



Division of Hazardous Waste Remediation

Record of Decision

DZUS FASTENER COMPANY
Operable Unit 01
Inactive Hazardous Waste Site
Site Number 152033

March 1995

TECHNOLOGY
SECTION
COPY

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

RECORD OF DECISION

DZUS FASTENER COMPANY
INACTIVE HAZARDOUS WASTE SITE
OPERABLE UNIT 1

WEST ISLIP, SUFFOLK COUNTY

SITE NO. 152033

PREPARED BY:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

MARCH 1995

DECLARATION STATEMENT - RECORD OF DECISION

Dzus Fastener Company Inactive Hazardous Waste Site Town of Islip, Suffolk County, New York Site No. 152033

STATEMENT OF BASIS AND PURPOSE

The selected remedial action for Operable Unit 1 for the Dzus Fastener Site is presented in this decision document. The selection of the remedy was made in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The factual and legal bases for selecting the remedy for this operable unit are summarized in this document.

A list of the documents that comprise the Administrative Record for this site is presented as Exhibit A. The documents in the Administrative Record were used to provide the bases for this Record of Decision.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action described in this Record of Decision (ROD), present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The components of the remedy for the on-site soils remedy (Operable Unit 1) are:

1. Design and implementation of an in-situ stabilization/solidification technology to remediate on-site soils contaminated with cadmium at concentrations greater than 10 parts per million (ppm).
2. Design and installation of a final topsoil/asphalt cover as agreed upon between the Dzus Fastener Company and the NYSDEC. The purpose of this cover is to protect the treatment cell from the effects of erosion.
3. Implementation of institutional controls designed to protect the integrity of the treated soils. These controls will depend upon the future use of the area to be treated.

DECLARATION

The selected remedy is protective of human health and the environment, is in compliance with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent possible, and is cost effective. This remedy is considered to be a permanent remedy. The preference for remedies which result in the reduction in the toxicity and mobility of the waste is satisfied to the maximum extent possible.

3/30/95

DATE



Michael J. O'Toole, Jr., Director
Division of Hazardous Waste Remediation

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**RECORD OF DECISION
DZUS FASTENER COMPANY
SITE NUMBER: 152033**

SECTION 1: SITE LOCATION AND DESCRIPTION

The Dzus Fastener site is located at 425 Union Boulevard, West Islip, Suffolk County. The site is one acre in size and is located in a mixed residential, commercial, and industrial area. The site is triangular in shape and is bounded by Union Avenue to the south, Beach Street to the west, and Long Island Railroad tracks to the north. Immediately to the east of the site is Willetts Creek which drains into Lake Capri which is a man-made lake (see Figure 1). The Lake drains into the tidal portion of Willetts Creek via a culvert located underneath Montauk Highway.

The New York State Department of Environmental Conservation (NYSDEC) has divided this project into two operable units. Operable units are used to separate a site into distinct, manageable areas where each area may require a different remedy. The remediation of the contaminated on-site soils is covered under Operable Unit 1 (O.U. 1) which is the subject of this decision document. The remediation of the contaminated groundwater and sediments (Willetts Creek and Lake Capri) will be addressed under Operable Unit 2 (O.U. 2). A proposed remedy for O.U. 2 will be presented in a Proposed Remedial Action Plan (PRAP) which should be issued by the NYSDEC in late-1995 or 1996.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Since 1932, the Dzus Fastener Company has manufactured fasteners, small springs and other specialty devices. Until 1985, portions of the manufacturing process produced electroplating

and metal cleansing wastes which were discharged into a series of drywells and a leach field, thereby releasing contaminants (primarily cadmium, chromium, and cyanide) into the soil and groundwater. A waste water discharge pipe was discovered along the northern boundary of the site, ending near Willetts Creek. It appears that sometime in the past, likely in the early periods of the manufacturing history of the site, waste waters were discharged directly into the Creek.

2.2: Remedial History

The Dzus Fastener Company site was added to the NYSDEC's Registry of Inactive Hazardous Waste Sites in New York State in 1982. In 1991, the site was classified as a Class 2 site, meaning that the site poses a significant threat to human health or the environment.

The first environmental investigation conducted at the site was a Phase I Investigation conducted in 1984 by the NYSDEC. A literature/file search, a review of disposal practices and a site reconnaissance were conducted during the Phase I Investigation.

A Phase II Investigation, funded by Dzus Fastener (Dzus) with oversight by the NYSDEC, was conducted in 1990. Numerous soil samples were collected on-site, and fourteen groundwater monitoring wells were installed and sampled during the investigation. Elevated levels of cadmium, chromium, and cyanide were detected in groundwater both on-site and off-site. The source of this contamination appeared at that time to be the industrial leach field on the eastern portion of the site.

An Interim Remedial Measure (IRM), funded by Dzus, was conducted in 1991 with oversight by

the NYSDEC. The purpose of this IRM was to remove the aforementioned leach field. Approximately 1960 cubic yards of contaminated soil were excavated and disposed of off-site before the IRM program stopped due to economic problems at Dzus. A report on the IRM activities was prepared in June 1992.

The NYSDEC started the Remedial Investigation/Feasibility Study in May 1992. This investigation was funded through the 1986 Environmental Quality Bond Act (EQBA). The consulting engineering firm hired by the NYSDEC conducted the RI/FS and submitted the final RI/FS Report in October 1994.

SECTION 3: ENFORCEMENT HISTORY

The Potentially Responsible Parties (PRPs) in this action include:

- Dzus Fastener Company, Inc. (Dzus Fastener);
- Dzus International Limited (Dzus International); and
- Theodore Dzus, Sr.

The PRPs refused to sign a consent order with the NYSDEC in which they would have agreed to conduct an RI/FS at the site. As a result, the NYSDEC, using EQBA funds, conducted the RI/FS. The funds required for remediating the site (implementing the remedy outlined in the ROD) will also come from EQBA bonds.

Dzus Fastener and Dzus International signed consent orders which became effective on December 13, 1993 in which they agreed to pay the State the following amounts which are to go towards the investigation and remediation of the site:

- Dzus Fastener: \$1,100,000
- Dzus International: \$400,000

A legal action was filed by the Attorney General of the State of New York against Mr. Theodore

Dzus, Sr. on November 18, 1994. In this action, the State is seeking to recover approximately \$632,000 spent to date by the State in investigating the site as well as future costs to be incurred by the State in this matter.

SECTION 4: HIGHLIGHTS OF COMMUNITY PARTICIPATION

In order to inform the local community and to provide a mechanism for citizens to make the NYSDEC aware of their concerns, a citizen participation program has been implemented by the NYSDEC. In accordance with the 1988 New York State Citizen Participation Plan, the following goals have been accomplished:

- 1 - Information repositories have been established at the West Islip Public Library and the NYSDEC Region 1 Office in Stony Brook.
- 2 - Documents and reports pertaining to this site have been placed into the aforementioned repositories.
- 3 - A "contact list" of interested parties (e.g.- local citizens, media, public interest groups, and elected government officials) has been developed.
- 4 - A public meeting was held in September 1992 during which the work plan for the RI/FS was presented to the public.
- 5 - Public meetings were held in June and December of 1993 to update the local community on the progress of the RI/FS.
- 6 - A questionnaire was distributed to those residents living along Willetts Creek and Lake Capri. The purpose of this questionnaire was to elicit information regarding the Creek and Lake (such as flooding events and recreational uses of the Lake).
- 7 - A public availability session was held in June 1994 during which local residents were able to meet with representatives of the NYSDEC and NYSDOH to discuss the ongoing RI/FS.

