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Record of Decision:

REEVES SOUTHEASTERN GALVANIZING CORP.
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RECORD OF DECISION OPERABLE UNIT ONE October 1992

Reeves Southeastern Superfund Site
Hillsborough County, Florida

REGION IV
Atlanta, Georgia

SITE NAME AND LOCATION

Reeves Southeastern Corporation Site
Hillsborough County, Florida

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Reeves Southeastern Corporation site in Hillsborough County, Florida, which was chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. This decision is based on the Administrative Record for this site.

The State of Florida, as represented by the Florida Department of Environmental Regulation (FDER), has been the support agency during the RemedialInvestigation and Feasibility Study process for the Reeves Southeastern site. In accordance with 40 CFR 300.430, FDER, as the support agency, has provided input during this process. Based upon comments received from FDER, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE REMEDY

This operable unit is the first of two operable units planned for the site. The first operable unit for this site will involve the remediation of the soils/sediment on the site. This action will address the principal threat by solidifying/stabilizing the contaminated soils/sediment.

The major components of the selected remedy include:

- Excavation of approximately 6,000 cubic yards of contaminated soils/sediment
- Ex-situ solidification/stabilization of contaminated soils/sediment
- Onsite disposal of solidified/stabilized material above the water table and capping.

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 to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Because this remedy will not result in hazardous substances remaining onsite above health-based levels, the five-year review will not apply to this action.

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REEVES SOUTHEASTERN CORPORATION SITE
HILLSBOROUGH COUNTY, FLORIDA

1.0 SITE NAME, LOCATION, AND DESCRIPTION

The Reeves Southeastern Corporation Site is located in central Hillsborough County, Florida. The site consists of two facilities located across the road from each other: the 17.36 acre Reeves Southeastern Galvanizing (SEG) facility on the north side of State Road (SR) 574 approximately 1200 feet west of Faulkenburg Road; and the 11.6 acre Reeve Southwestern Wire (SEW) facility located on the south side of SR 574 approximately 600 feet west of Faulkenburg Road. Two additional Superfund sites are located in the area. These are the Peak Oil site, which is located immediately west of the SEW facility and the Bay Drums site, which is located immediately west of the Peak Oil site. Figure 1-2, taken from the Reeves site source characterization Feasibility Study (FS), shows a map of all three sites.

Currently, the area north of the SEG facility is Sabal Industrial Park, a development containing various light industrial and office buildings. The area south of the Reeves site is generally undeveloped, but does encompass about 400 acres owned by Hillsborough County that contains a wastewater treatment plant, a solid waste resource recovery facility and an area designated as the potential location of a new jail. There is no residential development in the immediate vicinity; the nearest being .25 miles east of the SEW facility. According to the Official Zoning Atlas for Hillsborough County (1985), the Reeves, Peak Oil and Bay Drums properties are all currently zoned for light manufacturing. All of this information would indicate that it is unlikely that the future use of the property would include residential development.

The largest building on the SEG facility is where commercial steel products are pre-treated and galvanized. There is also a small office building and maintenance shed. A 300 gallon tank situated in a small rectangular area in the northwest corner of the maintenance shed was used in the 1960s as a wastewater catch basin during electroplating. Two inactive liquid waste percolation/evaporation ponds are located in the north-central part of the property area. A waste-water pretreatment facility and a doublelined storage basin for settled solids are located on the northeast portion of the SEG.

The largest building on the SEW facility is where steel wire is drawn, weaved into chain link fence, pre-treated and galvanized. The smaller building on the facility is an office building. There are three former percolation/evaporation ponds: one on the

central western edge of the property (now backfilled); and two on the southwestern corner of the property.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The SEG facility was originally built and operated as Acme Plating and Galvanizing Company in the mid-1960s. In 1970, the facility was acquired by Metal Coatings, Inc, which merged into the Southeastern Galvanizing Corporation in 1971. Through internal reorganizations, Southeastern Galvanizing Corporation became the Southeastern Division of Reeves Southeastern Corporation. The SEG facility utilized two depressions as percolation/evaporation ponds for their wastewater. The ponds were later enlarged to their present size of 100' by 100' each, with 5' berms surrounding them and a below grade depth of about 10'. The ponds were used for disposing of process wastewater until 1982, when the current wastewater pretreatment system was installed. Wastewater from the facility is now discharged into the local publically owned treatment works (POTW).

The SEW facility was originally built in 1955 and operated by Florida Wholesale Fence, Inc., a subsidiary of Reeves Fences, Inc. Through two mergers, Florida Wholesale Fence became the Southeastern Wire Division of Reeves Southeastern Corporation. The first percolation/ evaporation pond for disposal of SEW's wastewater was built in 1955 and was used until it was backfilled in the late 1960s. Its dimensions were approximately 75' long and 25' wide and was located along the central western border of SEW. A second pond was constructed prior to 1969; it was subdivided in 1975 to form the two current ponds in the southwest corner of the facility. Both ponds are approximately 35' by 35', and are surrounded by a 3' berm. The ponds were excavated to a depth of 3'. Discharge into these ponds ceased in 1980 when SEW began using its wastewater pretreatment program. Discharge from this facility also goes into the local POTW.

The U.S. EPA conducted a site investigation in 1981 that indicated elevated metal levels in surface water and groundwater at the SEG facility. Subsequently, the Florida Department of Environmental Regulation (FDER) conducted a survey of the types and magnitude of chemical contamination at SEG; this survey resulted in the 1982 placement of SEG on EPA's National Priorities List (NPL). Reeves contracted in 1985 with CH2MHill for a terrain conductivity survey utilizing electromagnetic induction technology to be performed at both SEW and SEG. The results indicated a possible groundwater contamination problem in the surficial aquifer underneath both facilities.

In 1988, the Reeves Southeastern Corporation and a group of potentially responsible parties (PRPs) for the adjacent Peak Oil site signed individual Administrative Orders of Consent (AOCs) to perform source characterization Remedial Investigations and Feasibility Studies (RI/FSs) at their respective sites. Under the AOCs, the Peak Oil PRPs agreed to perform a source characterization RI/FS at the Peak Oil site and the Reeves Southeastern Corporation would perform a source characterization RI/FS at its SEG and SEW facilities. EPA decided to perform a source characterization RI/FS at the Bay Drums site. In addition to the source control RI/FSs being conducted by Reeves, the Peak Oil PRPs and EPA, the Peak Oil and Bay Drums PRPs and the Reeves Southeastern Corporation agreed in a separate AOC to perform an area-wide groundwater RI/FS. The results of the groundwater RI are detailed in the "Area-Wide Hydrologic Remedial Investigation and Risk Assessment", Canonie Environmental, Inc., 1992 and will be addressed in detail in a separate Record of Decision. There is also a wetlands impact study being performed by EPA on wetlands which are located to the north of the three sites; the results of this study will also be addressed in a separate ROD.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Community relations for the Reeves Site has, for the most part, been handled in conjunction with the Peak Oil and Bay Drums sites. Interest in the Reeves site itself has been minimal. What community interest that has been noted was focused on EPA activities at the other two Superfund sites. This is probably due to the removal at Peak Oil, where contaminated sludge from a lagoon was incinerated, and the removal at Bay Drums, where a large pile of roofing shingles had to be removed from the site in order to conduct the RI/FS. The 1989 Community Relations Plan, prepared by Beverly Mosely, EPA, states the following:

