PRELIMINARY Health Assessment for

INTERIM

B & B CHEMICAL COMPANY

HIALEAH, DADE COUNTY, FLORIDA

CERCLIS NO. FLD004574190

DECEMBER 23, 1991

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i)(6)(F) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term "health assessment" shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessment, risk evaluations, and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR prepared this Interim Health Assessment using available data and information. ATSDR will re-evaluate this site and prepare an updated health assessment as warranted by the availability of additional data and information and as resources permit.

INTERIM PRELIMINARY HEALTH ASSESSMENT

B & B CHEMICAL COMPANY

HIALEAH, DADE COUNTY, FLORIDA

CERCLIS NO. FLD004574190

Prepared by

Florida Department of Health and Rehabilitative Services

Under Cooperative Agreement with the

Agency for Toxic Substances and Disease Registry

SUMMARY

The B & B Chemical Company site is a National Priorities List (NPL) site located in Miami, Dade County, Florida. Polynuclear aromatic hydrocarbons (PAHs) present in on-site and off-site surface sediments and subsurface soil would be of concern if human exposure routes were established. Metals and volatile organic compounds (VOCs) found at this site have contributed to the degradation of the local shallow ground water. In the past, workers excavating soil adjacent to the site reported skin irritation from exposure to shallow ground water. This shallow ground water represents the upper level of the potable water source for this area, the unconfined Biscayne Aquifer. The area has not been surveyed for downgradient private potable or industrial process wells; therefore, it is not known whether human exposure to metals and VOCs (at levels of health concern for long-term exposure) is occurring via potable water or industrial process water. This site is an indeterminate public health hazard because based on available information it is not possible to fully evaluate routes of human exposure to hazardous substances in ground water at levels that may result in adverse health effects.

BACKGROUND

A. Site Description

The B & B Chemical Company (B & B) is an active facility which produces industrial cleaning compounds. It is located at 875 West 20th Street, approximately 6 miles northeast of downtown Miami (see Figure 1). B & B has been at this location since 1958; it expanded in 1970 to its present size.

The area surrounding the 2-acre site is characterized by a mixture of light industry, warehouses, retail operations, and residential housing. Single and multiple family dwellings are located northeast of the site. The Metro Rail Okeechobee Station and parking garage is located to the west, and a variety of warehouses and businesses are located in other directions from the site (Figure 2). The Miami Canal is located approximately 800 feet south-southwest of the site.

The plant produces numerous cleaning compounds for the aircraft, defense, and space industry. Most of the raw materials arrive in bulk or in 55-gallon drums, transported by company owned semi-trailers. In the past, materials were also transported by railroad boxcars. These chemicals are combined in mixing vats to make specific cleaning compounds. Approximately once a year, the mixing vats are washed down and the waste enters a pretreatment system before being discharged into the Hialeah sewer system. The pretreatment system was installed in 1976. Previously, the company used soakage pits to discard the washdown waste. The pits have been filled and covered. Approximate locations of the former soakage pits are shown in Figure 3.

The B & B site has been the subject of a number of investigations which focused on the following concerns: (1) air pollution problems during the period 1967 to 1970 [Dade County Environmental Resources Management (DERM), 1986]; (2) the use of the soakage pits for disposal of the contents of the sodium hydroxide aluminum etching tanks and smut recovery tanks for Ware Aluminum Windows, Inc. [one of the company's customers (Brock, 1971)]; (3) the disposal of process wastewater into two storm water collection boxes (Bestard, 1975a), and (4) discovery of a third soakage pit containing oil and grease (Bestard, 1975b).

In 1981, foaming and effervescing ground water affecting city waterline installers (adjacent to the site) was found to contain phenol at 0.55 mg/L (Valdez, 1981). Later, ground water causing skin burns on workers installing track for the Dade County Metro Rail just south of B & B Chemical in 1985 was found to contain a chemical with the same "fingerprint" as a paint stripping product produced by B & B (Gancher, 1985).

A Notice of Violation (NOV) was issued to B & B in June 1984 for failure to submit a plan for on-site ground-water monitoring. DERM filed suit against B & B in January 1985 to compel the company to submit a plan to assess on-site contamination (Goldstein, 1985). A court appointed engineer recommended installation of 11 shallow wells on site, at a depth of 5 to 7 feet. These wells were to be constructed and sampled by trained personnel according to established protocols to determine the predominant direction of the hydraulic

gradient under the site. A background well was also recommended for construction as far upgradient as practical (Bermes, Jr., 1985). B & B installed three monitoring wells on site without DERM approval of the well construction design in March 1985. These wells were screened at 20-25 feet, too deep to allow sampling for contaminants which might float on the water table.

The site was investigated in October 1985 by the NUS Corporation Field Investigation Team (FIT). NUS was tasked by Region IV, Environmental Protection Agency (EPA), to perform an expanded site investigation at the request of DERM. EPA obtained a warrant from the Federal District Court in Miami to conduct the on-site sampling (EPA, 1986).

B & B had a Remedial Investigation and Feasibility Study (RI/FS) prepared based on data from the NUS expanded site investigation (Camp Dresser and McKee, Inc., 1987). However, the extent of the ground-water contamination plume was not determined by the expanded site investigation sampling, and the RI/FS was not accepted by the EPA (Dora Ann Danner, personal communication).

B. Site Visit

A site visit was conducted by staff of the Florida Department of Health and Rehabilitative Services (HRS) Health Office and ATSDR in February 1989. A follow-up site visit was conducted by staff from the Dade County Health Department in November 1990. Site access is restricted by a cement block fence 10 feet high that completely surrounds the site and a chain-link and barbed-wire gate and guard house at the site entrance. Figure 3 indicates that plant buildings cover about one-fourth of the 2-acre site, and the southeast quadrant of the site is the only area that is not covered with concrete slab.