8 - A public notice on the completion of the on-site RI/FS and the development of the Proposed Remedial Action Plan for Operable Unit 1 was distributed to the contact list on January 16, 1995. A public comment period extended from January 16, 1995 - February 24, 1995 during which time the public was invited to submit written questions or comments on the proposed remedy to the NYSDEC.

9 - A public meeting was held on February 6, 1995 during which the NYSDEC and NYSDOH presented the proposed remedy for Operable Unit 1 to the public, and provided the public with an update on the status of the work completed and proposed for Operable Unit 2.

A summary of the questions/comments offered during the February 6, 1995 public meeting and written questions/comments received during the public comment period, as well as the State's responses to these questions/comments is presented in Exhibit B, the Responsiveness Summary, of this document.

SECTION 5: CURRENT STATUS

The NYSDEC, under the State Superfund Program, initiated a Remedial Investigation / Feasibility Study (RI/FS) at the Dzus site in May 1992 in order to determine the nature and extent of the contamination attributable to the site, and to develop a remedy for addressing said contamination.

5.1: Summary of the Remedial Investigation

The Remedial Investigation (RI) was conducted in two phases. The first phase began in May 1992 and ended in March 1993. The second phase began in August 1993 and ended in April 1994. The results of the work conducted during the RI are presented in Chapters 1 through 8 of the RI/FS Report dated October 1994. A brief summary of the work conducted during the RI is presented below:

- Area Well Inventory: An inventory of wells screened in the upper glacial aquifer in areas south of the site was

conducted. A total of 18 wells were inventoried, none of which are used as public or private water supplies. It is believed that all residences, businesses, schools, etc. in these areas are hooked-up to a public water supply.

■ Identification of On-site Source Areas: Six (6) source areas were identified during the course of the RI (see Figure 2):

1 - Former oil/water separator: During the Phase II Investigation, oil-stained soils were observed to a depth of 14 feet in the vicinity of the oil/water separator. The top eight feet of soil were excavated during the IRM in 1991. The soils at the bottom of the excavation were sampled during the IRM and were determined to be hazardous waste (cadmium). Cadmium concentrations are as high as 81 parts per million (ppm) at a depth of 8-10 feet below grade.

2 - Former dry wells: Contaminated soils were excavated to a depth of eight feet in this area during the IRM. Soils along the sides and at the bottom of the excavation were sampled during the IRM and were determined to be hazardous waste (cadmium). The highest cadmium concentration along the sidewall was 2,060 ppm and the highest cadmium concentration at the bottom of the excavation was 884 ppm.

3 - Laterals from Dry Well #4: This dry well was removed during the IRM. However, not all of the laterals (piping) connected to this dry well were removed. Stains were visible near joints in the piping, and the soils in this area are contaminated with cadmium at concentrations as high as 570 ppm.

4 - Drainline to Willetts Creek: A discharge pipe along the northern property line was used for the discharge of wastes. This 10 inch diameter pipe

was discovered during the IRM excavation activities. The outlet of this pipe is located in a cobble leachfield on the eastern portion of the site. Based on the analytical data from samples collected beyond the east gate of the site, it appears that, at some time in the past, wastes were disposed of directly into Willetts Creek. These wastes consisted of cadmium and chromium compounds.

Soil samples were collected from eleven locations along the area where this pipe was located. Cadmium concentrations as high as 2,190 ppm (5-7 feet deep) were detected near the eastern gate on the site. Significant levels of cadmium were detected at depths of 10-12 feet below grade (34 ppm).

5 - Western catch basins: A former catch basin was identified during the Phase I RI. Soils in this area were stained with oil. The source of this oil is believed to be a spill event. Cadmium was detected in a surface soil sample at a concentration of 12 ppm.

6 - Industrial leach pool: During the RI, an industrial leach pool which had not been referenced in previous studies was discovered on the western portion of the site. Based on the samples collected from this leach pool, it appears that this is the source of the western plume of groundwater contamination (see Figure 3.)

- Groundwater Quality Investigation: A total of 21 groundwater monitoring wells were installed during the RI. The analytical results from the sampling of these wells and 11 pre-existing monitoring wells are summarized in the RI/FS Report. A graphic representation of the cadmium groundwater plumes is presented on Figure 3. In addition to cadmium, cyanide was detected on-site at concentrations ranging up to 705 ppb

(the standard is 100 ppb). Chromium was also detected in on-site and off-site wells at concentrations ranging up to 258 ppb (the standard is 50 ppb).

- Surface Water and Sediment Investigation: Surface water (SW) and sediment (SED) samples were collected from 22 locations on Willetts Creek and in Lake Capri. Cadmium was detected in surface water at two locations in Willetts Creek and at one location in Lake Capri. The highest cadmium concentration in Willetts Creek was 37.6 ppb (SW-3, see Figure 1) which is significantly higher than the NYSDEC's surface water standard of 0.7 ppb. Cyanide was also detected at the SW-3 location at a concentration of 13.1 ppb. The surface water standard for cyanide is 5.2 ppb. Cadmium was detected in only one of ten surface water samples collected in Lake Capri at a concentration of 3.8 ppb. In each of these cases, it is believed that the source of the observed surface water contamination was contaminated sediment entrained in the surface water samples.

Cadmium was detected in most of the sediment samples (see Table 1 and Figure 1). The sediments in the southern half of Lake Capri have been significantly impacted with cadmium. Cadmium concentrations as high as 347 ppm were detected in the top layer of the sediments in this part of the Lake. As a result, fish tissues were sampled to determine if cadmium is bioaccumulating in the food chain.

- Analysis of Fish Tissues: Fish were collected from Lake Capri via electrofishing in March 1994. The fillets and carcasses of the fish were analyzed separately for cadmium. The results of this work are summarized in Table 2. Carp were the most contaminated species with cadmium at

concentrations up to 1.4 ppm in the fillet samples. While there are no established guidelines or standards for cadmium in fish, the NYSDOH has concerns regarding the consumption of fish caught from Lake Capri, and has issued a health advisory:

1. no one should eat more than one meal of carp per month, and
2. women of childbearing age and children under 15 years of age should not eat any fish from Lake Capri.

- Sampling of Residential Soils: Soil samples were collected from thirteen residences along Willetts Creek and Lake Capri. The samples were analyzed for cadmium and chromium. Cadmium concentrations ranged from non-detectable levels to 1.8 ppm (the health-based clean-up goal is 10 ppm). The results are presented in Table 3.

The analytical data obtained during the RI were compared to applicable Standards, Criteria, and Guidance values (SCGs) in determining the need for remedial action goals for the site. Groundwater, surface water, and drinking water SCGs identified for the Dzus Fastener Company site were based upon the NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the New York State Sanitary Code. Soil and sediment SCGs identified for the site were based on NYSDEC clean-up guidelines and health-based clean-up goals developed by the NYSDOH.