> "Community involvement at the Bay/Peak/Reeves sites has been minor to date, judging from responses during interviews of local environmental agency staffs. Agency personnel from the Hillsborough County Environmental Protection Commission (HCEPC), Southwest Florida Water Management District (SWFWMD), Tampa Bay Regional Planning Council (TBRPC), and Florida Department of Environmental Regulation, Southwest District (FDER-SWD) were contacted to ascertain the nature of comments or complaints received at those agencies. No formal complaints or inquiries were on record, however there have been concerns over the disposition of the roofing debris on the Bay Drum site.

Elected officials or their representatives displayed general knowledge of the sites, but overt concern within the community was not known to them. General concerns associated with groundwater contamination and hazardous materials were referenced frequently by officials, but nothing specific to the Bay/Peak/Reeves sites was presented.

Many national and regional environmental organizations, such as National Audubon Society, Sierra Club, and National Wildlife Federation, have local groups in the Tampa-St. Petersburg area. Local environmental organizations, such as Brooker Creek Preservation Society, Manasota-88, and Izaak Walton League, also have interest in situation similar to the Bay/Peak/Reeves sites. Specific interest in the Bay/Peak/Reeves sites by any of the national or local organizations has not been identified at this time. Contact with the organizations usually has resulted in a request to be notified of public meetings or issuance of public documents.

Contact with the Brandon area Chamber of Commerce did not reveal specific concerns. The Brandon Chamber does have a committee that follows local activities associated with water, wastewater, and hazardous waste activities."

In the time period between the preparation of the 1989 CRP and the public comment period for the Reeves RI/FS, no significant community interest in the Reeves site was noted.

The Source Characterization RI/FS Report and Proposed Plan for the Reeves Southeastern Site were released to the public in August 1992. These documents were released in conjunction with the Peak Oil and Bay Drums RI/FSs and Proposed Plans and were made available to the public in both the Administrative Record and the information repository maintained at the EPA Docket Room in Region IV and at the Brandon Public Library. The notice of availability of these documents and announcement of the pending public meeting was published in the Tampa Tribune on both August 11 and 17, 1992. A public comment period was held from August 13, 1992 to September 12, 1992. The public meeting was held on August 18, 1992. At the meeting, representatives from EPA presented the three Proposed Plans and answered questions regarding the problems at the three sites and the source control remedial alternatives under consideration for the Reeves, Peak Oil and Bay Drums sites. A response to the comments received for the Reeves site during the public comment period is included in the Responsiveness Summary, which is Appendix A of this ROD. This decision document presents the selected source control remedial action for the Reeves Southeastern Site, in Hillsborough County, Florida, chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable the National Contingency Plan. The decision for this site is based on the Administrative Record.

4.0 SCOPE AND ROLE OF OPERABLE UNIT

As with many Superfund sites, the problems at the Reeves Southeastern site are complex. As a result, EPA divided the work into two operable units (OUs). These are:

- OU One: Contamination in the soils and sediments.

- OU Two: Contamination in the groundwater and wetlands.

OU Two will be addressed in conjunction with the groundwater and wetlands remediation at the Peak Oil and Bay Drums sites. OU Two will also address any needed disposal of surface water from the ponds. The remedial action for OU Two will be selected in a later ROD.

This ROD for OU One will address the soil and sediment contamination on the Reeves SEG and SEW facilities. The purpose of this response action is to prevent current or future exposure to levels of contamination that exceed EPA's acceptable risk range in contaminated soils/sediment

and to prevent current or future migration of contamination to the groundwater. Potential ingestion of water extracted from these aquifers poses the principal risk to human health because the EPA's acceptable risk range is exceeded and concentrations are greater than MCLs. This operable unit will be the first response action for the site.

5.0 SUMMARY OF SITE CHARACTERISTICS

5.1 Scope

This section will discuss general site characteristics and outline the results of the source characterization RI. The issue of groundwater contamination is addressed in the Areawide Hydrologic Remedial Investigation and Baseline Risk Assessment - Bay Drums, Peak Oil and Reeves Southeastern Superfund Sites, Canonie Environmental, April 1992. Although a short summary of this report will be discussed here, EPA decisions pertaining to the need for groundwater remediation will be addressed in a separate ROD.

5.2 General Site Characteristics

Climate in the Tampa area is characterized by mild winters and relatively long, humid, warm summers. Spring and fall tend to be dry, with the majority of the rainfall in the summer. The general topography is flat. The land use in the area is either industrial or undeveloped, with the nearest single family residential area being 0.25 miles east of the SEW facility. Topographically, surface elevations on the SEG facility range from 36 feet above mean sea level (MSL) at the southern boundary to 26 feet above MSL on the northern boundary. The southern portion of the SEW facility slopes gradually toward the south and southwest toward small wetland areas. The area around the two facilities is relatively flat.

The groundwater system beneath the area consists of two major water bearing units: a surficial aquifer referred to as the upper aquifer; and the Floridan aquifer system. The upper aquifer, which is defined as a Class IIB aquifer, is from 8.5 feet to 37 feet thick with a saturated thickness of about 5 to 25 feet. It is separated from the Floridan aquifer by the Hawthorne formation, a clayey low-permeability layer from 16 to 40 feet thick. The upper aquifer is hydraulically connected to surface waters (wetlands and streams) and the flow direction varies seasonally. Water levels also fluctuate seasonally and change rapidly in response to rainfall and other natural influences. Although regionally the Floridan aquifer flows to the west-southwest, in the vicinity of the site the flow direction shifts to the northwest. This is thought to be due to the proximity of the site to the Tampa Bypass Canal, which reportedly cuts into the low-permeability layer and reaches the upper Floridan aquifer in several places.

5.3 Results of Site Source Remedial Investigation

The Reeves source RI of the SEG and SEW facilities included the collection of soil, sediment, surface water, and air samples at the two facilities. The field work was conducted in two phases. Soil samples were collected from targeted areas on the properties as well as random locations. Sediment samples were collected from the four inactive ponds at the two properties and the unnamed creek. Surface water samples were collected from the three ponds that contain water. The general range of contaminants can be seen in Table One.