Elevated rails of the metro are located just south of the site and the area north of the site is a high traffic through-way. A residential area is located northeast diagonally across a 4-lane intersection from the site.

C. Health Outcome Data

Based on the evaluation performed as part of this Preliminary Health Assessment, there are no indications that humans have been exposed to site-related contaminants. In addition, there were no community health concerns identified during this evaluation. Therefore, health outcome data were not evaluated in conducting this preliminary health assessment.

COMMUNITY HEALTH CONCERNS

Dade County Department of Environmental Resources Management representatives expressed concerns in July 1991 that metals and volatile organic compounds found at this site have contributed to the degradation of local ground water. This shallow ground water represents the upper level of the potable water for this area; however, municipal water is available. Municipal water wells located hydrogeologically downgradient from the site provide only 5 to 10 percent of Dade County Water and Sewer Authority's total system output because

low levels of VOCs are present in the water that recharges them. These wells are being fitted with airstrippers to remove VOCs from the pumped ground water.

The area has not been surveyed for downgradient, private , potable or irrigation wells or industrial process wells. Therefore, it is not known if human exposure to metals is occurring via dermal, inhalation, or ingestion exposure to ground water. The extent of off-site plume movement is also unknown.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

To identify possible facilities that could contribute to the ground water, surface water, soil, and air contamination near the B&B site, HRS staff searched the 1987, 1988, and 1989 Toxic Release Inventory (TRI). TRI is developed by the EPA from the chemical release information provided by certain industries. TRI contained information indicating point and non-point air releases of chemicals from 1987 through 1989 by the B & B facility on-site and by industrial operations located nearby in off-site areas. These releases are not expected to significantly impact contaminant levels detected in on-site and off-site areas.

A. On-Site Contamination

On-site samples were collected at the inferred locations of the former soakage pits, the tank farm, the site periphery, and other areas of interest. These samples included: (1) two sediment and two surface water samples from storm water drains, (2) twelve subsurface soil samples from the saturation zone at the top of the aquifer (5 feet to 7 feet below land surface), and (3) fourteen monitoring well ground-water samples (two at 10 feet, seven at 20 feet, two at 50 to 75 feet, and three at 20 to 25 feet [B & B's wells] below land surface). The storm water drains collect surface water runoff from the site. These drains are concrete boxes approximately 4 feet by 4 feet and 3 feet deep. They are designed only to drain surface water and permit infiltration into the ground and are not connected to each other or to a drainage system.

The contaminants present at levels of potential health concern are listed below. Not included in the table is bis(2-ethylhexyl)phthalate which was detected at a similar level in the control sample and is a common lab contaminant.

Of the contaminants listed on the next page, arsenic and bis(2-chloroethyl)ether are not known to have been used on site.

SHALLOW GROUND WATER CONTAMINANTS (7-20 FEET BELOW LAND SURFACE)	CONCENTRATIONS DETECTED (µg/L)	DETECTION FREQUENCY [a]
Arsenic	ND - 310	15/28
Benzene	ND - JN21	4/36
Chlorobenzene	ND - 350	11/36
bis(2-Chloroethyl)ether	ND - 210	8/36
Chromium	ND - 210	15/36
trans-1,2-Dichloroethene	ND - 890	9/36
Lead*	ND - 20	18/28
Vinyl Chloride	ND - J 4.4	4/36

DEEPER GROUND WATER CONTAMINANTS (55 FEET AND 75' BELOW LAND SURFACE)	CONCENTRATIONS DETECTED (µg/L)	DETECTION FREQUENCY [b]
Chlorobenzene	2.55 - 95	2/2
trans-1,2-Dichloroethene	ND - 3.95	1/2
Lead	ND - 6.5	1/2

SUBSURFACE SOIL CONTAMINANTS (BORINGS 7-10 FEET BELOW LAND SURFACE)	CONCENTRATIONS DETECTED (mg/kg)	DETECTION FREQUENCY [c]
Benzo(a)anthene	ND - 0.41	3/12
Benzo(b)fluoranthene and/or Benzo(k)fluoranthene	ND - J0.41	3/12
Benzo(a)pyrene	ND - J0.28	3/12
Chrysene	ND - J0.35	3/12
Indeno(1,2,3,-c,d)pyrene	ND - J0.35	1/12

STORM WATER DRAIN SEDIMENTS CONTAMINANTS	CONCENTRATIONS DETECTED (mg/kg)	DETECTION FREQUENCY [d]
Benzo(a)anthene	ND - 7.40	1/2
Benzo(b)fluoranthene and/or Benzo(k)fluoranthene	ND - J4.30	1/2
Benzo(a)pyrene	ND - J6.80	1/2
Chrysene	ND - J11.00	1/2

ND - Not detected (detection limits not available).
J - The numerical value is estimated.
N - The analyte was tentatively identified and the associated numerical value may not be consistent with the amount actually present in the environmental sample.
* - Acceptable levels of lead are currently controversial. The MCL at State and Federal levels is 50 µg/L; however, the EPA Drinking Water Health Advisories are 20 µg/L for the lifetime value for a 70 kg person and EPA is considering lowering acceptable municipal levels to 5 µg/L so that "at tap" levels do not exceed 10 µg/L.

a - shallow monitoring wells 17-20 feet deep with 10 foot screening, sampled 10/85, 15 of the 28 wells contaminated, etc.

b - deeper monitoring wells 55 and 75 feet deep with 10 foot screening, sampled 10/85, 2 of 2 wells contaminated, etc.

c - soil borings 5-7 feet below land surface. Sampled 10/85, 3 of 12 contaminated, etc.

d - surface sediments from storm water drainage boxes sampled 10/85, 1 of 2 contaminated.

