 1996 and 1997 on such groundwater issues as the design for the groundwater cleanup remedy (OU1), redevelopment of the properties addressed by the OU2 ROD, and on both OU3 and 4 issues. In addition, EPA responded to numerous letters and phone calls from citizens and to Congressional inquiries to insure that the Fort Valley community had sufficient information on Superfund activities at the WCW Site.

III. Summary of Major Questions and Comments Received During the Public Comment Period and EPA's responses.

Citizens Comments

Mailing List Additions/Corrections (only) - **(OU3, OU4)**
Several individuals who responded during the public comment period had no specific comments. They were just requesting that EPA either add or update their contact or mailing address information The mailing list has been updated to include the latest information.

Monetary Compensation - **(OU3, OU4)**
Several individuals responded during the public comment period to inform EPA about where they lived, either now or previously, and the proximity of where they reside(d) to the former facility. These individuals asked about receiving monetary compensation for their potential exposure to chemicals previously used at the former WCW facility. The majority of individuals based their request on heresay from neighbors or friends who previously received compensation from CGC.

CERCLA, also known as Superfund, and its implementing regulations in the National Contingency Plan (40 CFR Part 300) govern EPA actions at all Superfund removal and remedial Sites, including the WCW Site. The statute and rules do not authorize EPA to pay any type of compensation from the Superfund or from any other source to persons who are potentially injured by contamination at a Superfund Site. Such damages can only be recovered in private law suits under state common law.

The only time EPA became involved with compensation for persons impacted by the Woolfolk Site contamination was when it reviewed the amount of relocation payments potentially responsible party (PRP). CGC made to residents displaced during removal activities the company conducted pursuant to the December 1, 1993 UAO As part of its oversight of the UAO's implementation, EPA ensured that CGC made payments commensurate with those provided for in the Uniform Relocation Act.

Any questions related to previously agreed-upon private settlements should be directed to CGC.

Exposure/Human Health Risk Assessment - **(OU3, OU4)**
Several individuals cited specific health problems they themselves or their deceased relatives experienced and their relationship to the former facility. Individual health concerns included both current conditions and conditions of deceased individuals, including breathing problems, blood pressure problems, headaches, skin conditions, swollen appendages, gastrointestinal irritation, anemia, miscarriage, and cancer. Several of these individuals cited confirmation of contaminated soil on their property.

Several individuals were concerned about the potential for exposure to contamination by either breathing dust or ingesting groundwater. One individual said discolored (yellow) groundwater was used for both potable and irrigation purposes.

While it is possible that the afflictions several individuals suffered were connected in some way to the contamination associated with the former facility, these types of problems can have many possible causes. The only way to state with any certainty whether there is a connection to the Site is through an epidemiological investigation. Such a study would examine whether there is an increased likelihood of disease due to exposure to contaminants released from the Site. Such studies are generally conducted by ATSDR.

With regard to groundwater, residents obtain water from the City of Fort Valley which has six (6) operating municipal wells located within a 12 mile radius of the Site that are set in the Tuscaloosa aquifer at depths in excess of 500 feet. As a municipal supplier, the City of Fort Valley regularly checks the water quality for compliance with state and federal water quality standards Residents in the vicinity of the Site who obtain water from private wells should contact EPA since testing of the water may be advisable.

General Statements **(OU3, OU4)**
Several individuals voiced their opinions about the extent of contamination in the air, soil, and groundwater as it relates to the WCW Site and the inefficiency of both CGC and EPA to identify the extent of contamination, alleviate their health concerns, and implement a remedy.

One individual specifically requested to receive any and all information about the cleanup.

Several individuals thought that EPA was doing a good job and were in general very pleased with the Proposed Plan

Canadyne-Georgia Corporation Letter to Angela Leach Regarding Proposed Plans for Operable Unit 3 and 4 (September 10, 2003)

Concern 1:
Questions about absence of required documents in ARs (OU3, OU4)

EPA Response:
EPA is preparing the ARs for OU3 and OU4 in compliance with the requirements of 42 U.S.C. Section 9613(k)(l), as well as 40 CFR §§ 300.800, 300.810, and 300.825. In response to this comment and previous requests by CGC, EPA is currently reviewing both ARs to ensure that all documents which formed the basis for the selection of the response actions proposed in both plans, as well as any others required by law, have not been inadvertently omitted.

