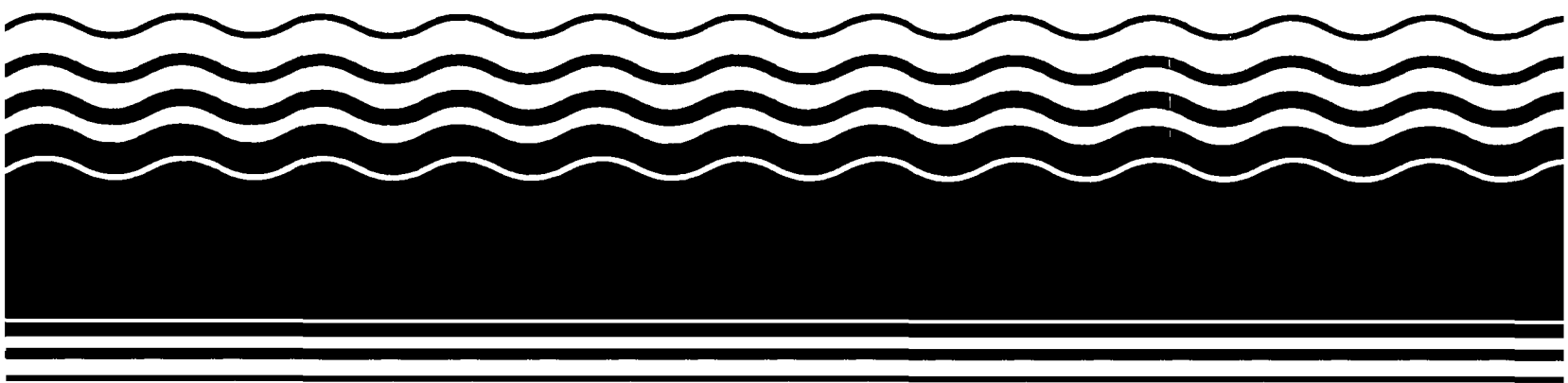


**PB96-963110
EPA/AMD/R05-96/302
May 1997**

**EPA Superfund
Record of Decision Amendment:**

**Cannelton Industries Inc.,
Chippewa County, MI
9/27/1996**



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DECLARATION OF AMENDED RECORD OF DECISION

Site Name and Location

Cannelton Industries, Inc. Site
Sault Ste. Marie
Chippewa County, Michigan

Statement of Basis and Purpose

This decision document amends the 1992 Record of Decision (ROD) for remedial action at the Cannelton Industries, Inc. site, in Sault Ste. Marie, Michigan. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The information supporting this remedial action amendment decision is contained in the administrative record for the Cannelton Industries site. The attached index identifies the items that comprise the administrative record.

The Michigan Department of Environmental Quality (MDEQ) agrees with the approach taken in this selected remedy.

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 Remedy

This final remedy addresses remediation of soil and sediment contamination by eliminating or reducing the principal threat posed by contaminated tannery waste, contaminated soil and sediment at the site, through containment and removal.

The major components of the selected remedy include:

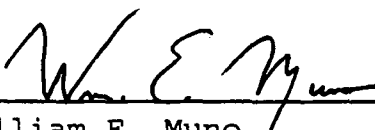
- ◆ Excavation and removal of contaminated soil and tannery waste down to clean sand from the Barren Zone (Zone B), tannery waste from the southern shoreline of Tannery Bay and surficial debris and waste materials from the western shoreline of the site to an off-site facility for appropriate disposal.
- ◆ Collection and treatment (if needed) of groundwater from construction/dewatering activities and discharge to the Publicly Owned Treatment Works (POTW). If applicable NPDES standards are met, water can be discharged to the river.
- ◆ Surface water, groundwater, sediment, wetland soils, and biological monitoring, including bioavailability studies for site specific metals (chromium, cadmium, mercury, arsenic and lead). Action triggers will be determined and agreed upon, by the U.S. Environmental Protection Agency (U.S. EPA) and the MDEQ.
- ◆ Appropriate regrading and landscaping of the western shoreline; regrading and backfilling as necessary of the excavated area in the barren zone to restore wetland.
- ◆ Construction of surface drainage works and maintenance of shoreline protection to prevent erosion.
- ◆ Further evaluation of the stability of soils and sediments, and monitoring study to evaluate the potential for future releases or impacts of metal(s) to the environment; evaluation of Tannery Bay using appropriate analysis to determine if erosion of sediments and site materials are a concern.
- ◆ Construction of a sheet pile containment system or other appropriate remedy for the Tannery Bay area if it is determined that erosion of sediment is a concern.
- ◆ Modification of the amended remedy or the monitoring plan, if indicated, following assessment(s) of the monitoring results. Such revisions, if necessary, would be established through an Explanation of Significant Difference (ESD) to be issued by U.S. EPA, in consultation with the State.

- ◆ Site deed restrictions to limit future use to industrial or recreational uses in specific areas (consistent with wetland protection regulations), while permitting residential use of other portions of the site.

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. The remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies, to the maximum extent practicable. However, because treatment of the principal threats of the site was not found practicable, this remedy does not satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in some levels of contaminants remaining on-site, a review will be conducted every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.



William E. Muno
Superfund Division Director

9/27/96
Date

DECISION SUMMARY AMENDED REMEDIAL ALTERNATIVE
CANNELTON INDUSTRIES, INC. SITE
SAULT STE. MARIE, MICHIGAN

I. INTRODUCTION

The Cannelton Industries, Inc. (Cannelton) Site, a fenced 75-acre site located on the shore of St. Marys River, approximately one mile upstream of the Soo Locks in Sault Ste. Marie, Chippewa County, Michigan was formerly a tannery which operated from 1900 to 1958.

