

Health Assessment for

CALDWELL TRUCKING COMPANY

FAIRFIELD, NEW JERSEY

OCTOBER 1988

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

SUMMARY

The Caldwell Trucking Company (Caldwell) National Priorities List (NPL) Site is located in Fairfield Township, Essex County, New Jersey. Volatile organic compounds (VOC's) and polychlorinated biphenyls (PCB's) were detected in the soils and sediments sampled at the site. Low levels of VOC's were also detected in the surface water. The groundwater plume, which consists of VOC contamination, is well defined (see Appendix) and extends from the Caldwell site northeast to the Passaic River. A second plume includes Fairfield municipal supply well #7 (MW-7) to the southwest of the site, and although the pump test indicates that the flow near the site could theoretically flow in that direction, sampling of the intervening area does not show notable VOC contamination. There are approximately 530 single family homes located within a 1-mile radius of the site with an occupancy of approximately 3 persons/residence. The Record of Decision (ROD) addresses several of the most immediate concerns present at the Caldwell site: (1) wellhead treatment of MW-7, (2) excavation, treatment, and containment of the contaminated soils from the Caldwell property, (3) provision of municipal water for up to 100 homes along the periphery of the plume that are using their private wells, and (4) preparation of a supplemental Remedial Investigation/Feasibility Study (RI/FS). The ROD has not addressed the concerns for the surface water, the sediment, or the groundwater plume. The supplemental RI/FS will address these issues and also try to determine whether there are sources, other than Caldwell, responsible for the contaminant plume. This site is currently a potential public health concern.

BACKGROUND

A. SITE DESCRIPTION

The Caldwell NPL Site is located in Fairfield Township, Essex County, New Jersey. The 12.2-acre site consists of parcels acquired by Caldwell from 1948 through 1954. Caldwell operated as a transport and disposal operation for septic wastes since after World War II. Open, unlined lagoons were used to store and treat the waste beginning in approximately 1954. From records that Caldwell supplied to the New Jersey Department of Environmental Protection (NJDEP) it appears that the septic wastes were placed in the open lagoons and the disinfectant, sodium hypochlorite, was added. The waste was allowed to settle for a period of time and eventually the liquid phase was pumped out and trucked to a large seepage lagoon located in the far northeastern portion of the site.

Light industry began developing in the Fairfield area in the mid-1950's. Sewage systems were not supplied to the area until the late 1970's. It is very possible that during this time, septic tanks may have contained hazardous wastes. Caldwell and other trucking companies periodically pumped out the septic tanks and disposed of the waste material at the Caldwell site.

In 1973, Caldwell was denied a permit to operate as a landfill and instead installed above ground storage tanks to store the wastes transported to the site. All the open, unlined lagoons were backfilled with the exception of one which was covered with plywood. By 1984 the tanks were no longer in use and Caldwell was operating solely as a transport facility. Caldwell continued to operate as a transport facility until 1988, when the business was closed.

Contamination first became apparent in the early 1970's. Chlorinated hydrocarbons were detected in industrial and domestic wells. By 1980 an intensive investigation was underway. Caldwell and a neighboring facility, General Hose, were requested by NJDEP to install monitoring wells. While Caldwell complied with the request, General Hose did not comply until 1983 when it was ordered to install the wells. Currently, the plume is well defined (see Appendix) and extends from the Caldwell site northeast to the Passaic River. A separate, unrelated plume to the southwest of Caldwell includes MW-7.

The ROD for Caldwell was signed in September 1986. The selected remedy consists of: (1) Excavation and treatment by heat addition of approximately 28,000 cubic yards of soil and waste material and disposal in an on-site landfill, (2) Restoration of a lost potable water source by treatment via air stripping of MW-7, (3) Provision of an alternate water supply to residents potentially affected by the groundwater contaminant plume, and (4) Preparation of a supplemental RI/FS to identify the extent of the groundwater contamination and other potential sources of the contamination, and to develop and evaluate appropriate remedial alternatives.

