

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

AGERE SYSTEMS, INC., ET AL.,

Plaintiffs,

v.

ADVANCED ENVIRONMENTAL
TECHNOLOGY CORPORATION, ET AL.,

Defendants.

CIVIL ACTION

FILED AUG 18 2008

NO. 02-3830

ENTERED

AUG 18 2008

CLERK OF COURT

FINDINGS OF FACT AND CONCLUSIONS OF LAW

I. Introduction

The present action was filed under the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 U.S.C. § 9601, *et seq.*, ("CERCLA") and the Pennsylvania Hazardous Sites Cleanup Act, 35 Pa. Cons. Stat. § 6020.101 *et seq.*, ("HSCA") for the recovery of past and future costs incurred as a result of the release, and threatened release, of hazardous substances at the Boarhead Farms Superfund Site (the "Site").

Beginning in approximately 1972, DeRewal Chemical Corporation began an extended course of illegal dumping and disposal of chemical wastes at the Site. In varying degrees, this practice continued until 1977. In the early 1980s, the Environmental Protection Agency ("EPA") began investigating the Site and in 1989 Boarhead Farms was listed on the National Priorities List. Around this time, EPA began issuing General and/or Special Notice Letters to potentially responsible parties ("PRPs") whose waste EPA believed was present at the Site. In February 2000, plaintiffs Cytec Industries, Inc. ("Cytec"), Ford Motor Company ("Ford") and SPS Technologies, LLC ("SPS") entered into a Consent Decree agreeing to perform the first operable

unit of the Record of Decision (“ROD”) and to reimburse EPA for its administrative and oversight costs related to this work. Plaintiffs Cytec, Ford, SPS, TI Group Automotive Systems LLC (“TI”) and Agere Systems, Inc. (“Agere”) then entered into an agreement with NRM Investment Company (“NRM”) and Worthington Steel Company whereby these entities agreed to collectively fund and perform the first operable unit of the ROD.

Cytec, Ford, SPS, and TI thereafter entered into a second Consent Decree, agreeing to fund, implement and administer the second operable unit of the ROD, to reimburse EPA for past costs and to pay for EPA’s future response costs related to the OU-2 work. Plaintiffs Cytec, Ford, SPS, TI, and Agere then entered into an agreement to collectively fund the second operable unit.

In 2002, Agere, Cytec, Ford, SPS and TI filed the present action against twenty-three defendants. When the bench trial in this matter commenced on June 23, 2008, only two defendants remained. After trial, one defendant settled, leaving Carpenter Technology Corporation (“Carpenter”) as the sole active defendant.

For the reasons set forth below, judgment is entered in favor of plaintiffs and against Carpenter on all counts. Judgment is entered in favor of Carpenter and against plaintiffs on Carpenter’s counter-claims for contribution.

II. Findings of Fact

Upon consideration of the Proposed Findings of Fact and Conclusion of Law (Doc. Nos 406, 407), the responses thereto, and the testimony, exhibits and arguments presented during the bench trial, the Court finds the following facts:

A. Background

Manfred DeRewal, Senior (“DeRewal Senior”) was born in 1927 (P-333, Dep. of Manfred T. DeRewal, Senior [hereinafter DeRewal, Sr. Dep.] 12:3-4) and he obtained a bachelor’s degree in chemistry from the University of Miami (DeRewal, Sr. Dep. 12:5-8). In the early 1960s, DeRewal Senior owned, operated and served as president of Echo, Incorporated, a pesticide manufacturing company located in Revere, Pennsylvania. (DeRewal, Sr. Dep. 15:22-16:23.) The corporation operated until 1967 when, as a consequence of its pollution practices, it was sold to Revere Chemical Corporation, (DeRewal, Sr. Dep. 17:9-18:2), a corporate entity operated by DeRewal Senior, and of which he also served as president (P-43; P-13, page 2).¹ Revere Chemical Company was also forced to cease operations as a result of industrial waste pollution practices. (P-45; P-13, page 2; See also Noll N.T. 21:16-23:9.)

On September 2, 1969, DeRewal Senior established Boarhead Corporation for the purpose of purchasing real estate which eventually came to be known as Boarhead Farms. (J-1; DeRewal, Sr. Dep. 18:11-19:9; J-33 ¶ 9, 10.) Boarhead Farms is located on Lonely Cottage Road in Upper Black Eddy, Pennsylvania. (J-33 ¶ 1; DeRewal, Sr. Dep. 19:10-13;) On December 29, 1969, DeRewal incorporated DeRewal Chemical Company, Inc. (“DCC”), whose business was to remove, transport and dispose of chemical waste generated by other companies. (J-3; J-33 ¶ 11; DeRewal, Sr. Dep. 20:24-21:12.) Manfred DeRewal, Senior was the sole owner of DCC and, as such, he controlled the day-to-day operations of the company. (DeRewal, Sr. Dep. 20:22-21:17.)

¹DeRewal Senior denied involvement with Revere Chemical Corporation (DeRewal, Sr. Dep. 18:8-10.) However, multiple documents identify him as the President of Revere Chemical Corporation. (See P-13, page 2; P-14; P-43.)