Based upon a comparison of the analytical results outlined above and the SCGs for this site, it has been determined that the following areas and media are contaminated above SCGs:

- On-site soils in the locations shown on Figure 4 contain cadmium at concentrations greater than the 10 ppm health-based clean-up goal established by the NYSDOH. In the areas shaded on

Figure 4, the cadmium concentrations ranged from 10 to 2,190 ppm, with an average concentration of 280 ppm (43 samples). Some of this contamination is located below the water table.

- Groundwater contamination at concentrations greater than 10 ppb exists both on- and off-site (see Figure 3).
- Sediments in Willetts Creek and Lake Capri are contaminated above the guidance value of 0.6 ppm (see Table 1 and Figure 1) which represents the lowest level above which detrimental effects to benthic organisms may occur. Cadmium is bioaccumulating in the food chain as evidenced by the cadmium contamination detected in the fish specimens.

(NOTE: As stated in Section 1, remedies for groundwater, Willetts Creek and Lake Capri will be developed, and evaluated in a PRAP/ROD to be issued in late-1995 or 1996.)

5.2: Summary of Human Exposure Pathways

A baseline human health evaluation/ risk assessment was conducted to assess the potential risks to human health which might be related to chemicals originating from the site. In this investigation, the likelihood of non-carcinogenic effects was indicated by the hazard index, whereas the carcinogenic effects were presented as probabilities.

The hazard index, which is used to describe the potential for noncancer health effects to occur in an individual, is expressed as a ratio of estimated contaminant intake to the risk reference dose. A risk reference dose is the estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects. A ratio equal to or less than one is generally considered to be an insignificant (minimal) increase in risk.

Increased cancer risks were estimated using site-specific information on exposure levels for the

contaminants of concern and interpreting them using cancer potency estimates derived for that contaminant by the United States Environmental Protection Agency (USEPA). For known or suspected carcinogens, the NYSDOH considers an individual lifetime cancer risk exceeding one in one million to be unacceptable. In other words, an individual would have no greater than an approximately one in one million chance of developing cancer over a lifetime (i.e., 70 years) as a result of site-related exposure under specific exposure conditions.

The potential human exposure pathways at the Dzus site and the associated contaminants are:

<u>Chemical</u>	<u>Exposure Pathway</u>
Cd, Ni	Ingestion of chemicals in soil by adult on-site workers
Cd, Ni	Ingestion of chemicals in soil by children trespassing on-site
Cd, Cr	Ingestion of chemicals in residential soils by adults
Cd, Cr	Ingestion of chemicals in residential soils by children

NOTE: Cd = cadmium, Cr = chromium, Zn = Zinc, Ni = Nickel, CN = cyanide

For noncarcinogenic effects, it was assumed that workers are exposed only through the ingestion of contaminated soils while present on-site. For the residential scenario, it was assumed that adults may potentially be exposed to site contaminants through the ingestion of contaminated soils from yards along Willetts Creek and Lake Capri. Children may potentially be exposed to site contaminants through the ingestion of chemicals while trespassing on-site and ingestion of chemicals in residential soils.

Based upon the results of the noncarcinogenic risk calculations, it is unlikely that the contaminants of concern at the Dzus Fastener site will result in adverse human health effects at the concentrations currently identified in the

surface soils on-site and in off-site residential yards. Of the scenarios evaluated, the ingestion of chemicals in soil by adult workers on-site resulted in the highest hazard index (0.128).

Based upon the results of the cancer risk calculations, the inhalation of airborne cadmium and nickel on-site does not pose a significant health risk to either children or adults at the site. The off-site inhalation exposure pathway has been eliminated from consideration as off-site contaminant exposures are unlikely to exceed on-site levels.

Cancer risk calculations were not performed for inhalation exposure to hexavalent chromium as none was detected in any of the surface soil samples collected at the site. No evidence exists that suggests a cancer risk exists from the inhalation of chromium in the trivalent form. Carcinogenic health effects are not known to result from inhalation exposures to cyanide and zinc. No evidence currently exists that suggests that cadmium and cyanide are carcinogenic upon ingestion. Only very limited evidence exists that suggests that zinc may cause cancer by the oral route of exposure. Therefore, oral exposures to these contaminants are not expected to pose an increased risk of cancer to human populations.

If sub-surface soils containing cadmium at levels which are considered to be hazardous waste are allowed to remain at the site, then a health risk exists for persons who may, through excavation activities, come into contact with these soils.

5.3: Summary of Environmental Exposure Pathways

The cadmium contamination in the on-site soils is a continuing source of groundwater contamination, and thus poses a continuing threat to the environment.

The groundwater and off-site issues above will be addressed via a PRAP/ROD to be issued by the NYSDEC in late-1995 or 1996.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

The goals for the remedial program have been established through the remedy selection process outlined in 6 NYCRR Part 375-1.10. These goals were established under the guidelines of meeting all Standards, Criteria, and Guidance values (SCGs) and protecting human health and the environment.

At a minimum, the remedy implemented should eliminate all significant threats to public health and to the environment posed by the disposal of hazardous waste at the site through the proper application of scientific and engineering principles.

The goals selected for O.U. 1 of the Dzus Fastener Company site are:

- Eliminate the potential for direct human contact with the contaminated soils at the site.
- Eliminate or reduce the mobility of contaminants in on-site soils that would cause further groundwater contamination.
- Eliminate the hazardous wastes on-site or treat them to render them as non-hazardous.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The potential alternatives for O.U. 1 of the Dzus Fastener Company site were identified, screened and evaluated during the Feasibility Study (FS). This analysis is presented in Chapters 9-13 of the RI/FS Report. A summary of this analysis follows.

7.1: Description of the Remedial Alternatives

The potential alternatives which were developed for remediating the Dzus Fastener Company site involved different technologies for achieving the

major goals of this project (see Section 6). Fourteen alternatives were developed and evaluated during the Feasibility Study.

As presented below, present worth is defined as the amount of money needed up-front (in 1994 dollars at 5% interest) in order to fund the construction, and operation and maintenance (O&M) costs for each alternative. Construction, rental, and engineering costs are included in the capital cost estimates. The average yearly costs for operating treatment systems and the costs for maintaining the remedy are included in the O&M cost estimates.

The remedial alternatives for O.U. 1 which were evaluated during the Feasibility Study can be divided into two categories:

- A. No Action
- B. Remediation of On-site Soils

(NOTE: The alternatives presented below are somewhat different than those presented in the RI/FS Report.)

A. No Action Alternative

Alternative 1 - No Action

Capital Cost: \$ 0
O&M Costs: \$ 0
Present Worth: \$ 0

Under this alternative, no remediation would be conducted at the site. This alternative was developed pursuant to the National Contingency Plan as a baseline for comparing the other alternatives which were developed during the Feasibility Study.

Deed restrictions would be incorporated into this remedy.

B. Remediation of On-site Soils

Alternative 2 - Source Isolation

Capital Cost: \$4,862,000
O&M Costs: \$ 8,000/year
Present Worth: \$4,985,000

Vertical and horizontal barriers would be constructed at the site in order to prevent contaminated groundwater from migrating offsite. A surface cap consisting of a 12-inch layer of gravel overlain by 4 inches of asphalt would be constructed to prevent precipitation from infiltrating the contaminated soil. The vertical and bottom horizontal barriers would consist of either bentonite/cement or soil/bentonite slurries.

Deed restrictions would also be incorporated into this remedy.