At this time the remedial effort is in the design phase. A mailing will be sent to 100 potentially affected homes during the summer of 1988. All of the affected residences in Fairfield will be connected to municipal water beginning November 1988.

B. SITE VISIT

ATSDR has not made a site visit to date.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION AND OFF-SITE CONTAMINATION

VOC's were the most frequently detected compounds in the groundwater. VOC's detected include trichloroethane (TCE) at 36,000 ug/L in monitoring wells and 14,000 ug/L in residential wells, chloroform at 4,400 ug/L in monitoring wells and 3,600 ug/L in residential wells, and 1,1 dichloroethane at 560 ug/L in monitoring wells and 400 ug/L in residential wells. Surface water samples taken off-site indicated elevated levels of VOC's including TCE at 340 ug/L.

VOC's, PCB's, and Polynuclear Aromatic Hydrocarbons (PAH's) were detected in the soils sampled. Maximum concentrations of VOC's and PCB's detected in on-site subsurface soil samples included TCE at 790 parts per million (ppm), chloroform at 14 ppm, and Aroclor 1242 at 360 ppm. Maximum concentrations of VOC's and PCB's detected in the surface soils included TCE at 5.8 ppm and Aroclor 1248 at 76 ppm. Maximum concentrations of PCB's detected in the sediments included Aroclor 1254 at 12.3 ppm.

Air samples taken along the periphery of the site near the seepage lagoon indicated concentrations of total VOC at a range of 5 to 114 ppb.

B. PHYSICAL HAZARDS

Caldwell is no longer operating as a transport facility. There are two old trucks located on-site. Access to the site is reported to be difficult, but it is not prevented by either a fence or a guard. There is a potential for children playing in and around the equipment to be injured.

DEMOGRAPHICS OF POPULATION NEAR SITE

Caldwell is located in a heavily populated residential area. There are approximately 530 single family homes located within a 1-mile radius of the site with an occupancy of approximately 3 persons/residence. The nearest home to Caldwell is approximately 400 feet from the site. Another 320 of the homes are within 900 feet of the site. All of the homes were originally provided private wells as their potable water source. Many of the residences have since been connected to municipal water. Most of the homes that remain to be connected with the municipal supply are located along the periphery of the plume where only low concentrations have been detected.

There are 45 small businesses within a 1-mile radius of the site. Many have process and/or potable wells. The boundary of Essex Regional High School, which has 1,800 students in grades 7 to 12, is 200 feet east of the site. The school obtains its water from the Essex Fells water supply. The Essex County Airport is located 200 feet west of the site.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

For many of the media sampled on this site it was impossible to distinguish on-site samples from off-site samples because concentrations were not reported by sample number. The results were reported as maximum concentrations of the various contaminants for each media of concern. The appendices for the RI/FS were not included in the information packet received by ATSDR, the information on the results of the sampling may have assisted in the determination of on-site/off-site contamination.

2. Land Use and Demographics

The information provided on land use and demographics is quite substantial. Additional information on the population of the homes near the site would be helpful in defining possible exposures to high risk subpopulations (e.g., children, elderly, etc.).

3. Quality Assurance/Quality Control

Conclusions contained in this Health Assessment are based on the information received by ATSDR. The accuracy of these conclusions is determined by the availability and reliability of the data.

B. ENVIRONMENTAL PATHWAYS

The groundwater on-site and off-site is significantly contaminated with VOC's. The ROD mandates several remedial actions for the groundwater: (1) MW-7 will receive wellhead treatment, (2) up to 100 homes which were identified during the RI will be provided municipal connections, and (3) 90 percent of the abandoned wells will be sealed. The remaining wells will be used for monitoring in the future. There have been no alternatives chosen for the treatment of the plume at this time. It was reported that more information would need to be gathered before such an alternative selection could be made.

Results from the soil sampling indicate VOC and PCB contamination. The proposed excavation on-site will increase potential exposure of remedial workers and trespassers to the contaminants in the soil. Once remediation is complete and the landfill is constructed, the possibility of exposure to the soil will be greatly reduced. Since the values reported for soil contamination were not sample specific, the concentration of contaminants off-site are unknown; and therefore, are of public health concern.

