FY1

Controlled Correspondence For REGION 6

Congressional

CONTROL NO : R6-0400089-C **ORIG. DUE DATE:** 04/20/2004

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STATUS: **PENDING**

CORRES. DATE: 03/23/2004
RECEIVED DATE: 03/29/2004
ASSIGNED DATE: 03/30/2004
CLOSED DATE:

FROM: SENATOR JAMES INHOFE
ORG: **U.S. HOUSE OF REPRESENTATIVES**
SALUTATION:
CONSTITUENT: JACK TENNANT, WILBROS ENGINEERS, INC.

TO: GREENE/RICHARD E.
TO ORG: EPA
SUBJECT: DISPOSAL OF CHAT PILES ON THE TAR CREEK SF SITE.

ASSIGNED: Superfund Division

COPIES OF INCOMING PROVIDED TO: 6RA, 6RD, 6RC, 6XA

SIGNATURE: **RICHARD E. GREENE**
R6 COMMENTS:

R6 INSTRUCTIONS:

Lead - Please send a copy of the reply to Jan Wilson in 6XA, 7331.
(6EN) D. Bradford 8593, (6MD) S. Langley 2728, (6PD) M. Oldham 7200,
(6RC) S. Price 3186, (6SF) J. Buzzell 7177, (6WQ) J. Greensage 7518,
(6XA) L. Braziel 6449.

	Assigned	Date Assigned	Code/Status	Date Completed by Assignee	Date Returned to R6 :
Lead	6SF	03/30/2004	ACTION	-	-

181737

(Untitled)

United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

6RA ✓
6DRA ✓
6MD
6OEJ
6PD
6EN
6WQ
6SF ✓ Control
6PC
6XA
6 SPEC ASST

March 23, 2004

Richard Greene, Regional Administrator
C/O Ginny Vietti, Congressional Liaison
EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Dear Mr. Greene:

Enclosed is a proposal I received from Mr. Jack Tennant of Willbros Engineers, Inc., regarding disposal of the chat piles on the Tar Creek Superfund site. I advised Mr. Tennant and his colleagues that I would pass this proposal along to you for your consideration in the remediation work to take place in Operable Unit 4.

Should you have any questions, please contact my Staff Counsel, Mr. Ryan Jackson, at (202)224-6176. Thank you for your consideration of this proposal, and I look forward to your response.

Sincerely,

James M. Inhofe
Chairman

WILLBROS ENGINEERS, INC.

March 5, 2004

Mr. Ryan Jackson, Counselor
Office of U.S. Senator, James M. Inhofe
300 Yokum Parkway, 1503
Alexandria, Virginia 22304

Subject: Removal and disposal of chat piles from the Tar Creek Superfund Site
Ottawa County, Oklahoma

Dear Mr. Jackson:

You will recall our telephone conservation on January 9, 2004 in which Mr. Joe Anderson and I briefly discussed with you a conceptual plan to address the problem of removal and disposal of the chat piles at the Tar Creek Superfund site in northeastern Oklahoma. The plan incorporates the use of slurry pipeline segments to transport the chat from the piles for disposal into the mines.

You requested that we provide you with a white paper explaining the conceptual approach with supporting details. Subsequent to our telephone discussion, we engaged Willbros Engineers, Inc. of Tulsa, Oklahoma to assist us in the development of the white paper, three copies of which are attached hereto.

Mr. Richard L. Moore, Project Manager, for Willbros Engineers, Inc. worked with Mr. Anderson and me in the preparation of the white paper. Your review and forwarding of the white paper to the appropriate governmental agencies will be most appreciated. Should you have questions regarding the white paper or need extra copies, please call Mr. Moore at 918-481-4305. Please advise Mr. Moore or me of your action on this matter.

Very truly yours,

Jack D. Tennant

Jack D. Tennant
P.O. Box 171
Strang, Oklahoma 74367
Phone: 918-593-2593

WEI-04-O-0001
CC: Richard L. Moore
Willbros Engineers, Inc.
2087 East 71st Street
Tulsa, Oklahoma 74136
Phone: 918-481-4305
Fax: 918-481-4317
Email: richard.moore@willbros.com

WHITE PAPER
CHAT REMOVAL PROGRAM FOR TAR CREEK SUPERFUND SITE

1.0 Executive Summary

Senator James Inhofe's strong leadership was credited by Christie Whitman, former EPA Administrator, in a press release dated June 1, 2003 as instrumental in the development of and signing of a Memorandum of Understanding (MOU) between three federal agencies, the Environmental Protection Agency (EPA), Department of the Interior (DOI), and U.S. Army Corps of Engineers (USACE). The MOU was signed in May of 2003 and will facilitate cooperation of the agencies in development of a response plan to ensure protection of public health and to encourage sustained economic stability and future environmental recovery for the Tar Creek Superfund Site (hereinafter referred to as the "Site").