Alternative 3 - In-situ Solidification/Stabilization of Soils

Capital Cost: \$1,077,000
O&M Costs: \$ 0/year
Present Worth \$1,077,000

The soils contaminated with cadmium at concentrations greater than 10 ppm would be treated in-place under this alternative. This treatment would be accomplished by mixing the soils with a chemical reagent such as a cement / bentonite slurry. As a result, the cadmium would be converted to an insoluble compound which would be fixated in a concrete-like matrix.

Approximately 8,100 cubic yards (cy) of soil would be treated under this alternative. A more accurate estimate of the volume of the waste which would be treated would be determined during the remedial design.

A site drainage and erosion control plan will be developed and implemented in order to protect the treatment cell.

Deed restrictions would also be incorporated into this remedy.

Alternative 4A - Excavation with Off-site Disposal of Wastes

Capital Cost: \$4,129,000
O&M Costs: \$ 0/year
Present Worth \$4,129,000

Soils contaminated with cadmium at concentrations above the 10 ppm action level would be excavated and disposed of off-site. Approximately 5900 cubic yards (cy) of soils are anticipated to be hazardous wastes and would be disposed of at a hazardous waste landfill. Approximately 2200 cy of cadmium-contaminated soils at concentrations greater than 10 ppm but which would not be classified as hazardous wastes, would be excavated and disposed of off-site at an industrial waste landfill. The excavations would be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

Alternative 4B - Excavation with Solidification/Stabilization of Wastes

Capital Cost: \$3,159,000
O&M Costs: \$ 0/year
Present Worth: \$3,159,000

Approximately 8100 cy of cadmium-contaminated soils would be excavated under this alternative. The estimated 5900 cy of soil which are anticipated to be classified as hazardous wastes would be treated on-site via a solidification/ stabilization process. A chemical reagent (such as a cement/bentonite mixture) would be mixed with these soils to render them non-hazardous. This treated waste, along with approximately 2200 cy of cadmium-contaminated soil with concentrations greater than 10 ppm, but which would not be classified as hazardous wastes, would be disposed of off-site at an industrial waste landfill. The excavations would

be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

Alternative 4C - Excavation with Soil Washing of Wastes

Capital Cost: \$4,114,000
O&M Costs: \$ 0/year
Present Worth: \$4,114,000

Approximately 8100 cy of cadmium-contaminated soils would be excavated under this alternative. The estimated 5900 cy of soil which is anticipated to be classified as hazardous wastes would be treated with a chemical solution designed to strip the metals from the soil. The treated soil, along with 2200 cy of soil (non-hazardous waste) containing cadmium at concentrations above the 10 ppm clean-up goal, would be disposed of off-site at an industrial waste landfill. The excavations would be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

7.2: Evaluation of the Remedial Alternatives

The criteria used to compare and contrast the potential remedial alternatives are defined in 6 NYCRR Part 375. For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the RI/FS Report.

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. **Protection of Human Health and the Environment** - This criterion is an overall and final evaluation of the health

and environmental impacts to assess whether each alternative is protective. This evaluation is based upon a composite of factors assessed under other criteria, especially short/long term effectiveness and compliance with Standards, Criteria, and Guidance values (SCGs).

The institutional controls incorporated into Alternative 1 would not be protective of human health or the environment because direct contact with the waste could still occur and cadmium would continue to migrate via the groundwater and surface water from the site into Willetts Creek and Lake Capri. The source isolation component incorporated into Alternative 2 may not be reliable, and cadmium may still migrate into the Creek and Lake.

The treatment technologies incorporated into Alternatives 3 and 4A-C would be protective of human health and the environment in that the direct contact pathway would be eliminated and the potential for contaminants to migrate off-site would be decreased significantly. Cadmium which is already in the off-site groundwater would continue to move southward.

2. **Compliance with New York State Standards, Criteria, and Guidance values (SCGs)** - Under this criterion, the issue of whether a remedy will meet all of the Federal or State environmental laws and regulations is addressed. If these laws and regulations will not be met, then grounds for invoking a waiver must be provided.

The SCGs for this site would not be met if Alternatives 1 or 2 were implemented. The soil SCGs would be met if any of the other on-site remedies were implemented.

Primary Balancing Criteria - The next five "primary balancing criteria" are used to compare and contrast the positive and negative aspects of the various alternatives.

3. Short-term Effectiveness - Under this criterion, the potential short-term impacts of the remedial action upon the community, the workers, and the environment are evaluated. The period of time required to achieve the remedial objectives is estimated and compared/contrasted with the other alternatives.

The eastern portion of the site would be unusable to the Dzus Fastener Company for approximately 4 months if Alternatives 2 or 3 were implemented. Most of the property would be unusable to the company for approximately 2-4 months if Alternatives 4A-4C were implemented. Dust controls would be needed to keep dust emissions to a minimum. There are no adverse short-term impacts associated with Alternative 1.

4. Long-term Effectiveness and Permanence - If wastes or residuals will remain at the site after the selected remedy has been implemented, then the following items are evaluated: 1) the magnitude and nature of the risk posed by the remaining wastes; 2) the adequacy of the controls intended to limit the risks posed by the remaining wastes; and 3) the reliability of these controls.

The greatest degree of long-term effectiveness and permanence would be realized by implementing Alternatives 4A, 4B, or 4C because the contamination at the site would be removed from the site. Alternative 3 is expected to be effective in preventing further leaching of contaminants into the surrounding environment. The long-term effectiveness of Alternative 2 is unknown, and long-term monitoring would be required to verify the effectiveness of that remedy. Alternative 1 would not be effective in the long-term.

5. Reduction of Toxicity, Mobility, and Volume - Preference is given to alternatives that permanently, and by treatment, reduce the toxicity, mobility,

or volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

The implementation of Alternative 1 would not result in the reduction of toxicity, mobility, or volume of the wastes on- or off-site. A reduction in the mobility of the contaminants on-site would result if Alternatives 2 or 3 were implemented; however, an increase in the waste mass would occur. A reduction in the mobility and volume of the waste would result if Alternatives 4A and 4B were implemented. A reduction of toxicity would result in addition to a reduction of mobility if Alternative 4C were implemented.

6. Implementability - Under this criterion, the technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

Alternative 1 is the easiest alternative to implement as there are no difficult technical or administrative tasks associated with this alternative. An impermeable sub-grade horizontal barrier would be extremely difficult to construct, therefore, Alternative 2 would be very difficult to implement. The in-situ solidification/stabilization technology is a new technology, and there may be some difficulty implementing Alternative 3. The treatment and disposal options incorporated into Alternatives 4A-C should be easily implementable; however, the excavation of the soils may be very difficult due to the high water table and the close proximity of the proposed excavation areas to the active railroad tracks.

On-site deed restrictions can only be imposed with the concurrence of the property owner.

7. Cost - Under this criterion, capital and operational and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the other criteria, lower cost can be used as the basis for final selection.

The present worth costs of the remedies range from no cost for Alternative 1 (No Action Alternative) to \$4,985,000 for Alternative 4A (Source Isolation).

Modifying Criterion - This final criterion is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan (PRAP) have been received.

8. Community Acceptance - The concerns of the community regarding the RI/FS Report and the PRAP were evaluated. These concerns are presented along with the NYSDEC's responses to these concerns in the Responsiveness Summary (Exhibit B of this Record of Decision).