Initially, DCC disposed of the acquired waste solely at Boarhead Farms. (DeRewal, Jr. N.T. 22:17-23; 30:8-25; Bruce DeRewal N.T. 50:10-15; Barsum N.T. 73:3-22; Bean N.T. 107:5-11; Shaak N.T. 115:14-20; P-332, Stephens Dep. 28:14-24; 92:13-21; 98:15-22; 99:12-16; 170:16-171:11.) The disposal of industrial waste at Boarhead Farms continued, and in October 1973, a neighboring resident complained to the Bucks County Department of Health (“BCDOH”) that a stream which flowed near Boarhead Farms and onto his property was discolored and foamy. (P-9; P-13; Noll N.T. 23:10-19.) Peter Knoll, a field inspector for the BCDOH, inspected the stream, determined that it was polluted, and identified the source of the pollution as Boarhead Farms. (P-9; P-13; Noll N.T. 23:19-24:3.) The BCDOH notified the Pennsylvania Department of Environmental Resources (“DER”), and on November 2, 1973, DER issued an order to DeRewal Senior to neutralize pollutants on the property and to remove residual waste by November 9, 1973. (P-13, page 2.) DeRewal Senior failed to comply with this order. (*Id.*)

On December 1, 1973, DCC took possession of a rental property on Ontario Street in Philadelphia, Pennsylvania. (J-4.) The Ontario Street property consisted of a warehouse building with a floor drain, and was located two blocks from the Delaware River. (J-33 ¶ 63; DeRewal, Jr. N.T. 37:3-38:1.) DCC began disposing of waste solutions directly into the floor drain at the Ontario Street location. (DeRewal, Jr. N.T. 38:8-20.) The Philadelphia Water Department wrote to DeRewal Senior on September 24, 1974, about the disposal of improper waste into the city sewer system from the Ontario Street property. (J-33 ¶ 64.) On June 13, 1975, the Water Department plugged and sealed the lateral connection between the warehouse and the sewer system. (J-33 ¶ 66-67.)

Undeterred, DeRewal established another corporation, Environmental Chemical Control,

as a straw entity to rent yet another property to use as a waste disposal site for DCC. (J-5; DeRewal, Sr. Dep. 114:14-115:19; 116:20-117:19.) At this site, located in the Wissinoming Industrial Park in Philadelphia, Pennsylvania, (DeRewal, Sr. Dep. 114:19-24.), DCC disposed of waste directly down a storm drain which emptied into the Delaware River. (DeRewal, Jr. N.T. 40:7-20.) DCC eventually ceased use of this site as a result of concerns raised by the Philadelphia Water Department, Philadelphia Police Department and EPA. (DeRewal, Sr. Dep. 124:11-125-14.)

“Between February 20, 1973, and July 30, 1976, the Bucks County Department of Health filed in excess of fifteen Waste Discharge Inspection Reports regarding the Boarhead Farms Site.” (J-27.) The reports chronicled improperly stored chemicals, releases of liquid chemicals, sewage sludge dumping, and burial of drums. (J-27.) On March 26, 1976, DeRewal Senior and the Boarhead Corporation were found guilty of nine violations of the Pennsylvania Clean Streams Law. (J-27, AR400018.) On October 15, 1976, an injunction issued preventing DeRewal from bringing any chemicals to the Boarhead Farms site. (J-24, page 2-3.)

B. EPA Action at Boarhead Farms

In 1984, the EPA began its Preliminary Assessment and Site Investigation of Boarhead Farms. (J-24; J-25; J-33 ¶ 12.) The assessment and investigation confirmed the presence of a variety of contaminants (J-33 ¶ 12) and, based on this information, on March 31, 1989 EPA placed Boarhead Farms on the National Priorities List (J-33 ¶ 13; Vandeven N.T. 132:2-17). The EPA Remedial Investigation began on December 5, 1989, and found a multitude of hazardous substances present in the soils, sediments and groundwater at Boarhead Farms. (J-33 ¶ 14-16; Vandeven N.T. 137:21-138:11.) During the Remedial Investigation, EPA excavated and

removed in excess of 2,500 buried drums, excavated and removed buried tanks, removed contaminated soil, constructed a preliminary groundwater treatment system and installed treatment systems on sixteen residential wells. (Vandeven N.T. 155:24-156:17; Seibel N.T. 48:8-49:5.) Additionally, several drums of radioactive materials were excavated and removed by General Ceramics, Inc., the company which had produced the waste. (J-23, page 4, AR314513.)

After the Remedial Investigation, EPA conducted a Feasibility Study and issued a Proposed Remedial Action Plan in January 1998. (J-33 at ¶ 17-18.) Following notice and comment on the Proposed Remedial Action Plan, EPA issued a Record of Decision (“ROD”) on November 18, 1998. (J-26; J-27; J-33 ¶ 19.) The ROD identified numerous chemicals of potential concern. (J-26, Table 7.) Specifically, nine chemicals of potential concern were identified as present in the surface soil,² fifty-three chemicals of concern in the shallow groundwater,³ four chemicals of concern in the pond sediments,⁴ and two chemicals of concern in the pond surface water.⁵ (J-26, Table 7; J-33 ¶ 20.)

²These include cadmium, chromium, arsenic, beryllium, copper, thallium, zinc, bis(2-ethylhexyl)phthalate, and n-Nitrosodipropylamine. (J-26, Table 7.)

³These include aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide, lead, manganese, nickel, silver, vanadium, thallium, zinc, benzene, bromodichloromethane, 2-butanene, carbon tetrachloride, chlorobenzene, chloroform, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, 1,2-dichloropropane, ethylbenzene, methylene chloride, methyl isobutyl ketone, 1,2,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, vinyl chloride, xylenes, bis(2-chloroethyl)ether, 2,4-dichlorophenol, 2,4-dinitrophenol, 2-methylnaphthalene, 4-methylphenol, naphthalene, nitrobenzene, 2-nitrophenol, 1,2,4-trichlorobenzene, 2,4,6-trichlorophenol, BHC-alpha, BHC-delta, and heptachlor. (J-26, Table 7.)

⁴These include arsenic, beryllium, chromium, and nickel. (J-26, Table 7.)

⁵These include chromium and manganese. (J-26, Table 7.)

The ROD also set forth a remedial strategy for the Boarhead Farms Site. (J-26.) The strategy consisted of seven components: (1) soil aeration and treatment of volatile organic compound hot spots; (2) excavation and offsite disposal of buried drums; (3) groundwater extraction, metals precipitation, and air stripping; (4) installation of additional monitoring wells; (5) implementation of institutional controls and monitoring; (6) residential water treatment; and (7) phytoremediation. (J-26; J-33 ¶ 23.)

