

Health Consultation

MATERIALS EXCHANGE CORPORATION CONSTRUCTION
and DEMOLITION LANDFILL
(a/k/a WEST COAST MATERIALS)

HOMOSASSA SPRINGS, CITRUS COUNTY, FLORIDA

EPA FACILITY ID: FLSFN0407001

DECEMBER 2, 2002

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

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Prepared by:

Florida Department of Health
Bureau of Environmental Epidemiology
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Summary

Residents near the 142-acre former Materials Exchange Landfill in Homosassa Springs are concerned that dust from trucks leaving the landfill contaminated soil in their yards. They are also concerned that fly ash and other buried material has contaminated groundwater, their drinking water source. In the 1980s, Monex deposited 1.25 million tons of fly ash from a nearby coal-fired electric-generating plant in this landfill.

In this health consultation, Florida Department of Health (DOH) evaluated recent soil and groundwater test results. Florida DOH evaluated test results of 16 surface soil samples (0 to 3" deep) collected from nearby residential yards in June 2002. Florida DOH also evaluated the analytical results for 26 water samples from 12 nearby private drinking water wells collected since November 2000.

Chemicals measured in surface soil from residential yards near the Material Exchange Landfill are unlikely to cause illness. Except for lead, there were no measured chemicals in nearby private drinking water wells above health-based screening values. At five houses it appears that water in contact with the plumbing for an extended time (overnight) picks up lead from brass fixtures or lead solder in the plumbing. It does not appear that lead is elevated in the groundwater. Higher lead concentrations were found only in the standing water and not in water that had been run for 15 to 20 minutes. Although the lead concentrations in the "first draw" are above drinking water standards, average daily concentrations are likely below the drinking water standards and unlikely to cause illness. These limited data appear to show that residents can avoid elevated lead concentrations by letting the water run for a few minutes first thing in the morning or after water has not been used for other extended periods.

The Citrus County Health Department should continue to test the private drinking water wells nearest the landfill. They should also check the acidity (pH) of the groundwater. The Citrus County Health Department should advise the residents of the five houses with elevated "first draw" lead levels to let their water run for a few minutes first thing in the morning or when the water has been not been used for an extended period.

Background

The Materials Exchange Corporation site (later known as West Coast Materials and currently as R.I.P.) is a privately owned and operated construction and demolition (C&D) landfill. It is about 3.5 miles east of US 19 at 5355 Grover Cleveland Boulevard in Homosassa Springs, Florida (Figure 1). On April 2, 1999, a resident living near this landfill petitioned the federal Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate the potential public health threat. The ATSDR asked the Florida Department of Health (DOH) to prepare a health consultation for this site.

In a March 10, 2000 health consultation report, Florida DOH reviewed the limited existing environmental data and recommended additional testing. In a subsequent health consultation report, Florida DOH found no volatile organic chemicals or metals above state or federal drinking water standards in five down-gradient private wells. In a November 7, 2001 health consultation report, Florida DOH found the air concentrations of hydrogen sulfide measured for eight months at three

nearby locations were not likely to cause illness. In a November 8, 2001 health consultation report, Florida DOH evaluated soil and private wells test results and recommended additional testing.

Site History

Mr. Fred Parsons operated a sand mine on the site in the 1970s. From 1980 to 1990, Monex (also known as Monier Ash) disposed of 1.25 million tons of coal fly ash in thirty acres near the center of the site. The fly ash came from the Florida Power Energy Complex north of Crystal River. Nearby residents reported dust in their yards from the fly ash trucks. Residents reported that drivers covered their truck-beds when they entered the landfill, but removed the covers when they left. Residents are concerned about inhaling contaminated dust and ingesting groundwater contaminated by fly ash.

In 1992, Materials Exchange Corporation, Inc. purchased the site. Also in 1992 the Florida Department of Environmental Protection (DEP) permitted a second burial area on the site for construction and demolition (C&D) waste. Beginning in 1993, this second area received about one million cubic yards of waste every two years from Citrus and several other nearby counties. Residents began complaining of odors in 1994. Florida DEP attributed the odors to rotting drywall (gypsum) which can produce hydrogen sulfide under anaerobic (no oxygen) conditions.