Elevated zinc concentrations were detected at several of the SEG targeted and random soil sample locations. Arsenic, cadmium, calcium, chromium, iron and mercury were elevated in samples from an area of high subsurface conductivity noted in studies conducted in 1985. Elevated lead levels were noted near a currently used raw acid storage tank area. Cadmium, chromium, gold and lead were present at elevated concentrations in a yellow waste material near a former electroplating waste storage tank. Cyanide concentration was also elevated in this material and

in a drainage pathway south of a former drum storage area and in the drainage swale along the east side of the SEG site. Organic species are not significant contaminant sources in soil samples from the SEG site.

Sediment samples from the west SEG pond contained elevated zinc and cyanide while samples from the east pond contained cadmium, copper, lead, zinc and cyanide at elevated concentrations. Surface water samples from the two ponds generally contained elevated concentrations of calcium, iron, magnesium, manganese, potassium, sodium and zinc. Organic species are not significant contaminant sources in either sediment or surface water at SEG. Elevated zinc concentrations were noted at several of the SEW targeted and random soil sample locations. Lead was also elevated in soils located in a backfilled pond area on the western edge of the site. The soils in this general area also contained organochlorine pesticides, chlorinated benzenes, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), phthalate compounds and petroleum related compounds.

Sediment samples from the north inactive SEW pond area indicated elevated lead and zinc. The samples also contained a phenolic compound and PAHs. Samples from the south inactive pond contained elevated lead, sodium and zinc. The samples also contained phenolic compounds, a chlorinated benzene compound and petroleum related compounds.

Surface water samples from the south SEW pond (the north pond was dry during sample collection activities) generally contained elevated concentrations of calcium, chromium, iron, magnesium, manganese, nickel, potassium and sodium. Organic constituents were not reliably present (i.e. present at low levels in two samples but either not confirmed in a duplicate sample or also present in a travel blank) in surface water during the Phase 1 study period and were not investigated further in the Phase 2 study with the concurrence of U.S. EPA.

The following conclusions were made in the Reeves RI based on the information generated from the Phase 1 and 2 RI activities:

- Metal constituents are present at elevated concentrations in soils, sediments and surface water at both SEG and SEW. Constituents are limited in areal extent and are found at concentrations that are amenable to conventional remedial technologies.

- Organic contaminants are present in soils and sediments on the western edge of SEW only. Review of the combined Reeves Phase 1 and 2 sediment and soils data for SEW, Phase 1 and 2 data from the Peak Oil Site Source Characterization RI, available deeds, boundary survey information and available aerial photographs and the absence of significant petrochemical usage in the SEW operation process indicates that the oily material on the western edge of SEW is probably associated with past operations at the adjacent Peak Oil site.

- Remediation of sediments and soils for organic constituents along the western edge of SEW will be addressed in the Peak Oil Site Source Characterization Feasibility Study (Peak FS). The Peak Oil PRPs have acknowledged the need to include these materials in the Peak FS.

5.4 Area-Wide Groundwater Investigation

The study area for the Area-Wide investigation encompasses the Reeves SEG and SEW facilities, the Bay Drums site, the Peak Oil site, and adjacent properties covering an area of approximately 95 acres. In addition to the existing wells, 38 additional monitor wells were installed and developed in the upper surficial aquifer and 6 monitor wells installed and developed in the upper Floridan aquifer. Analytical parameters that were investigated include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs),

organochlorine pesticides (OCPs), total petroleum hydrocarbons (TPHs), total suspended solids (TSSs), total dissolved solids (TDSs), metals and cyanide. Maps showing the well locations can be seen in Figures 3.1 and 3.2, which were taken from Area-Wide Hydrologic RI prepared by Canonie.

The analytical results of the groundwater sampling in the surficial aquifer showed 25 VOCs, 29 SVOCs, 6 pesticides, and 23 inorganic constituents. No PCBs are present in the surficial aquifer groundwater samples. Eight of the 23 detected inorganic species are common constituents normally found in soil and present in most groundwater samples. Most VOCs were detected in areas close to the Bay Drums and Peak Oil Sites (which is consistent with the site source findings). Eight inorganic constituents in the surficial aquifer are found in amounts exceeding federal maximum contaminant levels (MCLs) or Florida MCLs. These are antimony, arsenic, beryllium, cadmium, chromium, lead, nickel, and sodium. Elevated concentrations of zinc are also present. A total of 51 wells in the upper aquifer and 14 wells in the Floridan aquifer were sampled.

The analytical sampling results of ground water from the Upper Floridan Aquifer detected impacts primarily at two of the 10 wells sampled, Well F-2 (the Peak Oil Site production well) and Well F-3 (the Bay Drums Site production well). Previously, these wells acted as conduits for surficial aquifer ground water to migrate to the Upper Floridan Aquifer. Prior to the Phase 2 field investigation, EPA installed outer casings around these wells to prevent further migration. Wells F-2 and F-3 contained 13 and 15 VOCs, respectively. For most of the VOCs, concentrations are significantly higher in Well F-3 than in Well F-2. Compounds detected that are higher than MCLs include benzene, 1,1-dichloroethene (1,1-DCE), trichloroethene (TCE), methylene chloride, toluene, 1,1,2-trichloroethane (1,1,2-TCA), total 1,2dichloroethene (1,2-DCE), tetrachloroethene, and vinyl chloride. Sixteen SVOCs were also detected at relatively low concentrations in Well F-2 and Well F-3.

OCPs and PCBs were not found in the Upper Floridan Aquifer wells, except a low level of aldrin [0.000061 parts per million (ppm)] in Well F-3.

Fourteen inorganic constituents were detected at relatively low levels in the samples from Well F-2 and Well F-3. Nine of the 14 inorganic constituents are also present in the background sample from Well F-1. Arsenic was detected in Well F-10 (0.130 ppm) above the federal and Florida MCL of 0.050 ppm. Since Well F-10 is upgradient from the study area, the arsenic is most likely from an offsite source. Beryllium was detected in Wells D-1, F-4, F-5, and F-7 above the federal MCL. The highest concentrations of metals found in Upper Floridan Aquifer wells were detected in Well F-5 and included aluminum, cobalt, iron, magnesium, manganese, nickel, sodium, and zinc. None of the detected concentrations were above federal MCLs. Well F-5 is constructed with galvanized steel and has been in place over 20 years.

6.0 SUMMARY OF SITE RISKS

6.1 Human Health Risks

6.1.1 Scope

A baseline risk assessment (RA) was conducted as part of the RI to estimate the health or environmental problems that could result if the Reeves site was not remediated. A baseline risk assessment represents an evaluation of the "No Action" alternative, in that it identifies the risk present if no remedial action is taken. The assessment considers environmental media and exposure pathways that could result in unacceptable levels of exposure now or in the foreseeable future. Data collected and analyzed during the RI provided the basis for the risk evaluation. The risk assessment process can be divided into four components: contaminant identification;

exposure assessment; toxicity assessment; and risk characterization.

