FILE COPY

BEFORE THE UTAH SOLID AND HAZARDOUS WASTE COMMITTEE

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In the Matter of:	:	ORDER
HERCULES INC., Bauer Dump Site.	:	No. 8405185

---ooOoo---

This ORDER is issued by the Solid and Hazardous Waste Committee of the Utah Department of Health, pursuant to Section 26-14-5(4) and 26-14-7(7), Utah Code Annotated, as amended.

FINDINGS

1. Hercules is a Delaware corporation qualified to do business in Utah.

2. Hercules owns certain property in Tooele County near the old Bauer townsite which Hercules acquired from Blackhawk Resin Company.

3. Portions of the Hercules property at Bauer have been used to produce adhesives from coal fines or coal derivatives. The coal materials were transmitted to the site and treated with solvents to extract resins for use by Hercules. Residues were then dumped for disposal in diked surface areas.

4. The remaining coal dust, and possibly other waste constituents at the Bauer site, are subject to spontaneous ignition each spring and generally burn through the summer.

5. Two boys who were in the Bauer area on or about the weekend of April 26, 1985, came into direct contact with the ignited materials and were seriously burned.

6. The coal fines and other potentially hazardous materials at the Hercules Bauer site remain in an uncontrolled status posing a threat to public health and the environment through the potential for further direct human contact as well as water releases and air releases.

7. The coal fines and other hazardous materials at the Hercules Bauer site are solid wastes which have caused, and are causing, a public nuisance and a public health hazard.

BASED UPON THE FOREGOING FINDINGS, HERCULES IS HEREBY ORDERED TO:

1. Take immediate action(s) to assure prevention of unauthorized access to the Bauer site;

2. Within 14 days of the date of this order, submit to the Utah Department of Health, for approval, a proposed plan for identifying and characterizing all waste material located at the Bauer site;

3. Within 30 days of approval by the Utah Department of Health of the proposed waste characterization plan, implement and complete the plan;

4. Within 30 days of completion of the waste characterization plan, submit to the Utah Department of Health for approval a remedial action program and schedules for elimination of hazardous materials and clean-up of the site.

DATED this 10 day of May, 1985.

By: Dale D. Parker
DALE D. PARKER, Ph.D.
Executive Secretary
Utah Solid and Hazardous Waste
Committee

Information Received at Utah SOH on Sept 21, 88

BLACKHAWK Resp Sito

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BEFORE THE SOLID AND HAZARDOUS WASTE COMMITTEE

STATE OF UTAH

* * * * * * *

IN THE MATTER OF HERCULES, INC.)	ANSWER AND REQUEST
)	FOR HEARING
BAUER DUMP SITE)	Case No. 850 5185

* * * * * * *

Respondent Hercules Incorporated (hereinafter the "Respondent"), by and through the undersigned counsel, hereby answers the Order issued by the Executive Secretary (hereinafter the "Staff") as follows:

FIRST DEFENSE

The Utah Solid and Hazardous Waste Committee (hereinafter the "Committee") lacks jurisdiction over Respondent with respect to any and all acts or omissions on, or conditions of, the subject property referenced in the Order.

SECOND DEFENSE

The staff's Order, and each and every alleged finding therein, fails to state a claim against Respondent upon which the Order or other relief can be granted.

THIRD DEFENSE

FINDINGS

1. Respondent admits the allegations set forth in paragraph 1.

2. Respondent denies the allegations set forth in paragraph 2.

3. Respondent admits that portions of the Blackhawk property at Bauer were used to produce adhesives from coal fines or coal derivatives, that the coal materials were treated with solvents to extract resins and that certain residues were placed in diked surface areas, but denies each and every other allegation contained in paragraph 3.

4. Respondent denies the allegations set forth in paragraph 4.

5. Respondent lacks sufficient information or belief to either admit or deny the allegations in paragraph 5, and therefore denies such allegations.

6. Respondent denies the allegations set forth in paragraph 6.

7. Respondent denies the allegations set forth in paragraph 7.

GENERAL DENIAL

Respondent denies each and every allegation of the Order not specifically admitted in this Answer.