In 1997, West Coast Materials, Inc. purchased the site. The second burial area closed in 1998, after receiving about two and one-half million cubic yards of C&D waste. A third area is currently receiving C&D waste. DEP permitted four subareas within this third area, one for each of the four years of the current permit (Figure 1). West Coast Materials, Inc. applied for a Class III landfill on the western side of the site. In 2001, in the middle of permit negotiations with Florida DEP, West Coast Material, Inc. sold the site to R.I.P., Inc.

Demographics

Eleven single-family homes and five mobile homes are within 500 feet of the site boundaries. Farther than 500 feet to the west and northwest of the site are both undeveloped and residential areas. The areas to the east, north, and immediately west of the site are planned for low residential density. The areas farther west and south of Grover Cleveland Boulevard are planned for medium residential density.

According to 1990 census data, roughly 5,200 people live within a two-mile radius of the site. About half use private wells. Average family incomes in this area range from about \$20,000 to \$25,000 per year. Most of the population is Caucasian (99%), with the remaining 1% composed of Hispanics, Asians, Native Americans and others. Four public schools with about 3,200 students are within two miles of the site.

Local Hydrology

The first groundwater encountered under this site is contained in the Floridan aquifer system. Groundwater elevations are between 32 and 80 feet below the land surface. Mining activities and the limited number of monitoring wells complicate the interpretation of groundwater flow direction.

The Floridan aquifer system is the primary source of drinking water in Citrus County. Three public supply wells and 50 commercially operated potable (drinking water) supply wells, serving a population of 9,917, exist within four miles of the site. Figure 3 shows the location of the nearest private drinking water wells. Private drinking water well PW-10 is approximately 500 feet west of the site, making it the closest down-gradient well. However, private drinking water well PW-5 is the closest well down-gradient of past landfill operations. It is about 2,250 feet from the first closed C&D debris burial area.

Environmental Sample Collection, Analysis, and Interpretation

Surface Soil Testing

On June 20, 2002, Florida DEP collected 16 surface soil samples (zero to three inches below the ground surface) from residential yards around the site (Table 1 and Figure 2).

Table 1. Residential Soil Sample Locations.

Sample ID	Location
MEC-SS-01	Background - Canadian Way South
MEC-SS-02	Grover Cleveland Boulevard (west location)
MEC-SS-03	Grover Cleveland Boulevard (east location)
MEC-SS-04	Delard Way
MEC-SS-05	Tedna Terrace
MEC-SS-06	S. Delard Way
MEC-SS-07	W. Grover Cleveland Boulevard
MEC-SS-08	Northern property on S. Tedna Terrace
MEC-SS-09	Lot south of landfill on Grover Cleveland Boulevard (west)
MEC-SS-10	Lot south of landfill on Grover Cleveland Boulevard (middle+west)
MEC-SS-11	Lot south of landfill on Grover Cleveland Boulevard (middle+east)
MEC-SS-12	Lot south of landfill on Grover Cleveland Boulevard (east)
MEC-SS-13	West Keremar Court
MEC-SS-14	West Keremar Court
MEC-SS-15	W. Grover Cleveland Boulevard
MEC-SS-16	Miller Road

Surface Soil Results

Florida DOH assumes that Florida DEP followed standard quality assurance and quality control procedures in collecting and analyzing these surface soil samples. The Florida DEP laboratory in Tallahassee analyzed each surface soil sample for arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, tin, and vanadium.

Florida DOH evaluated these soil analytical results; cadmium, selenium and tin were not present above instrument detection levels in any of the samples. The other metals were found at varying levels which is common since many occur naturally in soil.

Florida DOH screened the soil results using health-based levels. Except for arsenic, none exceeded ATSDR’s health-based screening values (2) or Florida DEP’s Soil Target Cleanup levels (3). Table 2 lists the concentrations of arsenic found in residential surface soil.

Table 2. Residential Surface Soil Arsenic Concentrations.