Willbros is familiar with the remediation programs that have been completed in recent years and also with current programs announced to be started this year by the Oklahoma Department of Environmental Quality (DEQ), the University of Oklahoma, and the USACE. The programs discussed in public meetings to date do not directly address the timely removal of the huge chat piles left from the lead and zinc mining operations.

Studies of chat disposal programs to date have primarily focused on the sale of chat as aggregate for road paving projects. Aggregate is a high-bulk, low unit value commodity that derives much of its value from being located near the market, thus is said to have a "high place" value.

It is not economically feasible to transport aggregate long distances to markets, particularly in situations such as Tar Creek where centralized rail-car loading facilities are not available. The market for the sale of chat as aggregate for road projects in the Tar Creek Site vicinity is very limited as is evidenced by the fact that chat sales over the years have not substantially reduced the quantity of the chat piles. Disposal of the chat piles by sale for aggregate in road paving projects will require several decades or longer and presents a number of environmental problems.

Willbros believes an idea proposed by Mr. Jack D. Tennant offers a practical and economical alternate solution for removal and disposition of the chat from the Tar Creek Site. His idea is to remove the chat piles from the land surface and to deposit the chat back into the mines from which it originated. He proposes to utilize slurry pipelines to transport the chat from the piles to disposal wells drilled from the ground surface into the mine roof.

Mr. Tennant and his associate, Mr. Joe Anderson contacted Mr. Ryan Jackson, an attorney in the environmental section of Senator Inhofe's office in Washington D.C. on January 9, 2004 to discuss this conceptual plan with him. Mr. Jackson

requested that they prepare and send him a "white paper" to describe the general methodology of the plan. Subsequent to the aforementioned telephone discussion, Messrs: Tennant and Anderson engaged Willbros Engineers, Inc. to assist in the preparation of the white paper requested by Mr. Jackson.

The white paper also addresses the reasons Willbros believes that removal of the chat piles should be included in the overall Tar Creek Site remediation program. We hope the information presented will provide sufficient detail for consideration by the political leaders and/or governmental agencies that will formulate and implement the overall remediation program for the Tar Creek Site.

2.0 History of Mining Operations and Site Description

2.1 General

The Site is located in Ottawa County and generally consists of a forty-square mile area that includes five communities: Picher, Cardin, Quapaw, North Miami, and Commerce in far northeastern Oklahoma. Site Photographs (Rural Operable Unit 4) attached were taken from the Oklahoma DEQ website and show the chat piles in the Picher and Cardin area and a view of a chat pile near a residence.

Underground mining for lead and zinc was performed using room-and-pillar method from 1891 lasted through early 1970. Following cessation of mining operations, water from an aquifer slowly filled the mine caverns. The native sulfide minerals dissolved in the fresh water creating acid mine water. In 1979 acid mine water containing high concentrations of heavy metals began discharging into Tar Creek from nearby natural springs, and open mine shafts. The Site was listed on the EPA National Priorities List (NPL) in 1981.

There are numerous public concerns with the Site as well as the Tar Creek and Spring River watersheds. Public concerns include: chronic flooding, extensive subsidence, open or poorly sealed mine shafts, impaired water quality from abandoned mine discharges, remaining mine tailings, depressed local economy, health and safety affects, and Native American issues.

The U.S. Geological Survey and the U.S. Army Corps of Engineers have estimated that the Site contains approximately 75 million tons of chat piles which are very large (some being 200 feet high). The chat piles are located throughout the Site including the aforementioned communities. The EPA estimates that 70% of the Site is on Quapaw land. It is also estimated that 60% to 80% of the 75 million tons of chat is located on lands owned by the members of the Quapaw Tribe (including 16 of the largest chat piles) and held in trust by the Bureau of Indian Affairs (BIA). The BIA represented the tribes in dealing with the mining companies and (as was common practice in that time) approved the practice of leaving the chat piles on the land surface).

For years, the government represented to the Indian royalty owners that the chat piles represented an economic benefit for current and future generations which could be derived from the sale of chat. In reality, the chat piles have been of minimal economic benefit to most Tribal members, and to the contrary have resulted in severe environmental and economic impacts. Chat from the piles has sold slowly over the years, the market for it tempered by, among other factors, low prices, environmental concerns and handling and transportation costs.

To further complicate the issue; in 1997 out of health concerns, the BIA placed a moratorium on the sale of chat from Native American-owned lands. Members of the 2003 MOU Team will also partner with the Quapaw tribe on efforts to consolidate chat ownership and reach an agreement with the BIA to dismiss the above mentioned moratorium.

The area's Tribes desire a full cleanup of the land surface to insure an end to exposure to heavy metals by the human, plant, fowl, fish, and animal populations. This cleanup should include removal of the chat piles and debris around abandoned mine sites as well as closure of open mine shafts and sink holes.

A report dated September 8, 2000 by former Governor Frank Keating's "Chat Usage Subcommittee" states the subcommittee's belief that the health and environmental problems caused by the presence of the chat piles can never be fully mitigated unless the chat is removed and disposed of in a safe and effective manner. This report calls the chat piles a historic "attractive nuisance".