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS conducted at the Dzus site, the NYSDEC has selected the following remedy for O.U. 1:

- Design and implementation of the in-situ stabilization/solidification alternative for remediating soils containing cadmium at concentrations greater than 10 ppm at the Dzus site (Alternative 3). Three small areas on the western portion of the site would be excavated and mixed with the soils to be treated on the eastern portion of the site. The clean soils which were used to backfill the IRM excavations will not be treated.

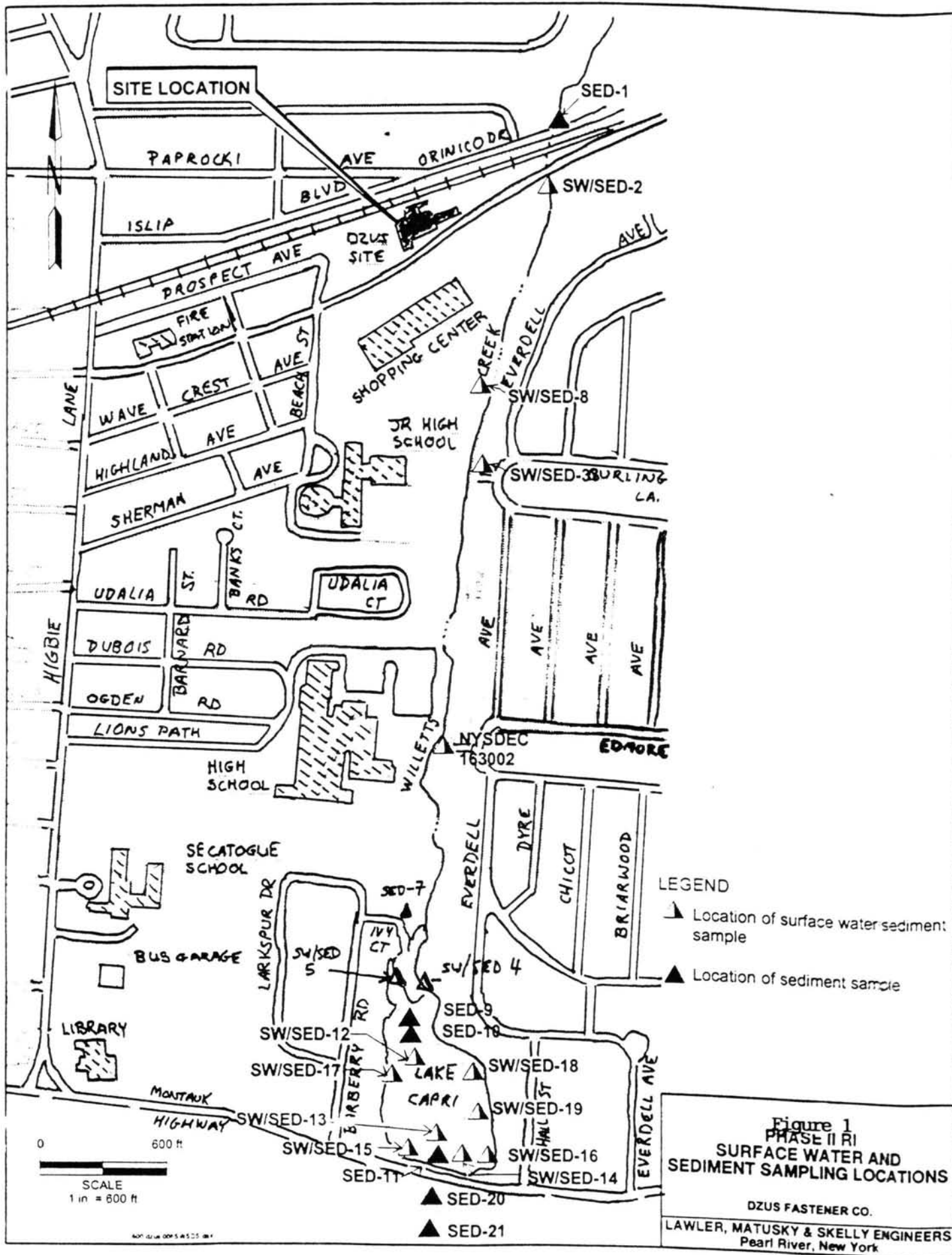
This treatment would be accomplished by mixing the soils with a chemical reagent such as portland cement using a drill rig outfitted with augers. A bench-scale test will be conducted in order to determine the optimal chemical reagent for this project as well as to develop an estimate for the curing time. If portland cement is used, it is anticipated that the curing time would be approximately four (4) weeks.

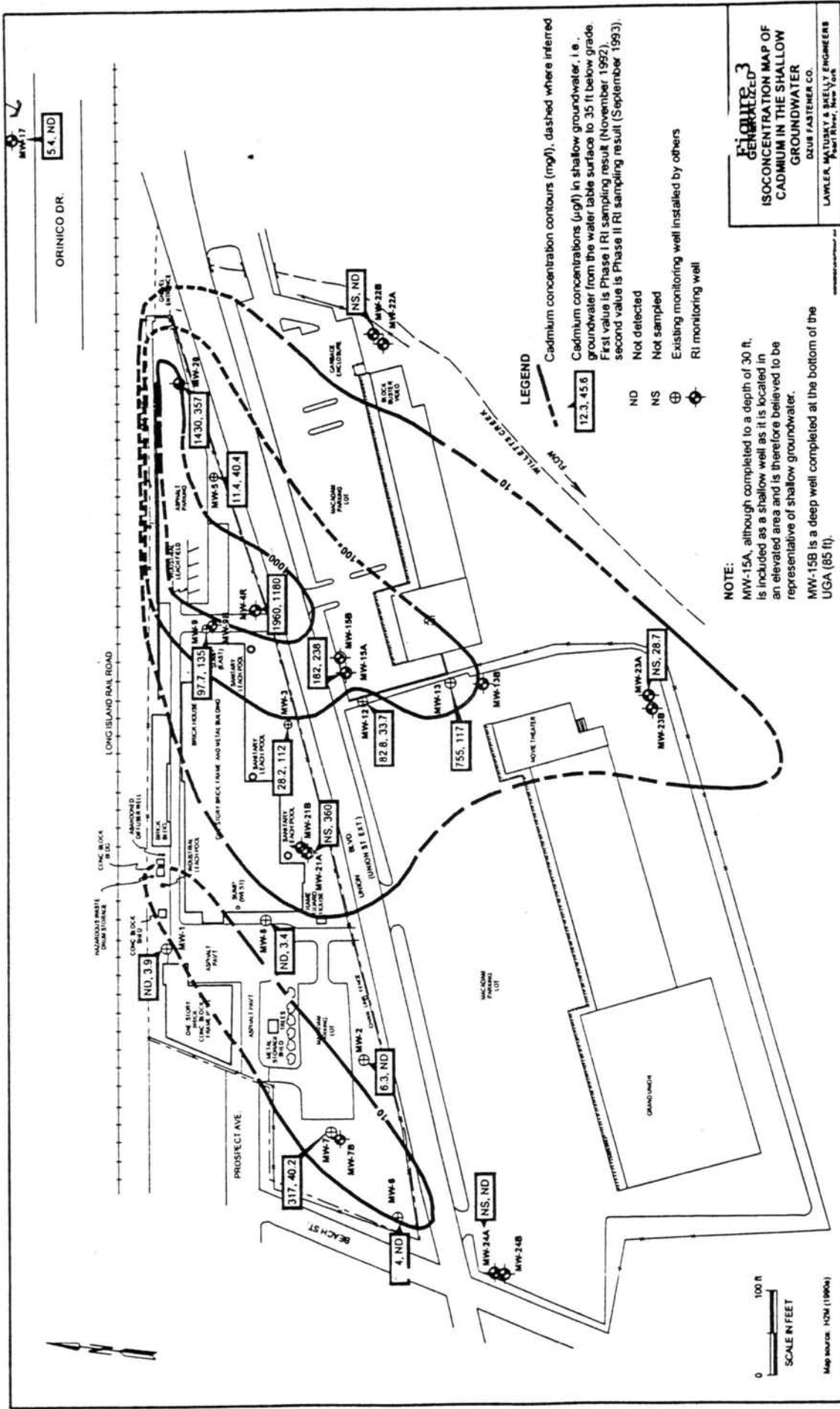
- Design and installation of a final topsoil/asphalt cover as agreed upon between the Dzus Fastener Company and the NYSDEC. The purpose of this cover is to protect the treatment cell from the effects of erosion.
- Implementation of institutional controls such as deed restrictions at the site.