B. Off-Site Contamination

As part of the expanded site investigation, background samples were collected off site. For ground water, (1) two samples were collected upgradient (see Figure 4, the Walker Park location); (2) seven monitoring wells were sampled west of the site (three at 10 feet, three at 20 feet, and one at 55 feet); and (3) six monitoring wells were sampled south of the site (three at 10 feet and three at 19 feet). Sediments and surface water were sampled west of the site in a storm water drainage holding box similar to those sampled on site.

Seven subsurface samples (5 to 7 feet below land surface) were collected west of the site and one background sample was taken at Walker Park. The contaminants present off site at potential levels of health concern are listed below.

GROUND WATER CONTAMINANTS (7-9 FEET BELOW LAND SURFACE TOP OF SCREEN AT 3-5 FEET)	CONCENTRATIONS DETECTED (µg/L)	DETECTION FREQUENCY [a]
Chromium	ND - 240	7/19
Lead*	ND - J52	9/21

STORM WATER DRAIN SEDIMENT CONTAMINANTS	CONCENTRATION DETECTED (µg/kg)	DETECTION FREQUENCY [b]
Benzo(a)anthene	J69	1/1
Benzo(b)fluoranthene and/or Benzo(k)fluoranthene	J150	1/1
Benzo(a)pyrene	J55	1/1
Chrysene	J92	1/1

* - Acceptable levels of lead are currently controversial. MCL at State and Federal level is 50 µg/L; however, the EPA Drinking Water Health Advisories are 20 µg/L for the lifetime value for a 70 kg person and EPA is considering lowering acceptable municipal levels to 5 µg/L so that "at tap" levels do not exceed 10 µg/L.

J - The numerical value is estimated; however, the data should be seriously considered for decision-making and are usable for many purposes.

a - shallow monitoring wells 7-9 feet deep with five foot screening, sampled 10/85, 7 of 19 wells contaminated.

b - surface sediments from storm water drainage box sampled 10/85 this set of sediments was contaminated.

C. PHYSICAL HAZARDS

Site access is restricted by concrete block fencing, a chain-link and barbed-wire gate and a guard house; therefore, any physical hazards on site should not be accessible to the public.

DEMOGRAPHICS

B & B Chemical Company is located in a heavily developed area of Miami that allows mixed zoning. Fifty percent of the land within a 1-mile radius of the site is occupied by commercial and industrial facilities. Residential communities occupy 30 percent of the area. Single and multiple family homes are located directly northeast of the site and in all directions beyond the industrial area that surrounds the site. The remaining 20 percent is occupied by recreational parks (Walker Park) and schools (Springview, Walters, Johnson, and Bright); the closest school is 1/4 mile north of the site. NUS (1987) estimated that more than 10,000 people live within a 1-mile radius of the Standard Auto Bumper site proposed NPL site located about 1/2 mile east-northeast of B & B, and another 1,000 people work within the same area.

Probably less than 10,000 people live within the same radius of the B & B site, and more than 1,000 people work there because the area is more industrial and less residential than the area surrounding Standard Auto Bumper.

There are four municipal well fields within 3 miles of the site. The nearest is 4,200 feet southeast (downgradient) of the site. Presently, these wells provide only 5-10 percent of the Dade County Water and Sewer Authority (WASA) total system output due to WASA's heavy reliance on water from the Northwest Well Field located approximately 10 miles west (upgradient) of the site. Water from these less-utilized well fields is mixed with water from the northwest well field at a common header; from there, water is distributed to the Hialeah and Preston water treatment plants. The Dade County WASA installed air strippers (to remove volatile contaminants) at the Preston plant in 1987. Air strippers should be operational at the Hialeah plant by 1990. At that time, the Hialeah, Preston, and the upper and lower Miami Springs well fields will again become operational (NUS, 1987). A potable well survey has not been carried out in the vicinity of the site, but some of the residences in the area may have been built 40 years ago; therefore, some area residents may use private wells for drinking water and irrigation. Use of such wells could expose people and animals to waterborne contaminants from the Biscayne Aquifer.

EVALUATION

A. SITE CHARACTERIZATION

1. Environmental Media

Results of the NUS expanded site investigation have verified ground water and subsurface soil contamination at the B & B Chemical site. However, the volume of contaminated soil has not been defined, nor has the extent of the ground water contamination (plume size and speed and direction of movement). Historically, ground-water flow at the site may have been influenced by the Hialeah-Preston well field, located approximately 1 mile southeast of the site during times of continuous pumping. Pumpage from this well field has been curtailed from a rate of 122 million gallons per day (MGD) in 1983 to 4 MGD presently, but future water use plans include reliance on the Hialeah-Preston well field. Movement of on-site contamination in the lower portion of the Biscayne Aquifer is difficult to address without additional information about the local hydrogeology. A ground-water model for the site utilizing location and pumpage data for large capacity industrial supply wells, municipal wells, and drainage canals could allow better assessment of the future flow rate and flow direction of area ground water.

2. Demographics and Land Use

The United States Geological Survey (USGS, 1969) 7.5 minute topographic map for Hialeah, Real Estate Data, Inc., airphotos 6A and 37B, and the NUS 1987 expanded site investigation for the Standard Auto Bumper site located approximately 1/2 mile to the northeast were used to address the land use and demographics of the area. These sources and the site visit provided adequate information on demographics and land use.

3. Quality Assurance/Quality Control (QA/QC)

A sample of the monitoring well screen sand pack, a field sample of water used for mud rotary drilling, and a sample from the organic free water used for equipment decontamination were analyzed as part of the expanded site investigation QA/QC (NUS, 1986). These samples were only analyzed for inorganic chemicals and were not found to contain them at levels which would contaminate the equipment.

