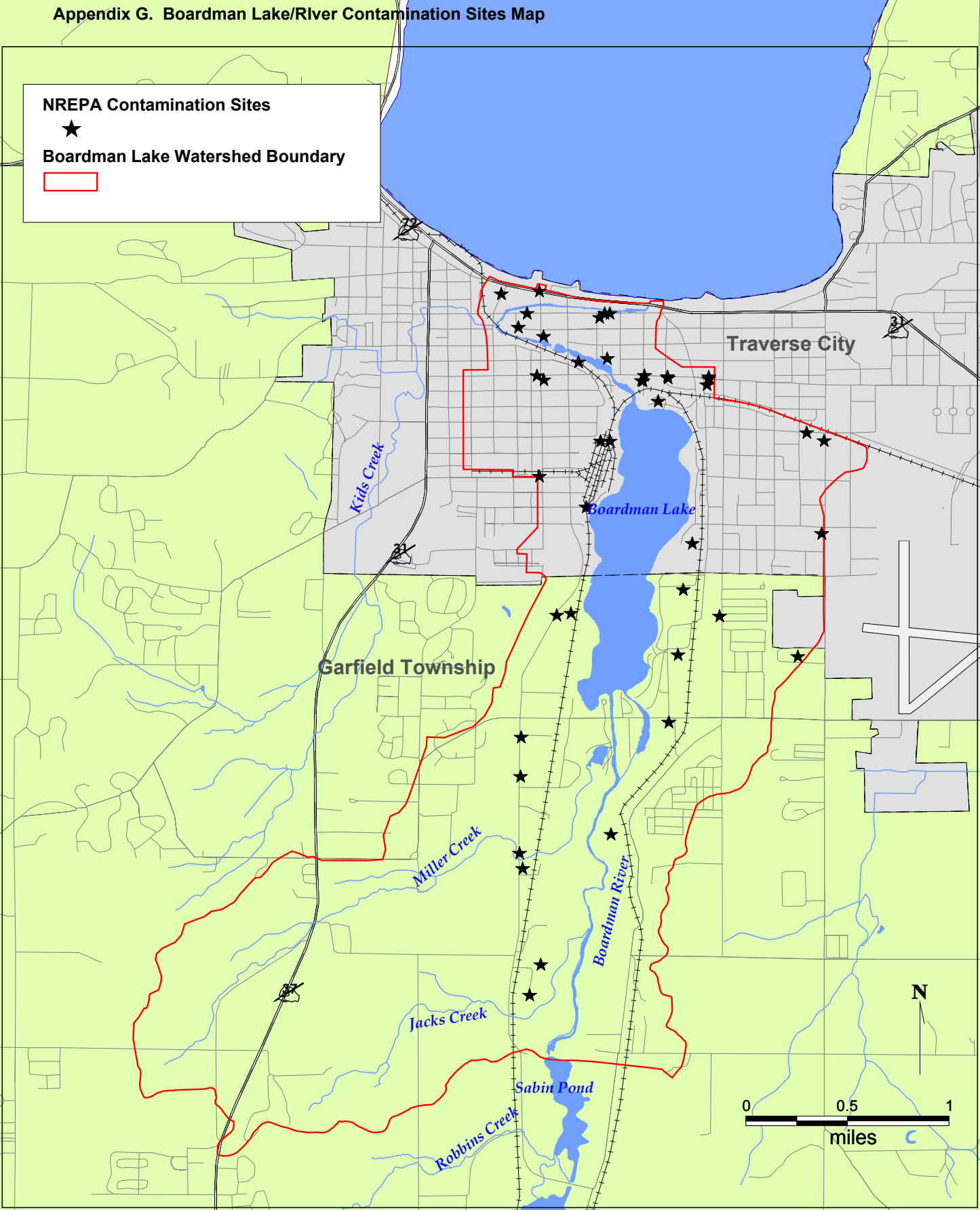
Appendix G. Boardman Lake/RIver Contamination Sites Map



Part 201, NREPA Listed Sites
Boardman Lake Watershed Protection Plan
December 2003

Key
* MDEQ file was deemed incomplete, therefore site location and available file information only are summarized.

** Current site status is "active" meaning the site is uncontrolled and site investigation and/or remediation are on-going. These sites are deemed to represent known or potential threats to the waters of the Boardman Lake watershed.

Stromberg Carlson Products, Inc. **

In December of 1966 Stromberg Carlson Products, Inc. purchased the southern portion of the property from Elsie Thirlby of Thirlby automotive parts. Beginning in 1952 and for a period no later than 1966, Thirlby leased the southern portion of the property to Parsons Corporation. Parsons Corporation manufactured large metal parts for airplanes and helicopters. Thirlby in turn purchased the southern property form Michigan Tractor and Machinery Co. in October of 1952. The Michigan Tractor and Machinery Company purchased the southern property in May 1946 from Ben H. and Frieda Koenig, who had purchased this portion of the property in January of 1946 from Maude and James Smith. From 1970s through mid-1990s metal recreational vehicle accessories were manufactured at the site. In a 1988 MDEQ inspection of the facility the existence of environmental compliance problems at two locations, at a door along the east wall and at an overhead door at the end of an abandoned alley at the northeast central part of the facility. A 1988 complaint prompted the Traverse City Fire Department inspection which included the photographing of drums and small spill areas in two locations at the exterior of the Stromberg Carlson facility. Drums were photographed at the door along the east wall of the building and immediately west of an overhead door at the end of an abandoned alley and east of the former paint room. According to the pictures, the drums were labeled flammable. In 1990 two areas of soil were excavated. One hundred and sixty-six (160) cubic yards of soil were removed, characterized and properly disposed. Soil samples were collected to verify the success of soil removal along the facility's eastern wall at a door exiting the welding/press room and at a loading area in the midsection of the building at the end of a vacated alley. Soils were reported by the MDEQ to have been impacted at this location due to the improper storage of paint products and/or wastes. Closure soil samples indicated the proper removal of contaminants to within the Michigan Environmental Response Act, Act 307 of 1982, as amended, Type A criteria. Stromberg Carlson Products, Inc. submitted a closure report to the MDEQ in December of 1993 and received a "clean closure" letter related to this location on January 25, 1994 from the MDEQ Cadillac District Quality Review Board. A Baseline Environmental Assessment was submitted to the MDEQ on September 10, 1996 from Lancz Warehouse Storage and on January 11, 2000 from Kerry Lane Development. The current status of the site is contamination from lead, arsenic, barium, silver, iron, selenium, Xylene isomers, and perchlorethylene (PCE) above MDEQ, Part 201, Residential Drinking Water Protection Criteria.