Most of the north part of the site is wetland and is located in the 100-year floodplain, with an elevation of 3-5 feet above average river level. The remaining areas of the site are not in the 100-year floodplain. There are approximately 400 single-family residences located within one-half mile of the site boundary, the majority of which are south and west of the site. Primary land use surrounding the site is residential and light industrial. The tannery property is currently zoned for heavy industrial use. The twenty-year City Master Plan (May 1995) designates the majority of the property for general industry, with the exception of the area from 4th Avenue to South Street and from 18th Street to 16th Street, which has been projected as high density residential. There are no known endangered species however, the wetlands and Tannery Bay are currently used by wildlife as habitat.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

On September 30, 1992 EPA signed a Record of Decision (ROD) for the final remedy at the Site. The ROD required: excavation of on-site soil and sediments from Tannery Bay where levels of contamination exceeded ROD cleanup standards; disposal in a cell to be constructed on site; collection and treatment of groundwater from the construction and dewatering activities; and groundwater monitoring and land use restrictions for landfilled area. On April 12, 1993, U.S. EPA and Cannelton, entered into an Administrative Order on Consent (AOC) for Remedial Design.

III. REQUEST FOR REMEDY MODIFICATION

After completion of Pre-Design Studies and Preliminary Design, pursuant to the AOC, Cannelton requested that U.S. EPA and MDEQ consider and evaluate an alternate cleanup option for remediation of

contaminated soil and sediments in a document entitled "**Alternative Remedy Proposal**" dated June 5, 1995 and revised on October 30, 1995. In general, the alternate remediation proposal consisted of: (1) excavation, dewatering and disposal of tannery waste and soils from the area with highest contaminant concentrations, the Barren Zone (Zone B), in an off-site landfill that meets Resource Conservation and Recovery Act (RCRA) Subtitle D and Part 115 of the Michigan Natural Resources and Environmental Protection Act (NREPA, formerly 641) solid waste landfill requirements; (2) excavation and off-site disposal of surficial waste and debris from the western shoreline (Zone A) and of tannery waste from the southern shoreline of Tannery Bay (Zone D); (3) construction of a sheet pile containment system in Tannery Bay to prevent off-site migration and erosion of sediments; (4) appropriate regrading and landscaping of the western shoreline and backfilling as necessary in the "barren zone" area to restore wetland and allow for natural revegetation; (5) construction of surface drainage system and maintenance of shoreline protection to prevent erosion; (6) further evaluation of soil stability and monitoring study to evaluate potential future release of metal(s) into the environment; (7) development and implementation of a long-term monitoring program for soils, surface water and sediments; and (8) implementation of deed restrictions to limit land use to industrial, recreational and residential in certain specific areas of the site. As described in this amended ROD, U. S. EPA agreed with the proposed changes to the 1992 selected remedy.

In addition, on June 5, 1995, the State of Michigan passed into law Part 201 of NREPA which changed the environmental cleanup requirements and standards. Part 201 standards are based on different land use scenarios and the potential exposure under each scenario. These standards also allow for the use of engineering (e.g. sheet piling) and institutional (e.g. deed restrictions) controls to prevent adverse exposures. The amended remedy will be consistent with future land use of the property. The cleanup standards for each scenario are shown in Table 1.

Table 1

Area Description	Remedy
Western Shoreline (Zone A)	Excavation and removal of an estimated volume of 2,000 cubic yards (cy) of surficial waste materials and disposal in off-site landfill. Regrading and landscaping of area as appropriate for future land use. Construction of surface drainage works to prevent erosion.
Barren Zone (Zone B)	Excavation and removal of an estimated volume of 35,000 cy of soil and tannery waste down to clean sand; dewatering of materials and disposal in off-site landfill. Backfilling of excavated area with clean fill (from off-site sources) as necessary to restore wetland habitat.
Wetland Area (Zone C)	Further evaluation of stability of soils. Monitoring study to evaluate the potential for future releases or impacts of metals to the environment. Deed restriction to limit future use to industrial or recreational uses, consistent with wetland protection regulations.
Tannery Bay/Sediments (Zone D)	Further evaluation of stability of sediments and the potential for future releases or impacts of metals on the environment. Evaluation of Tannery Bay using appropriate analysis to determine if erosion of sediments is a concern. Construction of a containment system or other EPA approved remedy, for the area where erosion of sediments is a concern (if necessary). Removal of visible tannery waste along the southern shoreline of Tannery Bay (estimated volume of 3,000 cy) and disposal in off-site landfill.
Plant Area (Zone E)	No action required, deed restrictions to limit future use to industrial will apply.

Under the amended remedy, tannery waste and soils from the barren zone, western shoreline and southern shoreline of Tannery Bay will be excavated and transported to an appropriate off-site facility for disposal. Soils in the wetland (Zone C) and sediments (Zone D) will be evaluated to determine any potential future release of metals into groundwater and surface water. Upon review, it was determined that further evaluation of the sediments in Tannery Bay was needed to assess whether the area is subject to significant erosion. If evaluation shows a concern for erosion and off-site migration of sediments and site materials, a containment system to prevent off-site migration, or other appropriate measure, will be constructed. The results of studies performed will be used to better define the long-term monitoring plan.

A requisite monitoring plan will also be designed and implemented as part of the amended remedy to monitor the ongoing reduction of groundwater and surface water contaminant concentrations at the Site, and to determine the stability of soils in the wetland (Zone C), and sediments in Tannery Bay. Biological monitoring will also be included to ensure the protectiveness of benthic organisms and wildlife. The requisite monitoring plan will specify the sampling frequency, parameters, locations and protocols to be implemented and include a contingency for further action if continued reduction of contaminant concentrations are not observed or if site conditions indicate that human health and the environment are not being protected. The requisite monitoring plan will be assessed after each sampling event to determine the ongoing site stability and protectiveness and the need for future modification of the amended remedy or the monitoring plan. At each monitoring event, the most current and sensitive analytical methods will be used as they are approved for use by the U.S. EPA.

IV. REASONS FOR AMENDING THE 1992 RECORD OF DECISION

Ground water, soil and sediment data, collected as part of the pre-design investigations, along with major changes in Michigan's environmental cleanup standards, present significant opportunities for enhancement of the remedy with respect to future Site uses, and cost-effectiveness.