Two separate baseline risk assessments have been developed for this site: the first developed for the site-specific source control RI/FS; the second developed as part of the area-wide groundwater RI/FS. The source control risk assessment is summarized in this ROD. However, because the remedial action recommendation in this Operable Unit One ROD does not focus on the groundwater, the area-wide groundwater risk assessment is not summarized in this ROD. Since the soils and sediments evaluated in the source control RI/FS are a source of groundwater contamination, the risks associated with the groundwater exposure pathway are an important consideration for any proposed remedial action. The risks derived in the area-wide groundwater RA for the potential future groundwater exposure pathway for both workers and onsite residents exceed the acceptable range for both the shallow aquifer and the deeper Floridan aquifer. The Floridan aquifer is the current source of municipal water supplies in the area.

6.1.2 Contaminant Identification

The Reeves source control RI/FS has focused on soil and sediment contamination on the Reeves SEG and SEW facilities. Both of these facilities contain currently operating plants. According to the Future of Hillsborough Brandon Planning Area Land Use Plan Map, the site falls within the Urban Level 2 (UL-2) Land Use Plan Category. This land use category designates those areas located within the I-75 Corridor and determined to be best suited for urban use, with development occurring with the provision and timing of transportation and public facility development. The area around the site does not appear to contain the public facilities and services associated with the "urban" classification. An "urban" area is defined as an area having the characteristics of a city, with intense development and an extensive range of public facilities and services. The Comprehensive Plan recognizes that development and redevelopment should be integrated with existing adjacent land uses.

Thirty-six (36) chemical contaminants were found in the soils, surface water and/or sediments at the Reeves site. Based on the chemical screening guidelines published in the U.S. EPA Human Health Evaluation Manual (HHEM), 1989, 11 chemicals of potential concern were retained for the detailed health risk assessment. Those 11 chemicals are:

- arsenic
- cadmium
- chromium
- gold
- lead
- mercury
- nickel
- polychlorinated biphenyls (PCBs)
- polynuclear aromatic hydrocarbons (PAHs)
- 1,2,4-trichlorobenzene
- zinc

While the selection of chemicals of potential concern was conducted on a media-specific basis, each chemical on a final list of chemicals of potential concern was modeled in the exposure assessment for all media in which it was detected. Closer analyses of the soils data, revealed that some of the chemicals of potential concern were uniformly distributed around the site while others were non-uniformly distributed. Plotting of this data indicated that four "target areas" existed on the two facilities where levels of contaminants are higher than both the levels on the remainder of the site and background levels. These target area can be seen on the next page in Figures 1-8 and 1-9, taken from the site source characterization FS. The soil and sediment exposure point concentrations at the site can be found in Table Two.

6.1.3 Exposure Assessment Information

The two facilities are fenced and guarded, so onsite access is limited to workers and occasional visitors. Based in part on this information, both a current and future use exposure assessment were developed. Two human receptor populations, adolescent trespassers and Reeves employees, were evaluated in the current use scenario. Chemical exposure was modeled through the following pathways:

- inhalation of fugitive dust;
- ingestion of fugitive dust;
- ingestion of soil;
- ingestion of surface water;
- ingestion of sediment;
- dermal contact with soil;
- dermal contact with surface water;
- dermal contact with sediment.

The adolescent trespassers were assumed to be exposed to soils for 10 days/year for a period of time of 9 years. The workers were assumed to be exposed to soils for 8 hrs/day, 5 days/week, 50 weeks/year, for 30 years. For sediments, workers were exposed for 30 days/year; the trespasser scenario remains the same. Two human receptor populations were also evaluated for the future use scenario - onsite resident, both children and adults, and adolescent trespassers. Chemical exposure to the residents were assumed to be from:

- ingestion of soil;
- dermal contact with soil.

Chemical exposure to trespassers was modeled through the following pathways:

- inhalation of fugitive dust;
- ingestion of fugitive dust;
- ingestion of soil;
- ingestion of surface water;
- ingestion of sediment;
- dermal contact with soil;
- dermal contact with surface water;
- dermal contact with sediment.

The standard exposure assumptions used in this risk assessment are as follows:

	Adult	Adolescent	Child
Body Weight (kg)	70	35	16
Soil Ingestion Rate (mg/day)	50	100	200
Inhalation Rate (m[3]/day)	20	10	10
Skin Surface Area (cm[2]/event)	2300	1520	2500

For the resident adult scenario for exposure to soils, the period of exposure was 80 days/year for 16 years. The resident child scenario period was 280 days/year for 9 years. The future use adolescent scenario period of exposure was 80 days/year for 9 years. For exposure to sediments, only the trespasser scenario was used; the exposure was assumed to be 30 days/year.

The assumption made in the risk assessment is that onsite chemicals in soil disperse into the air at this site. All of the chemicals of potential concern are of low volatility and bind to soils weakly.

In summary, the current use scenarios were based on limited access to the site due to various security measures. The future use scenario were based on the assumptions that: (1) the site was developed for residential use (no sediment numbers were generated because sediments would be removed for residential development); and (2) because access is unrestricted, trespasser frequency is greater than in the current use scenario.

6.1.4 Toxicity Assessment Information

Slope factors (SFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to the potentially carcinogenic contaminant(s) of concern. SFs, which are expressed in units of (mg/kg-day)[-1], are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans).

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to contaminant(s) of concern exhibiting noncarcinogenic effects. RfDs, expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of contaminant(s) of concern ingested from contaminated drinking water can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans).

The Chronic Daily Intake (CDI) factors and the applicable route specific Slope Factors for the chemicals of potential concern can be found in Table Three.

Arsenic, cadmium, chromium, mercury, nickel, trichlorobenzene and zinc were each evaluated for their chronic systemic poisoning using U.S. EPA chronic reference doses.

Gold was evaluated for systemic poisoning using a derived chronic non-carcinogenic criteria developed by SEC Donohue during the course of this study. U.S. EPA guidelines were followed in the development of this criteria. The human exposure database for gold obtained in published scientific literature was used as the input to this analysis.

Lead exposure was evaluated on a subchronic basis for toddlers (children ages 1-5 years). The current U.S. EPA uptake/biokinetic model for lead exposure was used. A reference blood lead level of 10 ug/dl for 95% of the exposed population was used to assess the potential hazard for lead at this site. Arsenic, cadmium, chromium (VI), nickel, PCBs, and PAHs were each evaluated for their carcinogenic potential using U.S. EPA slope factors. Cadmium, chromium (VI) and nickel are viewed as carcinogenic from the inhalation route of exposure only. Arsenic, PCBs and PAHs are assumed to be carcinogenic from all routes of exposure.