The estimated capital cost and present worth of this remedy is \$1,077,000. There are no operation and maintenance costs associated with this remedy.

GLOSSARY OF ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cy	cubic yards
ECL	Environmental Conservation Law (New York State)
EQBA	Environmental Quality Bond Act
IRM	Interim Remedial Measure
6 NYCRR	Title 6 of the Official Compilation of Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
O.U.	Operable Unit
ppb	parts per billion
ppm	parts per million
PRAP	Proposed Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments Reauthorization Act
SCGs	Standards, Criteria, and Guidance values of NYS
USEPA	United States Environmental Protection Agency





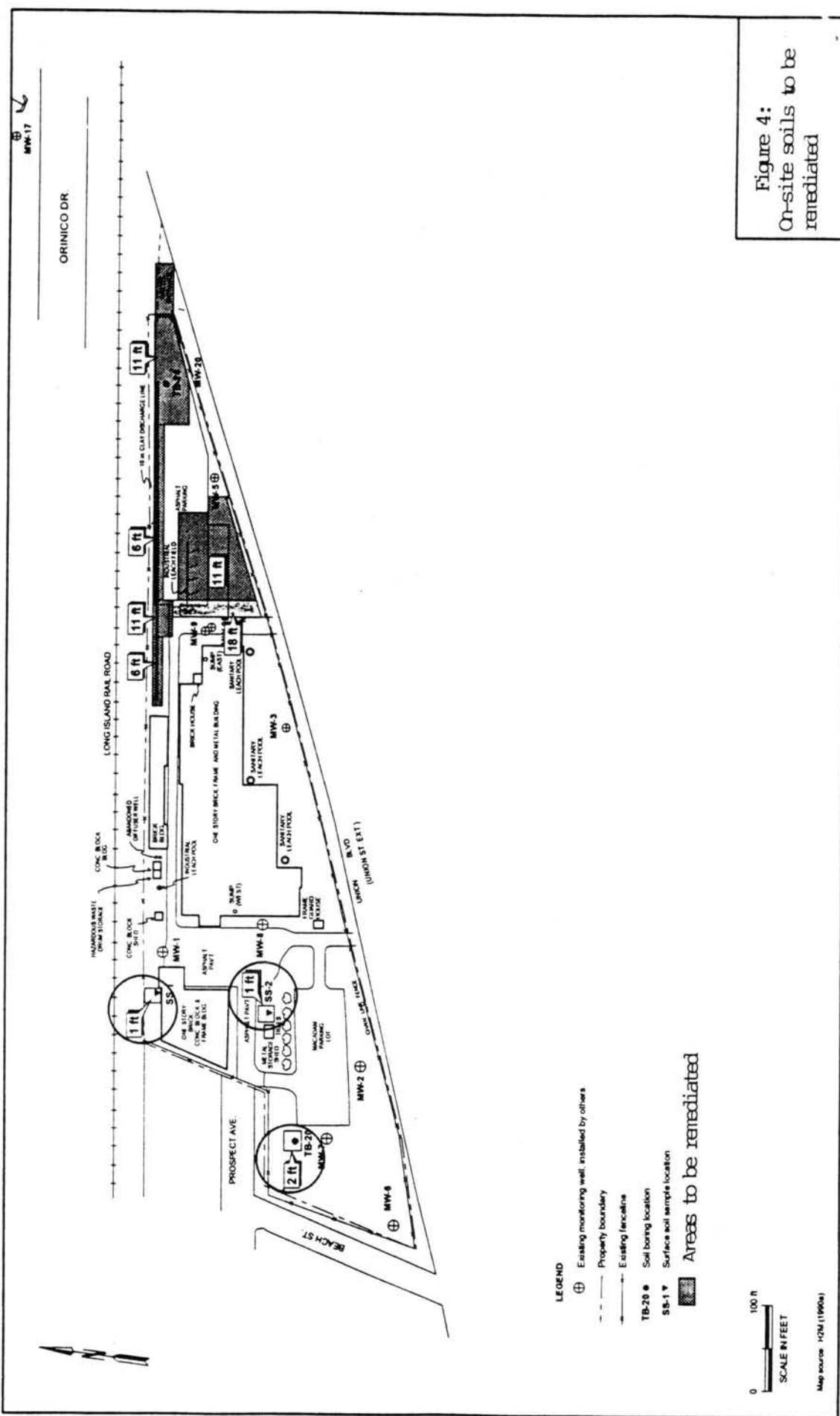


TABLE 1
SEDIMENT DATA FROM WILLETTS CREEK AND LAKE CAPRI

LOCATION AND DEPTH	CADMIUM (ppm)	CHROMIUM
SED-1	ND	12.1
SED-1	ND	9.4
SED-3	79.8	17.3
163002	2.1	14.0
DUP 163002	1.6	1.9
SED-8	ND	2.6
SED-9 (0-5 in)	9.0	ND
SED-9 (5-10 in)	2.0	ND
SED-10 (0-7)	23.6	14.2
SED-10 (7-14 in)	4.9	ND
SED-11 (0-9 in)	249	44.6
DUP SED-11 (0-9 in)	247	48.4
SED-11 (9-18 in)	15.8	3.8
SED-12 (0-14 in)	14.7	9.3
SED-12 (14-28 in)	ND	3.9
SED-13 (0-5 in)	306	72.4
SED-13 (5-10 in)	37.1	5.2
DUP SED-13 (0-5 in)	310	74.7
SED-14 (0-5 in)	175	29.9
SED-14 (5-10 in)	33.4	4.7
SED-15 (0-6 in)	347	78.3
SED-15 (6-12 in)	79.2	19.9
SED-16 (0-7.5 in)	41.3	9.4
SED-16 (7.5-15 in)	7.3	3.8
SED-17 (0-7 in)	12.1	4.5
SED-17 (7-14 in)	ND	2.5
SED-18 (0-7 in)	1.4	9.7
SED-18 (7-14 in)	ND	9.6
SED-19 (0-3 in)	102	13.0
SED-19 (3-6 in)	14.6	3.5
SED-20	4.2	3.5
SED-21	5.9	8.2

Note: See Figure 1 for sampling locations

ND = Not Detected

	<u>Guidance Values</u>	
	LEL ⁻¹	SEL ⁻²
Cadmium	0.6 ppm	9.0 ppm
Chromium	26	110 ppm

1 - LEL = Lowest Effect Level

2 - SEL = Severe Effect Level

TABLE 2

FISH DATA SUMMARY (APRIL 1994)
DZUS FASTENER CO.