Ground Water

Based on testing conducted during pre-design investigations, the quality of groundwater discharging from the site is protective of St. Marys River. Only two groundwater sampling locations, bordering the "barren zone", showed exceedances of the groundwater/surface water interface surface water quality criteria (Interim Environmental Response Division Operational Memorandum #8, Revision 4: "Generic Residential Cleanup Criteria" [June 5, 1995]). After implementation of the amended remedy, the source will be eliminated and groundwater discharging from the site is expected to remain protective of surface water quality in the future.

Soils/Sediments

Much of the chromium and other metals are present in tannery wastes and organic soils, which significantly reduces the mobility of metals at the site. Previous analysis had indicated that the site soils, wastes and sediments have low potential for leaching and are not classified as RCRA characteristic hazardous waste with respect to chromium or other metals. However, to confirm protectiveness of levels left in place under the 1992 ROD, additional soil leaching studies were performed under pre-design investigations. Based on the results of these studies, there is minimal leaching and movement of contaminants from site soils into groundwater and surface water.

Sediment toxicity and bioaccumulation studies performed during pre-design investigations were in some cases inconclusive, but otherwise indicated that the soils and sediments which are proposed to remain on-site do not pose a significant threat to terrestrial and aquatic organisms. Leaving the sediments in place will minimize impacts due to sediment resuspension from dredging or excavation. If Tannery Bay is determined to be consistently depositional, sedimentation of clean sediments over contaminated sediments will serve as a natural cover and as protection from erosion or migration. Aerial photographs have shown that part of Tannery Bay is in a depositional area but, concern remains with major storm and flood events and ice scouring, which might cause significant erosion and off-site migration of sediments and site materials into St. Marys River. An evaluation of erosion/ deposition will be undertaken to evaluate the potential for future off-site movement of site materials and endangerment to human health and the environment.

Based on testing conducted during the pre-design investigation, the volume of soils/sediments requiring remediation has been more accurately defined. The revised estimated volume of soils/sediments which require removal is approximately 40,000 cy. This volume represents a decrease of approximately 75 % from the 1992 ROD estimate which was based on data collected during the Remedial Investigation (RI) and the Feasibility Study (FS). For this reason, short-term risks associated with transportation of excavated materials off-site would be significantly reduced from the short-term risks of the off-site disposal options considered as part of the 1992 ROD. Additionally, Cannelton has proposed that on-site excavated areas will be appropriately regraded to allow for revegetation and formation of wetlands. The plant area, which under the 1992 ROD would be the location for the on-site landfill, will now be available for industrial land use and possibly other uses.

The excavation of soils followed by off-site disposal at a Subtitle D landfill will eliminate the need for long-term deed and access restrictions which could interfere with future use or development of the Site. This approach also furthers U.S. EPA's policy of attempting to return contaminated property to productive use where feasible and appropriate.

The design and implementation of off-site disposal of soils in a Subtitle D landfill could be completed within about 8-12 months, whereas, the design and implementation of the on-site landfill would require 24-36 months to complete.

V. COMPARATIVE ANALYSIS

The amended remedy will address all remaining principal threats at the Site. These threats include: on-site tannery waste; debris and contaminated soils in the "barren zone"; surficial waste and debris in the western shoreline; tannery waste in the southern shoreline of Tannery Bay; and sediments in Tannery Bay. Surface water and groundwater will be addressed through the removal of the existing sources.

The final remedy for the Site is intended to address the entire Site with respect to the principal threats to human health and the environment.

A. The Nine Evaluation Criteria

Based on current information, the amended remedy provides an improved balance of trade-offs with respect to the nine criteria that EPA uses to evaluate alternatives when compared to the 1992 ROD. This section compares the performance of the amended remedy and the 1992 ROD against the nine criteria and explains the rationale for revising the 1992 selected remedy.

B. Comparative Analysis

Overall protection of human health and the environment. Both alternatives provide protection of human health and the environment by eliminating, reducing, or controlling risk through treatment, engineering controls, institutional controls, or a combination of these measures. Under the amended remedy, the principal criteria for overall protection of human health and the environment were based on the new Michigan soil, groundwater, and surface water cleanup standards. At the present time, based on available data, the quality of groundwater discharging from the site is protective of the St. Marys River and is expected to remain protective of surface water quality in the future. Localized groundwater quality will further improve after the removal of soils and waste from the barren zone. After implementation of the remedial actions described in this amended remedy, the soil quality at the site will be protective of human health and the environment under all reasonably anticipated future land uses. Deed restrictions will be used to ensure that future uses of the site remain consistent with the remedial approach taken. The remedial actions described in this amended remedy preserve a large area of wetland habitat which would have been destroyed in completing the remedy specified in the 1992 ROD. The existing shoreline stabilization system will be maintained over time in order to prevent erosion of shoreline. If found to be necessary, sediments along the western side of Tannery Bay will be contained. A monitoring study to be completed will evaluate the long-term stability and bioavailability of contaminants in soils in the wetland area and in sediments. The amended remedy provides the same level of overall protection as the 1992 ROD.

Compliance with ARARs. Both remedies would be designed to meet all current applicable or relevant and appropriate substantive requirements (ARARs) of Federal and State environmental laws.

Compliance with ARARs is applicable only to on-site activity. Because disposal of contaminated soils and tannery waste and debris will not occur on site under the amended remedy, RCRA disposal requirements (beyond certain on-site preparatory activities) are not ARARs. Excavated material will be disposed of in an off-site Type II landfill in accordance with the requirements of Michigan's solid waste management rules and those of the landfill. Any groundwater collected during excavation activities will be collected, treated if necessary, and discharged to the City of Sault Ste. Marie POTW in accordance with the requirements of the City and the MDEQ.