2.2 Chat Piles contribution to local flooding

Over time, portions of the chat have been washed into stream channels contributing to the degradation of the water quality. Clogging of the stream channels exacerbates flooding during rainfall events. The chat piles have significantly altered the drainage characteristics of the area and in certain areas, the streams themselves have been altered to meander around the chat piles. The impact of the chat piles on the surface drainage patterns contributes to the local flooding in the area. The USACE will conduct studies and issue a report of their findings and recommendations for the Tar Creek and Spring River Watershed Management Plan by August 2004. Also, the Oklahoma DEQ will embark on a program to remove chat and mine waste from streams and other water channels in 2004.

2.3 Chat Piles contribution to public health concerns

Chat in its bulk form contains elevated levels of metals, raising serious human health and ecological concerns. The chat is composed of chert, dolomite, calcite and residual oxides and sulfides of iron, zinc, manganese, lead, cadmium, and other metals. The lead-contaminated chat piles are a source of exposure to the population, especially to young children. The smaller size fractions contain most

of the lead, zinc and cadmium. The USACE reported that the contamination of residential yards was primarily from people hauling in chat to backfill their yards over the years.

The cleanup of lead contaminated soils from over 1300 residential yards and high access areas located within the five-city mining area was completed at a cost of approximately $26.6 million in 2000. The cleanup program in conjunction with extensive educational efforts by federal, state, county, and tribal entities has resulted in a 50% reduction in the number of children between one and six years of age with blood lead levels greater that than the 10 µg/dL standard set by the Center of Disease Control (CDC).

2.4 Impact of Chat Piles on Land Values

The presence of the chat on the land in the Site has resulted in loss of productive capacity of the land and to extremely depressed land values. Owners have abandoned much of the chat-covered land, resulting in the land being removed from the tax rolls. Willbros believes removal and disposition of the chat into the mine caverns to be the best and most cost effective solution to this problem.

3.0 Conceptual Plan for removal and disposition of chat into mines.

3.1 Process Overview

The conceptual plan for removal of the chat from the surface lands and disposition of chat into the mine caverns basically involves pumping the chat in a slurry form through relatively short pipelines (constructed on the ground surface) between the chat piles and disposal wells drilled through the mine roof. The mine caverns are typically 200 to 300 feet below ground surface. The mine caverns are reported to be 600 feet to 800 feet square with varying heights up to 150 feet. The geometry of the mine caverns renders these mines ideal for the proposed method of slurry backfill and will require drilling only a few injection wells for deposition of the slurry in the mine.

The injection wells will be drilled at strategic locations to enhance deposition of the chat in the mine. Raw water from the mine cavern will provide the water source to mix the water-chat slurry. Figure 1 attached shows the proposed materials handling scheme for removal of the chat piles and deposition of the chat back into the mine caverns. Figure 1 also shows the typical layout of the raw water pipeline, slurry pipeline, slurry disposal wells, etc. envisioned for this process.

Figure 2 depicts a vertical section of the mine cavern and shows the raw water well with submersible pump, the mine shaft and the slurry injection wells. The injection of the slurry will be switched between disposal wells during the cavern

filling process to fill the cavern in lifts and optimize distribution of the chat in the mine cavern.

The type of slurry pipeline used for this project is known in the industry as a "brute force" pipeline which is a relatively short, high velocity system typically used in dredging operations for transport of mine tailings. The raw water and slurry will be small diameter pipelines. The sizes will depend on the selected project design parameters (i.e. tons/day of chat to be moved). It is anticipated that raw water pipelines and the slurry pipelines will be in the 10" to 12" diameter range, respectively. The injection well bores are expected to be in the 12" to 14" range.

The raw water supply pipeline and the slurry pipelines will be laid above ground so they can be moved from location to location as required. The line pipe will be 20 ft. or 40 ft. joints with flange or ring-clamp couplings to allow for quick assembly and/or disassembly to facilitate relocation as the situations dictate. The line pipe for slurry pipeline may be lined with a polyethylene liner to resist erosion from the abrasive chat-water slurry.

3.2 Equipment and process at Chat Pile

Standard equipment including and front end loaders and self-loading scrapers (Pictures 1 and 2) will be used to move and load the chat into hopper with screen mechanism to remove large particles, etc. from the chat. The hopper will feed a horizontal conveyor belt system (Picture 3) which will deposit the screened chat into a mixing basin where the water-chat slurry will be formed. The portable hopper will be moved as required with additional sections of conveyor belts added as required to facilitate loading of the chat from the piles onto the belt conveyor system. The self-loading scraper will also be used to transport chat from smaller nearby chat piles to the slurry mixing basin.

3.3 Equipment and process at the slurry mixing station

The slurry mixing station is a fixed location which can serve one or more chat piles, depending on the relative location of the chat piles. A temporary pond will be used to store raw water pumped from the mine to the slurry-mixing area. The mixing station will combine the raw water and chat to create the slurry to be pumped to the mine disposal wells. The dry chat will be deposited in the sparge box at constant rate from a conveyor belt.