Arsenic in Off-site Surface Soil (0-3" Deep) June 2002			
Sample Identification	Concentration in milligrams per kilogram (mg/kg)	Exceeds ATSDR's CREG ¹ of 0.5 mg/kg?	Exceeds background?
SS-01 (Background)	0.92	✓	Background
SS-06	1.2	✓	✓
SS-11	1.2	✓	✓
SS-13	0.54	✓	no
SS-14	0.70	✓	no
SS-14 duplicate	0.62	✓	no

¹ ATSDR cancer risk evaluation guide for a one-in-a-million excess cancer risk (2).

Possible Health Effects from Arsenic in Surface Soil

While the arsenic levels measured in residential surface soil near the landfill are slightly above the ATSDR cancer risk evaluation guide, it is unlikely these arsenic levels would cause illness. The assumptions used to calculate an average person’s dose are unlikely to be met and extrapolation of effects seen at high doses may not be seen at low levels of exposure.

To calculate a daily exposure amount, Florida DOH assumes that an adult would ingest (eat) 100 milligrams of soil per day (about the weight of one postage stamp), each day, for a period greater than a year. At this time it is unlikely that anyone might daily ingest this much soil. In addition, mechanisms for cancer development are not fully understood; there may be a exposure level below which cancer may not occur. Researchers refer to this level as a “threshold”. Health effects seen at high-levels of exposure may not develop at low levels of exposure.

Florida DOH assumes a daily ingestion level for children to be twice that of adults, 200 milligrams of soil per day (the weight of two postage stamps). The exposure level Florida DOH calculated for children ingesting 200 milligrams of soil with 1.2 milligrams per kilogram (mg/kg) of arsenic, daily, for 10 years, is about 70 times lower than the lowest dose linked with lung cancer in humans. Therefore, the risk of cancers associated with arsenic ingestion would be unlikely, for children as well as adults.

Private Drinking Water Testing

Since early November 2000, the Citrus County Health Department (CHD) has collected 26 groundwater samples from 12 private wells near the site (6). Florida DOH assumes that Citrus CHD followed standard quality assurance and quality control procedures in collecting these water samples. Citrus CHD purged each well for at least 15 minutes (let the water run freely to empty any held in the plumbing or holding tank) at the faucet closest to the well. At five locations, Citrus CHD also took a sample before the system was flushed (a “standing water” sample) to determine if lead was leaching from the plumbing. Table 3 and Figure 3 show the locations of these private wells. The Florida DOH Laboratory analyzed these samples for volatile organic compounds (VOCs) and metals.

Table 3. Residence Locations

Sample ID	Location
PW-1	W. Farrier Court
PW-2	W. Grover Cleveland
PW-3	W. Kime Lane
PW-4	W. Keremar Court
PW-5	W. Grover Cleveland
PW-6	S. Jody Point
PW-7	Claridge Avenue
PW-8	S. Springbreeze Way
PW-9	W. Grover Cleveland
PW-10	W. Keremar Court
PW-11	Claridge Avenue
PW-12	W. Old T-bird Court

Private Drinking Water Results

Except for lead, there were no chemicals in any of these private drinking water wells above health-based screening values. For five of these wells, water samples collected before flushing had concentrations of lead above the maximum contaminant level (MCL) drinking water standard. The lead concentrations in these wells after flushing, however, were below the MCL. This indicates that lead may be leaching from the plumbing and not the groundwater (Table 4). The acidity (pH) of the groundwater should be measured to determine if unusually high acidity (low pH) is contributing to the leaching of lead from the plumbing.

Table 4. Lead in Private Drinking Water Wells.