“Subsequent to the issuance of the ROD, EPA determined to implement the remedial action described in the ROD in two operable units.” (J-33 ¶ 23.) Operable Unit 1 (“OU-1”) addressed remedial components 3, 4, 5, 6, and 7 of the ROD and included groundwater extraction, metal precipitation, air stripping, installation of additional monitoring wells, implementation of institutional controls and monitoring for OU-1, residential water treatment, and phytoremediation. (J-33 ¶ 23; Seibel N.T. 60:3-7.) Operable Unit 2 (“OU-2”) addressed remedial components 1, 2, and 5 of the ROD and included soil aeration, treatment of volatile organic compound hot spots, excavation and disposal of drums, and implementation of institutional controls and monitoring for OU-2. (J-33 ¶ 23.)

C. Plaintiff's Settlements with EPA

Plaintiffs Cytec, Ford and SPS are signatories to an Administrative Order for Consent for Remedial Design, EPA Docket No. III-2000-002-DC, entered in February 2000, and a Consent Decree entered by this Court on September 28, 2000. (J-33 ¶ 24.) Pursuant to these agreements, Cytec, Ford and SPS agreed to perform the OU-1 work and to reimburse EPA for future OU-1 administrative and oversight costs. (J-33 ¶ 24.) Cytec, Ford, SPS, TI and Agere agreed to collectively fund the OU-1 remedial design and remedial action (“RD/RA”). (J-33 ¶ 25.) These

four entities then entered into an agreement with NRM and Worthington Steel Company-Malvern (“OU-1 Group”) to collectively fund and perform the OU-1 RD/RA. (J-33 ¶ 24.)

Plaintiffs Cytec, Ford, SPS and TI are signatories to an Administrative Order for Consent for Remedial Design, EPA Docket No. III-2001-0010-DC, effective October 17, 2001, and a Consent Decree entered by this Court on March 14, 2002. (J-33 ¶ 40.) Pursuant to these agreements, Cytec, Ford, SPS and TI agreed to perform the OU-2 RD/RA work, to reimburse EPA for \$7,000,000 in response costs incurred and accounted for prior to July 2000, to reimburse EPA for response costs incurred after July 2000 but not yet accounted for, and to reimburse EPA for its future costs related to OU-2. (J-33 ¶ 40.) Thereafter, Cytec, Ford, SPS, TI, and Agree (“OU-2 Group”) entered into an agreement to collectively fund and perform the OU-2 RD/RA. (J-33 ¶ 41.)

D. OU-1 Remediation

The OU-1 group hired de maximis, inc. as the supervising contractor of the OU-1 work. (J-33 ¶ 28; Seibel N.T. 43:7-45:2.) Geoffrey Seibel, a remedial project coordinator for de maximis, served as the project coordinator for the OU-1 work. (Seibel N.T. 43:9-45:2.) The OU-1 Group assumed responsibility for maintenance and operation of the groundwater extraction and treatment system on May 2, 2000. (J-33 ¶ 31.) At that time, the groundwater extraction and treatment system, constructed by EPA, consisted of a 1,000 foot long trench to collect groundwater. (Seibel N.T. 52:20-53:6.) The trench contained pumps which conveyed the groundwater to a treatment building, where the water was passed through an air stripper. (Seibel N.T. 53:6-54:5.) The air stripper bubbled air through the water, causing the volatile organic compounds to exit the water into the air. (Seibel N.T. 54:6-11.) The volatile organic compounds

were then vented into the air outside the building. (Seibel N.T. 54:10-16.) The groundwater extraction and treatment system did not remove inorganics or metals. (Seibel N.T. 54:24-1, 64:17-20.)

Because the third component of the ROD required precipitation of metals, the OU-1 Group retained Bigler and Associates, Inc., to reconstruct the preliminary groundwater treatment system in order to accomplish this task. (J-26; Seibel N.T. 64:15-23; 68:1-6; J-33 ¶ 32.) A proposed modification was submitted to, and approved by, EPA. (Seibel N.T. 68:17-70:12; J-33 ¶ 32.) In 2001 and 2002, a comprehensive groundwater treatment plant was implemented at the Site. (Seibel N.T. 71:23-72:15; J-33 ¶ 32.) In the new treatment system, the groundwater from the trench is pumped into a tank, which contains an air stripper and removes volatile organic compounds in much the same manner as the previous system. (Seibel N.T. 71:23-73:6; J-33 ¶ 32.) One major difference, however, is that the volatile organic compounds are now filtered from the air, as opposed to externally vented. (Seibel N.T. 73:1-6; J-33 ¶ 32.) Another difference is that the modified system removes metals. (Seibel N.T. 73:7-74:1; J-33 ¶ 32.) First, the holding tank allows some of the iron in the water to precipitate out. (Seibel N.T. 73:7-13; J-33 ¶ 32.) The water then flows from the tank to a metals treatment unit, where the remaining metals, except for manganese, are removed. (Seibel N.T. 73:21-74:1; J-33 ¶ 32.) The metals form a sludge, which is captured and taken to an EPA-approved disposal facility. (Seibel N.T. 73:21-74:4; J-33 ¶ 32.) The manganese is then removed by a special filter, and the water is discharged out of the treatment plant. (Seibel N.T. 74:6-14; J-33 ¶ 32.)

Bigler and Associates was also hired by the OU-1 Group, beginning in December 2001, to continue operation and maintenance of the groundwater treatment plant. (J-33 ¶ 33.) In May

2001, Bigler and Associates suggested conversion of the pneumatic pumps in the groundwater treatment system to electric pumps in order to decrease the system's maintenance costs.⁶ (J-33 ¶ 33.) This was approved by EPA and, between July and August 2001, the pneumatic pumps were replaced with electric pumps. (J-33 ¶ 34.)

