

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

INTEROFFICE COMMUNICATION

TO: Brandi Wheeler, Project Manager, Cadillac District Office
Remediation and Redevelopment Division

FROM: Brandon LaJoie, Geologist, Geological Services Section
Remediation and Redevelopment Division

DATE: May 6, 2024

SUBJECT: 6961 South Third Choice Street, Lake County, Location ID: N/A
GSS Job #1744
Geophysical Investigation

This memorandum summarizes the data gathered from a site investigation requested by the Department of Environment, Great Lakes, and Energy (EGLE), Remediation and Redevelopment Division's (RRD's), Cadillac District Office for the subject site. RRD's Geological Services Section (GSS) was tasked with performing a ground penetrating radar geophysical survey. The investigation took place on April 17, 2024.

This memorandum includes the following:

- Site Location Map (Figure 1)

SITE BACKGROUND

The area of interest is a parcel of vacant land owned by the local township located at 6961 South Third Street, in Chase, Lake County, Michigan (Fig 1). The area formerly housed a vehicle garage.

GROUND PENETRATING RADAR SURVEY

Ground penetrating radar (GPR) is the general term applied to techniques which employ radio frequency (10-2600 MHz) electromagnetic waves to map lithologic structures, objects or voids within the ground. The GPR method uses electromagnetic (radar) pulses, emitted at regular intervals by an antenna close to the ground, to transmit electromagnetic waves through the ground. The electromagnetic pulses are reflected where changes in electrical properties occur. These changes occur due to variations in stratigraphy (natural or man-made) or where there are discrete targets such as utilities, voids or metal debris. The reflected electromagnetic energy is received by an antenna, converted into an electrical signal, and recorded by the GPR unit. The data can be processed and viewed in real time and/or digitally recorded for later processing. The result is a cross-section of the subsurface directly beneath the path of the antenna. The center frequency of the input radar signal's bandwidth is referred to as the system's operating frequency. The bandwidth is generally the same as the operating frequency: i.e., a 200-MHz GPR system will have a center frequency of 200 MHz with a total bandwidth of 200 MHz (from 100 MHz to 300 MHz).

The depth penetration of a GPR signal is a function of the antenna frequency and the conductivity of the subsurface material. As the frequency of the GPR antenna increases, the resolution (ability to detect small objects) increases, but the depth of subsurface penetration decreases. A lower frequency antenna is capable of greater subsurface penetration, but with reduced resolution. Materials that are electrically conductive, such as clay, rapidly attenuate the GPR signal, resulting in a decrease in subsurface penetration. However, GPR signals are effective in penetrating asphalt and clay-poor fill. For this survey, staff utilized a GSSI 400-MHZ antenna which has penetration depths of approximately 12 feet.

There were no anomalies detected in or around the former building footprint on site. Nearby culverts were used to approximate a strong signal return

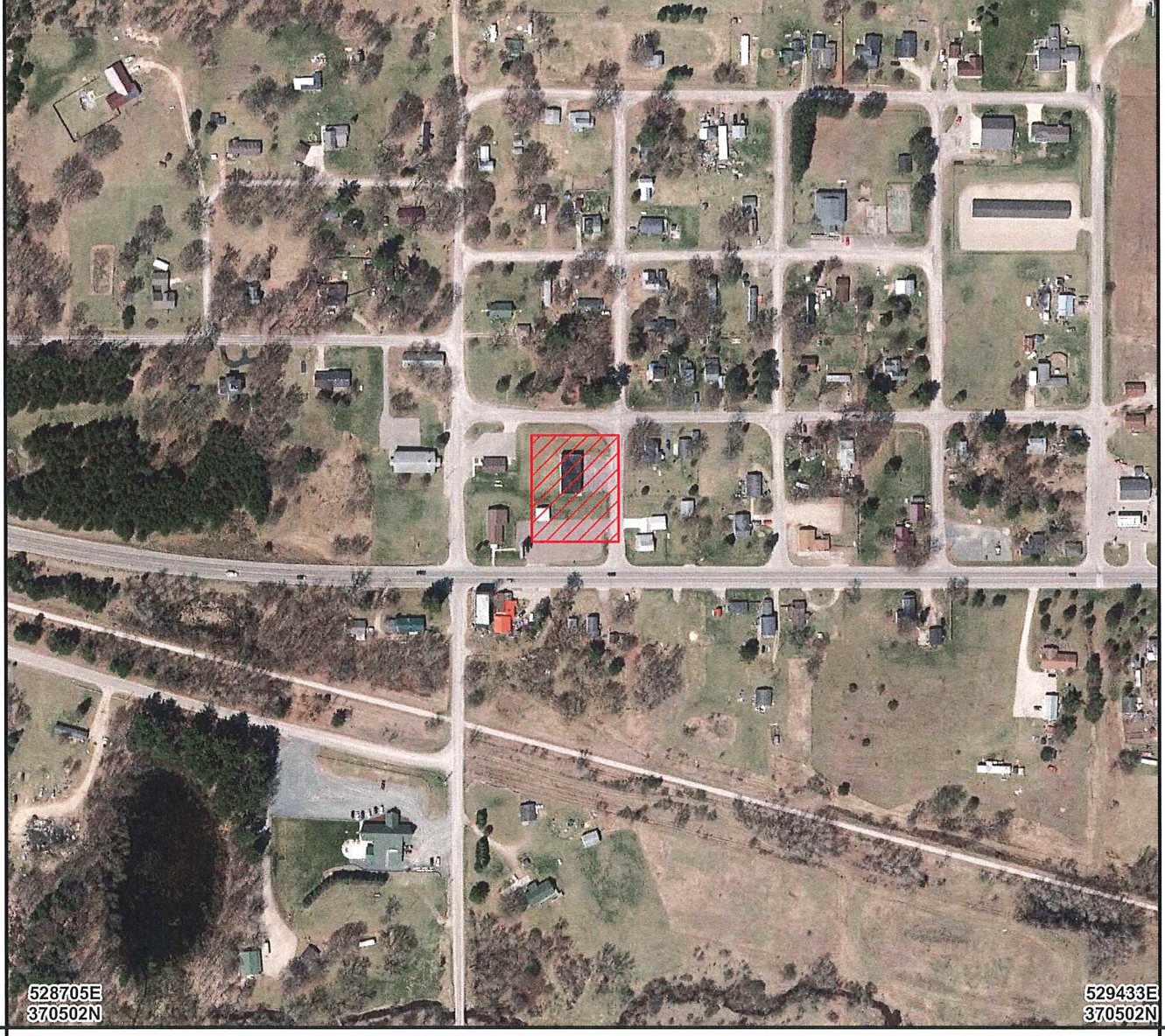
If you have any questions, contact me at 517-582-0143.

Brandon Lajoie

cc/att: Aaron Berndt, EGLE
Jeff Pincumbe, EGLE
Scott Densteadt, EGLE

528705E
371182N

529433E
371182N



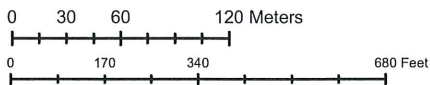
528705E
370502N

529433E
370502N

Datum: NAD83

Source: USGS 7.5 minute quadrangle

Projection: Michigan GeoRef



LEGEND



Site Location

6961 S Third Choice St

6961 S Third Choice St
Chase Township, Lake County
T17N R11W Sec 04

SITE LOCATION MAP

GEOLOGIST
Brandon LaJoie
GEOLOGICAL SERVICES
SECTION



CREATION DATE

April 2024

Remediation
and Redevelopment
Division

FIGURE 1