FOURTH DEFENSE

Each and every paragraph of the Staff's Order is null and void on its face and of no effect because it purports to require actions by Respondent prior to 30-days after issuance, contrary to Utah Code Ann. § 26-14-11(2) (Supp. 1983).

REQUEST FOR HEARING

Without acknowledging or admitting the Committee's jurisdiction in this proceeding, Respondent hereby requests a hearing before the Committee or a duly appointed Hearing Officer on the Findings and Order set forth in the Staff's Order and not specifically admitted in this Answer, and on Respondent's denials and defenses set forth in this Answer. Respondent expressly reserves the right to contest the Committee's jurisdiction in this proceeding and/or in other administrative or judicial forms.

WHEREFORE, Respondent requests that the Committee conduct or duly appoint a Hearing Officer to conduct a hearing on the issues raised by the Staff's Order and this Answer, dismiss the staff's Order and award Respondent such further relief as may be appropriate.

DATED this 6th day of June, 1985.

KEITH E. TAYLOR
DAVID W. TUNDERMANN
of and for
PARSONS, BEHLE & LATIMER

MAILING CERTIFICATE

I hereby certify that I caused to be mailed, postage prepaid, a true and correct copy of the foregoing ANSWER AND REQUEST FOR HEARING to the following on this 6th day of June, 1985:

Larry Edelman, Esq.
Special Assistant Attorney General
124 State Capital
Salt Lake City, Utah 84114

Norman D. Jones, Ph.D.
Chairman
Utah Solid and Hazardous Waste Committee
Utah State University
Logan, Utah 84321

Dale D. Parker, Ph.D.
Executive Secretary
Utah Solid and Hazardous Waste Committee
P.O. Box 2500
Salt Lake City, Utah 84110

0320J

HERCULES

Hercules Incorporated
Hercules Plaza
Wilmington, Delaware 19894
(302) 594-5000
Telex: 83-5479

July 13, 1988

RECEIVED
JUL 15 1988
Utah Dept. of Health
Bureau of Solid & Hazardous Waste

Mr. Muhammad A. Slam
Utah Bureau of Solid and Hazardous Waste
P. O. Box 16690
288 North 1460 West
Salt Lake City, Utah 84116-0690

Dear Mr. Slam:

Enclosed please find a copy of the Site Remediation Report for Hercules' Black Hawk Site in Bauer, Utah. The report details the remediation effort and the groundwater investigation at the site.

There are three notable items in the report. First, the coal fire was extinguished and the possibility of re-ignition has been minimized. Second, some erosion has occurred at the site but that condition is being addressed at the present time. Third, only minimal contamination of the groundwater has been observed at the site. No further groundwater monitoring should be required.

After you have reviewed this report, I would appreciate hearing your views on the project in general. Thank you for your help with this project.

Sincerely,

J. Louis Graham
Environmental Engineer

JLG/anl
2748v

Enclosure

HERCULES INCORPORATED 75 ANNIVERSARY

HER. 27100-2

SITE REMEDIATION REPORT

FOR THE

HERCULES INCORPORATED BLACK HAWK SITE

in BAUER, UTAH

June 12, 1988

BY:

J. Louis Graham
Environmental Engineer
Hercules Incorporated
Hercules Plaza - Room 5143 NW
Wilmington, Delaware 19894

Table of Contents

List of Tables

List of Figures

1. Introduction and Site History

Black Hawk Resins and Chemical Company, a subsidiary of Hercules Incorporated, owned and operated a coal resin extraction plant located at Bauer, Utah. The plant covered an area of approximately 26.9 acres. Until the plant was destroyed by fire in September of 1980, it extracted naturally occurring resins from coal fines obtained from mines in Carbon County, Utah. The extraction process employed a co-solvent consisting of aliphatic hydrocarbons (typically hexane) and 3 to 5% benzene or toluene. This co-solvent was extensively recycled in the process.[1]

After the plant was destroyed, it was not rebuilt. The sediment ponds in which the spent coal fines were placed dried out and eventually ignited. In May of 1985 Hercules contracted with STS D'Appolonia Ltd. to provide professional services for the abatement of the spent coal fire. At the same time Hercules provided 24-hour security by stationing a guard at the property to prevent unauthorized access to the site. This 24-hour security was maintained until site remediation was completed.