CGC Comments (September 10, 2003)

Operable Unit 3 and Operable Unit 4 Feasibility Study Addenda and Proposed Plans

Concern 2:
CGC asserts that EPA has arbitrarily chosen overly conservative cleanup goals for arsenic-contaminated surface and subsurface soils for both Operable: Units 3 and 4. (OU3, OU4)

EPA Response:
The arsenic cleanup goal of 20 mg/kg for surface soil was selected based on site-specific arsenic data and human health exposure scenarios, as required by CERCLA. The results of these human health risk assessment calculations and summary of conclusions can be found in the Final Human Health Risk Assessment found in Section 5 of the Final RI Report dated October 2002. The arsenic cleanup goal of 20 mg/kg for subsurface soil was selected based on site-specific subsurface soil arsenic data and fate and transport modeling for protection of groundwater, conducted by EPA's Senior Hydrogeologist. The results of the groundwater protection fate and transport modeling calculations and summary of conclusions can be found in a report titled, "Woolfolk Chemical Site Review of Arsenic Soil Remedial Goals for Groundwater Protection," dated February, 2001.

Concern 3:
CGC asserts that EPA withheld documents related to the development of arsenic cleanup goals for soil, dust, and sediment at the WCW Site in violation of federal law. Furthermore, CGC has requested that EPA suspend consideration of the current Proposed Plans for OU3 and OU4 to allow time for CGC/CTEH to work with EPA to develop new arsenic cleanup goals based on probabilistic risk assessment and site-specific data. (OU3, OU4)

EPA Response: As indicated in EPA's response to Concern 2, the human health risk assessment and conclusions used as the basis for the arsenic cleanup goal for surface soil can be found in the Risk Assessment dated June 2002. Furthermore, the groundwater protection fate and transport modeling calculations and conclusions can be found in a report titled, "Woolfolk Chemical Site Review of Arsenic Soil Remedial Goals for Groundwater Protection," dated February, 2001.

All documents used to develop the arsenic cleanup levels for OU3 and OU4 are located in the Administrative Record.

Concern 4:
CGC asserts that EPA gives no explanation for the limited bioavailabihty of arsenic in soil in the development of cleanup goals for OU3 and OU4. **(OU3, OU4)**

EPA Response:
The risk assessment was prepared according to EPA guidance. In general, Region 4 will not accept any adjustment in the 100% bioavailability default assumption in the exposure equation without extensive supporting data. Credible site-specific bioavailability studies for arsenic require animal testing and are costly and time-consuming to perform.

Concern 5:
CGC asserts that an arsenic soil cleanup goal of 245 ppm is protective of groundwater at the OU3 and OU4. **(OU3, OU4)**

EPA Response:
As indicated in EPA's response to Concern 2 the groundwater protection fate and transport modeling calculations and conclusions can be found in a report titled, "Woolfolk Chemical Site Review of Arsenic Soil Remedial Goals for Groundwater Protection," dated February, 2001.

Concern 6:
CGC asserts that while CTEH's Probabilistic Risk Assessment is consistent with the State of Georgia Hazardous Site Response Act, EPA's soil action level is not. **(OU3)**

EPA Response:
CTEH did not follow the process for conducting a Probabilistic Risk Assessment (PRA) as outlined in EPA guidance. This process is described in detail in RAGS, Volume3, available at:

http://www.epa.gov/superfund/program/risk/rags3adt/

In particular, no work plan was prepared and EPA was not consulted during the preparation of the document Chapter 1 of RAGS, Volume 3 states "A workplan should be developed and submitted for review before commencement of a PRA The workplan should document the combined decisions of the Remedial Project Manager (RPM) and risk assessor in the risk assessment, and positions of the stakeholders."

Chapter 2 of RAGS, Volume 3 states: "A PRA workplan should be developed early in the risk assessment planning process for the site regardless of who will actually develop the PRA (e.g., EPA, EPA contractor, or PRP). If a PRP performs the PRA, the workplan should be submitted to EPA for review and approval prior to commencing the PRA. It should describe the intended PRA in sufficient detail so that EPA can determine if the work products will actually address risk assessment and management needs. It is important that the risk assessor and RPM discuss the scope of the probabilistic analysis and the potential impact it may have

on the remedial investigation/feasibility study. In general, regions should not accept probabilistic analysis when a workplan for the analysis has not been submitted to the Agency and approved by the regional risk assessor and RPM." Without an approved workplan, EPA will not accept the probabilistic evaluation of the cleanup level for OU3 and OU4.

Concern 7:
CGC asserts that EPA did not follow its own requirement to submit the proposed remedies to the National Remedy Review Board prior to issuing the Proposed Plans for OU3 and OU4 **(OU3, OU4)**

EPA Response:
EPA did follow its own requirements Submittal to the National Review Board is required if the costs of the Selected Remedy are greater than $30,000,000 or are greater than 50% of the costs of the least expensive remedy that meets the threshold criteria; protection of human health and the environment and meeting ARARs.