Lead Concentrations Exceeding the MCL ¹ in Private Drinking Water Wells November 2000 to July 2002 (micrograms per liter - µg/L)						
Well ID Date Sampled	MCL ¹	PW-3	PW-5	PW-8	PW-11	PW-12
Lead (standing water)	15	17.0 4/8/02	23.0 4/8/02	NS 4/8/02	26.0 4/8/02	NS 4/8/02
Lead (flushed 15-20 minutes)	15	NR 4/8/02	NR 4/8/02	NS 4/8/02	5.3 4/8/02	NS 4/8/02
Lead (standing water)	15	7.8 7/16/02	7.3 7/16/02	26.0 7/16/02	57 7/16/02	90.0 7/16/02
Lead (flushed 15-20 minutes)	15	0.01 U 7/16/02	1.8 7/16/02	9.4 7/16/02	NR 7/16/02	0.2 I 7/16/02

¹MCL - Maximum Contamination Levels.

NS - Not Sampled

NR - Not resampled.

U - Not present above detection level (number listed is the detection level).

I - Approximate result between minimum detection level and practical quantitation level.

Possible Health Effects from Lead in Drinking Water

At five houses it appears that water in contact with the plumbing for an extended time (i.e. overnight, vacation, etc.) picks up lead from brass fixtures or lead solder in the plumbing. These higher lead concentrations appear to be above the MCL only in the “first use” samples and seem to decrease after the first few minutes of water use (usually in the morning). Although the lead concentrations in the “first use” are above drinking water standards, the average daily concentrations are likely below the drinking water standards and unlikely to cause illness. Although none of these wells have had standing water and flushed water sampled more than one time, the Florida DOH nonetheless assumes

these results will be repeated and residents can avoid elevated lead concentrations by letting the water run for a few minutes first thing in the morning or after water has not been used for other extended periods of time.

Children and Other Unusually Susceptible Populations

ATSDR and Florida DOH recognize that in communities faced with the contamination of their environment, the unique vulnerabilities of infants and children demand special attention. Children are at a greater risk than are adults for certain kinds of exposure to hazardous substances emitted from waste sites. Because they play outdoors and because they often carry food into contaminated areas, children are more likely to be exposed to contaminants in the environment. Children are shorter than adults, which means they breathe dust, soil, and heavy vapors closer to the ground. They are also smaller, resulting in higher doses of chemical exposure per body weight. If toxic exposures occur during critical growth stages, the developing body systems of children can sustain permanent damage. Probably most important, however, is that children depend on adults for risk identification and risk management, housing, and access to medical care. Thus, adults should be aware of public health risks in their community, so they can guide their children accordingly. In recognition of these concerns, ATSDR has developed chemical screening values for children's exposures.

Children's special susceptibility to lead includes impairment of nerve development which results in slower learning and lowering of other neurobehavioral measures, slowed bone growth and problems absorbing vitamin D. Absorption of lead appears to be higher in children who have low dietary iron or calcium intakes (ATSDR 1999b).

A susceptible population has different or enhanced responses to a toxic chemical than will most persons exposed to the same levels of that chemical in the environment. Reasons may include genetic makeup, age, health, nutritional status, and exposure to other toxic substances (like cigarette smoke or alcohol). These factors may limit that persons' ability to detoxify or excrete harmful chemicals or may increase the effects of damage to organs or systems in the body. The following sections are not exhaustive and reflect only currently available data, further research may target more subsets of the population. The special traits of children that make them more sensitive are discussed in the previous section, while we discuss other susceptible populations for specific chemicals below. In addition to children, pregnant women, the elderly, smokers, alcoholics, people with malnutrition, kidney or nerve problems, and people with genetic diseases affecting red blood cell production are more susceptible to lead's toxic effects.

For the purposes of this report, the Florida DOH calculated exposure doses for children and other unusually susceptible populations. Florida DOH does not expect any adverse health effects due to measured chemical levels evaluated in this report.

Conclusions

Measured levels of chemicals in residential surface soil and private drinking water wells near the Materials Exchange Landfill are categorized as a no apparent public health hazard. Florida DOH evaluated the results of tests on 16 surface soil samples collected in June 2002. Florida DOH also evaluated the results of tests on 26 water samples from 12 private drinking water wells.