Following discussions with the Utah Bureau of Solid and Hazardous Waste the contract with STS D'Appolonia was expanded to include waste identification and characterization, exploration of site hydrogeology and determination of groundwater quality. The findings of their study were presented in STS D'Appolonia's report "Site Exploration Spent Coal Fire Abatement Black Hawk Site" dated July 1986.[2]

A copy of STS D'Appolonia's report was given to the Utah Solid and Hazardous Waste Committee in August of 1986. At the same time the Committee was notified that Hercules intended to sell the property to a party who planned to recover minerals from the material at the site. This third party planned to extinguish the fire in a way acceptable to the Committee that would also allow him to recover the minerals. Eventually, in February 1987, the attempt to sell the property was terminated and Hercules immediately moved ahead to extinguish the coal fire. Figure 1 is an aerial view of the site before remedial activities began.

2. Site Remediation

On March 10, 1987, Hercules contracted with STS D'Appolonia to prepare the site design for extinguishing the coal fines fire at the Black Hawk Site. The site design developed by STS D'Appolonia was outlined in their report dated April 21, 1987.[3]

The technical specifications for the site design were presented to the Utah Bureau of Solid and Hazardous Waste for approval during the week of May 4-8, 1987. The specifications were also given to representatives of Tooele County and they were informed that work would begin at the site as soon as possible. Finally, during this same week, proposals were requested from three potential construction contractors.

During the following week, May 11-15, 1987, Hercules awarded the construction contract to Harper Contracting Incorporated of Kearns, Utah.[4] Also, during that week, Hercules received a waiver from Utah's Open Burning Rule to allow for the extinguishment of the fire.[5]

On May 18, 1987, Harper Contracting began moving men and equipment on to the site. Initially, the site was cleared and grubbed. Following that test pits were dug to determine the extent of burning coal as well as the overall extent of unburnt coal.

The burning coal fines were excavated with a front-end loader. They were then extinguished using water while still in the bucket of the loader. Care was taken to insure that all personnel and equipment remained at the edge of the fire on ground that did not contain burning coal. Additionally, all work was conducted on the upwind side of the burning area.

All of the burning coal was extinguished by May 28, 1987. During the period of time that the coal was being extinguished, two water trucks were continuously present. One truck supplied water for the actual extinguishment while the second truck was present for any emergencies that might have developed. No significant unanticipated problems were encountered while the coal fines were being extinguished.

The remains of the extinguished coal fines as well as the majority of unprocessed coal that was not burning were disposed of on-site. They were placed in one-foot-thick layers with a layer of soil in between each layer of coal. The layers of soil were also one foot thick and compacted to 90 percent of the Standard Proctor Maximum Dry Density. Compaction of the soil was verified with testing conducted by PTL Inspectorate, Incorporated of Salt Lake City, Utah. Occasionally the soil failed the compaction tests and had to be recompacted and retested. In all cases, the soil passed the compaction tests before it was approved. PTL test results are included in Appendix A. After the final layer of coal was put down, a two foot layer of soil was placed over the area as a cap. This cap was also compacted.

The most surprising aspect of the site remediation was the vast amount of unprocessed coal that was found. One area that appeared to be just wind-blown coal covering the ground turned out to be a depression in the ground filled with up to 10 feet of coal. Many of the berms that appeared to be soil were actually coal with a dirt cover.