There are several surface water bodies in the area of the site, they are Deepavaal Brook, an unnamed tributary to Deepavaal Brook, and the Passaic River. There is known recreational activity in the Passaic River. It is not known whether fishing is one of the recreational activities that occurs (shad and herring are present in the river). It is unknown whether recreational activities occur in Deepavaal Brook. The potential surface water and sediment contamination found in these surface water bodies has not been addressed in this ROD, additional sampling will be conducted in the supplement RI/FS. The contamination found in the surface water and sediments, although limited, is of potential public health concern.

The air quality was tested on-site in the area of the seepage lagoon, located on the northeastern portion of the site (see Appendix). VOC's were detected in the sampling. The levels were of potential public health concern, in the immediate area.

No samples were taken of the biota (e.g., fish, game, crops, edible wild plants, etc.) in the area. Fish are known to be present in both the Deepavaal Brook and Passaic River, but the extent of contamination is unknown. There is no information on the presence, use, or extent of contamination of any other biota in the area, therefore, all forms of biota are of potential concern.

Prior to the completion of the remedial actions proposed in the ROD, some environmental pathways will be cause for concern: migration of contaminated dust and vapors released on-site, contaminated surface water and/or sediment migration, contaminated groundwater migration, contamination of the biota, and migration of contamination from the soil.

C. HUMAN EXPOSURE PATHWAYS

Inhalation of dusts and vapors generated on-site from the soils is a potential exposure pathway for remedial workers and trespassers at the site. People may be exposed to contamination while performing tasks that require disruption of the soil, thereby causing a release of contaminated dust and vapors. This potential exposure will decrease once remedial work requiring excavation of the contaminated soil and construction of the on-site landfill is complete. Off-site there is a potential for exposure from fugitive dusts and vapors generated by disrupting the soil at the site, and inhalation of vapors generated while using the contaminated groundwater could occur if water from contaminated wells was used for irrigation, washing cars, etc.

Ingestion of contaminated groundwater is a potential public health concern while there are still contaminated wells in use. Presently there are still approximately 100 wells in use in the affected area. All are located on the fringe of the plume or outside the plume. All affected residents in the Fairfield area should be connected to the municipal water system beginning November 1988.

Ingestion of soil is a potential human exposure pathway on-site. The problem will center around the workplace (people eating lunch with dirty

hands, wiping dirt on their face, etc.). Dermal exposure is a potential human exposure pathway from working with the contaminated soils, especially in the locations of the old lagoons. This potential exposure will decrease once the soils are contained within the landfill.

There is a possibility of incidental ingestion and dermal exposure to surface water and sediments at the site. The surface water features in the area may be used for recreational activities (e.g., wading, fishing, etc.). Consumption of contaminated biota is considered a potential human exposure pathway, since there has been no sampling of the biota.

Human exposure pathways that are of public health concern are inhalation of fugitive dusts and vapors generated on-site and vapors generated from use of groundwater off-site; ingestion of contaminated soils, surface water, and groundwater; consumption of biota, and dermal absorption of contamination from soil, sediments, surface water, and groundwater.

PUBLIC HEALTH IMPLICATIONS

Until the remedial activities are complete, there is a potential public health threat to individuals exposed to VOC's through ingestion and inhalation of contaminated media. Some VOC's are known to cause central nervous system depression at high concentrations. Also, some VOC's cause liver and kidney toxicity as well as damage to the pulmonary and hematopoietic systems. In addition, there is evidence that some VOC's are carcinogenic in laboratory animals.