All sample collection, preservation, and chain-of-custody procedures used during the expanded site investigation were performed in accordance with the standard operation procedures as specified in the EPA Water Surveillance Branch Standard Operating Procedures and Quality Assurance Manual. As shown in the tables of contaminants, some of the organic compounds and inorganic constituents have been assigned estimated concentrations. According to NUS, the qualitative data should be seriously considered for decision-making and are usable for many purposes. The conclusions presented in this Preliminary Health Assessment are based on the NUS expanded site investigation. Therefore, the validity of these conclusions is dependent on the quality of the data provided.

B. ENVIRONMENTAL PATHWAYS

The environmental pathways of greatest potential concern are those that may allow human exposure. At B & B, the main pathway is transport of contaminants via ground-water movement. Air movement of dust which may carry contaminated sediments and soils or volatilized contaminants off site were not addressed by the information reviewed for this Preliminary Health Assessment. Levels of PAHs present in subsurface soils may not be applicable to assessment of exposure to windblown soils except in the event of soil excavation or removal operations. Analyses of the storm water drain samples did not indicate the presence of any contaminants at levels of health concern in the surface water. The drain sediments did contain contaminants at levels of health concern, but there is no on-site exposure route, and there is no pathway for off site transport.

Contaminants in ground water at potential health concern levels for daily, lifelong exposure are chromium, arsenic, lead, chlorobenzene, trans-1,2-dichloroethene, benzene, vinyl chloride, and bis(2-chloroethyl)-ether. Chromium and lead have also been found off site in shallow ground water at levels of potential health concern.

The highly transmissive character of the surficial deposits and geologic units that underlie the site facilitate rapid movement of contaminated ground water into and through the sole source Biscayne Aquifer. The surficial deposits consist of a thin soil. This soil is underlain by white to tan, medium to coarse-grained quartz sand which contains limestone rubble. Colitic sand occurs from 28 feet below land surface to the top of the limestone unit, located at a depth of 47 to 49. These surficial sand units make up the Pamlico and Miami Oolite Formations. They overlie the Pleistocene-aged Fort Thompson Formation which is limestone.

The Fort Thompson Formation is 100-110 feet thick and includes layers of porous limestone and quartz sand. During rock forming processes, ground-water dissolution created extensive lateral and vertical cavities in the limestone. Some of these cavities were later filled in with quartz sand, shells, and clay, but others remained open, leaving the formation highly permeable. The base of the Fort Thompson Formation is the effective limit of the Biscayne Aquifer in this area.

The Miocene-aged Tamiami and Hawthorn Formations that underlie the Fort Thompson Formation are made up of sandy clay and shell strata interlayered with numerous limestone and quartz sand beds. The Tamiami and Hawthorn Formations form an aquiclude that separates the Biscayne Aquifer from the Floridian Aquifer. The Floridian Aquifer consists of limestone and dolostone units of post Paleocene to Eocene ages. The Floridian Aquifer is not potable in this area due to high levels of chloride, sulfate and dissolved solids.

Regionally, the ground-water flow direction is southeast or east. NUS has defined the site-specific shallow ground-water flow direction as east-southeast during the dry season and west-southwest, toward the Miami Canal, during the rainy season. This seasonal oscillation of ground water has increased the potential for lateral dispersal of contaminants from points on

site (NUS, 1986).

PAHs in surface sediments and subsurface soils are at concentrations of possible health concern due to their potential to cause cancer following long-term exposure. The PAHs may not be related to site operations. PAHs have also been found west of the site in the area of the metro, in both drainage sediments and subsurface soils, at levels of potential health concern. Although soil contaminants may serve as a reservoir for further ground-water contamination, PAHs tend to adsorb to soil particles and are not readily mobile. If these PAHs do mobilize, they may do so via airborne particles or vapors; however, most of the on-site soil presently is paved and the only future exposure potential may be due to soil excavation.

C. Human Exposure Pathways

Ingestion, dermal absorption, or inhalation of metals and VOCs in ground water are the major potential human exposure pathways. The ground water pathway includes potential for exposure to contaminants floating on the water table surface by anyone excavating soil on or near the site.

Inhalation, ingestion, and possibly dermal absorption of contaminant-laden dust or vapors could occur on site if soil removal is undertaken.

PUBLIC HEALTH IMPLICATIONS

On-site ground-water contaminants at levels of potential health concern for daily, lifelong exposure include chromium, arsenic, chlorobenzene, trans-1,2-dichloroethene, benzene, vinyl chloride, bis(2-chloroethyl)ether and lead. These contaminants are present in shallow ground water 7-20 feet below land surface. Potential for on-site exposure to these compounds in ground water is unlikely because no drinking water wells or excavations that breech the water table are known. At the present time, there are also no known pathways for exposure to the carcinogenic PAHs in subsurface soils. Although on-site, shallow ground-water contaminants and on-site and off-site subsurface soil contaminants were mentioned in the On-Site Contaminants and Off-Site Contaminants sections, most of them will not be addressed in this Public Health Implications section because no human exposure pathway has been established for them.

A few of the compounds occurring in the shallow monitoring wells on site were also detected in two deeper on-site monitoring wells, indicating that there is a potential for their movement off site. The deeper monitoring wells are 55 and 75 feet deep with 10-foot screens. They contained chlorobenzene, trans-1,2-dichloroethene, and lead at levels of potential health concern for chronic exposure. Off-site shallow monitoring wells (7 to 9 feet deep with 5-foot screening intervals) contained lead and chromium at levels of health concern for chronic exposure. The chemicals detected in off-site shallow ground water and those detected in the deep on-site wells will be discussed in this section because the potential for human exposure to them cannot be ruled out (a well survey and subsequent monitoring of the nearest downgradient wells have not been completed). In recent years, a growing number of investigators

have examined the effects of exposure to low levels of lead in young children. The history of research in this field shows a progressive decline in the lowest exposure levels at which adverse health effects can be reliably detected (ATSDR, 1988). Children are especially sensitive to lead toxicity at low levels because their digestive systems absorb relatively greater amounts from ingested material than adult systems. Repeated low doses of lead may accumulate to toxic levels because lead is excreted very slowly.