The OU-1 Group also continues monitoring the Site, as required by the ROD. A contractor was hired to monitor and maintain the residential well treatment units. (Seibel N.T. 84:4-15; J-33 ¶ 36.) Additionally, water from the monitoring wells at the Site is regularly sampled to determine whether the level of contaminants in the groundwater is decreasing. (Seibel N.T. 80:16-83:6; J-33 ¶ 37.) All of this work was approved by the EPA. (J-33 ¶¶ 36-37.)

Through its consultant Brown and Caldwell, the OU-1 Group conducted a study to determine whether phytoremediation, or the use of plants to remove contaminants from soil, would be effective in helping to clean up the Site. (Seibel N.T. 85:9-86:13; J-33 ¶ 38.) In reliance on Brown and Caldwell's study, the EPA determined that phytoremediation would not be effective. (Seibel N.T. 85:9-87:5; J-33 ¶ 38.)

The last requirement of OU-1, installation of institutional controls, was not immediately performed. Rather, EPA allowed the OU-1 institutional control requirements to be combined with the OU-2 institutional control requirements. (Seibel N.T. 83:21-84:1.)

E. OU-2 Remediation

The OU-2 Group hired Brown and Caldwell as the supervising contractor of the OU-2 work and Code Environmental Inc. to perform the OU-2 construction. (J-33 ¶¶ 43, 44.)

⁶The pneumatic, or air-driven, pumps caused the iron in the groundwater to clog pipes and rust equipment. (Seibel N.T. 78:24- 79:17.)

Likewise, de maximis and Mr. Seibel were retained as the project coordinators. (J-33 ¶ 28.)

In performing the OU-2 remediation, the first task for the OU-2 Group was to more accurately delineate the areas previously identified by the EPA as being volatile organic compound (“VOC”) hot spots. (Seibel N.T. 89:8-20; 92:21-25.) The OU-2 Group determined that the VOC hot spots were actually much smaller in area than estimated by EPA. As such, it was determined that soil aeration and treatment of the VOC hot spots was not cost-effective. (Seibel N.T. 93:14-94:2.) Instead, the soil was excavated and removed for offsite disposal, as approved by the EPA. (Seibel N.T. 93:23-94:2; 91:9-13.)

Next, the OU-2 Group investigated the twenty-seven areas of the Site identified by EPA as presenting magnetic anomalies. (Seibel N.T. 92:4-8.; 95:10-18.) The magnetic study, which was performed by Brown and Caldwell, confirmed magnetic anomalies at some of the areas previously identified by the EPA and excluded others. (Seibel N.T. 95:10-13.) Code Environmental then excavated the confirmed areas to determine the source of the magnetic anomalies. (Seibel N.T. 95:19-96:7.) Scraps of metal objects, including water heaters, wire, fragments of drums, and crushed drums, were unearthed, removed and disposed. (Seibel N.T. 96:19-98:13.) Additionally, the OU-2 Group discovered drums buried beneath the garage at the Site. (Seibel N.T. 98:16-23.) This required the group to dismantle the garage, remove the concrete floor, and excavate and remove the drums. (Seibel N.T. 98:16-23.)

On November 10, 2003, the EPA issued a preliminary closeout report, (Seibel N.T. 99:25-100-15; J-20.), the type of document typically issued by EPA when remedial construction is complete. (Seibel N.T. 100:10-101:4.) The document does not indicate, however, that maintenance and monitoring are complete. (Seibel N.T. 101:2-3.) In this particular case, the

preliminary closeout report stated that the OU-1 and OU-2 remedy components were complete except for continued operation and maintenance of the groundwater extraction and treatment systems, continued maintenance of the residential filtration systems, possible modification of on-site phytoremediation and implementation of institutional controls. (J-20; Seibel N.T. 101:10-20.)

F. OU-1 and OU-2 Groups' Expenditures

The OU-1 Group established trust accounts into which OU-1 entities contribute, or have contributed, funds. (J-33 ¶ 26.) Costs related to the OU-1 work were paid from the OU-1 trust accounts. (J-33 ¶ 27.) Future costs related to the OU-1 Consent Decree will likewise be paid from the OU-1 trust accounts. (J-33 ¶ 27.) In a similar fashion, the OU-2 Group established and contributed funds to the OU-2 trust accounts. (J-33 ¶ 41.) The costs of activities carrying out the OU-2 RD/RA, and other requirements of the OU-2 Consent Decree, were paid from the OU-2 trust accounts. (J-33 ¶ 42.)

The bills from remediation consultants and contractors are reviewed by Seibel and Coslett of de maximis. (J-33 ¶ 50.) After reviewing the bills, they make recommendations to the OU-1 and OU-2 Groups regarding payment, and forward the bills to two members of the Technical Committee.⁷ (J-33 ¶¶ 50-51.) The two members of the Technical Committee review the bills and de maximis' recommendations and make a final determination with regard to payment. (J-33 ¶ 51.) If approved, a payment recommendation is forwarded to Timothy Bergere, an attorney at Montgomery, McCracken & Rhoads, and common counsel to the OU-1 and OU-2 Groups with

⁷The Technical Committee is comprised of representatives from the individual OU-1 and OU-2 entities. (J-33 ¶ 29.) The Technical Committee reviews and approves payments to contractors performing work at the Site. (J-33 ¶ 29.)

respect to the work performed at the Site. (J-33 ¶¶ 51-52.) Mr. Bergere reviews payment recommendations and, when appropriate, arranges for payments to be made from the OU-1 or OU-2 trust accounts. (J-33 ¶ 53.)