Figure 3 shows an elevation of the equipment to be used at the slurry mixing basin. An electric-motor powered water pump will be used to pump water from the raw water storage pond to the slurry mixing basin. The raw water pump will supply water to the sparge box through three or four small diameter hoses. The submersible mainline pump will be positioned in the sparge box and will be

connected to the slurry pipeline with a flexible hose. A jib-crane (Picture 4) will be used to facilitate movement of the slurry pipeline pump in the sparge box, as required. Density of the slurry will be controlled by varying the quantity of raw water pumped into the sparge box. Slurry density will be monitored with a densitometer installed on the slurry pipeline.

3.4 Slurry Pipeline Operation

Figure 4 shows the process flow diagrams for the raw water and slurry pipelines. The slurry pipeline pumps will be electric-motor driven pumps. If the length of the slurry pipeline dictates, a mainline pump will be installed at the mid point of the slurry pipeline to pump the slurry mix to the mine.

3.5 Equipment at the slurry injection wells

As mentioned previously holes will be bored through the roof of the mines at strategic locations to allow for deposition of the slurry into the mines. Picture 5 shows the type of drill rig that will be used to drill the injection wells. A large air compressor may also be utilized to inject air through a nozzle inserted through the well bore to agitate the water at the injection point to disperse the solids in the mine away from the injection point.

3.6 Tailings Ponds

There are reportedly 800 acres of tailings ponds at several locations in the Tar Creek Superfund Site. If desired, mine tailings from these ponds can be dredged with existing commercial dredging equipment and pumped back into the mines using a process similar to that for the chat piles. Picture 6 depicts the type of dredge that would be used to dredge the tailings ponds.

4.0 Summary and Benefits

Willbros believes that removal of the chat piles by depositing the chat in the mines can be performed in an economical manner and is the "right thing to do". In addition to restoration of the surface land, disposition of the chat in the mine caverns will ameliorate the future subsidence problems. The chat removal work will be very visual and progress will be apparent to the local population which is important from a political perspective.

The proposed process is very scalable and can be designed to meet the overall project objectives and timing of other associated remediation programs for the Tar Creek Site. The envisioned process could readily transport 600 tons of chat per hour. Systems to move more than one chat pile at a time can be implemented to accommodate the overall schedule for the Tar Creek remediation program. The

chat removal program schedule can be coordinated to accommodate the overall federal funding for the overall project with a time frame of 5 to 10 years, if desired.

A water treatment program to treat the displaced water could be accomplished through passive water processes such as the pilot program being carried out by the University of Oklahoma Civil Engineering Department this year. The location(s) of the passive water treatment lagoons can be designed to facilitate the overall land reclamation scheme adopted for the Tar Creek Site.

In summary the proposed process offers the following benefits:

- Chat removal program will complement other remediation programs being undertaken for the Tar Creek Superfund site and can be planned and scheduled to be compatible with and facilitate other programs.
- Removal of chat will eliminate health concerns posed by chat.
- Removal of chat from land surface will restore usage and value of land.
- Very visual program which will be apparent to local population who can see that actual progress is being made.
- Deposition of chat back into mine caverns will ameliorate subsidence problem of mine caverns and reduce hazards to the public from mine cave-ins. The program is very flexible and a priority can be assigned for filling mine caverns that pose the greatest safety hazard.
- Deposition of chat back into mine caverns is expected to partially neutralize the acidity of the mine waters and should improve overall quality of mine discharge water.
- Deposition of chat back into mine caverns is expected to reduce flow of aquifer water through the abandoned mines and thus reduce the quantity of water discharged into Tar Creek.
- Very scalable and production rates can be sized to accommodate overall remediation program for the Tar Creek Superfund Site.

5.0 Willbros Qualifications and Experience

Willbros is well-positioned to provide the application of engineering technology and resources to carry out the chat removal program and has experience in all phases of this process. Willbros designed, procured and tested a portable fuel pipeline for the U.S. Army which has been employed in the recent Gulf wars. The raw water and slurry pipelines for the Tar Creek Site are much shorter than the military fuel pipelines but requirements for portability and logistics are similar.

Willbros' subsidiary, MSI Energy Services designs, builds, operates and maintains slurry pipelines for several oil producers in the tar sands production areas in Canada. Willbros also has experience in disposal well design and operations in Oklahoma.

In our role of management of projects in the energy industry, we routinely interface with local, state and federal agencies to secure permits for such projects. We are accustomed to addressing operational issues such as dust abatement, hydrostatic test water treatment and disposal and right of way restoration for these type projects which are our forte.