The primary targets for lead toxicity are the brain and central nervous system. Low level exposure in children can adversely affect brain development and brain function resulting in learning disabilities and impaired hearing. Depending on the amount of lead absorbed, exposure can also cause toxic effects to the kidney, impaired regulation of vitamin D, and anemia (fewer red blood cells) (ATSDR, 1988).

Low blood lead levels have been associated with high blood pressure with no apparent threshold value. Increased risk of stroke and heart attack have also been reported at low levels of exposure (Hammond and Beliles, 1980). All of these effects are significant; toxicity can be persistent; and effects on the central nervous system may be irreversible (ATSDR, 1988).

Not enough information was given in the laboratory results to allow prediction of chromium toxicity because the chromium valence and compounds were not reported. However, the chromium levels reported did exceed the chronic exposure level permissible for both the trivalent and hexavalent chromium oxidation states. Trivalent chromium salts were shown by Akatsuka and Fairhall (1934) to have a very low order of chronic toxicity by ingestion compared with hexavalent chromium salts. Further, within each valency group, toxicity varies according to solubility. Chromic acid CrO_3, in which chromium is hexavalent, is highly corrosive and toxic, but Na_2CrO_4, a highly soluble chromium compound, in which chromium is also hexavalent, has a low order of toxicity. Soluble chromate species are tolerated by humans and animals at approximately 100 to 1,000 times higher concentrations than insoluble chromates (Stokinger, 1981). For example, a Long Island, New York, family (Davids and Leiber, 1951) reportedly drank water for several years from a well contaminated with 1 to 25 parts per million soluble chromate without known effects.

Little has been reported on the effects of chronic (low level, lifelong) ingestion of chlorobenzene in water. Industrial and household human exposures result from the inhalation of solvents, glues, cleaning agents and the manufacture and handling of the chlorobenzene compounds. Studies of chronic exposures have also focused on inhalation exposure. Subacute ingestion studies (less than lifelong exposure at elevated levels) in rats indicated the following effects: decrease in growth rates from which the rats recovered, significant increases in liver and kidney weights, and slight liver pathology (Food and Drug Administration, 1972; Deichmann and MacDonald, 1977; World Health Organization, 1971). In these and other studies (Kraybill, 1975; King et al., 1978), post mortem examination, including microscopic examination revealed no evidence of carcinogenic or teratogenic activity.

The cis- and trans- isomers of 1,2-dichloroethene have had use as solvents and

chemical intermediates. Neither of the isomers has developed wide industrial usage in the United States partly because of their flammability. Very little information concerning exposure solely to trans-1,2-dichloroethene is available. There are no data indicating carcinogenicity or teratogenicity in animals or humans. Little information is available on the effects of chronic exposure, although Freundt et al. (1977) have studied subchronic exposure in rats. They reported decreased numbers of white blood cells and liver and lung effects for short-term, elevated exposure. No information is known for the effects of long-term, low level ingestion exposure to trans-1,2-dichloroethene in humans, although it was studied as an anesthetic (Torkelson and Rowe, 1981).

CONCLUSIONS

Based upon information reviewed, this site represents an indeterminate public health hazard because of the potential risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects.

As noted in the human exposure section above, human exposure to lead, chromium, trans-1,2-dichloroethene, and chlorobenzene may be occurring and may have occurred in the past via ground water. The population potentially at risk from exposure to identified ground-water contaminants includes users of private, public, or industrial wells downgradient of the site. Because much of the soil in the area on and surrounding the site is covered with cement or asphalt pavement, PAHs in the subsurface soil should not pose a health concern for chronic exposure unless the soil is excavated.

Assessment of the health implications of ingestion of contaminated ground water, which contains metals and VOCs in the deepest on-site wells and metals in off-site wells, is limited by lack of information. The presence of private potable wells or large capacity industrial wells is unknown, and therefore their potential influence on the general direction of ground-water flow and the specific movement of the contamination plume are undefined.

RECOMMENDATIONS

The following steps are recommended to protect public health from potential risks resulting from exposure to hazardous substances present at the B & B Chemical Company site:

1. Determine the location of high capacity industrial wells in the area and analyze the effect these wells have on the flow rate and the ground-water flow direction. If there is worker exposure to ground water from these wells, the wells should be monitored on a quarterly basis.

2. Survey the area 1/4 mile downgradient of the site for private potable wells. If wells are identified that are currently utilized, those closest to the site should be monitored on a quarterly basis.

3. Take appropriate care to ensure worker safety. If building or excavation work are carried out in the future, workers on or adjacent to the site should be informed by site personnel that the soil may contain contaminants.

4. Define the extent of ground-water contamination and establish site-specific hydrogeology. Alter remediation recommendations based on site-specific hydrogeologic parameters and accurate plume information.

5. Modify the Remedial Investigation/Feasibility Study to adequately address the recovery and treatment of metals contamination or the effects of inorganic constituents on the operation of the proposed treatment system.

6. Provide additional information about wastewater quantity and quality resulting from the proposed treatment system and its impact on the waste treatment plant and treatment plant workers.