- 1) Chemicals measured in surface soil from residential yards near the Material Exchange Landfill are unlikely to cause illness.
- 2) Except for lead, there were no measured chemicals in nearby private drinking water wells above health-based screening values. At five houses it appears that water in contact with the plumbing for an extended time (overnight) picks up lead from brass fixtures or lead solder in the plumbing. It does not appear that lead is elevated in the groundwater. Higher lead concentrations are typically only in the "first draw" and decrease after the first few minutes of water use (usually in the morning). Although the lead concentrations in the standing water are above drinking water standards, average daily concentrations are likely below the drinking water standards and unlikely to cause illness. Nonetheless, residents can avoid elevated lead concentrations by letting the water run for a few minutes first thing in the morning or after water has not been used for other extended periods.

Recommendations

Continue to sample the private drinking water wells nearest the landfill twice a year for the next three and one-half years. Test for metals (EPA method 200.8) and purgeable organic chemicals (EPA method 524.2). Check the acidity (pH) of the groundwater. Advise the residents of the five houses with elevated "first draw" lead levels to let their water run for a few minutes first thing in the morning or when the water has been not been used for an extended period.

Public Health Action Plan

Florida DOH will continue to work with ATSDR, Florida DEP, the Citrus CHD, and nearby residents to protect public health.

- 1) The Citrus County Health Department will continue to sample 12 private drinking water wells twice a year for another three and one-half years. The Florida DOH Drinking Water Toxics section will continue to fund the analyses by the Florida DOH laboratory.
- 2) The Citrus County Health Department will advise those homeowners with elevated "first draw" lead levels to let their water run for a few minutes first thing in the morning or when the water has been not been used for an extended period.
- 3) Florida DOH Bureau of Environmental Epidemiology will continue to evaluate groundwater test results.

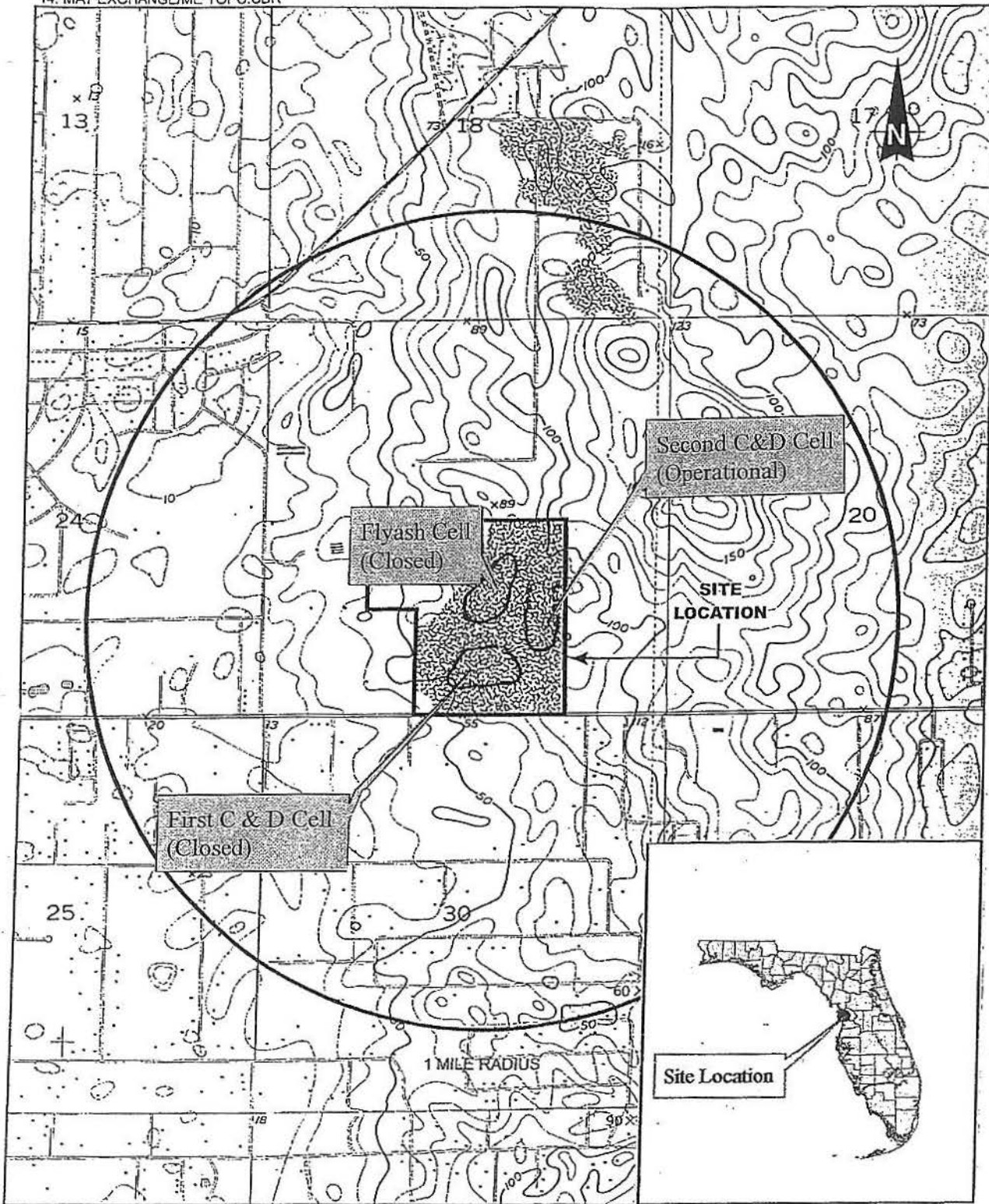
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References