Willbros appreciates the opportunity to submit this white paper, and will be pleased to answer any questions you may have. We recommend that meetings be scheduled with the parties/agencies (that will be involved in the Tar Creek Remediation program) at an appropriate time to discuss the scope and schedule for the chat removal program. Following such meetings Willbros will prepare and submit a proposal to develop a definitive budgetary cost estimate, execution plan and schedule for the chat removal program.

Sincerely,

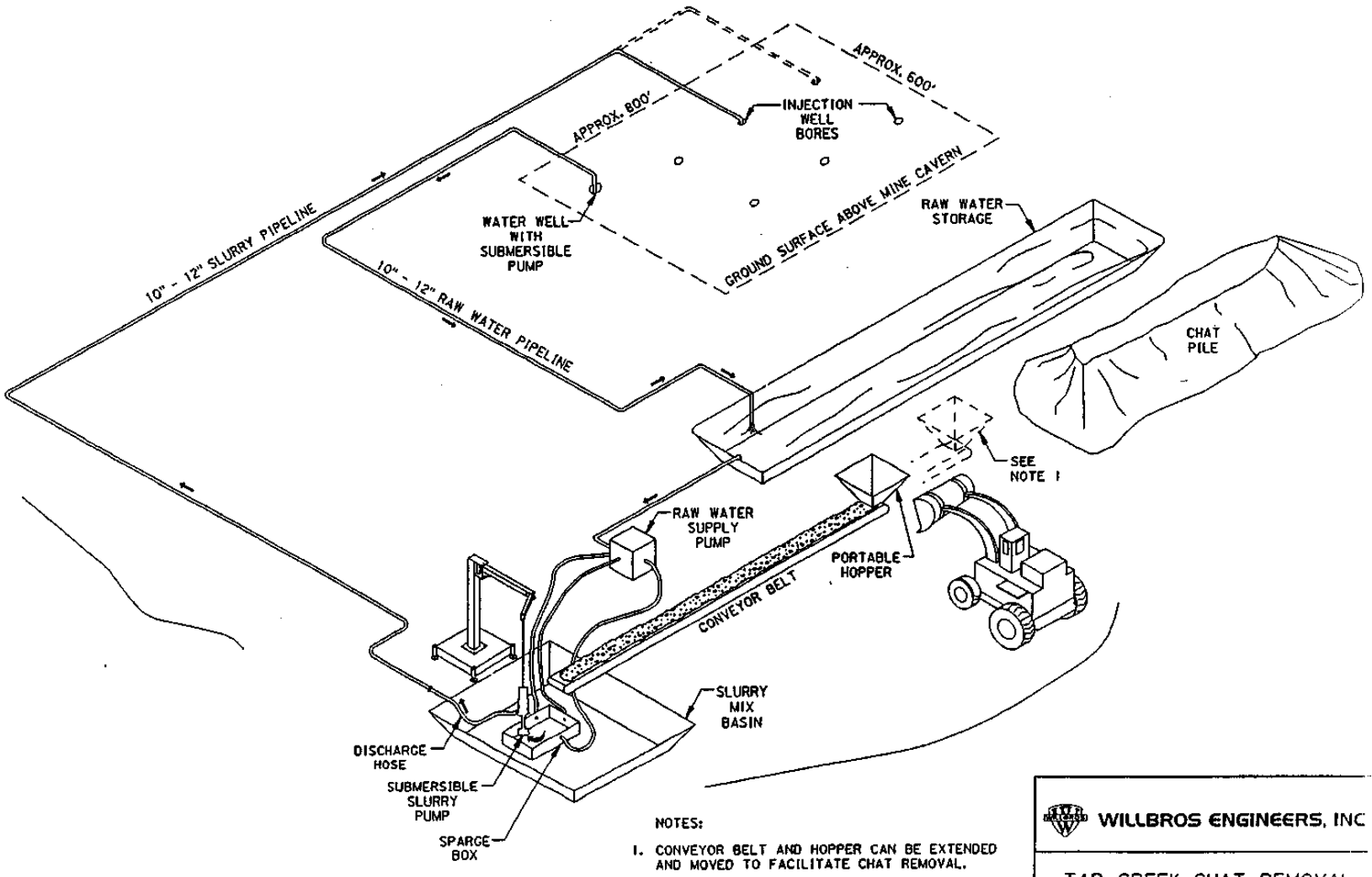
Richard L. Moore
Project Manager
March 5, 2004

SITE PHOTOGRAPHS
CHAT PILES (RURAL OPERABLE UNIT 4)
TAR CREEK SUPERFUND SITE, OTTAWA COUNTY, OKLAHOMA

Aerial Photograph of a Portion of the Site - Note the chat piles (gray areas). Also note the acid mine discharge (yellow areas). Cardin, OK, is located in the upper left, Picher is located in the upper right.

Chat Pile - Note the proximity of the residential property.

FIGURE 1



NOTES:

1. CONVEYOR BELT AND HOPPER CAN BE EXTENDED AND MOVED TO FACILITATE CHAT REMOVAL.

SCALE: N.T.S.