Forest Lane Subdivisions

The Forest Lane Subdivision encompasses the area between the Cherryland Mall, Leewall Terrace Mobile Home Park, Gladewood Place and the Forest Lane Subdivision. The site is north of South Airport Road and west of Garfield Road in Traverse City, Michigan. Following the July 1988 report of severe taste and odor problems with water from a residential well at 964 South Forest Lane, local health officials sampled al the residential wells in the area. Most residents in the area were utilizing private water systems with shallow drinking water wells set between 40 and 50 feet. In 1989, Part 201 (formerly known as Act 307) funds were used to complete municipal water extensions to nearly 50 residences. In January of 1991, approximately 30 residential wells were determined by local health officials and the MDEQ to still be contaminated with various purgeable aromatic hydrocarbons. The MDEQ undertook an extensive hydrogeological investigation in the area following the replacement of private wells with connection to municipal supplies, however, the source(s) of groundwater contaminants remain undetermined. The following were identified by the MDEQ as potential sources: the Cherryland Mall, K-Mart, gas stations, auto dealers, a laundromat, and the Jiffy Lube. Four phases of MDEQ remedial investigation failed to identify a source, and monitor well abandonment was completed in 1995. Subsequently, the MDEQ investigation was terminated.

Cone Drive/Textron

Cone Drive/Textron was identified by the MDEQ in 1984 as a site of potential environmental contamination through the Preliminary Assessment of Michigan locations for the inclusion on the federal CERCLIS, pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601, *et. seq*. Complaints were received by the MDEQ of the presence of petroleum sheen on the Boardman Lake along, proximate or adjacent to the Cone Drive/Textron facility, a former CSX Transportation (formerly Chesapeake and Ohio Railroad Yard) maintenance facility and a former Michigan Department of Transportation maintenance facility (known as the MDOT Boardman Yard). Cone Drive/Textron undertook an investigation and installed a groundwater inception trench, with the MDEQ oversight and approval, to prevent the migration of contaminants into Boardman Lake. Additional potentially responsible parties have undertaken investigations determining the presence of arsenic and volatile organic hydrocarbons above state standards for groundwater and soil. Due to the potential for numerous sources of contaminants, the MDEQ undertook hydrogeological investigations including a May 16, 1994 Interim Assessment and an Integrated Assessment Report of September 27, 1994. At the time of this report, all parties were moving cooperatively toward signing an agreement with the State of Michigan to implement site remediation. In 2001, Northern Michigan Environmental Action Council (NMEAC) and the City of Traverse City filed a lawsuit against Cone Drive/Textron for failure and lack of process in cleaning up the contamination that was ultimately ending up in Boardman Lake. In 2002, an Administrative Order by Consent (AOC) was signed by MDEQ and Cone Drive/Textron to implement a remediation plan. Late in 2001 and early 2002, an ozone sparging system was installed by Global Remediation Technologies in an

attempt to removed the contaminants from the soil and groundwater along the lake edge and to prevent further movement of contamination into the lake through groundwater. In April of 2002, an amended AOC was issued requiring Cone Drive/Textron to implement the January 2002 Revised Surface Water Interim Response Plan and the January 7, 2002 Pump and Treat Plan in order to cease discharges of venting groundwater to Boardman Lake above Mixing Zone adjusted groundwater-surface water interface (GSI) criteria. Currently, Cone Drive/Textron complied with the requests of NMEAC and the City of Traverse City, and the ozone sparge system/monitoring is ongoing. Currently the pump and treat system has achieved its goals. Negotiations with MDEQ are underway to implement an overall remedial investigation of the up-gradient plume on the property. Lake bottom sediment sampling was conducted in Summer 2003, and analyses determined that sediments were not impacted from the groundwater contamination plumes entry or "venting" into Boardman Lake.

MDOT Boardman Yard **

The MDOT Boardman Yard is comprised of 16.5 acres that were historically used for a number of rail-related operations. Cone Drive/Textron is located to the west of the site, with CSX Transportation (railroad real estate company) located to the east. From a 1992 Hydrogeological Investigation Report the following compounds were found in the soil along the railroad: solvents trichloroethylene (TCE), PCE, 1,1,1-trichloroethane, chloroform, dichloroethylene, perchloroethylene, 1,1,1-trichloroethylene, and vinyl chloride; petroleum constituents benzene, toluene, ethylbenzene and xylene isomers (BTEXs); polynuclear aromatics (PNAs), anthracene, pyrene, fluorene, perylene, and fluoranthene; and heavy metals arsenic, barium, selenium, and zinc. According to a September 1993 report, the location possessed a coal rail yard and diesel engine repair shop for most of the 20th century. Monitor wells at the site indicated petroleum and chlorinated solvents in the groundwater. The groundwater flow is east-northeasterly toward the Boardman Lake. In 1994, an Inland Lakes and Streams permit was issued by the MDEQ to dredge and install an interception trench to intercept and collect free product. In a 1995 investigation to determine source areas of contamination, two key areas were identified: the diesel locomotive refueling area and the engine repair building. In 1999, a Site Investigation and Remediation Report identified metals and polynuclear aromatics in the surface soil exceeding MDEQ Direct Human Contact criteria on the CSX Transportation property. This led to extensive soil excavation at the site in 2000 and in April 2000 in which MDEQ warranted no further response actions or a Remedial Action Plan, further stating the remaining environmental contamination issues could be addressed in a brownfield redevelopment effort. In August 2000, CSX Transportation sold the property to Boardman Banks, Inc. In September 2001, a Baseline Environmental Assessment was completed by Boardman Banks. Soil samples were collected and found detectible concentrations of volatile organic compounds (VOCs), polynuclear aromatics, pesticides and metals, while benzene, total xylenes, benzo(a)pyrene, flouranthene, naphthalene, phenanthrene, arsenic and selenium exceeded the Part 201 Generic Residential Cleanup Criteria. Groundwater sampling results indicated aluminum levels above Generic Residential Cleanup Criteria. In October of 2001 with the proposed Lake Ridge Condominium development pending, a Due Care Analysis was conducted and

revealed the presence of lead, arsenic and benzo(a)pyrene in the soil at levels exceeding the Part 201 Residential and Commercial I Drinking Water Criteria. Phase I of the Lake Ridge Condominiums have been occupied at the site, and Phase II is under construction at the time of this review.