These large amounts of unsuspected coal were a significant problem. There was not enough soil available to dispose of this quantity of coal using the method outlined in the specification. With the approval of representatives from the Utah Division of Oil, Gas and Mining and the Utah Bureau of Solid and Hazardous Waste, two alternative methods of disposal were used.[6]

First, approximately 13,000 tons of clean coal were given to Kennecott Copper Company to be burned in their powerhouse. Second, two pits were dug on-site for disposing of some of the coal. The first layer of coal in the pits was seven feet thick. On top of this layer of coal alternating one-foot layers of soil and coal were put down. Again the soil was compacted and tested for proper compaction. A final two-foot soil cap was placed over this area also.

One other advantage realized from digging the disposal pits was the additional soil that it made available for fill material. With this additional fill material and slightly changing the recommended contours of the site, no additional off-site material was needed.

On July 23, 1987, construction work at the site was completed. The rainwater intercepter ditch on the east edge of the site was deleted from the specification. It was felt that the existing irrigation ditch at that location served the same purpose since it was only about 100 feet from the coal disposal areas. Revegetation of the site was planned for later in the Fall of 1987. Figure 2 shows the final elevation contours for the site after remedial work was complete. Figure 3 indicates where coal was buried at the site.

During the construction period several people occasionally came out to the site to observe activities. These included representatives of the Utah Bureau of Solid and Hazardous Waste; the Utah Division of Oil, Gas and Mining; the Tooele County Environmental Health Department; and the Tooele County Building Inspector.

3. Revegetation

Hercules contracted with Mr. Alvin Matthews of Grantsville, Utah, to revegetate the site after construction work was completed. Advice regarding seed type and quantity was obtained from Mr. Carlos Garcia of the Soil Conservation Service, United States Department of Agriculture, Tooele Sub-office.[7] His recommendations were followed with one exception. Antelope Bitterbrush was substituted for Alfalfa because the roots from Alfalfa would have penetrated the two-foot soil cap at the site. The final seed mixture used at the site is as follows:

Oahe Intermediate	6 lb/acre
Ephraim Crested	4 lb/acre
Russian Wildrye	2 lb/acre
Eski Sainfoin	1 lb/acre
Antelope Bitterbrush	1 lb/acre

The procedure used for reseeding the site included loosening the top six inches of soil to prepare a seed bed. This was followed by applying wheat straw mulch at a rate of 2000 pounds per acre. Finally, a commercial 20-30-10 fertilizer was applied at 100 pounds per acre and the ground was seeded at 14 pounds PLS per acre. After the seeding was completed a five-strand barb wire fence was installed around the site to keep livestock off the seedbed. Revegetation work started on November 15, 1987, and the fence was finished on January 4, 1988.

On May 11, 1988, Hercules contracted with Reclamation Engineering and Construction to determine the success of the revegetation work. Substantial germination throughout the area was evident but there were indications of erosion in some areas.[8]

Measures to correct the erosion are being undertaken at this time. Actual erosion control work will be completed in the Summer or Fall of 1988. Corrective measures consist of re-seeding about two acres of ground and applying an erosion control blanket in the areas of highest run-off. This control blanket consists of a dense mat of wood excelsior with a photo-degradable plastic mesh. The mat will eliminate erosion while the grass takes hold. The grass will grow through the mat as the sunlight degrades the plastic mesh.

4. Groundwater

During the original site characterization performed by STS D'Appolonia six wells were installed at the Black Hawk site. Three of the wells were installed in October 1985, and the other three were installed in March 1986. Figure 2 shows the location of the six monitoring wells. A complete discussion of the drilling program and well construction can be found in STS D'Appolonia's final report.[9]

Due to misinterpretation of groundwater results and questions raised about analytical methods and selected analytes during the first two rounds of groundwater sampling, the Utah Bureau of Solid and Hazardous Waste requested that two additional rounds of groundwater samples be taken. It was agreed that the samples would be analyzed for priority pollutants and several other organic compounds. A list of compounds and the analytical method used to identify them are given in Tables 1 to 4.