As an interim procedure, until more definitive EPA guidance is established, Region IV has adopted a toxicity equivalency approach (TEF) methodology for evaluating PAHs. This methodology is based on each compound's relative potency to the potency of benzo(a)pyrene. The TEFs for the carcinogenic PAHs are contained in Table Three.

6.1.5 Risk Characterization Information

For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a life-time as a result of exposure to the carcinogen. Excess life-time cancer risk is calculated from the following equation:

Risk = CDI x SF

where:

risk = a unit less probability (e.g., 2 x 10[-5]) of an individual developing cancer;

CDI = chronic daily intake averaged over 70 years (mg/kg-day); SF = slope-factor, expressed as (mg/kg-day)[-1]

These risks are probabilities that are generally expressed in scientific notation (e.g., 1x10[-6] or 1E[-6]). An excess lifetime cancer risk of 1x10[-6] indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 additional chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site. The National Contingency Plan (NCP) states that sites should be remediated to chemical concentrations that correspond to an upper-bound cancer risk to an individual not exceeding 1x10[-6] to 1x10[-4] excess lifetime risk.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose derived for a similar exposure period. The ratio of exposure to toxicity is called a hazard quotient (HQ). By adding the HQs for all contaminant(s) of concern that affects the same target organ (e.g., liver) within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated.

The HQ is calculated as follows:

Non-cancer HQ = CDI/RfD

where:

CDI = Chronic Daily Intake

RfD = reference dose; and

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

The level of confidence that one has in the information produced by the risk characterization process is dependent on the validity of the information used in previous stages of the risk assessment. Although uncertainties are inherent in all four stages of a risk assessment, the most significant uncertainty in this assessment is probably associated with the toxicity assessment for carcinogenic PAHs and arsenic and the evaluation of the dermal absorption exposure route.

Lifetime cancer risks were estimated for all of the carcinogenic chemicals of potential concern at the Reeves Southeastern Corporation Site. The only significant risks as defined by the U.S. EPA (1990), e.g. risk >=10[-6], that were found associated with soil contamination at this site in the current use scenario were to onsite workers due to exposure to chromium. This risk was

less than 10[-5], however. On-site workers who contact pond sediments were also shown to exhibit significant risks due to arsenic exposure. Onsite residents (future use scenario) exhibited significant cancer risks due to exposure to arsenic, PCBs and PAHs in soil. Arsenic risks were at Target Area (TA) 1 and TA4, while PCBs and PAHs risks were present only at TA4. Arsenic in pond sediments also presented a significant risk to future adolescent trespassers.

These receptors, chemicals, and resultant cancer risks are summarized below:

		Carcinogenic Risk			
Receptor	Medium	Chromium	Arsenic	PAHs	PCBs
CURRENT USE SCENARIO					
Adolescent Trespasser	Soil	---	---	---	---
On-site Worker	Soil	8x10[-6]	---	---	---
	Pond	---	1x10[-5]	---	---
FUTURE USE SCENARIO					
On-site Resident (TA1)	Soil	---	6x10[-6]	---	---
On-site Resident (TA4)	Soil	---	5x10[-6]	1x10[-6]	1x10[-5]
Adolescent Trespasser	Pond	---	2x10[-6]	---	---

As is evident, these risks are all well within the EPA's target clean-up risk range for Superfund sites (10[-6] to 10[-4]).

With respect to the non-carcinogenic chemicals of potential concern at the Reeves site, none of the chronic hazard quotients for individual chemicals or the summation of all hazard quotients for all chemicals to a receptor were greater than 1.00 under the current use scenario. The largest chronic hazard quotient was found for on-site workers inhaling fugitive dust containing chromium (assumed to be exclusively chromium VI). This hazard quotient was 0.79, indicating that the Reeves site is unlikely to currently pose any chronic non-cancer health risks to the public.

However, the subchronic assessment of lead exposure to potential on-site children concluded that the levels of lead in on-site soils at several target areas (TA1, TA3) are sufficiently contaminated to be of health concern. The lead model predicts that exposure to lead concentrations in Areas TA1 and TA3 would result in 73% and 48% respectively, of the potential future population to have blood lead concentrations above the EPA benchmark of 10 ug/dl.

In the future use scenario, zinc at TA1 and trichlorobenzene at TA4 were primarily responsible for significant hazard quotients (>1.00), and these were associated with toddler ingestion of soil. Both cadmium and chromium at TA2 combined to produce a significant hazard quotient to toddlers for this area of the Reeves' properties. These calculated quotients were also derived in a highly conservative manner in that the on-site toddler was modeled assuming that they will live on this site (exclusively at each target area) for 5 years and ingest soil (200 mg/d) from only this area. It should be noted that, although these HIs exceed unity, the individual chemical hazard quotients do not exceed unity.

The area-wide groundwater risk assessment did not address current exposure since onsite groundwater is not currently being used. However, the risks associated with possible future exposure for workers or residents exceeds the risk range for both the shallow aquifer and deeper Floridan Aquifer, the current source of municipal water supplies in the area. For this reason, actual or threatened releases of hazardous substances from the site soils and sediments, if not

addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to the public health, welfare or the environment. The endangerment is a result of the potential for further degradation of the area-wide groundwater via leaching of contaminants from the contaminated site soils and sediments.

6.2 Environmental Risks

The environmental risks at this site were addressed in a separate study (Areawide Wetlands Impact Study). This study evaluates the ecological status of the wetlands associated with the Bay Drums, Peak Oil and Reeves Southeastern Sites. The results of this study are contained in the Areawide Wetlands Impact Study Report. The wetlands associated with these three sites will be addressed in a separate operable unit.

7.0 DESCRIPTION OF ALTERNATIVES

7.1 Remedial Action Objectives

Risk based remediation goals were determined for several exposure scenarios. Due to the expected continued industrial operations at the SEG and SEW facilities, risk based action levels based on a cancer risk of < 1x10[-4] were considered appropriate. None of those levels were exceeded in the soils, sediments or surface water. Although the average site concentration of chromium did not exceed the remediation goal for the onsite worker, some localized areas did exceed the remediation concentration of 49 mg/kg. No noncarcinogenic action levels were exceeded for sediment.

Soils/sediment remediation goals that were protective of groundwater were developed. A number of contaminants evaluated in the Baseline Risk Assessment did not have these goals developed; mostly because the contaminant was not present in both soil and groundwater or was present but in very low concentrations. Ultimately, remediation goals were developed for chromium, zinc and lead. A variety of methods were used to develop these goals.