Meach Cleaners and Laundry, Inc. **

Meach Cleaners is a laundry and dry cleaning service located at 725 East Eighth Street. According to MDEQ files, the site was placed on the Part 201 (the then Part 307 list) February 5, 1991. Groundwater contamination has been documented at this site from two possible sources: an UST system and improper storage; and disposal of dry cleaning solvents. The contaminant of concern is tetrachloroethene. The owner stated that the UST had been removed in approximately 1992 and the contamination is continuing. MDEQ Cadillac District staff have stated that groundwater flow is in a northerly direction, and has been documented to exist as far north as Webster Street. The groundwater plume is migrating north and has reached Grand Traverse Bay (2,100 feet to the north). A request was made December 1993 by the consultant to Meach Cleaners to monitor the plume only, rather than undertake active remediation. In response, a March 22, 1994 MDEQ memo from the Water Division to the Remediation and Redevelopment Division (RRD) stated that this alternative was unacceptable. In 1994, low levels of TCE, bromoform, chloroform, methylene and chloride were detected. Meach Cleaners submitted a closure report with groundwater restrictions. SWQ approved a proposal to allow the groundwater to vent without requiring further monitoring in 1997. A remedial Action Plan was submitted to the MDEQ in 1999 stating the need to rescreen the wells in order to determine approximate depth of the groundwater plume. Ongoing groundwater monitoring continues at the site as of this report.

Coal Gasification Plant **

A former coal gasification plant is located at 145 Hull Street. Groundwater flow is documented to be north towards Grand Traverse Bay. An old creosote pit existed at the rear of the building and former above ground storage tanks (ASTs) are known to have overflowed at the site. An underground storage tank (UST) was installed in approximately 1964 as a portion as a portion of a former coal gasification plant. In 1991, Northern Michigan Diesel Service confirmed a leaking underground storage tank system (LUST) release of diesel fuel and waste oil causing an approximate nine-foot deep groundwater and soil contamination plume consisting of BTEX, cyanide, styrene, phenols, polynuclear aromatics, and creosote. Other potentially responsible parties include, the Candle Factory located at 301 West Grandview Parkway and Red Mill. In 1993, the Candle Factory removed approximately 500 yards of contaminated soil. A Baseline Environmental Assessment (BEA) was conducted for Bazin, Inc. auto repair and maintenance in December 1997. Two to four inches of tar was discovered in Spring 2000 at the Harbor View Development and a twelve (12) foot cistern was removed as a consequence. In December 2001, a closure report was completed for the soils and the groundwater contamination was the only remaining issue. Currently, redevelopment/brownfield funds are being used for the Michigan Mill Park Development

Area. A former oil/water separator was found during the demolition of the Bazin Auto facility in preparation for site redevelopment.

Traverse City Canning Company

Traverse City Canning Company is defunct, but the facility remains at 3710 South Cass Road. The facility was a seasonal fruit and vegetable processing and packing operation, that went bankrupt in May 1980. The Traverse City Canning Co. intermittently operated one sewage lagoon and a spray irrigation system to treat organic process wastes discharged under permit to Boardman Lake. The wastewater treatment system of irrigation was implemented on the Northwest Michigan College University Center site along Boardman Lake. The outlet existed above the Eighth Street bridge and often discharged process water at 400 gallons per minute (gpm). In the 1960's, cherry parts and whole cherries were often documented discharging into Boardman River. In 1964, high levels of fecal coliform were documented in the River and in 1975, a fungus growth and slime was reported on the surface of the Boardman River near the discharge outlet. Groundwater flow at the site is east-northeasterly.

Chef Pierre purchased the facility in 1982, and changed its process to that of cake production - eliminating the need for surface water discharges. The wastewater lagoon was phased out at that time and the sludge was removed. A hydrogeological investigation undertaken in 1983 found waste materials in the aquifer adjacent to and downgradient of the sewage lagoon. The study recommended monitoring but no remediation. In 1991, counsel for Chef Pierre requested the removal of both location from the Part 201 list of sites of environmental contamination, absent the iron precipitation in Boardman Lake. A letter was written by the MDEQ in 1991 in agreement with the proposed delisting. The site remains inactive.

Traverse City Wastewater Treatment Facility

Historically, the Wastewater Treatment Facility has operated according to MDEQ standards. In September, 1998 a spill of ferric chloride solution potentially impacted groundwater and soils. A 4,000-gallon leaking tank was removed and a ground pump was installed to clean up the spill. The solution was detected in the soil to the water table to approximately 10 feet below ground surface.

In 2001 a mercury minimization program was implemented given the detection of the metal in the influent from several industries the facility services. Following the implementation of this program, no mercury was detected in the effluent since 2001. A pretreatment program was also implemented to determine and identify any industrial discharges in the influent. Each year between 1986 and 1990, the wastewater treatment facility had effluent violations with the following reasons cited: 1) high strength industrial wastes entering the system, 2) solids handling deficiencies in the system, 3) various equipment failures, 4) inconsistent process control procedures for biological oxygen demand (BOD), total dissolved solids (TSS), and phosphorous. In April 1994, it was determined the Bay Street and Coast Guard Station pumping stations were not

meeting the State's requirements for design and safety. In 1994, polychlorinated byphenols (PCBs) were detected in the influent. This prompted the City of Traverse City to suggest that the MDEQ National Pollutant Discharge Elimination System (NPDES) permit application address this concern in the future. In 1999 and September 2000, sewer overflow occurred into the Boardman River further causing subsequent beach closings following major rain events. In June 2000, the facility effluent exceeded NPDES permit limit for phosphorous. The possible cause being from a faulty pretreatment influent from Sara Lee Bakery was determined.