Cleanup standards for soil, sediments, and groundwater included in the 1992 ROD were developed to meet requirements in the Michigan Environmental Response Act (Act 307) administrative rules and associated for soils, sediments, groundwater, and surface water. The State of Michigan on June 5, 1995 enacted Part 201 of NREPA to amend the cleanup standards and liability in Act 307. The amended remedy will comply with Part 201 with respect to soil, groundwater, and surface water at the site. At the present time there are no chemical specific ARARs for sediment quality. The amended remedial action for sediments is based on the results of the sediment toxicity and bioaccumulation studies and further evaluation and monitoring of the potential for migration of metals at the site. Any remedial actions to address sediments will be completed in accordance with the State's action-specific and location-specific ARARs.

Long-term effectiveness and permanence. Under the National Contingency Plan (NCP), the analysis under this criterion focuses on any residual risk remaining at the Site after completion of the remedial action (55 FR 8720). The amended remedy will be effective over the long term through the removal and off-site disposal of contaminated soil and tannery waste which pose a potential risk to human health and the environment. If required, a containment system will be constructed along the west side of Tannery Bay to prevent migration of sediments in that area. On-going maintenance to prevent erosion will be required.

The amended remedy for groundwater provides long-term effectiveness and permanence by excavation and off-site disposal of contaminated media. Long-term effectiveness for the disposed materials is provided by the permit requirements of the disposal facility. The amended remedy provides its effectiveness without the need to

install, maintain and operate the on-site landfill. In addition, the established wooded wetland areas will be preserved. Soil remaining on-site will meet the Part 201 cleanup standards based on expected future land use.

Reduction of contaminant toxicity, mobility, or volume through treatment. The studies completed to date at the site have shown that the contaminants are not mobile to a significant degree in soils which are proposed to remain on site and that soils to be excavated are classified as non-hazardous waste. The amended remedy does not reduce contaminant mobility, toxicity, or volume through treatment. Several studies have been conducted by U.S. EPA and Cannelton to investigate possible treatment alternatives for the materials present at the site. However, feasible volume reduction techniques are not available for metals.

Short-term effectiveness. The amended remedy requires transportation of excavated materials through local neighborhoods and over public highways. The short-term risks related to these activities can be controlled by establishing and following a project specific safety plan in addition to strict adherence to all local, State and federal regulations regarding the transportation of solid waste. Because the volume of excavated material and the distance to the off-site disposal facility are dramatically reduced under the amended remedy, the scope of these short-term transportation risks is much smaller than those evaluated in the prior remedy decision. Exposure of the public and of the on-site workers to contaminated materials during excavation and transportation off-site will be minimized by implementation of appropriate management practices and standard safety precautions to minimize potential short-term impacts, including proper covering of trucks, dust control measures, site access restrictions, air monitoring, and personal protective equipment.

With respect to sediments, the amended remedy calls for a containment approach (natural or engineered) as opposed to dredging, dewatering, transport, and disposal of sediments. In the short-term, this approach could reduce impacts to the St. Marys River associated with dredging activities, which would include releases for suspended solids, migration of impacted sediments, and destruction of existing wetlands.

The amended remedy can be accomplished within a relatively short time frame (1 year). This time frame is significantly reduced from the 1992 ROD, which would have taken 3-4 years to implement.

Implementability. The amended remedy uses common construction equipment and technologies. The availability of off-site landfill capacity was investigated during the preliminary design and it was determined that adequate landfill volume is available and that the ability of the receiving landfill to service the surrounding community will not be adversely affected. Since waste disposal would take place off-site, this alternative would not require new construction activities. Thus, the amended remedy can be implemented much more quickly than the 1992 ROD, which would require significant on-site construction activity. Manifests would be required for the trucks hauling the material. Implementability of access restrictions and other institutional controls for both the 1992 ROD and the amended remedy would require the landowner to agree to such controls.

Cost. Cost estimate of the amended remedy is shown in Table 2. Costs are based on the revised volumes presented in the Alternative Remedy Proposal. Given the reduced volumes of material which require excavation and disposal under the revised remedy, the time and cost required to implement the cleanup would be less than the time and cost required to complete the 1992 ROD. In addition to the \$600,000 spent on construction of the shoreline stabilization, the amended remedial activities are estimated to involve capital costs of \$4.6 million, and annual operation and maintenance costs of \$17,000, for a total present worth cost of approximately \$5.2 million.

State acceptance: The Michigan Department of Environmental Quality (MDEQ) agrees with the approach in this remedial action amendment.

Community acceptance. Community acceptance of the amended remedy has been evaluated in the Responsiveness Summary which is part of this amended ROD. The members of the community who provided comments generally favor the amended remedy over the previous ROD based on the elimination of the on-site landfill. The City has informed U.S.EPA of its support for the alternative remedy which eliminates the need for an on-site landfill and facilitates the reuse and development of the property. The amended remedy addresses the City's and communities concerns regarding future land use and will