Concern 8:
CGC asserts that excavation of soils left in place along the Preston Street right-of-way is unnecessary to protect human health and the environment. **(OU3)**

EPA Response:
CGC initially proposed to remove all of the contaminated soil along the Preston Street right-of-way. However, subsurface contamination in the northern section of the Preston Street right-of-way (Railroad Street to the northern property line of 200 Chestnut Street) was left in place under paving and a 2-foot cover of imported backfill, with EPA's permission and understanding that the contaminated soil would be removed during site remediation.

In addition, there is insufficient information available to determine that the excavation of the contaminated soil is unnecessary to protect human health and the environment. EPA plans to sample and analyze the soil along the Preston Street right-of-way to obtain the necessary information.

If the contamination is found to exceed the paved area clean up goals, the soils must be removed. If the contamination is found to exceed the unpaved area clean up levels, the soils could remain in place under pavement, provided that they are above the groundwater level. However, in such a case, the contaminated soil will have to remain under pavement and deed restrictions would be required. Such conditions would be difficult and costly to maintain, particularly within the Preston Street right-of-way owned by the City of Fort Valley, Georgia.

Concern 9:
CGC claims the reasons that the drinking water aquifer associated with the WCW Site is not suitable for potable uses are unrelated to the Woolfolk Site and that they were not considered by EPA when it set the groundwater protection standards. **(OU3)**

EPA Response:
Please refer to the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6-13 Underground Injection Control.

Administrative Rules and Regulations of the State of Georgia, 391-3-6-13(4)(a) requires that all aquifers or parts of aquifers which meet the definition of an "underground source of drinking water" be treated as such. The drinking water aquifer at the Site meets the State's definition of source, therefore, the calculated groundwater protection standards are appropriate.

Because of analytical uncertainty in field screening techniques and inadequacy of site characterization, 20 ppm has been identified as the site-wide remediation level for arsenic in soils. Note that 20 ppm is protective of human health via direct contact exposure and meets the requirement for protection of groundwater.

Concern 10:
CGC asserts that EPA incorrectly stated the history of OU1 in the Proposed Plan as it relates to CGC's discontinued involvement at OU1. **(OU3, OU4)**

EPA Response:
It is EPA's position that the Agency operated within its authority by directing CGC to perform the necessary actions pursuant to the UAO for OUI.

Concern 11:
CGC asserts that there is no justifiable basis for EPA's decision to adopt a remediation plan for OU3 other than the remedy identified in the May 1997 Proposed Plan. **(OU3)**

EPA Response:
The remedy in the May 1997 Proposed Plan would not be protective of human health and the environment. During the RD investigations, substantially more contaminated soils, exceeding both the paved and unpaved clean up levels, were detected. Within the capped area, contaminated soils exceeding both the paved and unpaved clean up levels were found approaching or possibly into the groundwater. These soils are a source of contamination for the groundwater, which continuously moves laterally through the contaminated soils. This source of groundwater contamination must be either removed or controlled

Concern 12:
CGC asserts that neither excavation of the capped area nor construction of a containment wall is a cost-effective remedy for OU3. **(OU3)**

EPA Response:
The contaminated soils, which are sources of groundwater contamination, must be either removed or controlled. The combination of partial excavation and containment is cost effective as shown in the FS.

Concern 13:
CGC indicates that several additional comments generated by CH2M Hill and CTEH on the Proposed Plan require consideration and response. **(OU3, OU4)**

EPA Response:
Comment noted.

Attachment A - CTEH's Comments and Enclosures

Attachment B - CH2M Hill's Technical Memorandum and Enclosures

<u>Soil Cleanup Goal for Groundwater Protection</u>

The results of the groundwater protection fate and transport modeling calculations and summary of conclusions can be found in a report titled, "Woolfolk Chemical Site Review of Arsenic Soil Remedial Goals for Groundwater Protection," dated February, 2001.

Selected Remedial Actions for OU3 and OU4

OU3

Concern 14:
Cap Performance - CH2M Hill believes that the available data demonstrate that the current cap is preventing migration of contaminants contained within the cap. **(OU3)**

EPA Response:
EPA agrees that the RCRA-type cap currently in place minimizes the potential for infiltration of precipitation and this controls potential vertical migration of contamination to groundwater. However, the contaminated soils below the groundwater level in the capped area are still a source of contamination for the groundwater, which moves laterally through the contaminated soils. The underlying low permeability kaolin appears to be intact and continuous in the cap area, but it has been shown to be discontinuous on a larger scale. Therefore, the kaolin layer can not be relied on to prevent vertical migration into the underlying aquifers down gradient of the cap area. In addition, recent ground water investigations have shown that the existing groundwater recovery system is not effective in controlling migration of groundwater contamination. Contamination is moving down gradient in both the surficial aquifer above the kaolin layer and in the aquifers below the kaolin layer.