7. The B & B Chemical Company NPL Site, Dade County, Miami, Florida, has been evaluated for appropriate follow-up with respect to health activities. Based on this evaluation, this site is not being considered for follow-up health activities at this time. However, if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR will re-evaluate this site for any indicated follow-up.

8. If future ATSDR evaluations indicate that a substantive completed exposure pathway exists or that the community has expressed specific health concerns, then health outcome data bases should be evaluated in future assessments for this site.

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CERTIFICATION

This Preliminary Health Assessment was prepared by the Florida Department of Health and Rehabilitative Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health assessment was initiated.

Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health assessment and concurs with its findings.

Director, DHAC, ATSDR

REFERENCES

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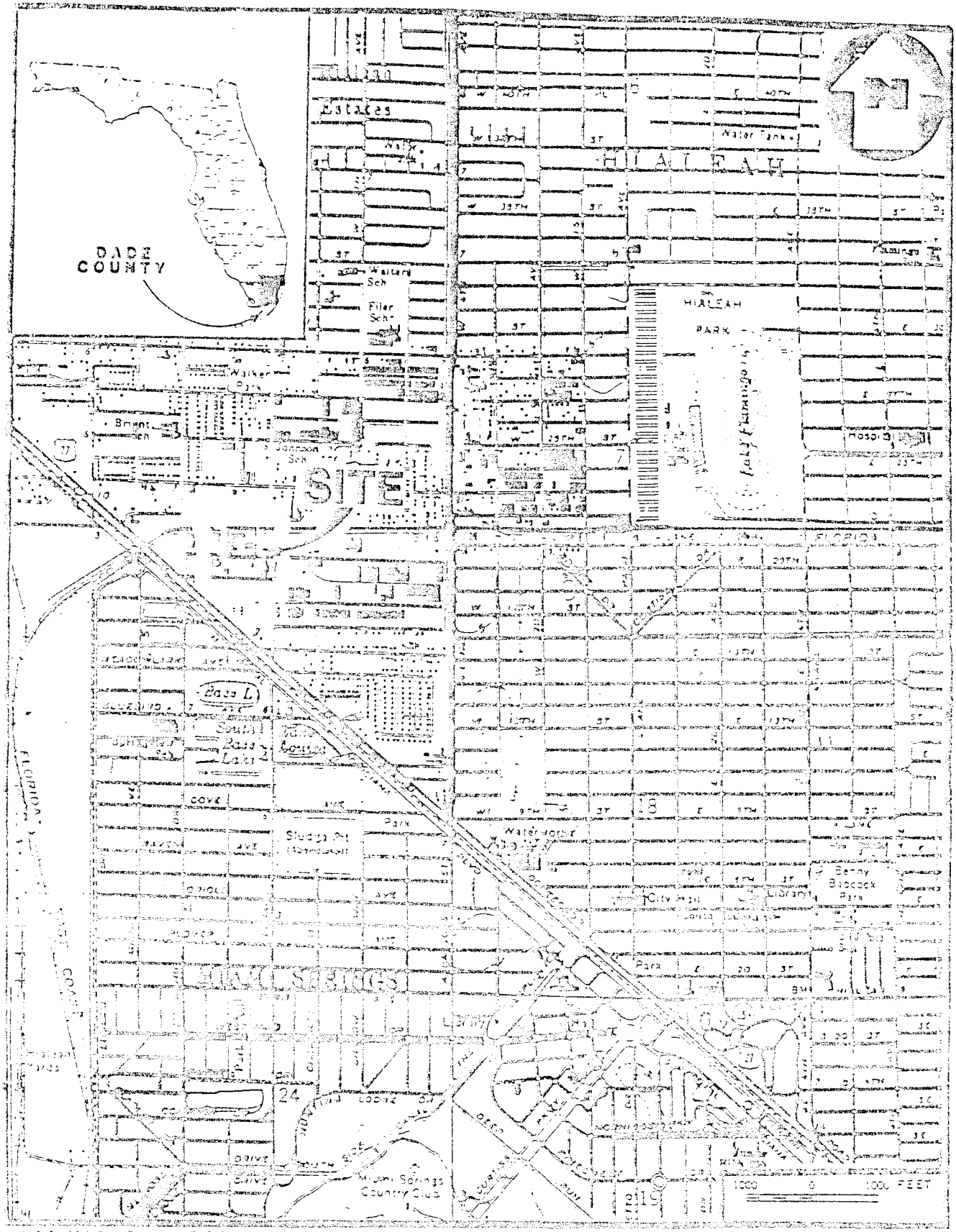
FIGURES