- (1) State of Florida, Department of Environmental Protection, 1996. Drinking Water Standards, Monitoring and Reporting, Chapter 62-550
- (2) ATSDR Soil Comparison Values 6/30/02
- (3) Florida DEP Soil Target Cleanup Levels 5/26/99
- (4) Florida DEP cover letter dated August 9, 2002 from Jesus Diaz, Bureau of Waste Cleanup, Site Screening Superfund Subsection with attachments: Soil Data from June 20, 2002 soil sampling episode with plat map showing locations of all but two of the samples.
- (5) Kamrin, M.A., 1988. Toxicology - A Primer on Toxicology Principles and Applications. Lewis Publishers. Chelsea MI.
- (6) Excel Spreadsheet from Florida DEP with all the Florida DOH groundwater sampling data from Citrus County since January 1999 (down-loaded and collated by Andrew Priest). Will Bryant of the Citrus County Health Department also discussed specific information about the sampling of these wells and the protocols he used with Florida a DOH



SOURCE: U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle: Homosassa, Florida 1954, photorevised 1988.

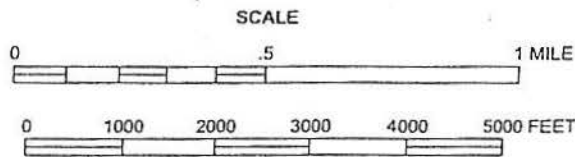
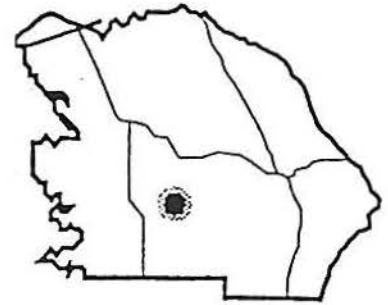