Concern 15:
Alternative 2 - Containment - In both the August 2000 FFS and the November 2000 FFS Addendum (Summary of Soil Alternatives Evaluation table), containment was shown to be the most favorable alternative based on CDM's own criteria rating assessment. **(OU3)**

EPA Response:
There was no reversal in ranking Alternative 2 (Containment) and Alternative 3 (Excavation/Disposal of Highly Contaminated Soils and Containment of Remaining Contaminated Soils). The Draft Addendum to the Focused Feasibility Study (FFS) (November 2000) is only a draft document which addressed a specific capping technology for the cap area and the on-facility contaminated soil, exclusive of the existing cap area of OU3. No specific conclusions or recommendations were intended for the cap area alternatives.

The FFS (August 2000) addressed only the cap area of OU3. In that document, the term "approximately similar" was used to generally compare Alternatives 2 and 3 with the other alternatives. Although not stated, Alternative 3 is more protective than Alternative 2, because the highly contaminated soils would be removed from the cap area, thus reducing the future risk of a significant release from the containment area. In addition, the FS (October 2002) combined the existing cap area and the surrounding on-facility contaminated soil for OU3. The alternatives considered in October greatly changed from those considered in the earlier FS document. The difference: is that the on-facility soils with the highest contamination exceeding the unpaved cleanup goals, excluding the cap area soils, are to be used as backfill in the cap area excavation. These contaminated soils are to be more securely contained by a cap and a containment wall This is more protective of human health and the environment than just placing pavement above them. The soils with contamination exceeding the paved cleanup goals are to be removed from the Site.

Further, when remediation of OU3 and 4 are combined, there is some cost savings associated with the extra disposal space provided by the cap area excavation.

OU4 Soils

Concern 16:
Question 1 - Is there a redevelopment plan? **(OU3, OU4)**

EPA Response:
The WCW Site is located in an area with mixed commercial and residential land uses. Residences are located to the west, south, and east, with homes to the southeast adjoining a peach orchard. Several businesses are located along the north, northwest, and east ends of the former plant. The same mix of future land use is anticipated for the OU4 properties, as residents and businesses will continue to inhabit the properties after remediation activities are completed. Based on discussions with city officials, anticipated future land use for the WCW Site may include commercial or recreational use. Residents associated with this environmental justice area have expressed interest in developing residential areas to the west and south of the Site.

A Brownfields Grant for redeveloping the former WCW Site has been issued by EPA. In addition, the City of Fort Valley, under a separate redevelopment grant issued by EPA, has approached Georgia Institute of Technology to evaluate both current and future land use scenarios and to provide a design that integrates future land use with redevelopment under the Brownfields initiative. The city is currently considering redevelopment of the WCW facility property into recreational areas or park Such scenarios could result in potential human contact with surface soils which will undergo remediation.

Concern 17:
Question 2 - Why did the soil volumes change? **(OU3)**

EPA Response:
The volume estimates evolved as follows

<u>Original FS</u>
Onsite Soils - 31,563 cy > unpaved levels (of these soils, 11,789 cy > the paved levels)
Capped Area - 8,000 cy > unpaved levels (of these soils, 4,000 cy were debris and sludge)

Note: Between the Original FS and the RD Phase I Sampling, EPA conducted a separate investigation which resulted in a recalculation of the estimated volume of soil exceeding the unpaved goals to approximately 40,000 cy.

<u>RD (Phase I Sampling)</u>
Onsite Soils - 47,000 cy > unpaved levels (of these soils, 24,000 cy > the paved levels)
Capped Area - 40,000 cy > unpaved levels (of these soils, 36,000 cy > the paved levels)

<u>RD (Phase II Sampling initiated by change in the arsenic MCL)</u>
Onsite Soils - 77,000 cy > unpaved levels (of these soils, 24,000 cy > the paved levels)
Capped Area - 40,000 cy > unpaved levels (of these soils, 36,000 cy > the paved levels)

Concern 18:
Question 3 - Were additional cost estimates prepared as a result of those changes? **(OU3)**

EPA Response:
The costs found in the final FS, located in the AR in the Information Repository, represent the most current cost estimate associated with the increase in soil volume resulting from the new arsenic MCL and RD sampling results

Concern 19:
Question 4 - Was the depth of excavation assumed to be the first sample depth that did not exceed soil goals [typically two (2) feet below the last exceedance depth] or was it assumed that excavation would stop at the depth of the last exceedance? **(OU3)**

EPA Response:
The estimated depth of excavation was determined based on the depth where the cleanup goals were last exceeded during the investigation. The actual excavation depths will be further refined during the remedial design.