According to the City of Traverse City population assessments and future projections, the current treatment plant is operating beyond capacity limit and a new facility is scheduled for construction approximately 4.5 miles upstream from the current site. The new facility assures a decrease loading of Total Suspended Solids, BOD, nitrogen ammonia, and phosphorous to the Boardman River.

In December 2002, the current wastewater treatment facility is operating in compliance with the current MDEQ NPDES permit. During 2002 and 2003 the plant was being upgrade to implement tertiary treatment, beyond state and federal treatment requirements.

Front Street Area **

The Front Street Area site is located at Front and Park Streets along the 300 block of Front Street. At 302 East Front Street, during a sewer replacement project in February 1985, contaminated soil was detected at the water table approximately six feet below ground surface. Subsequent soil and groundwater analysis indicates the presence of gasoline components. In March 1985, the MDEQ requested the potentially responsible parties to develop a work plan to define and resolve the contamination problem. The previous owner of the site continues to refute responsibility. The current owner, Midwest Broadcasting Company, purchased the property from Amoco Oil in 1974, and shortly thereafter removed the UST systems. According to the MDEQ status report dated March 19, 1985, conversations with city officials indicated at least six former gasoline stations and automobile shops existed within a 100-yard radius of the site including: 301 and 302 East Front Street, 314 and 315 East Front Street, 317 East Front Street, and 325 East Front Street. Further, there have been numerous reports of oil seeps into the Boardman River in this area during the 1960s and 1970s. Groundwater flow direction is estimated to be northwest toward Boardman River and Grand Traverse Bay. On May 22, 1985, approximately 58 cubic yards of soil bearing a fuel odor was removed. The excavating company representatives described a fresh fuel oil smell. An excavated area measuring approximately 30 feet by 20 feet was located on the north side of Front Street between Park Street and Boardman Avenue. Correspondence dated May 28, 1985 from the MDEQ, recommended the site be placed on the Part 201 list. The sewer replacement was completed in mid-1985. In July 1991, a complaint was received by the MDEQ regarding an UST system which was removed in 1990 at 311 East Front Street. The complaint stated that the removal resulted in a petroleum odor at the Boardman River. A MDEQ activity report stated that contamination was found in different locations in this area. The MDEQ site compliance file remains open.

One Hour Martinizing **

One Hour Martinizing is located at 115 Pine Street and is being operated as a dry cleaning facility. A hydrogeological investigation revealed the presence of PCE contamination in the groundwater at the water table following a release in 2001. Cis-1,2-dichloroethane was detected at 240 ug/L and exceeding the MDEQ Part 201 criteria for Generic Residential Drinking Water Standards. Benzene and 1,2,4-trimethylbenzene were also detected above these standards and are believed to be migrating onto One Hour Martinizing property from a former gas station property to the south. According to a report submitted to the MDEQ, very low vertical gradients within groundwater and density differences of compounds indicates no migrating contamination plume exists at this site. A letter from MDEQ, dated September 18, 2002, requests further delineation of the extent of the contamination and remediation of the site and that the current work plan submitted on behalf of One Hour Martinizing is inadequate. The MDEQ site file remains open.

Traverse City Iron Works */**

Traverse City Iron Works was formerly located along the Boardman River, between Eighth Street and Union Street in Traverse City. Historically, the Traverse City Iron Works operated as an iron processing plant. Regular dumping of core/mold sand, slag, and iron cuttings occurred around foundry buildings north of the railroad tracks along the Boardman River. Soil sampling was conducted in 1994 at and beneath old foundry buildings, evidencing elevated levels of heavy metals and polynuclear aromatics. Groundwater flow at the site is documented to be northeasterly toward Boardman River. 1998 soil analysis evidenced heavy metals in concentrations twenty times above MDEQ criteria. Metals within site soils include arsenic, barium, chromium, copper, lead and zinc. Additionally, (bis)1,2-ethylhexyl phthalate, and benzo(b)fluoranthene exceed GSI criteria. In 1998 and as a part of site redevelopment, a slope stabilization/containment wall was installed along the Boardman River's edge to prevent contamination from entering into the Boardman River. A 1998 hydrogeological investigation report revealed the presence of elevated levels of arsenic, lead, and PNAs in soil and lead in the groundwater. Nine samples of river sediment were also collected and analyzed, documenting elevated levels of arsenic and lead. Response activities included river slope stabilization, UST removal, removal of impacted soil and debris, the further elimination of contamination during site redevelopment, establishing engineering controls of contaminant migration, property deed restrictions, and a monitoring plan. During October of 1999, a site redevelopment work plan was approved by the MDEQ, and site redevelopment was approved with the inclusion of impervious barriers (such as concrete building slabs, asphalt parking areas, curbs and gutters, sidewalks, and clean cover/landscaping). According to a 2002 soil investigation, the following were detected in the soil above MDEQ Part 201, GSI criteria: chromium, mercury, selenium, fluoranthene, and phenanthene. All samples were collected from a proposed storm water infiltration basin location.

Cherryland Asphalt **

This facility produces asphalt at 2200 Cass Road. 1989 MDEQ investigations documented that Cherryland Asphalt dumped demolition waste material in adjacent wetlands and uplands between the years of 1980 and 1989. Waste dumped in wetlands along the Boardman River was referred for wetland violation enforcement to the MDEQ Geological and Land Management Division (GLMD). Solid waste, oil, ash, demolition waste, construction waste, cars and buses, drums, USTs, and floor drains to wetlands were discovered by the MDEQ at the site in 1989. A 1993 study of the site was completed by Cherryland Asphalt. Three notice letters from MDEQ were sent to Cherryland Asphalt between 1992 and 1997, requesting a site remediation/action plan for the recognized environmental contamination. Enforcement actions were recommended by the MDEQ in 1998, however no action had taken place at the time of this report.