WILLBROS ENGINEERS, INC

TAR CREEK CHAT REMOVAL
CONCEPTUAL LAYOUT

DRAWING NUMBER	SHEET
FIGURE-001	1 OF 1

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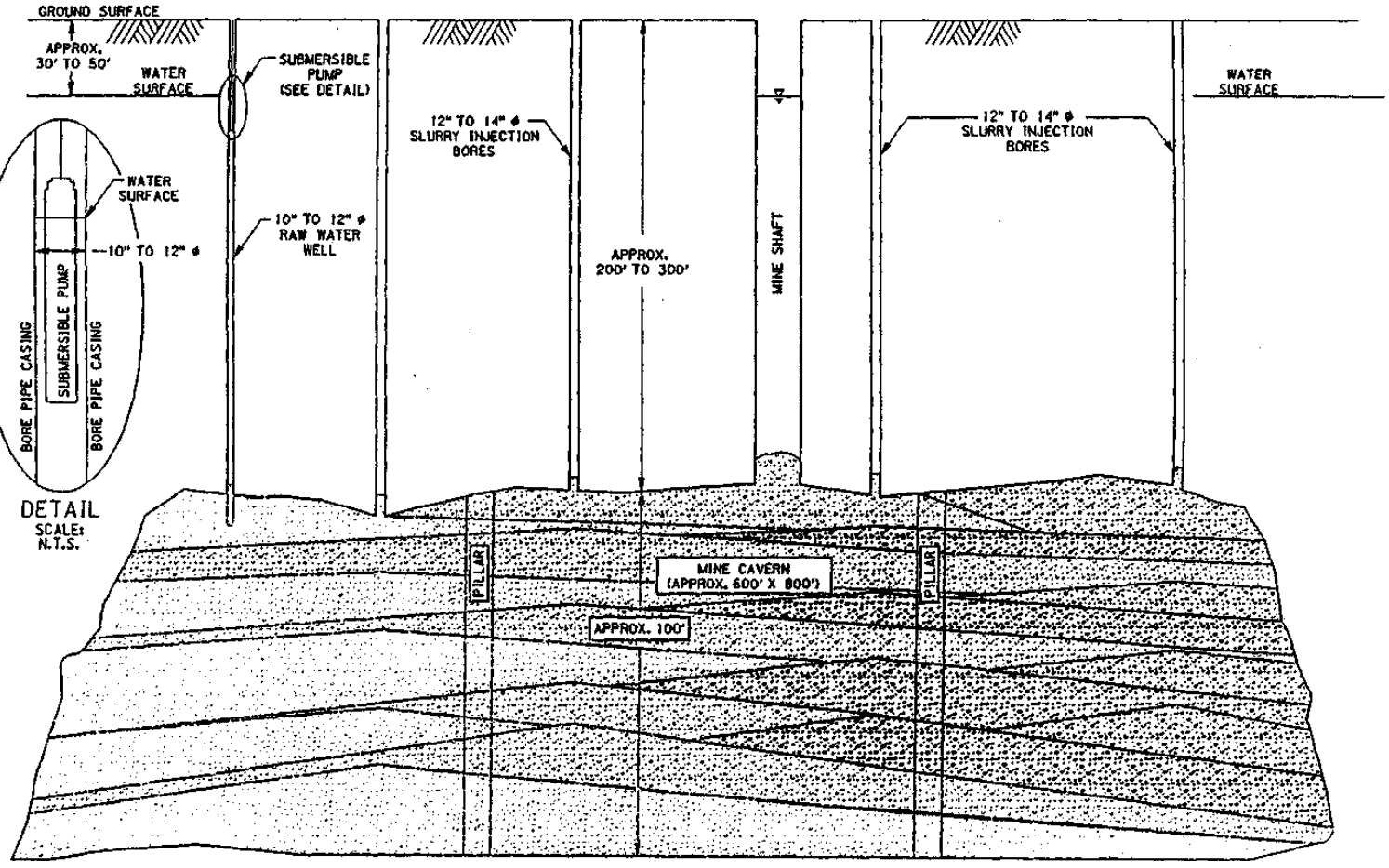
FIGURE 2



SCALE: N.T.S.