Plaintiffs have incurred \$13,678,378.55 in past costs as of December 31, 2007. (J-33 ¶¶ 55-59.) The costs break down as follows:

Cost Incurred	Agere	Cytec	Ford	SPS	TI	Total
OU-1 RD/RA	\$540,874.34	\$846,674.74	\$841,152.85	\$841,152.85	\$286,601.22	\$3,356,456.00
EPA Oversight for OU-1	\$64,439.21	\$67,080.45	\$67,080.45	\$67,080.45	\$22,360.15	\$288,040.71
OU-2 RD/RA	\$188,279.75	\$530,565.73	\$521,953.31	\$521,953.31	\$521,953.31	\$2,284,705.41
EPA Oversight for OU-2	\$25,428.64	\$75,359.08	\$75,064.54	\$75,064.54	\$75,064.54	\$325,981.34
EPA Past Costs	\$83,130.55	\$1,848,871.07	\$1,848,871.07	\$1,848,871.07	\$1,793,451.33	\$7,423,195.09
Total	\$902,152.49	\$3,368,551.07	\$3,354,122.22	\$3,354,122.22	\$2,699,430.55	\$13,678,378.55

The costs incurred by the OU-1 and OU-2 Groups were necessary to comply with the requirements of the ROD and were consistent with the National Contingency Plan. (J-33 ¶ 60.)

Cleanup at the Site must continue until the organic and inorganic contaminants in the groundwater reach an acceptable level as set forth by the EPA in the ROD. (J-26, page 34; Seibel N.T. 108:8-109:5.) As such, plaintiffs are incurring, and will continue to incur response costs for the indefinite future. (Seibel N.T. 108:8-109:17.)

G. TI Group Automotive Systems L.L.C.

EPA identified and notified Bundy Corporation that it was a potentially responsible party

with regard to the Boarhead Farms Site. (Guerriero N.T. 24:19-23.) Sometime later, in November 1999, Bundy Corporation amended its articles of incorporation to change its name to TI Group Automotive Systems Corporation. (P-154; Guerriero N.T. 23:8-21.) At this time, TI Group, PLC, a United Kingdom corporation, was the ultimate parent of TI Group Automotive Systems Corporation. (Guerriero N.T. 27:6-8.)

In December 2000, the parent company, TI Group, PLC, merged into Smith's Industries, PLC, another United Kingdom Corporation. (Guerriero N.T. 27:13-17.) The resulting entity was called Smith's Group PLC ("Smith's"), which became the ultimate parent of TI Group Automotive Systems Corporation. (Guerriero N.T. 27:13-17.) Smith's then agreed to sell TI Group Automotive Systems Corporation to 329th Shelf Investment Company Limited. (P-157; Guerriero 27:25-29:1.) As part of the agreement, Smith's agreed to indemnify TI Group Automotive Systems Corporation and 329th Shelf Investment Company from any liability arising out of the Boarhead Farms Site. (P-157; Guerriero N.T. 29:9-17.)

On June 8, 2001, TI Group Automotive Systems L.L.C. was incorporated as a Delaware limited liability company. (P-155.) On June 25, 2001, TI Group Automotive Systems Corporation was merged into TI Group Automotive Systems L.L.C. (P-156.)

Plaintiff TI Group Automotive Systems L.L.C. ("TI"), as a signatory to the October 17, 2001 Consent Decree and as a member of the OU-1 and OU-2 Groups, incurs obligations resulting from these agreements. (Guerriero N.T. 31:3-7.) These obligations are transmitted to Smith's which satisfies the debts in accordance with the indemnity agreement. (Guerriero N.T. 29:24-30:18; Orme N.T. 42:4-9.) Smith's caused its subsidiaries, Smiths Group Services Corporation and Smiths Group North America, Incorporated, to transfer funds to the OU-1 and

OU-2 trust accounts on behalf of TI and in accordance with the indemnity agreement. (Orme N.T. 40:9-43:4; 45:17-23.) In return, and pursuant to the indemnity agreement, TI agreed with Smith's to seek to recover and to repay all sums paid by Smith's on TI's behalf. (Guerriero N.T. 31:21-32:7; Orme N.T. 4:6-11.) In fact, TI transferred a portion of its settlement proceeds emanating from this litigation to Smith's on May 10, 2007. (Guerriero N.T. 32:14-36:3; Orme N.T. 45:24-47:5.) The remainder of the proceeds are held in a trust account for fees and costs associated with the present litigation. (Guerriero N.T. 32:14-33:23.)

TI has incurred, and will incur in the future, obligations resulting from the Boarhead Farms Site. (Guerriero N.T. 30:24-31:7.) Furthermore, TI, as a signatory to the Consent Decree and as a member of the OU-1 and OU-2 Groups, is primarily liable for obligations arising from those agreements. (Guerriero N.T. 30:24-31:7.)

H. Waste Disposal at Boarhead Farms.

Manfred F. DeRewal, Junior ("Freddie DeRewal") began working for his father as an employee of DCC in 1972. (DeRewal, Jr. N.T. 19:16-25; 22:14-16.) At the time he started working, his older brother Bruce DeRewal was already an employee of DCC. (DeRewal, Jr. N.T. 20:5-7.) With the exception of four months in early 1972,⁸ Bruce and Freddie worked continuously for DCC until April 1977. (DeRewal, Jr. 20:24-21:19.) John Barsum was also a DCC truck driver, and he began working for the company in 1969 or 1970. (Barsum N.T. 70:11-

⁸During this time period, Bruce and Freddie DeRewal worked for Ramos Steel in Easton, Pennsylvania. (DeRewal, Jr. N.T. 21:2-9.) Carpenter's defense focused on Bruce's hazy memory of the time period during which he worked for Ramos Steel. (Bruce DeRewal N.T. 63:3-64:8, 83:9-84:7, 85:6-87:2.) Freddie DeRewal's memory on this point was much clearer, particularly because he knew that he did not have a driver's license while he was working at Ramos Steel. (DeRewal, Jr. N.T. 21:11-19.) As such, the Court credits his testimony on this issue.