Concern 20:
Question 5 - Several soil sample locations/depths remain undelineated How were these sample locations addressed in the soil volume calculations? **(OU3)**

EPA Response:
Assumptions of excavation depths in undelineated areas were made by reviewing and interpreting contaminant concentrations from adjacent sample locations. As indicated above, actual excavation depths will be further refined during the remedial design

Concern 21:
Question 6 - Will soils be excavated from beneath buildings and roadways? **(OU3)**

EPA Response:
Excavation will occur beneath roadways as necessary and underneath buildings that have been or will be demolished

Concern 22:
Question 7 - There were several detection limit exceedances of the soil cleanup levels. Were these areas assumed to be exceedance locations or assumed to be below the soil levels? **(OU3)**

EPA Response:
They were assumed to exceed the soil cleanup goals

Concern 23:
Question 8 - Do the volume calculations include appropriate slope and lay-back conditions to safely excavate to a depth of 25 feet? **(OU3)**

EPA Response:
Yes, except the around the cap area, where bracing was assumed.

Concern 24:
Question 9 - E6 is shown as an excavation area in the Proposed Plan However, there were no samples collected in this area. Why was this area selected for excavation? How deep does the excavation extend? **(OU3)**

EPA Response:
Although E6 is considered as an excavation area, the volume of contaminated soil was estimated for this area Construction confirmation testing will be performed to verify this assumption.

Attachment 1 - Specific Comments

Concern 25:
Question 10 - What are the criteria for excavation? (i.e., soils greater than paved standard) This information is essential for verification of the excavation volume. **(OU3)**

EPA Response:
The goal is to excavate, as much as practical, material with the greatest contamination (therefore, materials exceeding the paved cleanup goals) in the capped area. It is understood that the degree of contamination varies considerably, but generally, the degree of contamination decreases with depth so that much (but not all) of the material with the greatest contamination is accessible. In some places deeper excavation will be necessary to pursue the highly contaminated material. Some material with lower degrees of contamination will inadvertently be removed, but as much as possible, the highly contaminated material will be segregated from the lesser contaminated material, based on visual inspection, field screening techniques, and analytical testing

Concern 26:
Question 11 - Will removal be based on field samples or pre-excavation samples? The variability of the capped materials may cause inconsistent sample results between field data and pre-excavation data. **(OU3)**

EPA Response:
Pre-excavation results will be used for planning and field testing and visual inspection and confirmation samples will be utilized to identify material for removal.

Concern 27:
Question 12 - How will soils below the excavation criteria be segregated from soils to be excavated? This may be particularly difficult when shallow soils are below the criteria from excavation and the deeper soils exceed the criteria. **(OU3)**

EPA Response:
The materials would be segregated based on visual inspection and analytical testing during excavation. Although details will be developed during the RD, generally, materials would be stockpiled next to or near the excavation for testing and final disposition. Highly contaminated materials would be treated and disposed of off-site. Materials with lower levels of contamination removed from the excavation would be treated if necessary and placed back into the cap area excavation or one of the areas requiring pavement to meet remedial objectives. Note that when identified and to the extent practical, lesser contaminated materials would not be removed from the cap area excavation for stockpiling.

Concern 28:
Question 13 - How was the average depth of 15 feet calculated? Based on the data, the average excavation depth may be significantly deeper than 15 feet In that case, the actual costs will substantially exceed the estimated costs. **(OU3)**

EPA Response:
Based on the data collected in the capped area, the majority of arsenic at elevated concentrations will be

addressed by excavating to an average depth of 15 feet. Actual excavations are expected to range from 4 feet to 25 feet depending on contaminant concentrations. If additional excavation is needed to achieve appropriate remediation levels, it will be conducted to the extent practicable. Any additional costs are expected to be minimal.

Concern 29:
Question 14 - Why does the October 2002 OU3 FS state that the maximum excavation range will be 25 feet when contamination above the paved cleanup goals has been detected at depths of 40 feet? **(OU3)**

EPA Response:
Contamination exceeding the paved cleanup goals extends to a depth of 40 feet in the cap area. The present thought is that excavation in the cap area would not extend below the groundwater level, which was estimated to be about 25 feet at the time of excavation. However, this concept will be evaluated during the RD.