The leaching potential of chromium contained in the soils/sediments was evaluated by performing TCLP analyses on select soil and sediment samples. The data was then evaluated to attempt to determine a correlation between the total and TCLP leach concentrations; however, the leach concentrations were low and no correlation could be determined. Considering these results, and the conservative nature of the health-based goal of 49 mg/kg, no further efforts were made to developed a separate groundwater protection goal. However, an evaluation of the chromium concentrations found during the Reeves RI indicates that 95% of the detections are below 69 mg/kg and the next highest concentration is 138 mg/kg. The large gap in detected concentrations indicates that values above 69 mg/kg are elevated for the site. Therefore, 69 mg/kg was selected as the soil remediation goal.

The leaching potential of zinc contained in the soils/sediments was evaluated in the same way as the chromium potential. Analyses of the TCLP versus total concentration data concluded that the sediment data was more variable than the soils data, therefore, only the soils data was used. The groundwater protection goal was computed using the correlation between total soil and TCLP and the computed dilution factor for the site. The health based drinking water standard for zinc (10 mg/l) was multiplied by the dilution factor to determine the maximum acceptable TCLP concentration and is used to determine the corresponding total allowable soil concentration. Based on this computation, the resulting groundwater protection goal is 10,860 mg/kg.

The leaching potential of lead contained in the soils/sediments was evaluated in the same way as zinc. However, the selection of a soil remediation goal for lead was complicated by the fact that lead was also a contaminant of concern at the Peak Oil and Bay Drums sites, necessitating

the selection of a common lead goal for all three sites. The level was established by averaging the soil cleanup levels calculated using the direct partitioning technique for the three sites. Reeves levels are 748 mg/kg and 386 mg/kg, the Peak Oil level is 246 mg/kg and Bay Drums levels are 11 mg/kg and 30 mg/kg. The rounded off average of these five levels is 280 mg/kg, which was selected as the soil remediation goal for lead.

In summary, the soil remediation goals are:

Chemical	Remediation Goals (mg/kg)
Chromium	69
Lead	280
Zinc	10,860

7.2 Volumes

Volumes of sediment and soil with metals concentrations above the remediation goals were calculated for the SEG and SEW facilities. As part of the proposed remediation scenarios on the SEG facility, the drainage ditch running immediately south of the two SEG ponds will be dredged to a depth of one foot. This is a precaution against contaminated surface water runoff from the site. Sediment and soil volumes for the two facilities were calculated as:

	Sediment (yd[3])	Soil (yd[3])
SEG	5000	450
SEW	250	1

The areas to be excavated can be seen on the next page in Figures 1-5 and 1-6, taken from the site source characterization FS.

7.3 ARARs

Section 121 (d)(2)(A) of CERCLA specifies that Superfund Remedial Actions must meet any Federal standard, requirement, criteria or limitation that is determined to be an applicable or relevant and appropriate requirement (ARAR). ARARs fall into three categories: contaminant-specific; locationspecific; and action-specific. Some rules do not specifically apply to a remedial action; however, because of their subject matter, they may provide some guidance in implementing a chosen RA. These rules are called to-be-considereds (TBCs). Potential ARARs and TBCs can be found in Table Four.

The contaminated material at the site was evaluated in regard to the applicability of the RCRA Land Disposal Requirements (LDRs) and it was determined that the RCRA LDRs were not an ARAR. The material would have, at one time, been considered a listed hazardous waste because of the disposal on the spent pickle liquor, which was included in EPA's definition of a K062 hazardous waste. However, in 1986, EPA amended the regulations by clarifying that the listing for spent pickle liquor applies to "Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332)". As a result, the solids generated by the treatment of spent pickle liquor at these two facilities can be evaluated for the characteristics of hazardous waste and is not considered a derivative of a listed hazardous waste. Testing done during the RI has determined that the contaminated material does not exhibit

any of the characteristics that would make it a characteristic hazardous waste.

7.4 Development and Screening of Alternatives

7.4.1 Process

As a part of the process, the FS preliminarily evaluates a number of different technologies. The technologies are generally evaluated on the basis of their effectiveness, implementability and cost in relation to the remedial action goals for the site. After the screening, four major alternatives were determined to be worth developing into detailed alternatives for evaluation as the final cleanup plan. For ease of cross reference with the FS, this ROD has maintained the numbering system used in the FS. The retained alternatives are as follows:

Alternative 1 - No Action

Alternative 3A - Cement Stabilization, Backfilling and Capping

Alternative 3D - Cement Stabilization, Backfill Onsite

Alternative 5B - Soil Washing.

7.4.2 Alternative 1 - No Action

Major Components of the Remedial Alternative. The National Contingency Plan (NCP) requires the development of a no action alternative as a basis for comparison with the other alternatives. Under this alternative, no action be taken to reduce the risk posed by the soil/sediment contamination at the site. Only continued groundwater monitoring is included in this alternative.

General Components. The groundwater would be monitored on an annual basis from the existing monitor well network. The estimated present worth cost of this alternative is $29,000.

7.4.3 Alternative 3A - Cement Stabilization, Backfilling and Capping

Major Components of the Remedial Alternative. The major features of this alternative include excavation of approximately 6,000 cubic yards of contaminated material from the two facilities, solidification/stabilization of that material, backfilling of the excavated areas to grade, disposal of the solidified material above ground where the SEG ponds formerly existed and capping of that material.

Containment Component. The solidified/stabilized material will prevent both current direct contact risk and continued contamination of the groundwater from contamination in the soils/sediments. A low permeability cap would be constructed over the stabilized material to minimize the amount of rainfall infiltrating through it. The cap would consist of an HDPE membrane overlaid with a synthetic drainage net and a fabric filter. A two foot thick vegetated soil cover would be placed over the fabric filter.

General Component. A dragline would be used to excavate the SEG pond sediments to a sloped bank constructed nearby. The sloped bank would allow excess water to run back into the ponds. The SEW pond sediment and the SEG soil would be excavated with a backhoe and moved to a staging area near the sloped bank. The former ponds and excavated areas would be backfilled with soil from the pond berms, and imported backfill, if necessary. The stabilization agent would be pneumatically pumped onto the soils/sediments and mixed into the material using a backhoe. The stabilized material would then be placed above the water table in the SEG pond area and capped.

To insure that contaminant leaching did not occur, a five year annual groundwater monitoring program would be implemented. The capital costs for this alternative is $544,000 and the operation and maintenance costs for the groundwater monitoring are $7,000. The total present worth cost of the alternative is $551,000.

ARARs Component. The major federal ARARs and TBCs for this alternative are as follows:

- Safe Drinking Water Act, 40 CFR 141.11-141.16, 141.50141.51;
- Endangered Species Act (50 CFR Part 402);
- Proposed Rule for Corrective Action for Solid Waste Management Units, 40 CFR Parts 264, 265, 270 and 271;

The major State ARARs and TBCs are as follows:

- Florida Drinking Water Standards, FAC 17-550;
- Florida Stormwater Discharge Regulations, FAC 17-25.042.