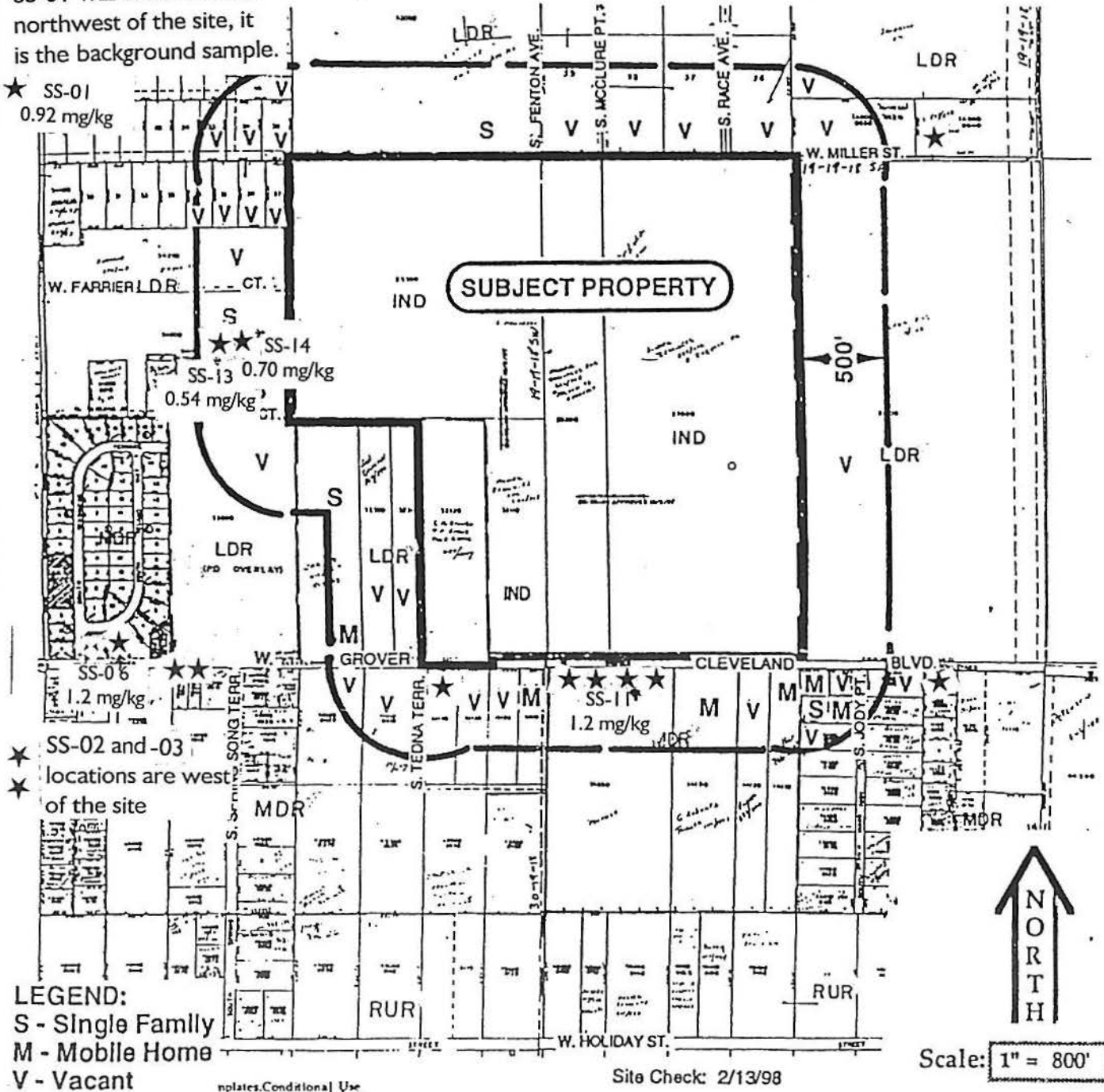
Figure 1 SITE LOCATION MAP -- MATERIAL EXCHANGE CORPORATION SITE, HOMOSSASSA SPRINGS, CITRUS COUNTY, FLORIDA

Labeled values exceeded the 0.5 mg/kg cancer screening values. Other values are not given. Sample locations (16) are marked by stars ★.



SS-01 was taken 2 miles northwest of the site, it is the background sample.