13; 71:14-19.) A short while later, around 1970 or 1971, June Stephens began driving a truck for DCC. (P-332, Stephens Dep. 86:20-87:13.) Ed Cypecki was also a DCC driver in the early 1970s, when Bruce DeRewal, Freddie DeRewal and John Bean were DCC truck drivers. (Bruce DeRewal N.T. 58:16-19; Bean N.T. 104:1-19; Shaak N.T. 110:2-5; DeRewal, Jr. N.T. 20:17-23.) Ed Cypecki was already a DCC truck driver at the time when Jeff Shaak began driving a truck for DCC. (Shaak N.T. 109:22-110:5.) Rich Minthorn began working as a truck driver for DCC sometime after Jeff Shaak in the early 1970s. (Bruce DeRewal 58:16-59:4; Bean N.T. 104:1-19; Shaak N.T. 110:6-10; DeRewal, Jr. N.T. 20:8-23.) Lastly, John Bean drove a truck on a part-time basis for DCC. (Bean N.T. 100:7-10.)

At all times, DCC predominantly disposed of its waste at a single location. (DeRewal, Jr. N.T. 22:17-23, 30:19-25, 36:12-20, 38:24-39:7; Barsum N.T. 72:25-73:2; Bruce DeRewal N.T. 50:10-19; Shaak N.T. 115:14-20; 118:6-9.) A change in location typically occurred after the government became aware of DCC's illegal dumping. (DeRewal, Jr. N.T. 56:19-58:4.)

1. January 1, 1972 through December 1, 1973 ("Pre-Ontario Period").

DCC received the following waste volumes from its customers during the Pre-Ontario Period (J-34, Supplemental Facts Stipulated by All Parties; P-329, Stipulation Between Plaintiffs and Handy & Harman Tube Company, Inc. ¶ 5; J-35 Stipulation Between Plaintiffs, Handy & Harman Tube Company, Inc., and Carpenter Technology Corporation):

Entity	Volume of Waste (gallons)
Ford	38,940
Cytec	0
SPS	21,991

TI	0
Agere	0
Techalloy	229,067
Flexible Circuits	33,798
Etched Circuits	16,905
Plymouth Tube Company	16,104
Novartis	0
U.S. Navy	0
Bostik	0
Simon Wrecking	0
Quickline	525
Ashland Chemical Company	0
Diaz Chemical Corporation	0
Unisys	3,465
Rohm and Haas	0
Thomas & Betts	0
Total	360,795

All of these wastes contained CERCLA hazardous substances. (J-35.)

a. Carpenter's Waste Hauled by DCC during the Pre-Ontario Period.

Carpenter's regular business practice was to meter the flow and record the volume of waste acid stored in the Carpenter waste tanks. (P-331, Adams Dep. 24:6-10.) The volume of waste deposited in the tanks was recorded in a daily log. (P-331, Adams Dep. 24:6-10.) Mr. Reger worked at Carpenter from January 1959 through 1985. (P-330, Reger Dep. 9:4-7.) Mr Reger received the log sheets contemporaneously and accurately tracked the volume of waste acid and associated removal costs. (P-330, Reger Dep. 16:9-24; P-331, Adams Dep. 24:6-23;

26:8-11.) In accordance with these job duties, Mr. Reger created P-36 and P-37, which record the volumes of waste acid removed from Carpenter and associated costs. (P-330, Reger Dep. 14:5-25, 17:23-18:15; June 24, 2008 N.T. 6:16-7:7, 8:16-24.) P-36 and P-37 were created directly from the purchasing invoices provided by the purchasing department for the purpose of monitoring waste volumes and disposal costs. (P-330, Reger Dep. 16:9-18:15.) These charts were created and maintained in the regular course of Carpenter's business. (P-330, Reger Dep. 17:23-18:15.)

Richard Cheri worked for Carpenter from 1956 until April 1, 1999. (Cheri N.T. 104:1-4.) In 1969 Cheri was assigned to Carpenter's Purchasing Department and one of his job duties was to select and hire acid waste removal companies. (Cheri N.T. 104:5-105:18.) Carpenter used blanket purchase orders to cover DeRewal's waste hauling services, (Cheri N.T. 108:15-109:18; P-35.) , and tracked and recorded the purchases on contemporaneously created documents. (Cheri N.T. 111:5-21.) Cheri created P-38, which recorded the volume of Carpenter waste acid removed by DCC, and the related costs, in accordance with his regular job duties. (Cheri N.T. 111:9-112:113:23.)

This Court finds as a fact that the Carpenter's contemporaneous business records accurately chronicle the volume of acid waste transferred to DCC. (P-36, P-37, and P-38.)

DCC obtained the following waste from Carpenter Technology during the pre-Ontario Period: during the month of June 1973, DCC hauled 143,850 gallons of waste at \$0.04/gallon for a cost of \$5,754.00. (P-36, Waste Acid Removal Cost; P-37, DeRewal Chemical Co. Waste

Acid Removal.⁹⁾ In July 1973, DCC hauled 188,100 gallons of waste at \$0.04/gallon for a cost

⁹⁾The photocopies of certain of the documents are difficult to decipher. However, by cross-referencing the gallons and cost on P-36, P-37, and P-38, all numbers can be discerned. The following charts summarize the relevant information in P-36, P-37, and P-38 regarding waste acid removed from Carpenter by DCC.