Crain Fabric Care **

Crain Fabric Care is located on the corner of Park Drive and South Airport Road. In 1991, a leaking 55-gallon drum was excavated at the site, revealing elevated levels of BTEX, PCE and TCE in the groundwater at twenty-three (23) feet below ground surface (b.g.s.), and flowing west-northwesterly. In April 1993, the site owner declared bankruptcy. The petroleum constituent toluene was also detected in the soils at and beneath the former UST. In 1997, trihalomethanes (THMs) were also detected in groundwater. In 2000 PCE was documented in groundwater at the site at 5 to 8 ug/L. During May of 2002, groundwater samples indicated PCE up to 4 ug/L. Groundwater at the site exists at 22 to 24 feet b.g.s., flowing to the northwest. The MDEQ began enforcement actions in July 1997. State costs as of 1997 have totaled nearly $100,000 to replace residential drinking water wells allegedly contaminated by this release.

Lear Corporation**

The Lear Corporation is located at 10010 Woodmere, manufacturing auto and truck parts. In 1924, the property was an electroplating facility known as Setwell Company. Two undescribed waste water lagoons were located along the western side of the Setwell property, periodically receiving untreated waste water. In 1973, the property was purchased by Essex Wire Corporation, and in 1974 United Technologies Automotive (UTA) became the owners and operators of the facility. At the time of purchase by UTA, groundwater downgradient of the lagoons was known to be contaminated with elevated levels of cyanide, nickel, and zinc. In 1989, an incident occurred in which paint waste containing lead and zinc was discovered discharging from beneath the parking lot. Soils within this area was excavated and disposed off-site. To date three contaminated groundwater plumes have been documented on-site, migrating and discharging to Boardman Lake. Groundwater contamination plumes at the site originate from a former catch basin near the rear parking lot, from the lagoon/pit area, and at the southern extent of the property. Low levels of volatile organic compounds including PCE were discovered within the southern groundwater plume. Groundwater flow at the site is documented to be northwest toward Boardman Lake. In June of 1981 the MDEQ

discovered a drum containing paint sludge, having contaminated adjacent soil with high levels of heavy metals. During November of 1981, approximately 300 yards of soil was removed in this portion of the Lear property, and all remaining drums were properly disposed. In 1987, MDEQ learned that the waste water lagoons were unlined, and a "holding tank" at the site existed with no bottom. In June of 1988, the MDEQ requested lake sediment and water sampling and analysis. Results of water column sampling within Boardman Lake indicated elevated levels of cyanide, nickel, and zinc in September of 1988. Sediment sampling at that time revealed the presence of elevated levels of chromium. The waste water lagoons were taken "off-line" in 1989. A December 1997 MDEQ inspection found many 55-gallon barrels containing auto parts, assembly wastes (especially paint wastes) present along the facility's 450-foot frontage along Boardman Lake. In December of 1998, MDEQ undertook soil sampling in the area of discarded drums finding stained soils, oil, metal, rubber gloves, pink dry paint, oil filters, carbon rods, and an undetermined white gypsum-like material. Soil analysis indicated the presence of PNAs, cyanide, lead, nickel, and zinc above GSI criteria. Groundwater analyses indicated the presence of chlorinated compounds at low levels along the waters edge, but with increasing concentrations to depths beneath Boardman Lake. Groundwater contamination along Boardman Lake has not yet been adequately defined, according to the MDEQ. Lear Corporation bought the property in 1999. According to MDEQ records at the time of the purchase, groundwater contamination including TCE, PCE, TEX, arsenic, cadmium, lead, nickel, cyanide, zinc, and hexavalent chromium was migrating to Boardman Lake. In May of 1999, a groundwater pump and treat/soil vapor extraction cleanup system at the site was determined by the MDEQ not to be working adequately, placing Boardman Lake at environmental risk. At that time TEX concentrations were determined to be high, and EX were found by the MDEQ to exceed calculated surface water mixing zone criteria within Boardman Lake. This finding prompted the MDEQ request for a new remediation treatment system. In September of 2000, soil excavation was undertaken at the lagoon site. In March 2001, Lear was found by the MDEQ to not be liable for soil and groundwater contamination. In April of 2001, Lear Corporation agreed to sample and analyze shallow on-site soils for cyanide. In September of 2001, mercury was determined to be present in groundwater above GSI criteria. Currently groundwater beneath the Lear property exceeds MDEQ GSI criteria for both heavy metals and VOCs, while the soil exceeds Direct Contact criteria for cyanide.

Woodmere Barrels **

Woodmere Barrels is located immediately south of the Lear Corporation on a 24.21 acre parcel, containing 450 feet of frontage along Boardman Lake. The property is currently owned by Melling Tool. In 1952 Ginsberg Auto Body Salvage was the property owner, and operated an auto salvage yard at this location until 1957. Some surface removal was reported in 1964, and the property was then operated as a salvage yard by Melling Tool beginning in 1970. The property was reportedly used for snow disposal by the City of Traverse City during the 1980s. A December 1997 field visit by MDEQ personnel indicated the presence of numerous barrels containing waste in addition to auto parts and assembly waste, especially paint waste. December 1998 MDEQ soil sampling

documented soils stained with oils, glues, paints, a white gypsum-like material, barrels, various metal, rubber, oil filters, and carbon rods. Soil sampling and analyses by the MDEQ confirmed the presence of PNAs, cadmium, lead, nickel, and zinc above MDEQ GSI criteria. A possible migration of contamination from the Lear property was suspected. Between 1980 and 2000 arsenic, barium, cadmium, chromium, copper, lead, selenium, mercury, and zinc were all detected above MDEQ residential soil clean up criteria at the site. Additionally, groundwater evidenced contamination with TCE and PCE at relatively low levels, but above generic residential drinking water criteria. Importantly, solvent concentrations in groundwater were reported to increase with depth, though the vertical extent of groundwater contamination was not defined. Soil removal was reportedly undertaken at the site in June of 2000. Reportedly, additional soil removal and sampling was undertaken by the MDEQ in 2001 along the fence at the northern property boundary with Lear. Phase I and II and Baseline Environmental Assessments were undertaken in July of 2001 by potential purchaser, Traverse City Light and Power. This report indicated the September 2001 discovery of mercury in groundwater at the site above GSI criteria. Recent data within the MDEQ file indicate that additional soil removal was completed in 2002, and that arsenic, barium, cadmium, chromium, cyanide, copper, lead, selenium, mercury and zinc exist at the site above MDEQ residential soil criteria. Lastly, most recent groundwater investigation document the presence of TCE, PCE, barium, cadmium, chromium, copper, lead, mercury, and zinc above MDEQ groundwater cleanup criteria. It is noted that hexavalent chromium has not been determined to be absent from the site. The site has been redeveloped into a 110 unit multi-family residential and an 100 unit unassisted senior living center.