Concern 30:
Question 15 - Does EPA plan to cease excavation when the total excavation volume reaches the estimated volume of 40,000 cubic yards? If excavation will continue based on verification sample results, the actual excavation volume could be substantially greater than 40,000 cubic yards. **(OU3)**

EPA Response:
A specific predefined volume of contaminated material will be removed from the cap area, that is, a volume equal to 15 feet multiplied by the area of the capped area. Some contaminated material will be left in-place and contained by the underlying kaolin layer, the containment wall, and the cap. As noted above, actual excavations are expected to range from 4 feet to 25 feet. If additional excavation is needed to achieve remediation levels, it will be completed to the extent practicable Any additional costs are expected to be minimal.

Concern 31:
Question 16 - What volume of additional soils will be excavated as a result of this 13% reduction in the soil action level? **(OU3)**

EPA Response:
The arsenic cleanup goal was lowered from 23 ppm to 20 ppm to be consistent with EPA's site specific long-term remediation goal for arsenic in residential soil. The impact that this change has on the estimated volume of soil is insignificant. Of the 351 Woolfolk OU3 soil samples analyzed for arsenic, a total of 175 samples exceed the 23 ppm cleanup level. Lowering the arsenic cleanup goal to 20 ppm would add only two (2) additional samples to the total exceeding the arsenic cleanup level.

Concern 32:
Question 17 - Will the slurry wall completely encircle the capped area? If so, what is the reason for doing so? **(OU3)**

EPA Response:
The containment or slurry wall will completely encircle the capped area The reason is to totally encapsulate the contaminated materials irregardless of future groundwater movements.

Concern 33:
Question 19 - What is the justification for the residential use scenario for OU3 and OU4? **(OU3, OU4)**

EPA Response:
EPA Region 4 risk assessment guidance states "A future residential scenario should be included in the baseline risk assessment unless there is a strong reason to do otherwise, e.g , an industrial area expected to remain industrial or a wetland. The City has informed EPA that several redevelopment/reuse options are being considered after remediation. One of the options includes the redevelopment of residential properties within the Site.

For OU4, the assumption of a future residential land use is reasonably anticipated based on current land use. A large number of the parcels which compose OU4 are currently occupied residential properties.

Concern 34:
Attachment 2 - June 21, 2002 Technical Memorandum to EPA
Letter from James D. Levine to Charles King dated June 21, 2002 Regarding UAO for RD/RA for OU1 dated May 23, 1994. **(OU3)**

CH2M Hill Technical Memorandum, Arsenic Soil Cleanup Goal for Groundwater Protection dated June 20, 2002 **(OU3)**

EPA Response:
The results of the groundwater protection fate and transport modeling calculations and summary of conclusions can be found in a report titled, "Woolfolk Chemical Site Review of Arsenic Soil Remedial Goals for Groundwater Protection dated February, 2001.

Concern 35:
Attachment 3 - May 18, 2001 Letter to EPA
Letter from CGC to Charles King dated May 18, 2001 Regarding Potential Remedial Alternative - OU3 Capped Area **(OU3)**

EPA Response:
Comment noted, however, EPA disagree.

Concern 36:
Attachment C - All FOIA Letters **(OU3, OU4)**

EPA Response:
There were several letters written from Daniel H. Sherman IV of Long Aldndge & Norman to U.S. EPA requesting specific information. These letters have been or are currently being processed under the Freedom Of Information Act (FOIA).

GCG contends that EPA inappropriately withheld documents related to the development of arsenic soil, dust, and sediment clean up levels at the Woolfolk Site. It cites, as an example, EPA's responses to a FOIA request submitted on January 22, 2001. In the request, the company asked for, among other things, copies of all documents that related in any way to the Woolfolk Chemical Works Site dated, generated by, received by, or transmitted to Region 4 subsequent to April 1, 1999. According to CGC, a potentially responsive document, a January 26, 2000 memorandum, prepared by lexicologist Ted W. Simon, was not provided in any of EPA's partial responses to the FOIA or listed on any partial indices of withheld documents.

The Agency responds to all information requests it receives pursuant to the FOIA statute, its implementing regulations at 40 CFR Part 2, Subpart A, and Agency guidance. Staff members make every effort to provide

timely responses to each request. When the amount of potentially relevant documents is voluminous, as in this case, the Agency often provides the requester with partial responses while it continues evaluating the remaining, documents in the case files. Unfortunately, the January 26, 2000 document CGC cited, one (1) of approximately 8,000 documents in the case file, was unintentionally omitted from, all of the responses. This document was released in response to a subsequent FOIA request.

CGC's challenge of Region 4 decisions to withhold specific relevant documents, pursuant to the exemptions specified in the statute, is currently the subject of an appeal the company filed with EPA Headquarters FOIA Staff, Records, Privacy and Collection Branch, as required by 40 CFR § 2.104(j).