Hercules contracted with Earthfax Engineering, Inc. to take the two sets of groundwater samples. The first round of groundwater samples were taken from September 30, to October 2, 1988. A misunderstanding concerning well designations resulted in samples from Well C-6 being labelled as Well C-5. During this sampling effort two wells, C-4 and C-5, did not have enough water to take representative samples. A blind duplicate sample was taken from Well C-6 and an equipment blank was taken after Well C-2 was sampled and prior

to sampling C-6. The second round of groundwater samples were taken from May 11-13, 1988. During this sampling effort three wells, C-4, 5, 6, did not have enough water to take representative samples. A blind duplicate sample was taken from Well C-3 and an equipment blank was taken after Well C-3 was sampled and prior to sampling C-2.

Sample collection was conducted in accordance with the "Groundwater Sampling and Quality Assurance Project Plan for Hercules Incorporated Bauer Township Site" which was submitted to the Utah Bureau of Solid and Hazardous Waste on April 2, 1987. In addition to the procedures outlined in the project plan, two additional items were requested by the Bureau. First, the Bureau wanted three well volumes purged before collecting a sample. Second, the Bureau wanted an equipment blank included in addition to the proposed blind duplicate sample. Both of these requests were incorporated in the sampling effort.

Sampling, sample preservation, and decontamination methods are outlined in the Earth Fax sampling reports which are included in Appendix B. Also included in the Earth Fax reports are the field water quality measurements and the field physical measurements taken at the time the wells were sampled. Data from Well C-6 is referred to as Well C-5 in the sampling reports and Well C-5 is referred to as Well C-6.

4a. Hydrogeology

Interpretation of data taken during the initial site investigation indicates that the hydrogeology at the site is complex. It appears to consist of one continuous aquifer at approximately 100 feet depth and several perched saturated zones of limited extent above this aquifer.[10] The reader is referred to STS D'Appolonia's final report for a more thorough discussion of the site hydrogeology.

Water level measurements obtained during the last two rounds of groundwater sampling are presented in Table 2. The water level data collected corroborates data obtained during the March 1986, sampling event. If levels in Wells C-5 and C-6, which are screened in a separate water bearing zone, are ignored, groundwater appears to flow in a generally westward direction across the site. Well C-2 appears to be the most downgradient well at the site.

As previously mentioned, the hydrogeology at the site is complex. Existing wells are not adequate to give a detailed description of the exact hydrogeology. However, further investigation is not warranted because only minimal contamination of the groundwater at the site has been observed.

4b. Water Quality

Groundwater samples were analyzed for priority pollutants plus several additional compounds by DataChem of Salt Lake City, Utah. The total list of compounds is given in Tables 1 to 4. These tables also includes the analytical method used for each compound and the method detection limit for each compound. DataChem analysis result sheets are in Appendix C.

Compounds detected in groundwater samples are listed in Table 6. Also listed in Table 6 are the available drinking water standards for the compounds detected. The three available drinking water standards are the Maximum Contaminant Level (MCL), the Suggested No Adverse Response Level (SNARL) and the World Health Organization (WHO) guidelines. There was only one compound found above the applicable drinking water standards. Selenium was found in Well C-2 at 52 ug/l during the October 1987, sampling event. The MCL for Selenium is 10 ug/l. Selenium was not found in previous sampling events and it was not found during the May 1988, sampling event.

Chloroform was again detected in Well C-1. This contamination is believed to be caused by the addition of calcium hypochlorite to well C-1 during well installation. Chloroform concentrations have been decreasing during the period the wells have been sampled. Chloroform concentrations found during all sampling events for Well C-1 are as follows:

Date	Chloroform Concentration (ug/l)
January 1986	64
February 1986	120
April 1986	17
October 1987	18
May 1988	5.5

Only the February 1986 concentration of 120 ug/l is above the MCL value of 100 ug/l.

Acetone was also found in Well C-1 during the May 1988 sampling event. This is the only time acetone has been found in Well C-1 and it was found at the very low level of 6.9 ug/l.

Chloromethane was detected in Well C-X during the May 1988 sampling event at a concentration of 230 ug/l. This was the first time chloromethane has been detected in any well during any sampling event at the site. There is the possibility that this may have been a laboratory error. MCLs or MCLGs have not been proposed for chloromethane. No other published drinking water standards were found to compare with the concentration found in Well C-X.