Former Keystone Road Dump **

Keystone Road dump is located along Keystone Road approximately one mile south of South Airport Road, within a 100-year floodplain of the Boardman River. Owned by the City of Traverse City, the 27-acre dump was operated as a licensed landfill since 1966. In March 1971, the City of Traverse City was cited by the MDEQ for violations for placing refuse too close to the Boardman River, and for an extensive rodent infestation. In January of 1972 the dump was ordered closed by the MDEQ due to violations of proper daily covering. The MDEQ stated in February of 1974 that the dump had not been properly covered or maintained to prevent leakage to the Boardman River. In February of 1975 the MDEQ notified the City of Traverse City in writing that the Keystone Road Dump was filled to capacity, operating as an unlicensed landfill, and likely polluting the Boardman River. The dump was again ordered closed in March 1975, after additional notification of violations. According to MDEQ correspondence, potential impacts to the Boardman River were identified and groundwater monitor wells were installed between the dump and the river in June of 1984. A hydrogeological investigation conducted in December of 1984 evidenced high levels of sodium, bicarbonates, and chlorides within on-site groundwater monitor well, MW-3. During February of 1992, the MDEQ noted the presence of landfill leachate in an on-site drain with elevated levels of chloride, chemical oxygen demand (COD), and alkalinity as compared to the ambient water chemistry of the Boardman River. In February 1992, increased levels of arsenic, barium, chloride, copper, zinc, mercury, and BTEX were

detected in the groundwater, however all were below MDEQ standards. PCE, benzene, and xylenes were also detected in high concentrations. During the summer of 1992, mercury was also detected in the groundwater. In March 1995, zinc was also detected above MDEQ groundwater criteria. Groundwater monitoring ended in 1996, and according to internal MDEQ correspondence, the dump has never been capped or closed with the required post-closure monitoring. In March 1, 1996 the City of Traverse City notified the MDEQ that no environmental investigation or remediation was completed or planned, and the expressed the desire to use the property for recreation. May 13, 2002, iron bacteria were noted by the MDEQ in seeps and springs downgradient of the landfill. Some wetland filling was evident and MDEQ file notes, "several seeps all along entire site, several 100 yards…" While the landfill has never been capped or officially closed, MDEQ waste management staff have recommended listing of the location as a site of environmental contamination, and expressed concern regarding potential nitrate contamination of groundwater from composting practices. In May 2002, the MDEQ considered the site a candidate for escalated enforcement actions.

Former Boot Lake Dump **

The former Boot Lake dump is located south of 2662 Cass Road along Boardman Lake, just beyond Traverse City's southern limit. The site is a former dump, owned by the City of Traverse City. From 1920 to 1930 the site was a part of the Traverse City Country Club, and was maintained as a part of its golf course. The property was deeded to the City of Traverse City in 1950, and was a city-owned and operated dump site from the 1950s to 1978. Kellogg Wholesale Supply bought the property in 1960. J&A Properties, formerly Kellogg Wholesale Supply recently performed a BEA for two parcels associated with the former dump. Parcel 1 includes two warehouse buildings, and Parcel 2 is comprised of the unregulated landfill. The former dump is documented as being a former lake filled with solid and other wastes. In the 1960s and 1970s, the dump was used for disposal of leaves, rubbish, snow, and waste soil. In the 1960s, potable water at Kellogg Wholesale Supply evidenced contamination. A deeper well was drilled to a depth of approximately 97 to 102 below ground surface, below a clay layer. Subsequently, lead was detected in soil, and silver and zinc were documented in the groundwater. During 2001, a Grand Traverse County plan sparked a discussion regarding the potential of brownfield funding for cleanup and redevelopment. Currently the site is being used by J&A Properties for storage, retail and office space.

Radio Centre of Traverse City, Inc.*

Radio Centre of Traverse City is located at 314 East Front Street, and was a former filling station and a print shop. While a filling station, the site contained 10 former petroleum USTs. Photo development chemicals were subsequently detected in on-site soil. The following chemicals of concern were detected above MDEQ residential generic cleanup soil criteria: naphthalene, benzo(a)pyrene, 2-methylnaphthalene, acenapthylene, phenanthrene, benzo(a)anthracene, dibenzo(a,h)anthracene, silver, mercury, cadmium, chromium, benzene, and fluoranthene. Lead and silver were detected in the groundwater.

Radio Centre of Traverse City, Inc. purchased the property in 2000 under a BEA. Groundwater flow has been documented to be directly north to the Boardman River.

Nottke Trucking*

A BEA was conducted at this location documenting the presence of the heavy metals cadmium, total chromium, total lead, and zinc in soil above Part 201 soil leaching to residential drinking water criteria. No further information was available. Site location requires verification.

Leaking Underground Storage Tanks

Former Amoco #0188 **

The former Amoco station #0188, is located at 206 South Union Street in Traverse City. In September 1988, a limited soil investigation was conducted. The results from the soil samples collected at the site indicated elevated concentrations of purgeable aromatic hydrocarbons (BTEXs). A confirmed release from UST systems was reported to the MDEQ on December 8, 1988. Upon further investigation it was determined that groundwater had also been impacted by the release from UST systems. Free phase petroleum product was further discovered upon groundwater at and beneath the site and was remediated. Preliminary reports suggest that groundwater flow is west-southwesterly.