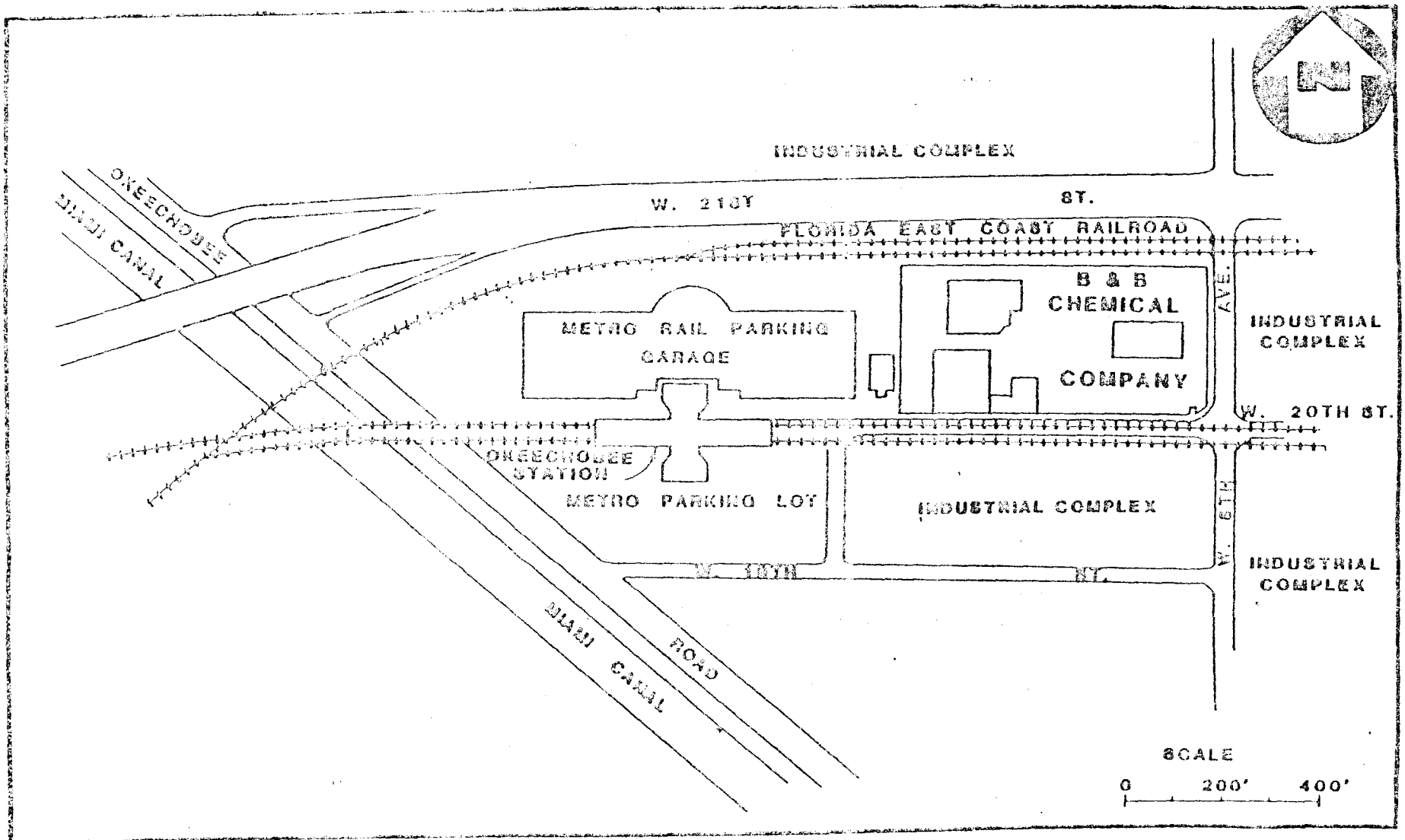


DADE MAP IN A PORTION OF THE HIALEAH, FLORIDA TOPOGRAPHIC QUADRANGLE
7.5 MINUTE SERIES, U.S.G.S. 1962

SITE LOCATION MAP
B & B CHEMICAL COMPANY
HIALEAN, FLORIDA

FIGURE 1

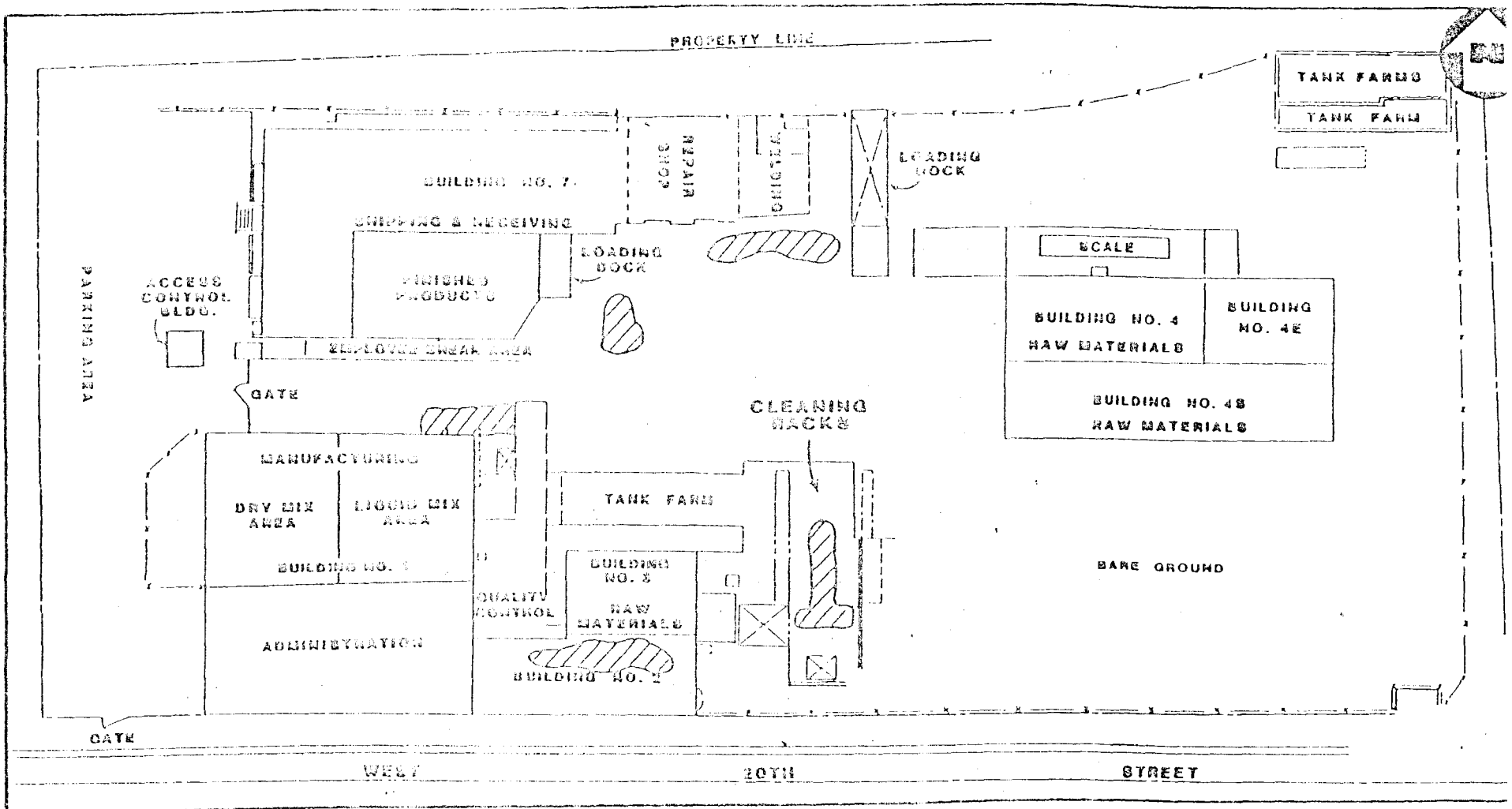
NUS CORPORATION
A Halliburton Company



ADJACENT INDUSTRIAL AREAS
B & B CHEMICAL COMPANY
HIALEAH, FLORIDA

FIGURE 2