During the October 1987, sampling event arsenic was found in Wells C-1, C-3 and C-6. It was also found in the equipment blank during that sampling event. These levels as well as arsenic levels found in previous sampling events, are below the MCL concentration of 50 ug/l.

Cyanide was found in Well C-X at a concentration of 5 ug/l during the October 1987, sampling event. This is well below the WHO guideline concentration of 100 ug/l. Lead was found in Well C-2 at 10 ug/l during the May 1988, sampling event. This is below the MCL for lead of 50 ug/l. Zinc was found in Wells C-2 and C-3 during the October 1987, sampling. The concentrations found were 120 and 70 ug/l, respectively. No published drinking water standards were found for zinc.

In summary, only minimal contamination was found in the groundwater at the site. Only selenium was detected at concentrations above published drinking water standards and in a subsequent sampling event it was not detected at all. The groundwater is surprisingly clean, especially if you consider how close the mine tailings located to the south of the property are to the site.

5. Summary and Conclusions

1. The coal fines fire that was present at the site has been extinguished. Remaining coal fines have been disposed of in a manner appropriate to prevent them from re-igniting.

2. A two-foot soil cap has been placed over the disposed coal to minimize rainwater infiltration. The site has been contoured to blend into the surrounding area and to minimize standing water.

3. The site has been revegetated with natural grasses. Germination across the site has been good. Removal of the fence protecting the grass should be possible in one to two years.

4. Some erosion has occurred at the site. This erosion will be corrected during the Summer or Fall of 1988.

5. The water table has dropped since the monitoring wells were installed. This drop in the water table has occurred due to the lack of precipitation in recent years. During the October 1987, sampling event two wells were not sampled because of lack of water. During the May 1988, sampling event three wells were not sampled because of lack of water.

6. No significant contamination was found in the groundwater at the site. No further groundwater monitoring should be necessary at the site.

J.L.Graham/anl
2681v
6/12/88

6. REFERENCES

1 Hercules Incorporated Bauer Township Site, Proposed Waste Identification and Characterization Plan by D. J. Keilman, Transmitted with letter from D. J. Keilman to Dale D. Parker dated May 24, 1985.

2 "Site Exploration Spent Coal Fire Abatement Black Hawk Site, Bauer, Utah", For Hercules Incorporated, Wilmington, Delaware, By STS D'Appolonia Ltd., Consulting Engineers, Monroeville, Pennsylvania, July 1986.

3 "Site Design Spent Coal Fire Abatement Black Hawk Site, Bauer, Utah", For Hercules Incorporated, Wilmington, Delaware, By STS D'Appolonia Ltd., Consulting Engineers, Monroeville, Pennsylvania, April 1987.

4 Construction Contract 906987-1, Black Hawk Site, Bauer, Utah, Spent Coal Fire Abatement, Hercules Incorporated, Wilmington, Delaware, May 15, 1987.

5 Letter from F. Burnell Cordner, Executive Secretary, Utah Air Conservation Committee to J. Louis Graham, Hercules Incorporated, dated May 13, 1987.

6 Letter from J. Louis Graham, Hercules Incorporated to Muhammed A. Slam, Utah Bureau of Solid and Hazardous Waste, dated June 3, 1987.

7 Letter from Carlos Garcia, Soil Conservationist, Tooele Utah, United States Department of Agriculture to Alvin Matthews, Grantsville, Utah, dated October 29, 1987.

8 Letter from L. A. Shafkind, RLA, Reclamation Engineering and Construction to J. Louis Graham, Hercules Incorporated, dated May 11, 1988.

9 "Site Exploration Spent Coal Fire Abatement Black Hawk Site, Bauer, Utah", For Hercules Incorporated, Wilmington, Delaware, By STS D'Appolonia Ltd., Consulting Engineers, Monroeville, Pennsylvania, July 1986.

10 Ibid, page 19.