Concentrations of BTEXs and methyl tertiary-butyl ether (MTBE) exist at this location in excess of the MERA Type B soil and groundwater cleanup criteria. The MDEQ suspects that the contaminated groundwater has migrated off-site and is venting into the Boardman River. Consequently, the MDEQ recommended an aggressive approach be undertaken for the definition of the impacted soil and groundwater to prevent any further migration of the groundwater to the surrounding properties and the Boardman River. In 2003 the site was redeveloped for commercial use in accordance with MDEQ regulations and brownfield redevelopment procedures

River Front Plaza

River Front Plaza is located at 315 and 317 East Front Street. This site is also known as contamination area #2 of the Front Street Area. A hydrogeological investigation undertaken in 1989 indicated that hydrocarbon contamination existed at the site. A diesel fuel UST release occurred in 1992. According to MDEQ reports, impacted soil was excavated in 1993. According to a report to MDEQ in 1994, groundwater containing polynuclear aromatics, BTEX constituents and dissolved lead is not migrating from the site above Residential GSI levels in accordance with Act 307 Type B Default GSI Criteria. Groundwater flow is to the northeast. Six USTs were removed from the ground following the release the site was officially closed in 1994.

Ware's Auto Sales

Ware's Auto Sales is located at 720 East Eighth Street. In 1991 six UST systems were located during an environmental site assessment at this location. A confirmed release was reported to the Michigan State Police/Fire Marshall Division (MSP/FMD) upon the removal of a 5,000-gallon unleaded gasoline UST in front of Ware's Auto Sale office. Subsequent hydrogeological investigations indicated the presence of lead in the soils at the site's former auto body shop, however potential groundwater contamination was determined not to be present. Soil removal occurred at the site and currently unrestricted residential use has been approved by MDEQ following site closure in 1995.

Aunt Barb's Day Care **

Aunt Barb's is located at 601 East Eighth Street, and is currently operated as a day care/learning center facility. From 1962 to 1982 the property was leased by Murphy Oil USA, Inc. and operated as a retail gasoline and automobile service station known as Murphy Oil Station #1563. UST systems have reportedly not been in operation at this facility since 1982 and have been removed. Following a September 1990 complaint at the day care of stained soils, a hydrogeological investigation was undertaken at this location and it was determined that regulated substances exist below state standards within soils at this location, but BTEX concentrations exist in the groundwater above the MDEQ criteria. Groundwater flow has been determined to be in the northeasterly direction. An audit of the project by the MDEQ has requested the installation of additional groundwater monitoring wells to determine the extent of off-site migration of contaminants. In 1995, this work was proposed to the MDEQ, and owner/operators were awaiting work plan review and approval. On June 21, 1994, a Consent Decree and Agreement was signed by all potentially responsible parties and to undertake a cleanup in accordance with state regulations. Currently the groundwater monitoring continues, and the facility has not been approved for closure.

Tower Automotive*

Tower Automotive is located at 1677 Park Drive, and has operated as a general automotive repair facility. According to a 2000 Soil Investigation Report, PCE and petroleum constituents above Part 201 soil leaching to residential drinking water criteria were detected in the soils following a 2000 overflow of an UST. All stained soils were excavated and backfilled. According to a MDEQ report, the site was approved for closure August 18, 2000.

No. 1 Cab Company **

The No. 1 Cab Company, formerly Cherry Capital Cab, is located at 747 East Eighth Street. In 1956, the site converted from residential to the Rengo Brothers Gas Station and Car Wash. On April 27, 1987 four UST systems, owned by Blarney Castle Oil Company, were removed from the site. The UST systems were comprised of a 12,000-gallon and three 4,000-gallon tanks containing gasoline. Historically, the No. 1 Cab

Company property was occupied by a car wash and a Phillip's 66 gasoline retail and automobile service station. In response to citizen complaints concerning the site, on March 22, 1991 the MDEQ requested further site investigation. Blarney Castle Oil Company began hydrogeological investigation, however additional work was requested by the MDEQ. The MDEQ requested an update of project activities by April of 1995, or else the state threatened to undertake enforcement actions. Groundwater is known to exist at approximately twenty-six (26) feet below ground surface. Soil and groundwater investigations in 1999 revealed the presence of BTEX, naphthalene, and lead in the soil and groundwater. A BEA was completed on the property in December 1999, and affirmed by the MDEQ in April 2000. Contamination at the site has not been addressed or defined satisfactorily. Only UST and contaminated soil source removal have been undertaken to date at the site.

Randy's Old Towne Service **

Randy's Old Town Service Station is located at the southeast corner of Union Street and Eighth Street in Traverse City. Groundwater from the site is documented to migrate to the north. A gasoline spill occurred at the site in 1983 and was cleaned up. In 1990, a 130 gallon gasoline spill occurred, sending gasoline north along Union Street. BTEX constituents have been documented to exist in the soil. Approximately 120 yards of contaminated soil was removed at three locations to attempt to remediate the site in November 1990.

Overhead Door

Overhead Door is located at 530 Wellington Street. A 1995 leaking UST revealed the presence of BTEX constituents in the groundwater. A BTEX contaminated groundwater plume extends onto to Wellington Street. Soil excavation activities occurred and the site was closed in 1995.

Cornille Concrete (formerly Peninsula Corporation) **

Cornille Concrete is located at 2900 Cass Road. Releases were confirmed from five USTs in 1991, releasing waste oil, diesel, and gasoline. Soil excavation occurred for approximately 300 yards of soil removed. Groundwater was documented to flow to the northeast. The groundwater plume was known to be impacted with TEX and PNAs, below MDEQ cleanup criteria at the time. However, benzene was detected in groundwater above MDEQ criteria. A 1995 closure report was submitted, however no official closure occurred by MDEQ.

Jr. Discount Tire

Jr. Discount Tire is located at 602 East Eighth Street. A gasoline UST release occurred in 1992, and remedial investigations were undertaken in January and April of 1993. Non-detect levels of BTEX, PNAs, and lead were documented. The site was closed in 1994.

Kellogg Wholesale Building Supply

Kellogg Wholesale Building Supply is located at 2662 Cass Road. In 1990 a release of diesel fuel occurred at this site followed by subsequent UST removal and approximately 100 yards of soil. Soil sampling indicated the presence of PNAs and BTEX constituents. A work plan was submitted by the responsible party, and the MDEQ file was officially closed in 1991.