NUS CORPORATION
A Halliburton Company



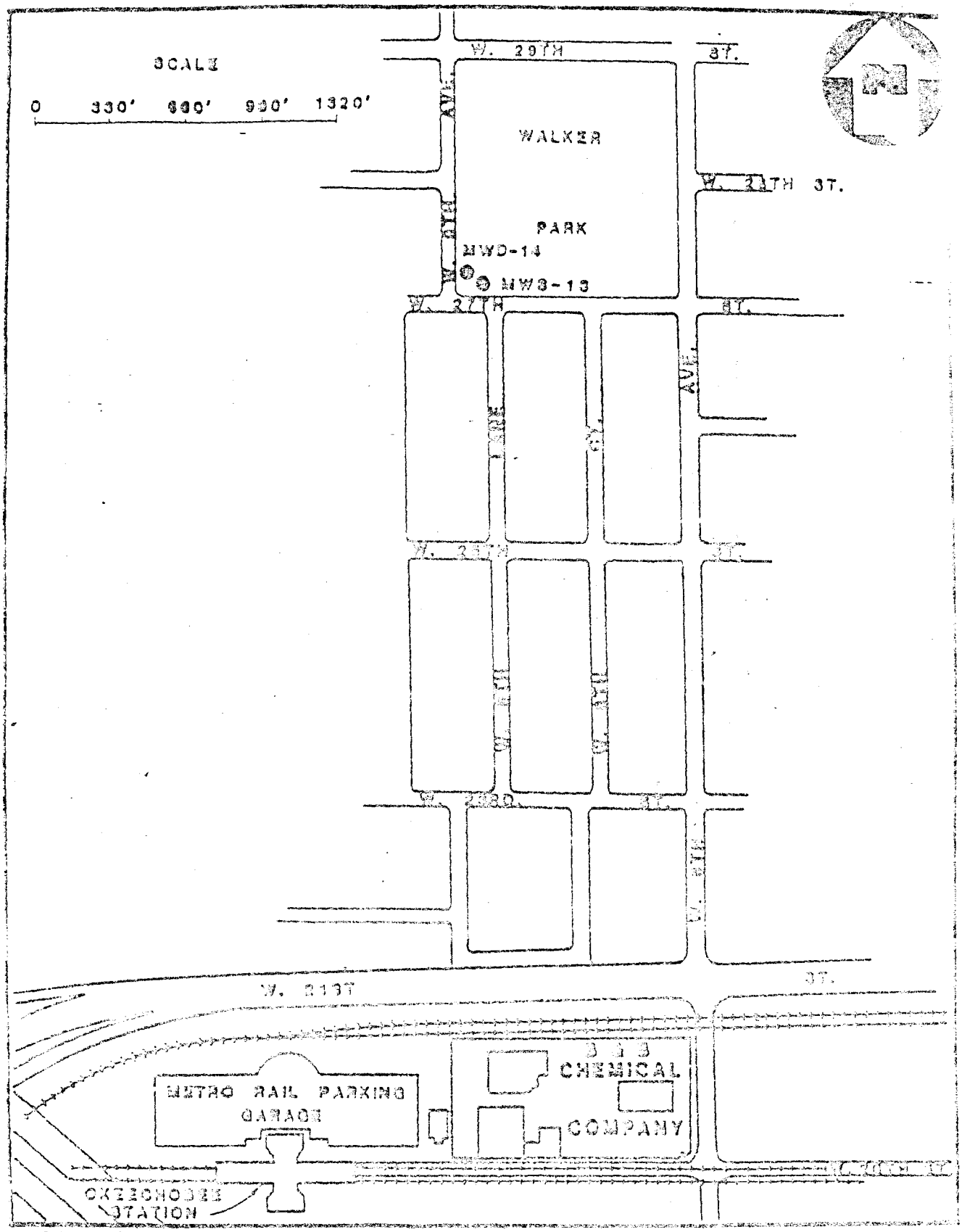
SITE LOCATION MAP
B & B CHEMICAL COMPANY
HIALEAH, FLORIDA

LEGEND

▨ APPROXIMATE LOCATIONS OF FORMER SOAKAGE PITS

FIGURE

NUS CORPORATION
A Halliburton Company



MONITORING WELL LOCATIONS
BACKGROUND (CONTROL) WELL
B & B CHEMICAL COMPANY
HIALEAH , FLORIDA

FIGURE 4

NUS CORPORATION
A Halliburton Company