TCE given orally in doses of 24 or 240 mg/kg/d for a period of 14 days produced effects including increased liver weight, decreased hematocrit, and depressed cell-mediated immune response (Tucker et al., 1982, Sanders et al., 1982). Based on liver tumor production in mice, EPA has designated TCE as a potential human carcinogen. It is unknown how long residents may have been drinking or using for domestic purposes the highly contaminated water present in the plume. Long-term exposure to TCE at the maximum concentration detected in residential wells could result in a significant, increased risk of cancer and other non-carcinogenic toxic effects such as liver damage and depression of immune function. Therefore the use of this groundwater for drinking, bathing, and other indoor domestic uses is not acceptable. Outdoor use of this water may cause significant inhalation exposure to TCE and other volatiles in the groundwater. Once the remediation is complete this will only be of concern to those residents whose wells are not sealed as discussed in the ROD.

Acute PCB-related health effects typically occur at higher concentrations than those detected on-site. However, for this site, the primary identified potential health effects, resulting from exposure to PCB's through ingestion, inhalation, and dermal contact, are carcinogenic effects. PCB's, have been designated as Group B2--Probable Human Carcinogens (EPA 1987). This designation is based on experiments which demonstrated the induction of hepatocellular carcinomas in laboratory animals fed high doses of PCB's in their diet (Kimbrough et al., 1975; Norback and Weltman, 1985).

CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

This site is of potential health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Environmental Pathways and Human Exposure Pathways sections above, human exposure to the groundwater, surface water, biota, soil and sediment may have occurred in the past or may be occurring now. The actions implemented as a result of the ROD will address several of the most immediate concerns present at the Caldwell site. The wellhead treatment of MW-7 will restore an important water source to the community of Fairfield Township. The excavation, treatment, and disposal of the contaminated soils from the Caldwell property will reduce the possibility for exposure to the soil or the vapors produced from the soil. The provision of municipal water to the 100 homes located along the periphery of the plume that were using their private wells, should reduce the risk of exposure to the groundwater. The ROD has not addressed the contamination present in the surface water or the sediment. It also has not addressed the treatment of the groundwater plume. The supplemental RI/FS will address these issues and will also try to determine whether there are sources, other than Caldwell, responsible for the creation of the plume.

B. RECOMMENDATIONS

1. During remediation, measures should be taken to protect people on-site and off-site from exposure to any dusts or vapors that may be released. Workers on-site should be provided adequate protective equipment and training, in accordance with 29 CFR 1910.120, and should follow appropriate National Institute for Occupational Safety and Health and Occupational Safety and Health Administration guidelines, when involved in activities that may result in an exposure. Workers should implement optimal dust control measures. During working hours, appropriate monitoring should be utilized at the worksite periphery to protect nearby residents.
2. The information requested in the Data Needs and Evaluation section of this Health Assessment should be provided to ATSDR.
3. Although a well survey was conducted using township well records, verification of the use of the wells which were abandoned when homes were connected to the municipal water system should be made. Also it should be confirmed that all private and public water supply wells containing unacceptable levels of site contaminants are (1) presently being provided an acceptable alternate water supply, and (2) using only the alternate water supply for indoor domestic uses. A copy of the well inventory and any additional sampling data of water supply wells should be forwarded to ATSDR.
4. The supplemental RI/FS should include additional environmental media sampling especially biota, and off-site soil and groundwater, in order to more fully characterize the site for future public health determinations.

5. In accordance with Comprehensive Environmental Response, Compensation, and Liability Act as amended, Caldwell Trucking Company has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to on-site/off-site contaminants may currently be occurring or may have occurred in the past, this site is being considered for follow-up health effects studies. After consultation with Regional EPA staff and State local health and environmental officials, the Epidemiology and Medicine Branch, Office of Health Assessment, ATSDR, will determine if follow-up public health actions or studies are appropriate for this site.

PREPARERS OF REPORT

Environmental Reviewer: Susan L. Mueller, Environmental Health Specialist, Health Sciences Branch.

Regional Representative: Denise Johnson, ATSDR Regional Representative Region II.