Grand Traverse County Governmental Center

This site exists at 400 Boardman Avenue in Traverse City, and was the site of a diesel release from a 5,000-gallon UST in 1992. Following soil sampling, PNAs were detected in the soil, and subsequent soil and UST removal occurred. The site was officially closed in 1993, according to MDEQ records.

Carpenter Enterprises #2

Carpenter Enterprises #2 is located at Hartman Circle in Traverse City. A 1992 release from two USTs was reported during UST removal. Elevated levels of total petroleum hydrocarbons were documented in both the soil and groundwater. A soil and groundwater verification report was submitted in 2000, stating that cleanup at the site was complete. The MDEQ site file was closed in February of 2001.

VanBroklin Shell/Schmukal Oil **

This site is located on Woodmere Avenue in the City of Traverse City. A 1991 release of gasoline was confirmed at the site from a 4,000-gallon UST. Groundwater flow at this location was documented to be to the northwest. BTEX was detected in the groundwater, however below the Part 201 residential criteria at the time. In 1996 a proposed closure report was denied by MDEQ. In 2000, free product was discovered at the site, and a soil vapor extraction remediation system was installed. In June 2002, a Free Product Recovery Status Report was submitted to MDEQ. No further correspondence was contained within the MDEQ file at the time of this report. The site file remains active.

Vencle Kauek Trust

Vencle Kauek Trust is located at 101 West Grandview Parkway in Traverse City. Soil sampling during 1991 documented soil contamination with PNAs above MDEQ criteria. Approximately 25 yards of impacted soil was removed in 1995, and on-site groundwater recovery and treatment was completed using pumping and treatment with carbon adsorption. Six USTs were removed, and the file was closed in 1997.

Twin Bay Freight Distributors **

Twin Bay Freight Distributor is located on Hartman Circle. A confirmed release from two 1,100-gasoline USTs occurred in 1990. BTEX constituents were detected above Part

201 generic criteria for soil and groundwater. According to MDEQ records, no closure report was submitted, and the last correspondence was in March 1996. The site file remains open.

Tire Factory **

The Tire Factory is located at 1100 South Garfield in Traverse City. A release was confirmed from an UST system in 1991, and sampling indicated BTEX contamination in groundwater at the site. An In-situ bioremediation system was installed and operated to cleanup soil and groundwater at the site. During 1996, the MDEQ requested a closure report from the owner of property. Currently the Tire Factory is trying to reach an agreement with its insurance company over remediation and investigation costs. The MDEQ file remains open.

Woodland Oil **

Woodland Oil is located at 501 East Eighth Street in Traverse City. Three gasoline USTs were removed from the site in March 2001. Groundwater is documented at 15 feet b.g.s., and flowing to the northeast. A contaminated groundwater plume exists flowing to Washington Street, containing BTEXM, trimethylbenzenes, lead, naphthalene, and phenanthrene. The MDEQ file remains open.

Grand Traverse Auto **

Grand Traverse Auto was historically located along Front Street between Pine and Union Streets in downtown Traverse City. A confirmed release from an UST containing waste oil occurred in December 1992, as indicated by the presence of a waste oil sheen on the Boardman River. In September of 1996, groundwater contamination with BTEX and lead was determined to exist in a plume flowing to the Boardman River, and a mixing zone determination was completed. In June of 1997, according to MDEQ records, land use restrictions were placed on the site, and monitoring is ongoing.

Ron's Service **

Ron's Service Station was located at 1114 South Union Street, currently the location of a Crystal Flash gas station. A release was discovered in the early 1990s contaminating the groundwater and soil with TEX, trimethylbenzenes, and naphthalene. Groundwater flow is documented to be west-northwesterly. Free product was discovered at twenty-four (24) feet b.g.s, and soil was removed to a depth of 22-24 feet. Recovery wells for free product and a granular activated carbon treatment system were installed to treat contaminated groundwater before discharge to an onsite drainfield. Cite cleanup was ongoing at the time of this report.

Eighth Street Blarney Castle **

Blarney Castle is located on 444 Eighth Street, at the intersection of Eighth and Wellington Streets. In June of 1999, a groundwater contamination plume containing BTEX constituents was documented to be migrating north-northeasterly, and is known to extend to Webster Street. Groundwater is at 12 feet b.g.s. The MDEQ file remains open.

Crandall's Service **

Crandall's Service Station site was located on the corner of Union and Eighth Streets. An August 1991 gasoline spill was discovered, and a confirmed release waste oil and gasoline occurred in April 1992. Soils were documented to be contaminated with TEX, lead, and PCBs. Groundwater flow was documented to be to the northeast towards the Boardman River. A surface water mixing zone determination was requested in September of 1996. Limited closure status was approved following a restrictive covenant and a City of Traverse City ordinance in January of 2002. A May 2002 MDEQ audit states that the extent of groundwater and soil contamination remain undefined, and more groundwater investigation was expected during for the summer of 2002. The MDEQ file remains open, but site closure is believed to be imminent.

Schmukal Oil Bulk Plant **

Schmukal Oil Bulk Plant is located at 1516 Barlow Street in Traverse City. Groundwater is documented at 30 feet b.g.s., and flowing northwest to west. Gasoline and diesel UST released were reported in June of 1990. Groundwater contamination includes Xylenes, trimethylbenzenes, 2-methylnaphthalene, and naphthalene. Free product was detected at the site in 1992, and was cleaned up during 1996. According to MDEQ records, the extent of the groundwater contamination plume has not need adequately defined. Free product was rediscovered in June 2001. The MDEQ site file remains open.

Tezak Trust

The Tezak Trust is located at 1026 Hannah Street in Traverse City. A LUST was reported to the MDEQ in 1991 due to the documentation of soil contamination above MDEQ criteria for BTEX and lead. Groundwater flow was documented to be to the northwest. Corrective actions were taken, and were completed in 1993. Following a May 1994 MDEQ audit, the site was removed form the Part 201 list, and site closure was approved by the MDEQ.