This alternative will meet all Federal and State ARARs.

7.4.4 Alternative 3D - Cement Stabilization and Backfill Onsite

Major Components of the Remedial Alternative. The major features of this alternative include excavation of approximately 6,000 cubic yards of contaminated material from the two facilities, solidification/stabilization of that material, backfilling of the excavated areas to grade, disposal of the solidified material into the SEG pond areas and backfilling over the stabilized material to grade.

Containment Component. The solidified/stabilized material will prevent both current direct contact risk and continued contamination of the groundwater from contamination in the soils/sediments. Soil would be backfilled over the stabilized material to reduce the infiltration of rainwater through the stabilized material.

General Component. A dragline would be used to excavate the SEG pond sediments to a sloped bank constructed nearby. The sloped bank would allow excess water to run back into the ponds. The SEW pond sediment and the SEG soil would be excavated with a backhoe and moved to a staging area near the sloped bank. The former ponds and excavated areas would be backfilled with soil from the pond berms, and imported backfill, if necessary. The stabilization agent would be pneumatically pumped onto the soils/sediments and mixed into the material using a backhoe. The stabilized material would then be placed above the water table in the SEG pond area and capped. To insure that contaminant leaching did not occur, a five year annual groundwater monitoring program would be implemented. The capital costs for this alternative is $451,000 and the operation and maintenance costs for the groundwater monitoring are $7,000. The total present worth cost of the alternative is $458,000.

ARARs Component. The major federal ARARs and TBCs for this alternative are as follows:

- Safe Drinking Water Act, 40 CFR 141.11-141.16, 141.50141.51;
- Endangered Species Act (50 CFR Part 402);
- Proposed Rule for Corrective Action for Solid Waste Management Units, 40 CFR Parts 264, 265, 270 and 271;

The major State ARARs and TBCs are as follows:

- Florida Drinking Water Standards, FAC 17-550;
- Florida Stormwater Discharge Regulations, FAC 17-25.042.

This alternative will meet all Federal and State ARARs.

7.4.5 Alternative 5B - Soils Washing

Major Components of the Remedial Action. Approximately 6,000 cubic yards of material would be excavated and put into a holding tank. The soils washing process would strip the metals from the soil/sediment particles. The cleaned soil would be backfilled into the SEG ponds. The backfilled areas would be leveled, covered with topsoil and reseeded.

Treatment Component. The soils washing process itself would consist of a chelating agent/acid solution countercurrent flow that would strip the metals from the sediment/soil particles. Three to seven washing stages would be required to achieve cleanup levels. The washed soil would go through two or three rinse stages, dewatering by filter press and then placement back into the SEG ponds. The leach solution would be treated by precipitation and recycled back through the soil washing process. The precipitated metal sludge would be transported to a metal reclamation facility. General Components. A hydraulic dredge would be used to remove the SEG pond sediments, which would then be pumped into a holding tank. The contaminated soil and SEW pond sediments would be excavated with a backhoe and mixed with the SEG sediments. Because this process would remove the contamination from the site, no operation and maintenance is required. The total present worth cost of this alternative $2,225,000.

ARARs Component. The major federal ARARs and TBCs for this alternative are as follows:

- Safe Drinking Water Act, 40 CFR 141.11-141.16, 141.50141.51;
- Endangered Species Act (50 CFR Part 402);
- Proposed Rule for Corrective Action for Solid Waste Management Units, 40 CFR Parts 264, 265, 270 and 271;

The major State ARARs and TBCs are as follows:

- Florida Drinking Water Standards, FAC 17-550;
- Florida Stormwater Discharge Regulations, FAC 17-25.042.

This alternative will meet all Federal and State ARARs.

8.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

8.1 Criteria for Evaluating Remedial Alternatives

In selecting its preferred cleanup alternative, EPA uses nine criteria to evaluate each of the detailed alternatives developed in the FS. Those nine criteria are developed in more detail in the figure on the next page. The comparison of the four alternatives using those criteria can be found in the remainder of Section 8 of this ROD.

8.2 Threshold Criteria

8.2.1 Overall Protection of Human Health and the Environment

Alternative 5B provides slightly better protection of human health and the environment than either 3A or 3D because the contaminants are removed from the environment. However, the immobilization of contaminants offered in 3A and 3D provides adequate protection. The protection offered by 3A is slightly better than 3D because water contact with the stabilized waste is minimized in 3A. Since the No Action Alternative does not eliminate, reduce or control any of the exposure pathways, it is therefore not protective of human health or the environment and will not be considered further in the analysis as an option for the source control.

8.2.2 Compliance with ARARs

All of the alternatives comply with relevant Federal and State ARARs and with SARA's preference for treatment.

8.3 Primary Balancing Criteria

8.3.1 Long-Term Effectiveness

Alternative 5B provides the greatest degree of long-term risk reduction because the heavy metals are removed from the soils/sediments. Alternatives 3A and 3D provide significant long-term protection in that the heavy metals are immobilized onsite and therefore are not significantly available for direct contact or leaching into groundwater. Because 3A minimizes the amount the stabilized waste comes into contact with water, it affords slightly more long term effectiveness than 3D; however, bench scale tests indicate that the stabilized waste will not significantly leach even if it comes into sustained contact with water.

8.3.2 Reduction of Toxicity, Mobility or Volume

Alternative 5B provides the greatest in toxicity, mobility or volume by reclaiming the heavy metals from the soils/sediment. Alternative 3A and 3D are roughly equal in that the stabilization should sufficiently reduce movement of contaminants to groundwater.8.3.3 Short-Term Effectiveness Alternatives 3A and 3D present minimal short-term risks, mostly to onsite workers implementing the cleanup plan. These can be averted by precautionary worker safety measures. Alternative 5B has a slightly higher risk that the other three because of a slight rise in potential risk to the general public due to the transportation of the metal sludge to a reclamation facility.

8.3.4 Implementability

Alternative 5B would be the most difficult to implement because it utilizes an innovative technology that has not been used at many sites. Consequently, there is not a large body of knowledge concerning how to apply the soils washing technology to a particular site.

Implementation of Alternatives 3A and 3D would present identical levels of difficulty to each other. The technology utilized by these two alternatives, solidification/stabilization, has been implemented at numerous sites and is well understood.

8.3.5 Cost

The comparative present worth costs of the three remaining alternatives are as follows:

Alternative 3A	$551,000
Alternative 3D	$458,000
Alternative 5B	$2,225,000

The costs developed for Alternatives 3A and 3D are substantially identical. The increased cost for Alternative 3A over 3D is based on the cost of the cap plus the cost of the additional backfill. The cost of Alternative 5B is primarily made up of the hydraulic dredging, soils washing, and the transportation and metal reclamation of the metals contaminated residual sludges. The excavation and backfill costs are otherwise identical to Alternative 3A.