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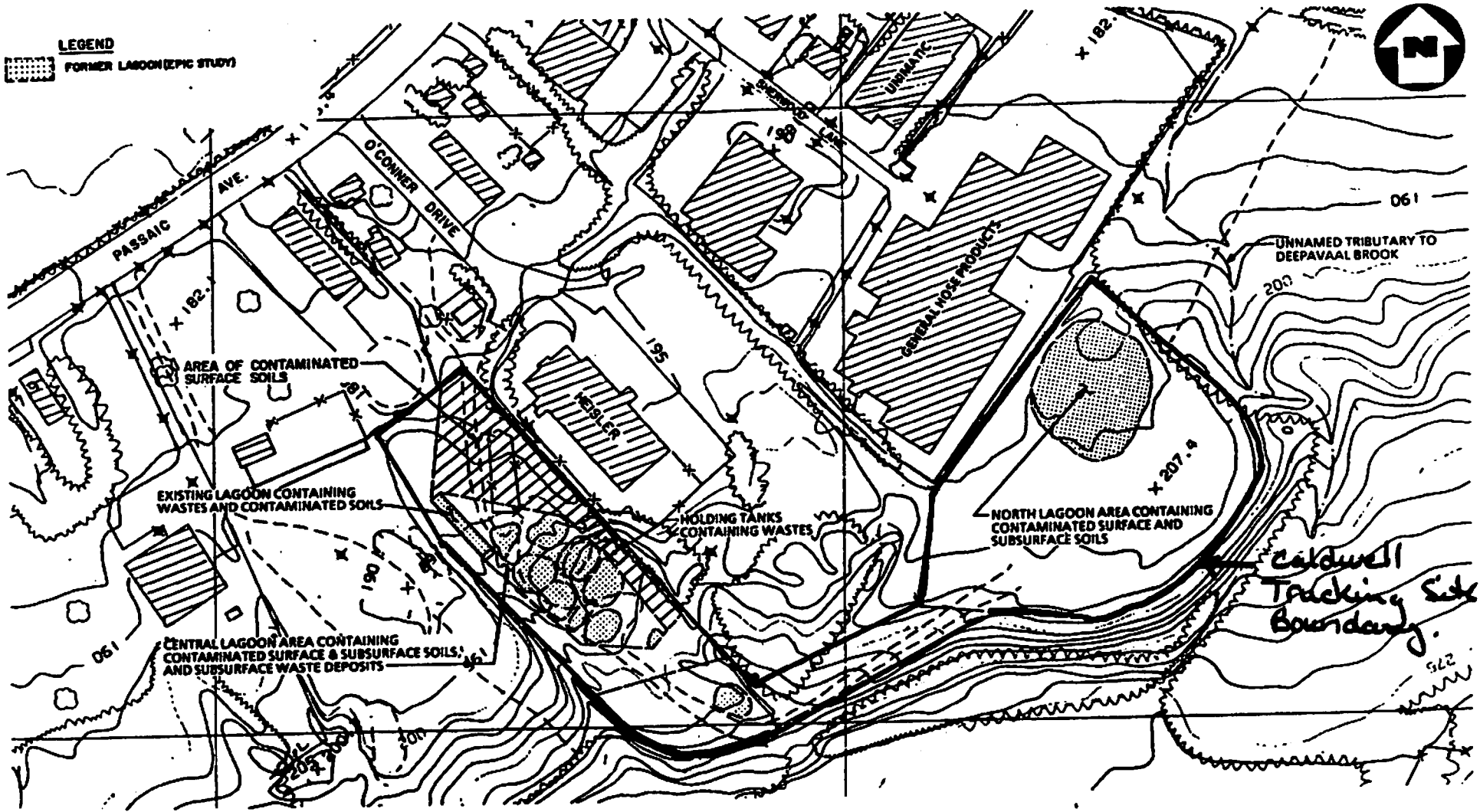
APPENDICES

Appendix A

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LEGEND
FORMER LAGOON (EPIC STUDY)