★ SS-01
0.92 mg/kg



LEGEND:
S - Single Family
M - Mobile Home
V - Vacant

plates, Conditional Use

Site Check: 2/13/98

Scale: 1" = 800'

Figure 2

Locations of Samples with Arsenic Levels above the ATSDR's 1 in 1 Million Cancer Screening Level

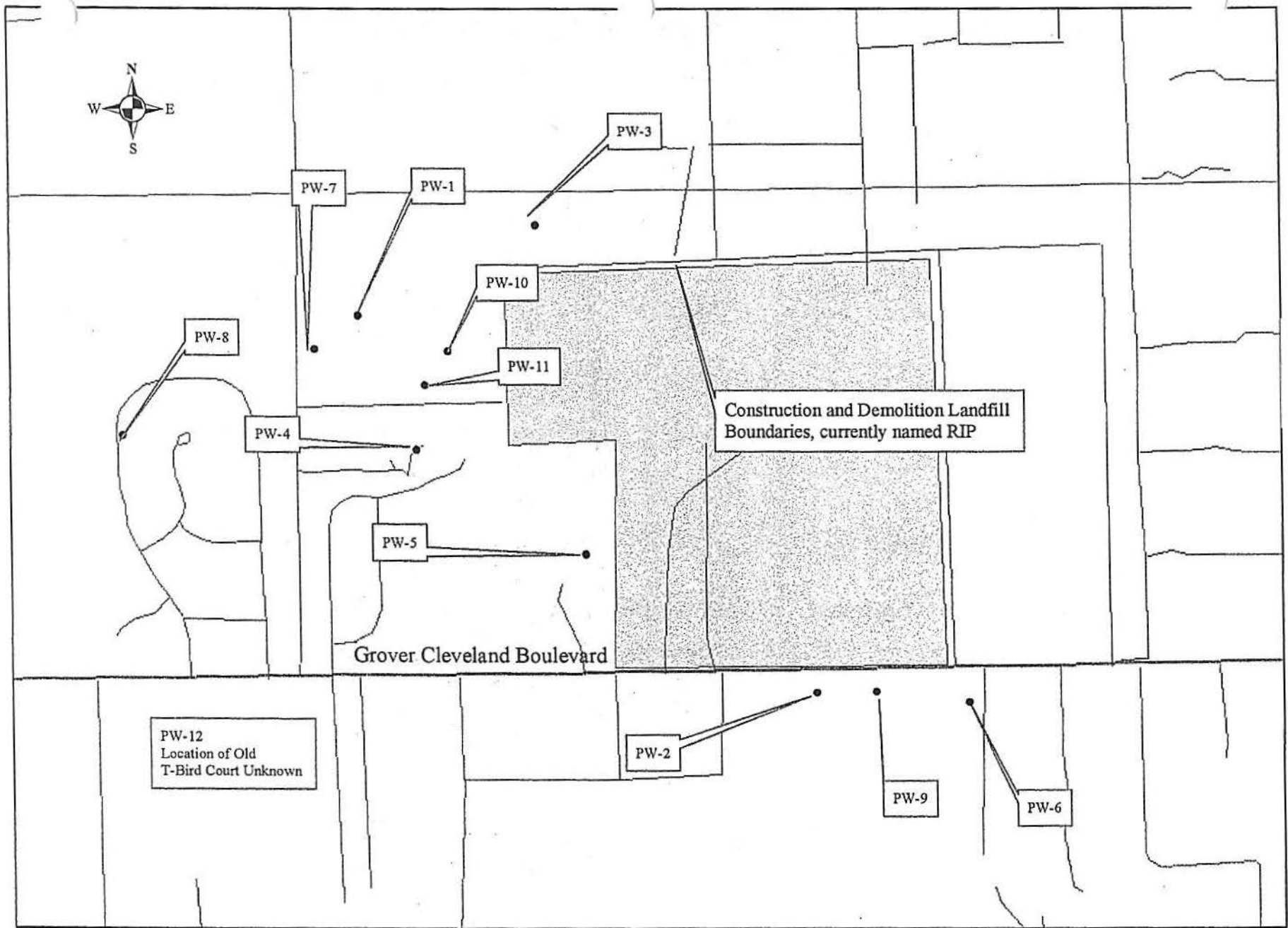
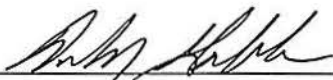


Figure 3 - Locations of the Private Wells
Tested since November 2000



Certification

The Florida Department of Health, Bureau of Environmental Epidemiology prepared this Public Health Assessment under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It followed approved methodology and procedures existing at the time it began.



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



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