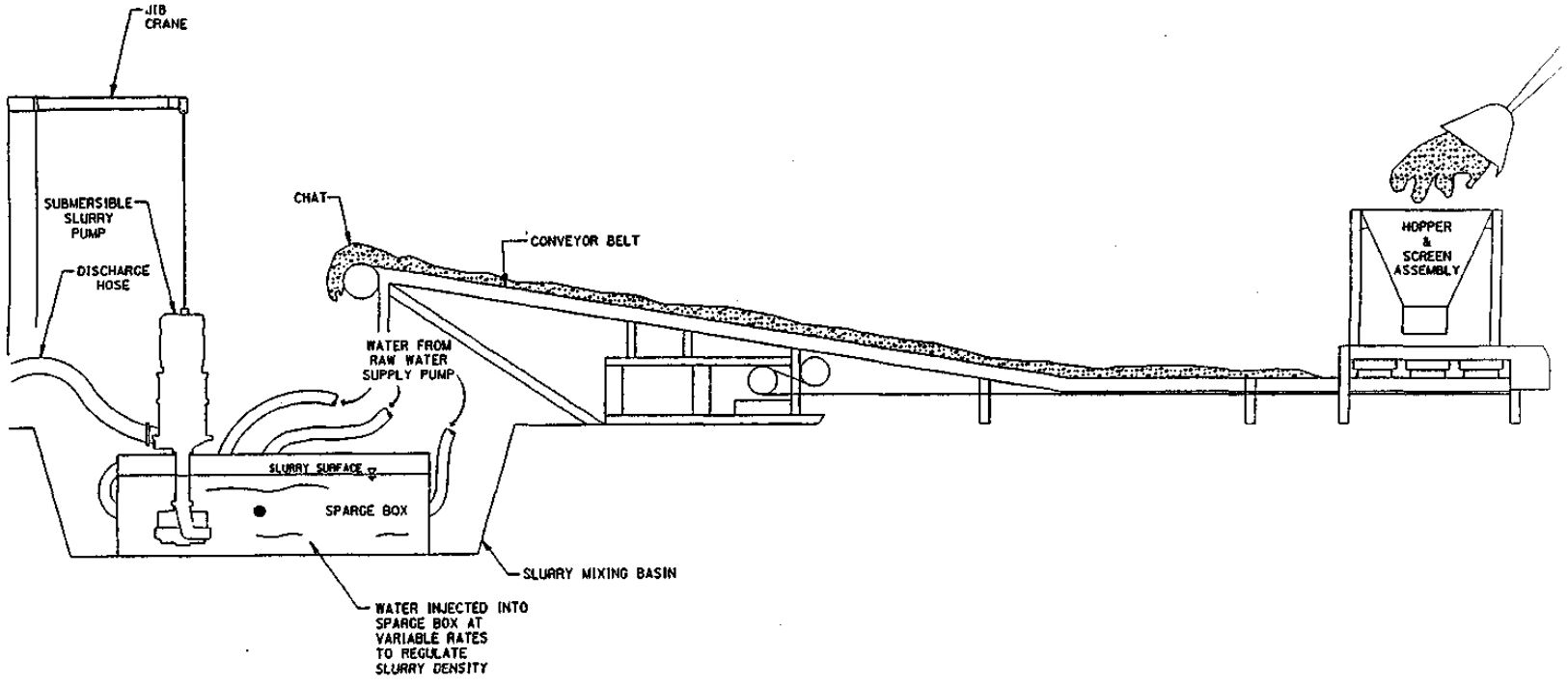
WILLBROS ENGINEERS, INC

TAR CREEK CHAT REMOVAL
TYPICAL MINE CAVERN

DRAWING NUMBER	SHEET
FIGURE-002	1 OF 1

H:\TL\JOHNTAR_CRE\INFIGURES\L.DGN 04-MAR-2004 15:22

FIGURE 3



H:\TLJOHN\TAR_CRK\FIGURE\2.DGN 04-MAR-2004 13:47

SCALE: N.T.S.