Parameter	AE#1	AE#2	AE#3	AE#4	AE#5	BSF#1-5 Fillet	BSF#5 Carcass	BSF#6- 10 Fillet	BSF#10 Carcass	CARP#1 -3 Fillet
(mg/kg) Cadmium	0.19	0.35	0.41	0.57	0.33	0.19	0.25	0.19	0.25	0.32

Parameter	CARP#1 Carcass	DUP CARP#1 Carcass	CARP#4 & 5 Fillet	CARP#4 Carcass	LMB#1 & 2 Fillet	LMB#2 Carcass	LMB#3 & 4 Fillet	LMB#3 Carcass	PS#1&2 Fillet	PS#2 Carcass
(mg/kg) Cadmium	1.90	1.67	1.40	0.49	ND	0.19	ND	0.07B	0.18	0.27

* Results are reported on a wet weight basis

B Value is less than the contract-required detection limit but greater than the instrument limit

AE Americal eel

ND Note detected at analytical detection limit

PS Pumpkinseed

BSF Bluegill sunfish

DUP Duplicate sample analysis

LMB Largemouth bass

CARP Carp

TABLE 3

SOIL SAMPLE SUMMARY (APRIL 1994)
DZUS FASTENER CO.

Parameter	Residence Number													Recommended Soil Clean-up Objective
	1	2	3	4	5	6	7	8	9	10	11	12	13	
(mg/kg) Cadmium	0.32B	ND	ND	0.39B	1.8B	.47B	0.83B	0.6B	.06B	1.6	1.7	0.93B	1.1B	10
Chromium	7.6	7.2	5.2	17.1	12.3	10.9	16.2	9.7	9.7	8.9	7.5	10.7	9.8	40

ND= not detected

B = Estimated concentration

EXHIBIT A

ADMINISTRATIVE RECORD DZUS FASTENER COMPANY SITE NUMBER: 152033

I - Reports

1. Phase II Investigation Report, prepared by H2M Group, July 1990.
2. Interim Remedial Measure Work Plan for Dzus Fastener Co., Inc., prepared by H2M Group, September 1990.
3. Report on Interim Remedial Measures Conducted at Dzus Fastener Co., Inc., prepared by H2M Group, June 1992.
4. Health and Safety Plan, prepared by Lawler, Matusky & Skelly Engineers, dated August 1992.
5. Quality Assurance Project Plan, prepared by Lawler, Matusky & Skelly Engineers, dated August 1992.
6. Field Activities Plan, prepared by Lawler, Matusky & Skelly Engineers, dated September 1992.
7. Remedial Investigation/Feasibility Study Report, prepared by Lawler, Matusky & Skelly Engineers, dated September 1994, 3 volumes.
8. Proposed Remedial Action Plan, prepared by the NYSDEC, dated January 1995.

II - Legal Documents

9. Order on Consent between Dzus Fastener Co., Inc. (Respondent) and the NYSDEC dated December 28, 1989. Signed by: Theodore Dzus, Jr. (for Respondent) and Edward Sullivan (NYSDEC).
10. Order on Consent between Dzus Fastener Co., Inc. and W.I. Holdings Ltd. (Respondents) and the NYSDEC dated December 13, 1993. Signed by: Stephen Meshover (for Respondents) and Thomas Jorling (NYSDEC).
11. Order on Consent between Dzus International Limited (Respondent) and the NYSDEC dated December 13, 1993. Signed by Michael Knight for Respondent and Thomas Jorling (NYSDEC).

III - Correspondence

12. Letter to Mr. Theodore Dzus from Robert L. Marino (NYSDEC) dated February 21, 1991.
13. Memorandum to Joshua Epstein (NYSDEC) from Andrew English (NYSDEC) dated July 27, 1992. Attached to memorandum:
 - i. Citizen Participation Plan, Dzus Fastener Site, prepared by the NYSDEC dated July 1992.

14. Letter to Mr. Thomas Pease (Lawler, Matusky & Skelly Engineers - (LMS)) from Michael J. O'Toole, Jr. (NYSDEC).
15. Fact Sheet - Dzus Fastener Company, prepared by the NYSDEC and NYSDOH dated February 1993.
16. Letter to Mr. John Barnes (NYSDEC) from Ms. Ruth Fritsch (LMS) dated 19 July 1993.
Attached to letter:
 - i. Memorandum to file from Ms. Ruth Fritsch dated 16 July 1993.
17. Letter to Mr. John Barnes from Ms. Ruth Fritsch dated 3 December 1993.
Attached to letter:
 - i. Data tables from the September 1993 sampling event.
 - ii. Analysis of the historical movement of the Willetts Creek streambed.
18. Notice of Public prepared by the NYSDEC dated November 1993.
Attached to the Notice:
 - i. Fact Sheet, prepared by the NYSDEC dated November 1993.
19. Letter to Ms. Ruth Fritsch from John Barnes dated June 9, 1994.
Attached to letter:
 - i. Chemical Information Sheet (cadmium), prepared by the NYSDOH.
20. Fact Sheet - Dzus Fastener Company, prepared by the NYSDEC dated January 1995.
21. Letter to John Barnes and John Olm (NYSDOH) from Ronald Pollio (attorney representing Dzus Fastener) dated January 31, 1995.

IV - Miscellaneous

22. Video tape of the February 6, 1995 public meeting.

EXHIBIT B

RESPONSIVENESS SUMMARY PROPOSED REMEDIAL ACTION PLAN DZUS FASTENER COMPANY SITE NUMBER: 152033

The issues addressed below were raised during the public meeting held on February 6, 1995 at the Beach Street Middle School, West Islip, Suffolk County, and in letters received from commentors. The purpose of the meeting was to present the Proposed Remedial Action Plan (PRAP) for Operable Unit 1 at the site to the public and to receive comments on the PRAP for consideration during the final selection of a remedy. The video tape of the public meeting is the official record of the meeting and is incorporated into the Administrative Record for this site. Written questions/comments which were received during the public comment period (January 16, 1995 - February 24, 1995) have also been incorporated into the Administrative Record. The documents included in the Administrative Record are available for public review at the document repositories.

The following is a list of comment letters received by the NYSDEC during the public comment period:

1. Statement by Ms. Lorraine Pace dated January 30, 1995.
2. Letter to John Barnes (NYSDEC) and John Olm (NYSDOH) from Ronald Pollio (attorney representing Dzus Fastener) dated January 31, 1995.

The comments which have been received by the NYSDEC and the corresponding responses are presented below:

1. **Will sediment samples be collected from the Great South Bay?**

Any sampling conducted must be designed such that the results can be linked to a specific site. It would be impossible to link any cadmium or chromium contamination found in the Great South Bay to the Dzus Fastener site due to all of the non-point source discharges into the Great South Bay. Therefore, sediment samples will not be collected from the Great South Bay as part of the Dzus Fastener RI/FS.