P-36, Waste Acid Removal Cost (DeRewal columns):

Month	Gallons	Cost
June 1973	143,850	\$5,754.00 (\$0.04/gallon)
July 1973	188,100	\$7,524.00
August 1973	95,700	\$3,828.00
September 1973	205,950	\$8,238.00
October 1973	188,164	\$7,526.56
November 1973	95,450	\$3,818.00
December 1973	113,058	\$4,462.00
Total	1,030,272	\$41,150.56
January 1974	49,800	\$1,992.00
February 1974	190,900	\$7,636.00
March 1974	161,850	\$8,092.50 (\$0.05/gallon)
April 1974	206,550	\$10,327.50

P-37, DeRewal Chemical Co. Waste Acid Removal:

Month	Gallons	Cost	Month Reported on Responsibility Sheet
6/13	4,350 (Summation of gallons written in margin as 30,450)	\$1,218.00	June
"	4,350		
6/14	4,350		
"	4,350		
"	4,350		
6/15	4,350		

"	4,350		
6/16 -	113,400	\$4,536	July [incorrectly states July, reported in June on P-36]
7/1-7/15	92,400	\$3,696	July
[indiscernible]	95,700	\$3,828	August [incorrectly states August, reported in July on P-36]
[indiscernible]	95,700	\$3,828	Sept. [incorrectly states Sept., reported in August on P-36]
[indiscernible]	100,050	\$4,002	Sept.
[indiscernible]	105,900	\$4,236	Oct. [incorrectly states Oct., reported in Sept. on P-36]
[indiscernible]	96,599	\$3863.96	Oct.
[indiscernible]	91,565	\$3,662.60	Nov. [incorrectly states Nov., reported in Oct. on P-36]
11/1-11/16	41,500	\$1,660.00	Nov.
11/17-11/30	53,950	\$2,158.00	Dec. [incorrectly states Dec., reported in Nov. on P-36]
12/2-12/14	58,100	\$2,324.00	Jan. [incorrectly states Jan., reported in Dec. on P-36]
[indiscernible]	54,958	\$2,198.32	Jan. [incorrectly states Jan., reported in Dec. on P-36]
1/1/74-1/15	29,050	\$1,162.00	Jan.
[indiscernible]	20,750	\$830.00	Feb. [incorrectly states Feb., reported in Jan. on P-36]
2/1-2/15	95,450	\$3,818.00	Feb.
2/16-2/28	95,450	\$3,818.00	Mar. [incorrectly states Mar., reported in Feb. on P-36]
3/1-3/15	83,000	\$4,150.00	Mar. Price increased to .05/gal.

of \$7,524.00. (P-36, P-37.) In August 1973, DCC hauled 95,700 gallons of waste at \$0.04/gallon for a cost of \$3,828.00. (P-36, P-37.) In September 1973, DCC hauled 205,950 gallons of waste at \$0.04/gallon for a cost of \$8,238.00. (P-36, P-37.) In October 1973, DCC hauled 188,164 gallons of waste at \$0.04/gallon for a cost of \$7,526.56. (P-36, P-37.) In November 1973, DCC hauled 95,450 gallons of waste at \$0.04/gallon for a cost of \$3,818.00.

The total volume of Carpenter waste hauled by DCC during the pre-Ontario Period was 917,214 gallons at \$0.04/gallon for a cost of \$36,688.56. Thus, the total volume of waste picked

3/18-3/31	78,850	\$3,942.50	Apr. [incorrectly states Apr., reported in Mar. on P-36]
4/1-4/15	103,750	\$5,187.50	Apr.
4/16-4/30	102,800	\$5,140.00	May [incorrectly states May, reported in Apr. on P-36]
5/1-5/15	94,500	\$4,725.00	

P-38, DeRewal Chemical Co.:

Inv. Date	Coverage Period	Amount	Gals.
1/20/74	1/1/74 thru 1/15/74	\$1,162.00	29,050
2/5/74	1/15/74 " 1/30/74	830.00	20,750
2/15/74	2/1/74 " 2/15/74	3818.00	95,450
2/28/74	2/16/74 " 2/28/74	3818.00	95,450
3/15/74	3/1/74 " 3/15/74	4150.00	83,000
3/31/74	3/16/74 " 3/31/74	3942.50	78,850
4/15/74	4/1/74 " 4/15/74	5187.50	103,750
4/30/74	4/16/74 " 4/30/74	5140.00	102,800
5/30/74	5/1/74 " 5/30/74	4725.00	94,500

up by DCC during the pre-Ontario Period was 1,278,009 gallons.¹⁰

b. Amount of Waste Disposed of at the Boarhead Farms Site During the Pre-Ontario Period.

From DCC's incorporation until December 1, 1973, when DCC obtained the Ontario Street location, its primary disposal site was Boarhead Farms. (DeRewal, Jr. N.T. 22:17-23; 30:8-25; Bruce DeRewal N.T. 50:10-15; Barsum N.T. 73:3-22; Bean N.T. 107:5-11; Shaak N.T. 115:14-20; P-332, Stephens Dep. 28:14-24; 92:13-21; 98:15-22; 99:12-16; 170:16-171:11.) During this time period, identified by the parties as the Pre-Ontario Period, DCC disposed of nearly all of its acquired waste at Boarhead Farms. (DeRewal, Jr. N.T. 22:17-23; 30:8-25; Bruce DeRewal N.T. 50:10-15; Barsum N.T. 73:3-22; Bean N.T. 107:5-11; Shaak N.T. 115:14-20; P-332, Stephens Dep. 28:14-24; 92:13-21; 98:15-22; 99:12-16; 170:16-171:11.) All of DCC's truck drivers unequivocally testified that during the Pre-Ontario Period, they took the overwhelming bulk of DCC customers wastes to Boarhead Farms. Freddie DeRewal took all but three tankers of DCC's customers' bulk wastes to the Site during the Pre-Ontario Period. (DeRewal, Jr. N.T. 22:17-23; 30:8-25.) When Bruce DeRewal first began working for his father, he took all of the waste he picked up back to the Boarhead Farms Site. (Bruce DeRewal N.T. 50:10-15.) John Barsum took all but four or five loads of bulk waste to Boarhead Farms during the Pre-Ontario Period. (Barsum N.T. 73:3-22.) Barsum further testified that prior to the Ontario Street location opening, almost all of the waste hauled by DCC was transported to Boarhead Farms. (Barsum N.T. 72:25-2.) John Bean hauled every load of bulk waste he

¹⁰Derived by adding 360,795 gallons from plaintiffs and settled entities (excluding Handy & Harman Tube Company, whose waste will be factored in later) plus 917,214 gallons from Carpenter.

obtained from customers to Boarhead Farms. (Bean N.T. 107:5-11.) Jeffrey Shaak worked for DCC as a truck driver during two different time periods. (Shaak N.T. 111:1-7.) During the initial period of employment, he transported all customer waste to Boarhead Farms. (Shaak N.T. 115:14-20.) Finally, the waste hauled by June Stephens during the Pre-Ontario Period was disposed at the Boarhead Farms.¹¹ (P-332, Stephens Dep. 28:14-24; 92:13-21; 98:15-22; 99:12-16; 170:16-171:11.)