Table 2
Cost Estimate¹
Cannelton Industries, Inc. Site

Schedule	Description	Quantity	Unit	Unit Cost	Cost
A	GENERAL REQUIREMENTS				
A.1	Bonds	1	L.S.	\$140,000	\$140,000
A.2	Insurance	1	L.S.	\$60,000	\$60,000
A.3	Permits	1	L.S.	\$17,000	\$17,000
A.4	Deed Restrictions	1	L.S.	\$30,000	\$30,000
A.5	Mobilization and Project Startup	1	L.S.	\$100,000	\$100,000
B	HEALTH AND SAFETY				
B.1	Development, implementation, and Maintenance of Site-specific Health and Safety Plan	1	L.S.	\$75,000	\$75,000
C	CONSTRUCTION FACILITIES & TEMPORARY CONTROLS				
C.1	Temporary Facilities and Utilities	1	L.S.	\$75,000	\$75,000
C.2	Security	1	L.S.	\$20,000	\$20,000
C.3	Equipment Decontamination Facilities	2	each	\$5,000	\$10,000
C.4	Wastewater Storage Tanks	4	month	\$1,000	\$4,000
C.5	Access Roadways	1	L.S.	\$30,000	\$30,000
D	CONTRACT CLOSEOUT, CLEANUP & RESTORATION				
D.1	Demobilization	1	L.S.	\$40,000	\$40,000
D.2	South Street Repair	1	L.S.	\$30,000	\$30,000
E	SITE CLEARING				
E.1	Clearing and Grubbing	4	acre	\$5,000	\$20,000
F	MONITORING WELLS				
F.1	Monitoring Well Abandonment	600	linear foot	\$25	\$15,000
G	EXCAVATING				
G.1	Excavation	40,000	c.y.	\$3	\$120,000
G.2	Dust Control	1	L.S.	\$20,000	\$20,000
H	OFF-SITE DISPOSAL				
H.1	Transportation	40,000	c.y.	\$15	\$600,000
H.2	Tipping Fees	40,000	c.y.	\$20	\$800,000
I	BACKFILLING				
I.1	Common Fill	19,000	c.y.	\$14	\$266,000
I.2	Topsoil	2,200	c.y.	\$24	\$52,800
I.3	Seeding	3	acre	\$3,500	\$10,500
J	SOIL COVER-WESTERN SHORELINE				
J.1	Base Preparation	15,000	s.y.	\$5	\$75,000
J.2	Earth Fill	10,000	c.y.	\$14	\$140,000
J.3	Topsoil	2,500	c.y.	\$24	\$60,000
J.4	Seeding	3	acre	\$3,500	\$10,500
J.5	Erosion Control Works	1	L.S.	\$75,000	\$75,000
K	SHORELINE STABILIZATION				
K.1	Clearing	1,300	L.F.	\$16	\$20,800
K.2	Access Roadways	1	L.S.	\$46,000	\$46,000
K.3	Sheet Pile Wall	900	L.F.	\$250	\$225,000
K.4	Fill Material (Aggregate)	1,600	c.y.	\$70	\$112,000
K.5	Geogrid	1,500	s.y.	\$10	\$15,000
K.6	Drainage Outlet	1	L.S.	\$20,000	\$20,000
L	TEMPORARY EROSION & SEDIMENT CONTROL				
L.1	Temporary Erosion & sediment control - land based	1	L.S.	\$15,000	\$15,000

¹Final Costs in Remedial Design

Schedule	Description	Quantity	Unit	Unit Cost	Cost
M	WASTEWATER MANAGEMENT FACILITIES				
M.1	Excavation Dewatering	1	L.S.	\$50,000	\$50,000
M.2	Water Treatment (Solids)	1	L.S.	\$40,000	\$40,000
M.3	Sanitary Use Surcharge	1,000,000	gallons	\$0.05	\$50,000
N	CHAIN LINK FENCES & GATES				
N.1	Temporary Fencing	3,000	linear foot	\$2	\$6,000
O	VERIFICATION SOIL SAMPLING				
O.1	Sampling & Analysis	1	L.S.	\$100,000	<u>\$100,000</u>
	Sub-Total Capital Cost				3,595,600
	Design & Construction Management Cost (20%)				719,120
Total Estimated Capital Cost					\$4,314,720
Operation & Maintenance					
Shoreline Stabilization - annual	1	L.S.	\$10,000	\$10,000	
Capped area - annual	1	L.S.	\$2,000	\$2,000	
Estimated Present Value Operation & Maintenance Cost (I=5%)					
Engineering - annual	1	L.S.	\$5,000	\$5,000	
Total Present Worth Operation & Maintenance (I=5%)					\$261,000
TOTAL ESTIMATED COST					\$4,575,720

allow for future development of site consistent with the City's long-term land use plans.

VI. THE AMENDED REMEDY

U.S. EPA believes that the amended remedy is the most appropriate solution for the Site because of its performance against the nine evaluation criteria previously discussed. The major components of this combined remedial alternative include the following:

- ◆ Excavation and removal of contaminated soil and tannery waste down to clean sand from the Barren Zone (Zone B), tannery waste from the southern shoreline of Tannery Bay and surficial debris and waste materials from the western shoreline of the site to an off-site facility for appropriate disposal.
- ◆ Collection and treatment (if needed) of groundwater from construction/dewatering activities and discharge to the Publicly Owned Treatment Works (POTW). If applicable NPDES standards are met, water can be discharged to the river.
- ◆ Surface water, groundwater, sediment, wetland soils, and biological monitoring, including bioavailability studies for metals of concern (chromium, cadmium, mercury, arsenic and lead). Action triggers will be determined and agreed upon by the U.S. EPA and the MDEQ.
- ◆ Appropriate regrading and landscaping of the western shoreline; regrading and backfilling as necessary of the excavated area in the barren zone to restore wetland.
- ◆ Construction of surface drainage works and maintenance of shoreline protection to prevent erosion.
- ◆ Further evaluation of the stability of soils and sediments, and monitoring study to evaluate the potential for future releases or impacts of metal(s) to the environment; evaluation of Tannery Bay using appropriate analysis to determine if erosion of sediments and site materials are a concern.

- ◆ Construction of a sheet pile containment system or other appropriate remedy for the Tannery Bay area if it is determined that erosion of sediment is a concern.
- ◆ Modification of the amended remedy or the monitoring plan if indicated following assessment of the monitoring results. Such revisions, if necessary, would be established through an ESD to be issued by U.S. EPA, in consultation with the State.
- ◆ Site deed restrictions to limit future use to industrial or recreational uses in specific areas (consistent with wetland protection regulations), while permitting residential use of other portions of the site.

The goal of the soil and sediment element of this remedial action is to dispose of those materials which pose unacceptable risks to human health and the environment.

The estimated cost for the amended remedy is as follows:

Capital Costs:	\$4, 600,000
O&M (annual):	\$ 17,000
Net:	\$5, 200,000

VII. STATUTORY DETERMINATIONS SUMMARY

1. Protection of Human Health and the Environment

The amended remedy provides overall protection of human health and the environment by removal, off-site disposal of contaminated soils, tannery waste and materials from the site. Institutional controls will be implemented following remediation to assure protection based on future use of the site.