SITE LAYOUT
CALDWELL TRUCKING CO. SITE, FAIRFIELD TWP., NJ

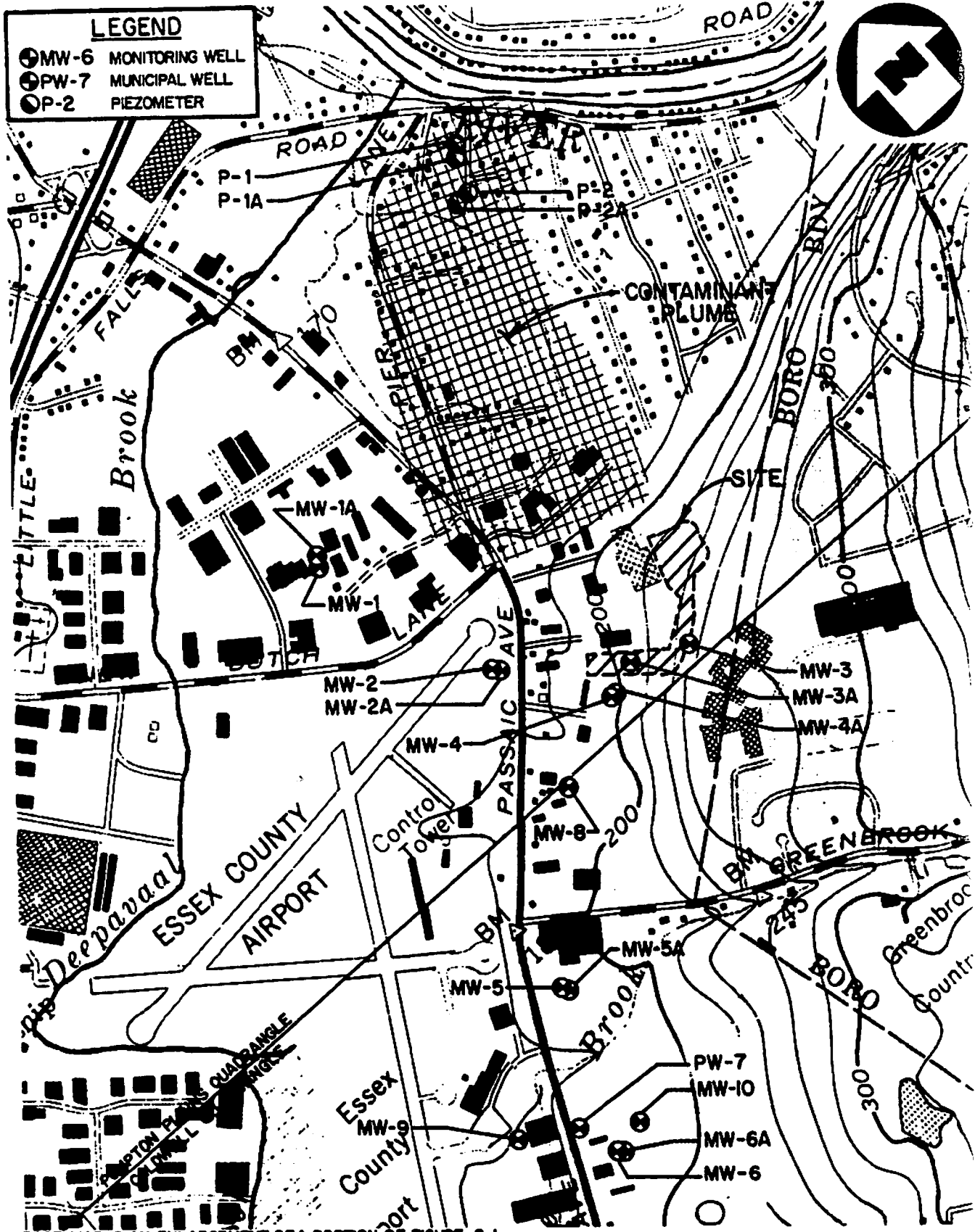


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FIGURE 1-2



Appendix B



BASE MAP IS AN ENLARGEMENT OF A PORTION OF FIGURE 2-1.

FIGURE 4-2

**MONITORING WELL LOCATION MAP
CALDWELL TRUCKING CO. SITE, FAIRFIELD TWP., NJ**

SCALE: 1" = 1000'