Concern 37:
Attachment D - 1997 Schwartz Letter Regarding ARAR
Letter from Paul Schwartz of U.S. EPA to Bill Mundy of GA EPD dated September 17, 1997. **(OU3)**

EPA Response:
The Hazardous Substance Response Act (HSRA) is listed in the ROD as a potential ARAR. EPA has deferred to the State HSRA soil cleanup levels for the Site and is continuing to evaluate the entire HSRA statute to determine if it is an ARAR.

WOOLFOLK CITIZENS RESPONSE GROUP

Concern 38:
WCRG asserts that EPA has failed to provide the legal grounds as stated in the Superfund Law that justify the need for the proposed ROD Amendments and that the planned ROD Amendment process is illegal. **(OU3)**

EPA Response:
WCRG asserts that EPA failed to provide the legal grounds that justify amending the ROD for OU3, therefore rendering the amendment process illegal. The community group supports its position by citing to item number 3 in Section II of EPA's 1991 Quick Reference Fact Sheet entitled, "Guide to Addressing Pre-ROD and Post-ROD Changes," which says "The information could not have been submitted during the public comment period." Although this particular guidance was superceded by EPA's July, 1999 "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents," the new guidance makes a similar statement in Section 7.1. As indicated in both the 1991 and 1999 guidances, that quoted provision is based on 40 CFR §300.825©), which pertains to information submitted by "interested persons," including a PRP, the public, or a support Agency. It does not apply to information developed by the lead agency after a ROD is signed. Immediately after the quoted sentence appears, both guidances state that the lead agency may also evaluate whether a change to the remedy is warranted on its own initiative, even where the requirements of NCP section 300.825©) are not triggered. EPA believes its decision to amend the ROD for OU3 was clearly warranted by the additional information it developed after the ROD was signed and that its decision is legally defensible.

When a remedial action taken differs in any significant respect from the remedy selected in the final plan, CERCLA Section 117(b) requires EPA to publish an explanation of those differences and the reasons for them. Further, 40 CFR § 300.435©)(2), an implementing regulation for that section of CERCLA, specifically authorizes EPA to propose an amendment to the ROD if the Agency determines that the differences in the remedial action fundamentally alter the basic features of the selected remedy with respect to scope, performance, or costs.

The original ROD, which memorialized the final plan for OU3, was signed on August 6,1998. At the same time an EPA contractor began conducting the remedial design, representatives from EPA's Science and Ecosystem Support Division (ESD) and GaEPD began collecting subsurface soil samples from the capped area to better determine the nature and extent of contamination under the cap. Sampling results indicated the actual volume of contaminated soils under the cap was approximately 40,000 cubic yards, four (4) times the amount originally estimated. The sampling also showed that the amount of contaminated soil outside the cap exceeding paved and unpaved cleanup goals increased from the original estimates by nearly 100% and 50% respectively. Another development which fundamentally affected the original remedy selected occurred in January of 2001, when EPA proposed a change in the maximum contaminant level (MCL) for arsenic in groundwater. Although the proposed MCL was temporarily withdrawn to permit further study, the lower 10 parts per billion (ppb) level was finalized on October 31, 2003. The change raised significant concerns about the protectiveness and long-term effectiveness of the already-selected remedy. EPA concluded that the soil cleanup level selected in the ROD would have to be lowered to ensure that the groundwater under and near the Site would be sufficiently protected. Since both of these developments, when considered together, fundamentally altered the scope, performance, and projected costs of the selected remedy, EPA decided that a ROD amendment was necessary.

In addition to the statutory and regulatory justifications, EPA's decision to amend the ROD is consistent with its guidances. The 1999 guidance referred to above discusses what post-ROD changes in scope, performance, or cost are and how they can be categorized as minor, significant, or fundamental. For example, changes in scope can include changes in the physical area of the response, the remediation goals to be achieved, or the type and volume of wastes to be addressed. Changes in performance can be changes that alter the treatment levels to be attained or the long term reliability of the remedy.

The guidance also provides general examples of what changes might be considered minor, significant, or fundamental. Although Highlight 7-1 suggests that a large increase in volume or cost could be considered a significant change that only requires an Explanation of Significant Differences (ESD), the guidance makes it clear that such characterizations do not mean there are strict thresholds for categorizing changes in cost, volume, or time. In addition, according to the guidance, an aggregation of nonsignificant or significant changes can result in a fundamental change. Based on the magnitude of change in the volume of soil requiring treatment and the stricter arsenic MCL requiring a lower soil cleanup level, EPA concluded that a ROD amendment was necessary. By making this choice, EPA ensured that the public, as well as the PRPs, had another opportunity to comment on a revised proposed plan.