Any short term risks associated with excavation and transportation of contaminated soils and sediments (dust generation) will be minimized by the use of standard construction practices. Air monitoring will be conducted to assess possible exposure during remedial action.

No significant environmental impacts have been identified for the

site, with the exception of the areas proposed for excavation. This is largely due to the fact that impacts from the Site have been to the soil and sediments in the site areas where disposal activities took place. Studies have indicated that contaminants present in soils and sediments proposed to remain undisturbed are not bioavailable and therefore, do not pose a risk to the environment.

2. Compliance with ARARs

The amended remedy will be designed to meet all applicable or relevant and appropriate requirements (ARARs) of Federal and more stringent state environmental laws. The following discussion highlights the ARARs that will be met by the amended alternative.

Action-Specific ARARs:

Clean Water Act (CWA) of 1977, as amended [33 U.S.C.1251]

40 CFR 122 and 40 CFR 125 - The National Pollutant Discharge Elimination System (NPDES), which specifies the scope and details of the NPDES permit applications, including limitations, standards, and other permit conditions which are applicable to all permits including specified categories of NPDES permits. The regulations also specify schedules of compliance and requirements for recording and reporting monitoring results. They are administered by MDNR under Part 31 of NREPA (formerly, Michigan Public Act 245, Part 21). The substantive requirements of these parts will apply to water removed during excavation that will be treated as necessary and discharged on-site.

Part 55 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (formerly known as the Air Pollution Act)

Emissions, which specifies emission limitations for particulate, fugitive dust, VOCS, and or contaminants which may be injurious to or adversely affect human health or welfare, animal life, vegetation, or property, or interfere with normal use and enjoyment. The substantive requirements of this section will apply to excavation activity, and to operation of any water treatment system that is necessary for on-site treatment of water removed during excavation.

Chemical-Specific ARARS:

Clean Water Act (CWA) of 1977, as amended [33 U.S.C. 12511

40 CFR 129 - Toxic Pollutant Effluent Standards, which establish toxic pollutant effluent standards and prohibitions of specific compounds for specified facilities discharging into navigable waters. 40 CFR 129.104 sets the ambient water criterion in navigable waters. These requirements may apply to water removed during excavation that will be treated as necessary and discharged on-site.

Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (formerly known as the Water Resources Commission Act)

Rule 57 - Water Quality Standards (Surface Water Quality Standards), which establishes limits for all waters of the State for the following components: dissolved solids, pH, taste and odor producing substances, toxic substances, total phosphorous and other nutrients, and dissolved oxygen. These requirements will apply to water removed during excavation that will be treated as necessary and discharged on-site.

Part 55 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (formerly known as the Air Pollution Act) Establishes standards for the density of emissions and emission of particulate matter. The substantive requirements of this section will apply to excavation activity, and to operation of any water treatment system that is necessary for on-site treatment of water removed during excavation.

Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (formerly known as the Michigan Environmental Response Act) The rules promulgated pursuant to the Act set requirements for evaluating remediation of hazardous waste sites in Michigan. These rules establish cleanup criteria for contaminated soil, groundwater and the groundwater/surface water interface.

Location-Specific ARARs

Executive Order 11988 - Protection of Flood plains. This Executive Order is applicable at this site since a portion of the site north of South Street lies within the 100-year floodplain of the St. Marys River. It requires the minimization of potential harm to or within floodplains and the avoidance of long and short term adverse impacts associated with the occupancy and modification of floodplains.

Executive Order 11990 - Wetlands Management. This Order is applicable to the site. The Order requires federal agencies to avoid, to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands.

Shoreline Protection and Management Act, Act 245 of 1970. This Act regulates construction of permanent structures in designated high risk erosion areas, designated flood risk areas and designated environmental areas. Substantive requirements will be met if permanent structures are constructed in areas under the act.

Part 91 of the Natural Resources and Environmental Protection Act, 1994 PA 451 (formerly known as the Soil and Sedimentation Control Act) Establishes general soil erosion and sedimentation control procedures and measures. Also, specifies earth change requirements and soil conservation district standards and specifications. These rules may apply to excavation and grading activities.

Part 301 of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994 (NREPA). This part was formerly known as the Inland Lakes and Streams Act.

Part 303 of the NREPA, formerly referred to as the Geomere-Anderson Wetlands Protection Act.

Part 13 of the NREPA, formerly referred to as the Water Resources Commission Act, regulating floodplains and floodways.

3. Cost-Effectiveness

The amended remedy provides overall cost-effectiveness. A high degree of permanence is achieved by excavation and off-site disposal of the contaminated soil and tannery waste in a solid waste cell. The amended remedy can be implemented at a cost which is approximately 70 percent less than the on-site remedy selected in the 1992 ROD.

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

The amended remedy provides a better balance with respect to the nine evaluation criteria than the remedy selected in the 1992 ROD. Treatment technologies are utilized to the maximum extent practicable by excavation, treatment (when required to meet regulatory standards), and off-site disposal of the contaminated soil and waste at an approved off-site facility. The amended remedy represents the maximum extent to which permanent solutions and treatment can be practicably utilized. The contamination in the waste, soils and sediments, especially considering the low mobility this contamination currently exhibits, can be reliably controlled over time through engineering and institutional controls, and treatment is therefore not practicable.

5. Preference for Treatment as a Principal Element

No principal threat which warrants treatment at the site has been identified. While the waste at the site does not readily fit the definition of a principal threat, it also can not be classified on the whole as a low level threat. Given the wastes characteristics, chiefly the low mobility of the principal contaminants, containment of the source material would be a safe and reliable option when coupled with institutional controls and monitoring. Therefore, by treating the contaminated groundwater where required for off-site disposal, the amended remedy satisfies the statutory preference for remedies that employ treatment of the principal threat which permanently and significantly reduces toxicity, mobility, or volume of hazardous substances as a principal element.