8.4 Modifying Criteria

8.4.1 State Acceptance

The State of Florida, as represented by the Florida Department of Environmental Regulation (FDER), has been the support agency during the Remedial Investigation and Feasibility Study process for the Reeves Southeastern site. In accordance with the 40 CFR 300.430, FDER, as the support agency, has provided input during this process. Based upon comments received from FDER, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

8.4.2 Community Acceptance

The community expressed no major concerns about the selected remedy during the public comment period. The concerns of the community are discussed in detail in the Responsiveness Summary, which is Appendix A of this ROD.

9.0 SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the NCP, the detailed analyses of alternatives and public and state comments, EPA has selected Alternative 3A as the source control remedy for this site. At the completion of this remedy, the risk associated with the soils and sediments at this site has been calculated to range between 1x10[-6] and 1x10[-5], which is within EPA's acceptable risk range of 1x10[-6] to 1x10[-4]. EPA has determined that this risk range is protective of human health and the environment. Because this remedy will not result in hazardous substances remaining onsite above health-based levels, the five-year review will not apply to this action. The total present worth cost of the selected remedy is estimated at $551,000.

Major Components of the Remedial Alternative. The major features of this alternative include excavation of approximately 6,000 cubic yards of contaminated material from the two facilities, solidification/stabilization of that material, backfilling of the excavated areas to grade, disposal of the solidified material above ground where the SEG ponds formerly existed and capping of that material. The areas to be excavated can be seen in Figures 1-5 and 1-6 on page 27 of this ROD.

Containment Component. The solidified/stabilized material should prevent both current direct contact risk and continued migration of contamination from the soils/sediments into the groundwater. A low permeability cap shall be constructed over the stabilized material to minimize the amount of rainfall infiltrating through it. The cap shall consist of an HDPE membrane overlaid with synthetic drainage net and a fabric filter. A two foot thick vegetated soil cover would be placed over the fabric filter.

Performance Standards. Performance standards for excavation of the soils/sediment were developed to protect human health, to prevent contamination of the groundwater and to be in compliance with ARARs. Excavation shall continue until the remaining soils/sediment are at or below the selected performance standards. All excavation activities shall comply with ARARs. Testing methods approved by EPA shall be used to determine whether the performance standards have been achieved. The standards selected for the chemicals of concern are as follows:

Because certain performance standards may not be determined until the Remedial Design phase, it shall be understood that the list of performance standards in this section is not exclusive and may be subject to addition and/or modification by the Agency in the RD/RA phase.

General Component. A dragline shall be used to excavate the SEG pond sediments to a sloped bank constructed nearby. The sloped bank would allow excess water to run back into the ponds. The SEW pond sediment and the SEG soil shall be excavated with a backhoe and moved to a staging area near the sloped bank. The former ponds and excavated areas shall be backfilled with soil from the pond berms, and imported backfill, if necessary. The stabilization agent shall be pneumatically pumped onto the soils/sediments and mixed into the material using a backhoe. The stabilized material shall then be placed above the water table in the SEG pond area and capped. Deed restrictions or some other type of land use restrictions will be sought in order to prevent any activity with the potential to damage the solidified/stabilized monoloth. To insure that contaminant leaching did not occur, a five year annual groundwater monitoring program shall be implemented. Addition operation and maintenance activities will be outlined in the Operations & Maintenance Plan that will be developed as a part of the RD/RA. The capital costs for this alternative is $544,000 and the operation and maintenance costs for the groundwater monitoring are $7,000. The total present worth cost of the alternative is $551,000.

ARARs Component. The major federal ARARs and TBCs for this alternative are as follows:

- Safe Drinking Water Act, 40 CFR 141.11-141.16, 141.50141.51;
- Endangered Species Act (50 CFR Part 402)
- Proposed Rule for Corrective Action for Solid Waste Management Units, 40 CFR Parts 264, 265, 270 and 271;

The major State ARARs and TBCs are as follows:

- Florida Drinking Water Standards, FAC 17-550.
- Florida Stormwater Discharge Regulations, FAC 17-25.042.

This alternative shall meet all Federal and State ARARs.

10.0 STATUTORY DETERMINATIONS

10.1 Purpose

Under CERCLA section 121, EPA 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 to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

10.2 Protective of Human Health and the Environment

The selected remedy protects human health and the environment by immobilizing the contaminants in the stabilized matrix and disposing of the matrix above the water table. Stabilization will reduce and/or eliminate the direct contact threat to human health and, by binding the contaminants in the stabilized matrix, will eliminate further migration of contamination to the groundwater. The stabilized matrix will be disposed of above the water table, covered with a low permeability membrane and a two foot soil cover that will be revegetated. This will serve further to prevent direct contact with the stabilized material and leaching into the groundwater from the material.

10.3 Attainment of the Applicable or Relevant and Appropriate Requirements (ARARs)

The selected remedy of excavation, stabilization, disposal above the water table and capping will comply with all ARARs. The ARARs are presented below.

- Safe Drinking Water Act, 40 CFR 141.11-141.16, 141.50141.51;
- Endangered Species Act (50 CFR Part 402);
- Proposed Rule for Corrective Action for Solid Waste Management Units, 40 CFR Parts 264, 265, 270 and 271;

The major State ARARs and TBCs are as follows:

- Florida Drinking Water Standards, FAC 17-550;
- Florida Stormwater Discharge Regulations, FAC 17-25.042.

This alternative will meet all Federal and State ARARs.

10.4 Cost Effectiveness

EPA believes that the selected remedy will reduce the risk to human health and the environment from the soils and sediments at a cost of $551,000. The selected remedy, though slightly more expensive than the similar Alternative 3D, provides a higher level of long term protectiveness by removing the contaminated material from contact with the groundwater. This will prevent further contamination of the groundwater. Although Alternative 5B provided the greatest degree of long term effectiveness, it cost significantly more than the other three alternatives without providing a significantly greater degree of reduction of risk to human health and the environment.

10.5 Utilization of Permanent Solutions 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 cost-effective manner for the final

source control operable unit at the Reeves Southeastern site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that this selected remedy provides the best balance of trade-offs in terms of longterm effectiveness and permanence, reduction in toxicity, mobility, or volume achieved through treatment, short-term effectiveness, implementability, and cost, while also considering the statutory preference for treatment as a principle element and considering state and community acceptance.

The selected remedy will effectively immobilized the contaminants in the soils and sediments and will prevent any further direct risk to human health or threat to the groundwater.

10.6 Preference for Treatment as a Principle Element

By immobilizing the contaminants in the stabilized matrix, EPA will meet the statutory preference for treatment as a principal element of the remedy.