In summary, during the Pre-Ontario Period, DCC drivers hauled all but 7 or 8 tankers of waste to the Boarhead Farms for disposal. (DeRewal, Jr. N.T. 22:17-23; 30:8-25; Barsum N.T. 73:3-22.) Each tanker truck held approximately 4,000 gallons of waste. (DeRewal, Jr. N.T. 31:1-12; Mann N.T. 59:12-18; P-34, Contract between DCC and Carpenter, ¶ 2; See also P-42, page 1 (stating that two truckloads contained approximately 8,000 gallons).) As such, all but approximately 28,000 to 32,000 gallons of waste hauled by DCC during the Pre-Ontario Period was disposed at Boarhead Farms. The total volume of waste hauled by DCC during the Pre-Ontario Period was 1,278,009 gallons. Of this, at most 32,000 gallons were disposed of elsewhere. Therefore, at least 97.5% of the waste hauled by DCC during the Pre-Ontario Period was disposed of at Boarhead Farms.¹²

Applying this percentage, the Court finds that of the 1,278,009 gallons of waste hauled

¹¹June Stephens testified that with the exception of six tankers, all of the waste she hauled for DCC was transported to Boarhead Farms. (P-332, Stephens Dep. 28:14-24; 92:13-21; 98:15-22; 99:12-16; 170:16-171:11.) Ms. Stephens stated that on six occasions, at most, she took waste to either the Ontario Street location or the Wissinoming Industrial Park location. (P-332, Stephens Dep. 28:14-24.) Because these sites were not obtained by DCC until after December 1, 1973 (J-33 ¶¶ 62, 63, 68, 69), we find as a fact that all of the pre-Ontario period waste hauled by June Stephens was disposed at Boarhead Farms.

¹² $(1,278,009 - 32,000)/1,278,009 = 0.975 = 97.5\%$.

from plaintiffs, settled entities¹³ and Carpenter by DCC during the Pre-Ontario Period, 1,246,059 gallons were disposed at the Boarhead Farms. Additionally, Handy & Harman Tube Company stipulated that 8,158 gallons of its waste was disposed at Boarhead Farms. (P-329, Stipulation Between Plaintiffs and Handy & Harman Tube Company, Inc. ¶¶ 1-4.) As such, the total volume of waste disposed at the Boarhead Farms Site from all entities during the Pre-Ontario Period was 1,254,217 gallons.

Because 97.5% of all waste hauled by DCC during the Pre-Ontario Period was disposed at Boarhead Farms, the following volumes of waste are attributable to plaintiffs, settled entities and Carpenter for this time period:

Entity	Volume of Waste Disposed of at Site during Pre-Ontario Period (gallons)
Carpenter	894,284 ¹⁴
Ford	37,967
Cytec	0
SPS	21,441
TI	0
Agere	0
Techalloy	223,340
Flexible Circuits	32,953
Etched Circuits	16,482
Plymouth Tube Company	15,701
Novartis	0

¹³With the exception of Handy & Harman Tube Company.

¹⁴ $0.975 \times 917,214 \text{ gallons} = 894,284 \text{ gallons}$

U.S. Navy	0
Bostik	0
Simon Wrecking	0
Quickline	512
Ashland Chemical Company	0
Diaz Chemical Corporation	0
Unisys	3,378
Rohm and Haas	0
Thomas & Betts	0
NRM	0
Handy & Harman	8,158
Total	1,254,217

2. December 1, 1973 through June 30, 1975 ("Ontario Period").

DCC acquired the following volumes of customer waste during the Ontario Period (J-34, Supplemental Facts Stipulated by All Parties; P-329, Stipulation Between Plaintiffs and Handy & Harman Tube Company, Inc. ¶ 5; J-35 Stipulation Between Plaintiffs, Handy & Harman Tube Company, Inc., and Carpenter Technology Corporation):

Entity	Volume of Waste (gallons)
Ford	0
Cytec	193,000
SPS	24,475
TI	0
Agere	0
Techalloy	0
Flexible Circuits	100,056

Etched Circuits	23,213
Plymouth Tube Company	11,667
Novartis	0
U.S. Navy	0
Bostik	0
Simon Wrecking	0
Quickline	2,261
Ashland Chemical Company	0
Diaz Chemical Corporation	0
Unisys	0
Rohm and Haas	0
Thomas & Betts	0
Total	354,672

All waste contained CERCLA hazardous substances. (J-35.)

a. Carpenter's Waste Hauled by DCC during the Ontario Period.

DCC received the following Carpenter waste during the Ontario period: During the month December 1973, DCC hauled 113,058 gallons of waste at \$0.04/gallon for a cost of \$4,462. (P-36, P-37.) During the month of January 1974, DCC hauled 49,800 gallons of waste at \$0.04/gallon for a cost of \$1,992.00. (P-36, P-37, P-38.) During the month of February 1974, DCC hauled 190,900 gallons of waste at \$0.04/gallon for a cost of \$7,636.00. (P-36, P-37, P-38.) In March 1974, DCC hauled 161,850 gallons of waste at \$0.05/gallon for a cost of \$8,092.50. (P-36, P-37, P-38.) In April 1974, DCC hauled 206,550 gallons of waste at \$0.05/gallon for a cost of \$10,327.50. (P-36, P-37, P-38.) In May 1974, DCC hauled 94,500 gallons of waste at \$0.05/gallon for a cost of \$4,725.00. (P-37, P-38.)