**RESPONSIVENESS SUMMARY
AMENDED RECORD OF DECISION
CANNELTON INDUSTRIES INC, SITE
SAULT STE. MARIE, MICHIGAN**

This Responsiveness Summary has been prepared to meet the requirements of Sections 113 (k) (2) (B) (iv) and 117 (b) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), which requires the United States Environmental Protection Agency (EPA) to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for a remedial action. The Responsiveness Summary addresses concerns expressed by the public and governmental bodies in written, and oral comments received by EPA and the State regarding the proposed amended remedy for the Cannelton Industries Site.

A. Overview

1. Proposed Plan

On May 13, 1996, the U.S. EPA proposed an amendment to the September 30, 1992 Cannelton Industries Inc, Superfund Site Record of Decision. The amended remedy proposes the off-site disposal of contaminated soil and tannery waste rather than on-site containment in a landfill cell. Continued monitoring of the site and appropriate actions for development of site areas.

Estimated volume to be removed: 40,000 cubic yards

Time frame for remedial action: 1-2 years

Capital Costs: \$4,600,000

O&M Costs: \$ 17,000

Net Present Value: \$5,200,000

2. Public Comment Period

A public comment period on the proposed plan was held from May 13, 1996 to June 12, 1996. In addition, a public meeting was held on May 22, 1996. At this meeting, representatives from U.S. EPA and the MDEQ presented the proposed changes to the remedy and answered questions regarding these changes. Approximately 12 people attended the meeting. Comments from the public were accepted at the meeting.

During the comment period, U.S. EPA received 2 written submittals of comments and 1 oral comment concerning the proposed plan.

B. Summary of Comments

The public comments regarding the Cannelton Industries Site are organized into the following categories:

- Summary of comments from local community
- Summary of comments from MDEQ and other Agencies

COMMENTS FROM THE COMMUNITY

Two written comments were received from community residents and one oral comment from the city manager of Sault Ste. Marie. These comments have been summarized, please refer to the actual comment letters and meeting transcript in the administrative record for a more complete reading of the comments.

a) Comment: Commentor applauds the proposed changes made to the remedy and believes that evaluating the needs of a cleanup should be dealt with on a case by case basis.

Response: U.S. EPA appreciates the view of the commentor and agrees with this comment.

b) Comment: Commentor believed that eliminating the on-site landfill was a big step forward, since the key objection to previous remedy selected was the on-site landfill that would ruin the key shoreline of this area.

Response: U.S. EPA appreciates and acknowledges this comment.

c) Comment: Commentor stated support for the amended cleanup and approach taken for this site since the City did not want a landfill on site. Key elements of concern from the technical committee [representing the City] were that the remedy allow for future development of the site as envisioned in the City's Twenty-Year Master Plan. For example, residential development across from the McKinley School, north of 4th Avenue and from 16th Street to 18th Street and the specific identification of industrial areas within the former plant area and other areas of the site. Also of concern

was the future stability of site materials and the continued monitoring to assure protectiveness to human health and the environment. Specific comments from the technical committee focused on: a) the barren zone after excavation, should be filled back up to existing grade; b) long-term assurance of wetland stability if left in place; c) adequately analyze and evaluate the health and environmental factors to determine stability of materials and sediments in Tannery Bay so that no health or environmental problem occurs in the future; d) concern that the final remedy for Tannery Bay not preclude the future development of a deep water port facility at some point in the future.

Response: U.S. EPA agrees with commentor's comments and concerns with respect to future development and protectiveness of human health and the environment. U.S. EPA has taken into consideration the City's input when developing the amended cleanup and will work with the community to meet appropriate goals. In regards to specific comments, U.S. EPA will take appropriate measures when implementing remedy to regrade barren zone area as necessary and establish adequate monitoring plan(s) for maintenance of site stability and protectiveness.

COMMENTS FROM OTHER FEDERAL AND STATE AGENCIES

Responses to Michigan Department of Environmental Quality Comments:

These comments were presented in a letter from John M. Shauver and Mitch Adelman of the MDEQ to Rosita Clarke-Moreno, U.S. EPA dated July 1, 1996 and in a letter from Russell J. Harding, MDEQ to William E. Munro, U.S. EPA dated July 12, 1996.

Comment: The MDEQ had several concerns and recommendations with respect to the long-term monitoring and proposed changes to the remedy.

Response: U.S. EPA has taken into consideration MDEQ's comments and concerns. The recommendations made pertain to monitoring issues which will be evaluated during remedial design and incorporated as appropriate into the monitoring plan(s) for this site. U.S. EPA considers the long-term monitoring of the site to be of most importance and will take the necessary measurements and actions as appropriate in consultation with MDEQ.



JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING PO BOX 30473, LANSING MI 48906-7973

RUSSELL J. HARDING, Director

September 26, 1996

Mr. William E. Munro, S-6J
Director, Superfund Division
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

Dear Mr. Munro:

On behalf of the State of Michigan, the Michigan Department of Environmental Quality (MDEQ) has reviewed the September 19, 1996 Amended Record of Decision (ROD) with Declaration and Responsiveness Summary, received September 19, 1996, for the Cannelton Industries, Inc. Superfund site located in the city of Sault Ste. Marie, Chippewa County, Michigan. The MDEQ is pleased to inform you that the state concurs with the selected remedial alternative as outlined in the amended ROD.

We look forward to working with you and your staff assisting in the development of remedial design and operation and maintenance documents, and in overseeing their implementation. If you have any questions, please contact Mr. Bruce Van Otteren, MDEQ Project Manager, at 517-373-8427, or you may contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell J. Harding".