2. **A 10-inch diameter pipe was found along the northern boundary of the site. The NYSDEC has concluded that "at some time in the past, wastes were disposed of directly into Willetts Creek" via this pipe. A commentor asked how the NYSDEC reached this conclusion considering that there were no significant levels of cadmium detected in a sample collected from Willetts Creek at the northeast corner of the site.**

The drainline in question extended from the rear of the plant to the eastern end of the site. Cadmium was detected in the soils just beyond the eastern gate at the site at concentrations as high as 2190 parts per million.

The Willetts Creek stream bed has been moved to the east by man over the past thirty-three years (see Figure A). It appears that some time in past, the stream bed existed along the eastern boundary of the site.

It is not surprising that the sample referenced above did not contain a significant concentration of cadmium because the streambed has been moved since the time that the discharge pipe was in use.

3. **Why is the NYSDEC not addressing the contaminated groundwater now?**

The NYSDEC is still researching possible groundwater remedies for this site. The NYSDEC had not found a viable remedial alternative at the time this document was prepared.

4. **Why is the contaminated groundwater not considered part of the source area?**

The source areas are defined as those areas where hazardous wastes were disposed of on-site. The groundwater plumes emanating from the site are the result of releases from the source areas.

5. **Why is Dzus Fastener not paying for the remediation of their site?**

The Dzus Fastener Company lacks sufficient financial resources to fund the entire remedial program and continue in business. If the NYSDEC forced Dzus Fastener to pay for the remedial program, they would go out of business, and their employees would be out of work.

The Dzus Fastener Company, along with their parent company (Dzus International Limited) signed consent orders with the NYSDEC in December 1993 in which they agreed to pay a total of \$1,500,000 to the NYSDEC to off-set the costs incurred in conducting the RI/FS and the remedial program.

The Attorney General of the State of New York has filed a lawsuit against Mr. Theodore Dzus, Sr. In this action, the State is seeking to recover \$632,000 spent to date by the State in investigating the site as well as future costs to be incurred in this matter.

6. **Was a crime committed when Dzus disposed of wastes on-site?**

It is not the position of the NYSDEC's Division of Hazardous Waste Remediation to determine if a crime was committed, but rather to investigate and remediate the contamination that exists at the site in order to protect human health and the environment.

7. **How were cadmium, chromium, and cyanide used at the site?**

Electroplating operations were conducted at the site in which products manufactured at the plant were treated with cadmium and chromium. Cyanides were also used in the plating vats.

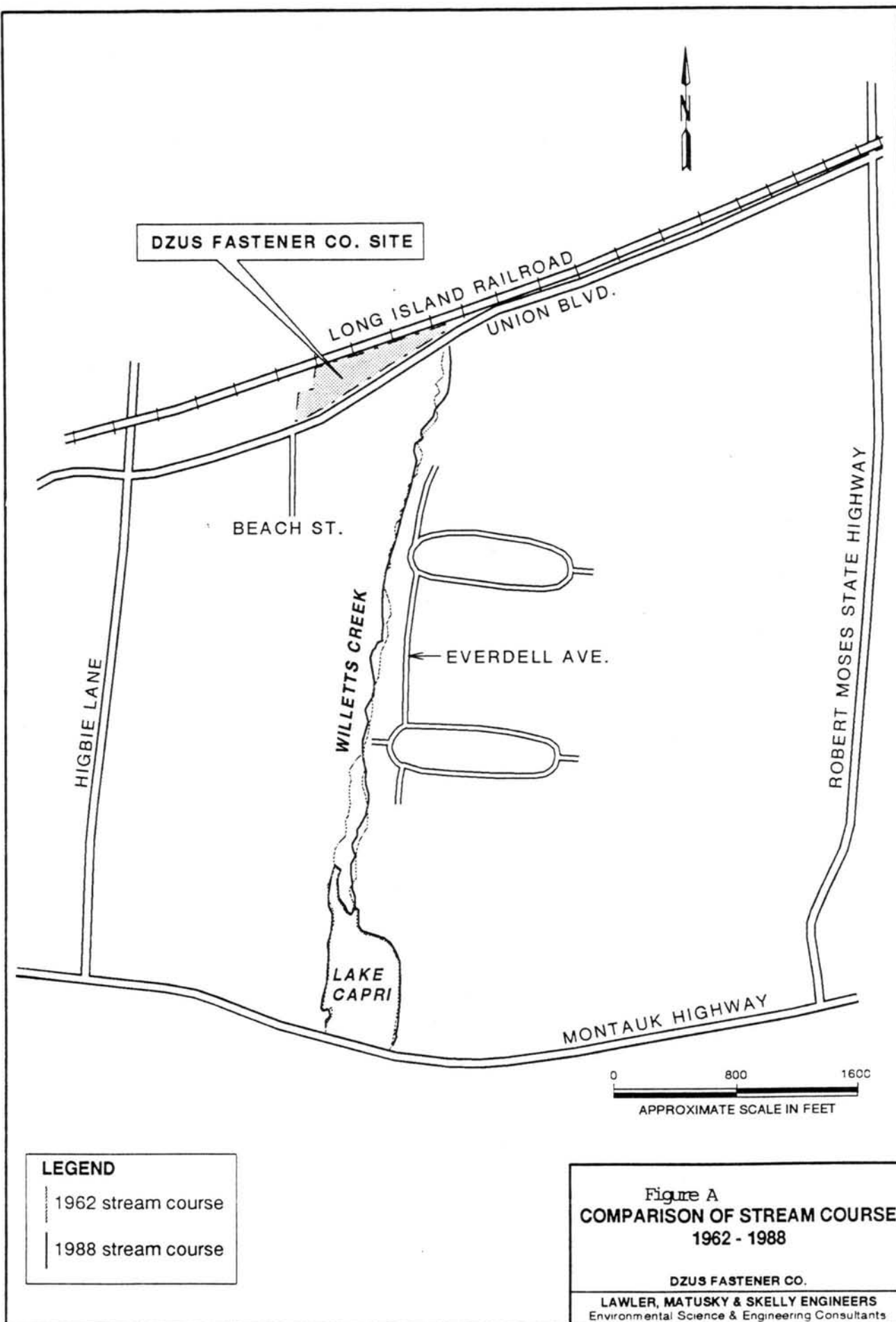
8. **Are there any fact sheets containing information on potential health impacts from exposures to site contaminants?**

Yes. These can be obtained from Ms. Nina Knapp of the New York State Department of Health at 1-800-458-1158 ext. 402.

9. **Why weren't the disposal practices at the site discovered back in the 1970's (or before)?**

Most of the environmental protection laws and regulations concerning hazardous waste did not come into effect until after the Love Canal case reached national prominence in the 1970's.

The Dzus Fastener Company did not have a State Pollutant Discharge Elimination System (SPDES) Permit to discharge waste water until 1976. Prior to that, few, if any inspections of the facility occurred.



LEGEND

1962 stream course

1988 stream course

Figure A
COMPARISON OF STREAM COURSE
1962 - 1988

DZUS FASTENER CO.

LAWLER, MATUSKY & SKELLY ENGINEERS
Environmental Science & Engineering Consultants