In addition to complying with the substantive requirements for amending the ROD, EPA has also complied with all relevant procedural requirements, as outlined in 40CFR § 300.435(c)(2)(ii). After the amended ROD is signed, the Agency will publish a notice of the availability of the amended ROD in a major local newspaper of general circulation. It will also make the amended ROD and supporting information available to the public in the AR located at the information repository prior to commencement of the remedial action described in the amendment

Concern 39:
WCRG asserts that instead of seeking corrective measures. EPA has used its testing practices in off-site areas to justify doing nothing and because nothing has been done at least two (2) citizens have died. **(OU3, OU4)**

In addition, WCRG has requested testing of the entire community during the Remedial Phase due to site-related contaminants being identified by ATSDR in the haul routes from the Site.

Additional concerns for OU4 include:

A. EPA did not explore a background standard for attic dust before a risk-based formula had been developed and adopted

B To date, no testing under residential properties has been conducted The concern seemed to be associated with plumbing coming into contact with contaminated soil and the potential for corrosion similar to that which occurred at the water treatment plant.

EPA Response:

Comment A
The comment correctly notes that there are no standard assumptions to use to evaluate attic dust. The approach that was used is the same that was used to evaluate exposure to soil. The results of the assessment showed that monthly exposure to attic dust containing greater than 1,000 mg/kg arsenic would result in unacceptable risk. Further, the assessment showed that daily exposure (350 times per year) would result in unacceptable risk at arsenic concentrations greater than 71 mg/kg (the reference concentration). Surveys conducted as part of the USACE study indicated that most residents do not use their attics on a regular basis. Typical entry consists of a few times per year (e.g., 1-3) to place or retrieve items stored in the attic. No residents indicated entry for extended periods of time or on a frequent basis (e.g., weekly for several hours). This is due in large part to the fact that none of the attics are air conditioned or otherwise temperature controlled. Most of the attics lack sufficient floored space for substantial use. Since EPA has no assurances about current or future attic use patterns, selection of 71 mg/kg is reasonable goal.

Comment B
Exposure under houses is expected to be minimal. In general, good hygiene practices will greatly reduce/eliminate any potential for exposure via direct contact scenarios.

GA EPD COMMENTS AND RESPONSES (dated July 20, 2004)

Comment 1. *Page 8, 5.2.1 Soil Contamination*: please indicate whether the remaining dioxin underneath the pavement is below GAEPD's HSRA Type 1-4 standards.

> **EPA Response**: The concentration of dioxin in the 30 cubic yards of soil currently paved and enclosed with a fence may exceed the GAEPD HSRA standards. Therefore, an investigation will take place in this area during the remedial action to determine the dioxin concentration in the soil. If the soil exceeds the GAEPD HSRA standards, the soil will be excavated, treated (if necessary), and disposed at an offsite disposal facility.

Comment 2. *Page 9, 5.2.3 Structure Contamination*: please explain why some contaminated buildings were demolished and the debris removed from the site and other buildings that exceed cleanup goals remain onsite.

> **EPA Response**: Buildings G, N, and W were demolished because they were not only contaminated but were also in such poor condition structurally that additional sampling within or underneath the buildings could not be conducted in a safe manner. Because these buildings were in such poor shape, future decontamination and reuse of the buildings was unlikely. EPA determined that the three buildings were immediately hazardous to site trespassers and site workers because of the potential for the buildings to collapse or catch fire. Contamination was also found within or beneath the floor slabs of Buildings F, S, and R. These three buildings are in reasonably good shape and could potentially be decontaminated, rehabilitated, and reused. Additional exploration of the extent of

contamination within and beneath these buildings will be performed during the remedial action and the decision to demolish or decontaminate and reuse the buildings will be made at that time.

Comment 3. *Page 11, Table 7-1, Soil Cleanup Goals and Remedial Goals.* EPD was unable to reproduce the risk levels listed in the table Please include a table of the exposure parameters used and a sample calculation (i.e , paved soils for arsenic) as part of the ROD.

EPA Response: The only changes made to these risk-based remediation levels from the previously approved Record of Decision were for some constituents that were lowered to the State of Georgia HSRA standards. The risk calculations can be found in Appendix C, Baseline Risk Assessment of the April 1997 Feasibility Study Addendum for OU3.

Comment 4. *Page 13, Common Elements of Alternatives 9.2 through 9.5:* please change 117 mg/kg to 317 mg/kg

EPA Response: This typographical error will be corrected as suggested.