Russell J. Harding
Director
517-373-7917

cc: Ms. Rosita Clarke-Moreno, EPA
Mr. Alan Howard, MDEQ
Mr. Bruce Van Otteren, MDEQ/Cannelton File (16)

U.S. EPA ADMINISTRATIVE RECORD
 CANNELTON INDUSTRIES SITE
 SAULT STE. MARIE, MICHIGAN
 REMOVAL ACTION
 UPDATE #6
 11/03/94

NO.	DATE	AUTHOR	REVISION	TITLE DESCRIPTION	PAGES
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1	11/03/94	Markel, A., L.B. EPA	Markel, A., L.B. EPA	Action Memorandum: Determination of Threat to Public Health or Welfare or the Environment	11

U.S. EPA ADMINISTRATIVE RECORD
 REMEDIAL ACTION
 CANNELTON INDUSTRIES
 SAULT. STE. MARIE, MICHIGAN
 UPDATE #7
 05/16/95

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DOC# ====	DATE ====	AUTHOR =====	RECIPIENT =====	TITLE/DESCRIPTION =====	PAGES =====
1	04/08/93	Mayka, J. and Peterson, L., U.S. EPA	Traub, J., U.S. EPA	Memorandum re: Execution of Attached Administrative Order on Consent for Remedial Design w/Attached Statement of Work for the Remedial Design	70
2	10/01/93	Clarke, R., U.S. EPA	Kerrigan, J., Amax Resource Conservati- on Company	Letter re: U.S. EPA's Comments on the Pre Design Studies Work Plan (2nd Revision)	6
3	12/12/94	Clarke, R., U.S. EPA	Lee, P., Cyprus Amax Minerals Company	Letter re: U.S. EPA's Approval w/Attached Modifications of the Revised Pre Design Studies Report	12

U.S. EPA ADMINISTRATIVE RECORD
 REMEDIAL ACTION
 CANNELTON INDUSTRIES
 SAULT STE. MARIE, MICHIGAN
 UPDATE #9
 07/05/98

NO	DATE	AUTHOR	RECIPIENT	TITLE DESCRIPTION	PAGES
0000	YYYY	XXXXXX	XXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXX
1	09-08-94	Clarke, R.	U.S. EPA	Action Memorandum re: Determination of Effect to Public Health or Welfare on the Environment at the Cannelton Industries Superfund Site	10
2	10-01-94	Cannelton Industries Incorporated	U.S. EPA	Remedial Design Pre-Design Studies	135
3	10-09-94	Cannelton Industries Incorporated	U.S. EPA	Remedial Design Pre-Design Studies: Technical and Data Report	60
4	10-14-94	U.S. EPA	Respondent	Administrative Order of Consent for Shoreline Stabilization w/ Attached October 5, 1994 Cover Letter From U.S. EPA to Cyprus Amax Minerals Company	27
5	11-01-94	Conestoga-Peters & Associates	U.S. EPA	Health and Safety Risk Barrier Zone Material Characterization Study	92
6	01-09-95	Sprenger, M., U.S. EPA, EPA	U.S. EPA	Final Report: Ecological Risk Assessment for the Cannelton Industries Site	114
7	04-09-95	Cannelton Industries Incorporated	U.S. EPA	Report: Bioaccumulation Studies (CANN 95-3)	75
8	05-09-95	Cannelton Industries Incorporated	U.S. EPA	Preliminary Design Report (CANN 95-4)	395
9	05-09-95	City of Sault Ste. Marie	U.S. EPA	Sault Ste. Marie Master Plan	100
10	07-09-95	Cannelton Industries Incorporated	U.S. EPA	Construction Report: Additional Shoreline Stabilization (CANN 95-7)	114
11	07-09-95	Cannelton Industries Incorporated	U.S. EPA	Technical Notes on the Site Specific Lead Assessment Criteria	78
12	09-27-95	Clarke-Moreno, R., U.S. EPA	Lee, R., Cyprus Amax Minerals Company	Letter re: Completion of Work Under the Administrative Order on Consent	2
13	11-01-95	Cannelton Industries Incorporated	U.S. EPA	Report: Remedial Alternative (CANN 95-5)	94
14	11-01-95	U.S. EPA Technical Review and guidance on Lead	U.S. EPA	Report: Review of a Technology for Establishing Risk Based Soil Remediation Goals for Commercial Areas of the California Beach Site	55

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
CANNELTON INDUSTRIES SITE
SAULT STE. MARIE, MICHIGAN
UPDATE #9
09/18/96

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
====	====	=====	=====	=====	=====
1	07/01/96	Shauver, J. and M. Adelman, MDEQ	Clarke-Moreno, R., U.S. EPA	Letter re: MDEQ's Recommendations Concerning Additional Studies to be Conducted by Michigan State University for the Cannelton Site w/Attachments	9
2	07/12/96	Harding, R., MDEQ	Muno, W., U.S. EPA	Letter re: MDEQ's Review and Concurrence, with Modifications, of the Proposed Plan for Amending the Record of Decision	1
3	07/17/96	Schauver, J. and M. Adelman; MDEQ	Clarke-Moreno, R., U.S. EPA	Letter re: Additional Studies Proposed in the May 1996 Revised Proposed Plan	1
4	07/24/96	Petito Boyce, C., PTI Environmental Services	Clarke-Moreno, R., U.S. EPA	Letter re: Summary of Assumptions Used in Deriving Soil Screening Levels for Lead at the Cannelton Industries Site	3

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
CANNELTON INDUSTRIES SITE
SAULT STE. MARIE, MICHIGAN
UPDATE #10
09/20/96

DOC# ====	DATE ====	AUTHOR =====	RECIPIENT =====	TITLE/DESCRIPTION =====	PAGES =====
1	05/22/96	Northwest Reporting	U.S. EPA	Transcript of May 22, 1996 Public Meeting	21
2	06/05/96	Concerned Citizens	U.S. EPA	Two Public Comment Letters re: the Revised Proposed Plan Received May 14 and June 5, 1996 (PORTIONS OF THIS DOCUMENT HAVE BEEN REDACTED)	2
3	00/00/99	U.S. EPA		Record of Decision Amendament (PENDING)	0