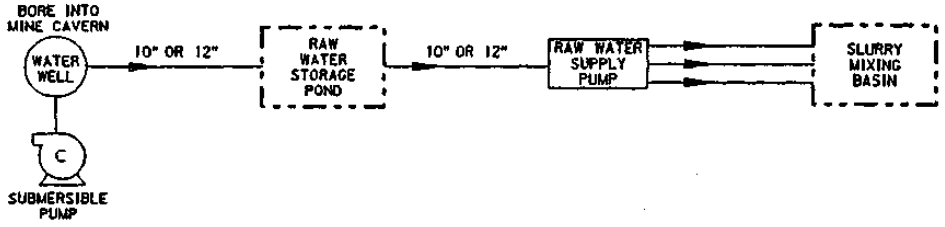
WILLBROS ENGINEERS, INC

TAR CREEK CHAT REMOVAL
SLURRY MIXING STATION

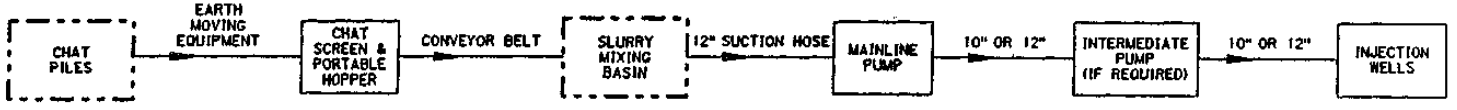
DRAWING NUMBER	SHEET
FIGURE-003	1 OF 1

FIGURE 4

WATER PIPELINE



SLURRY PIPELINE



H:\TLJOHN\TAR_CRE\1\FIGURE\4.DGN 04-MAR-2004 15:01

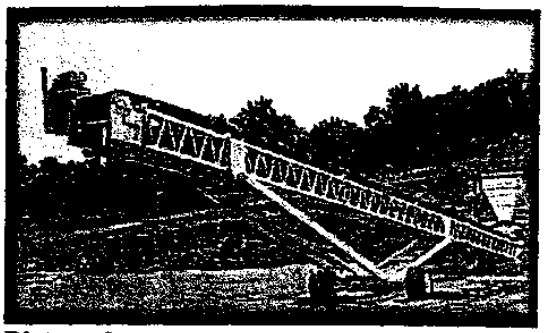
WILLBROS ENGINEERS, INC

TAR CREEK CHAT REMOVAL
PROCESS FLOW DIAGRAM

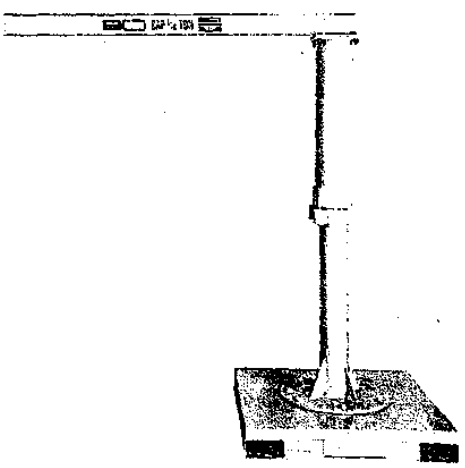
DRAWING NUMBER	SHEET
FIGURE-004	1 OF 1

Picture 1
Wheel Loader – Caterpillar

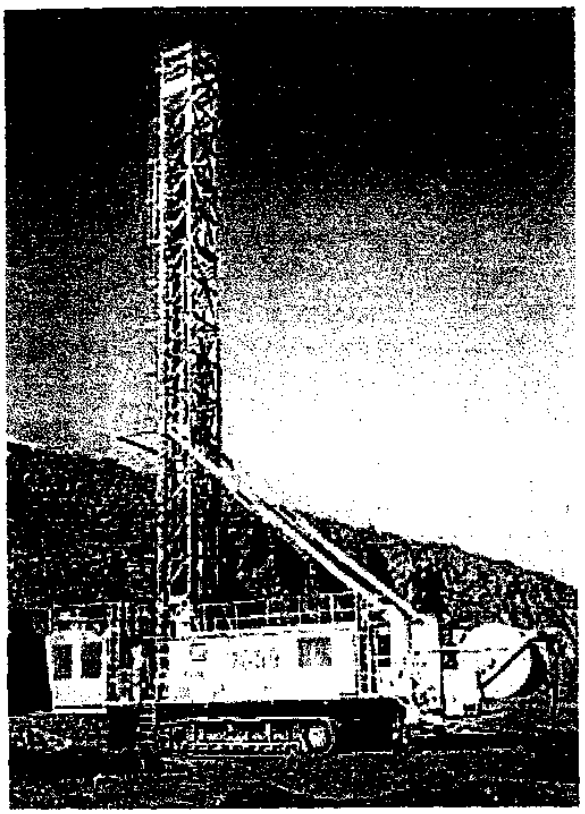
Picture 2
Elevating Scraper – Caterpillar



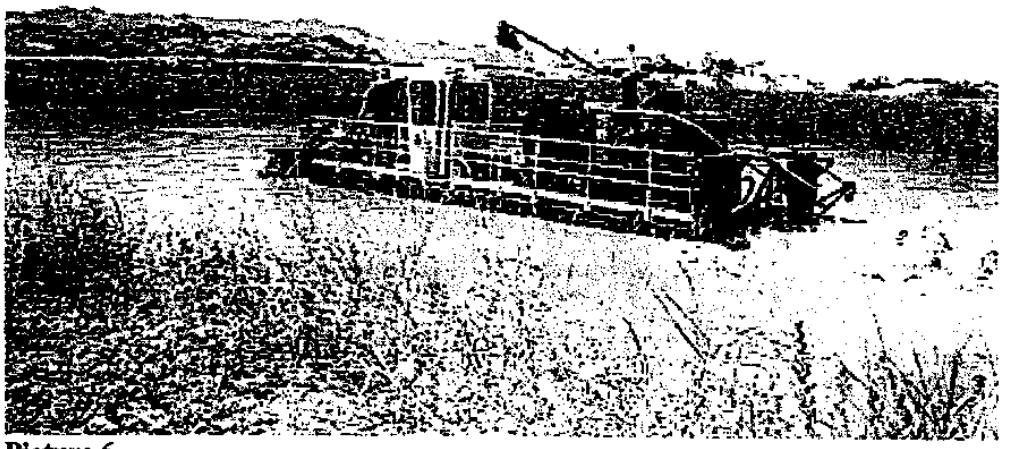
Picture 3
Conveyor – Peerless



Picture 4
Jib Crane – Contrx Cranes



Picture 5
Drilling Rig - Avtron



Picture 6
Floating Dredge