GPRS SUBSURFACE SCANNING SOLUTIONS

Underground Utilities Investigation

Prepared For: Eastern Louisiana Mental Health System

Prepared By:
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3/29/2018

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March 29, 2018

Eastern Louisiana Mental Health System
Attn: Billy Bellau
Site: ELMH Facility
Jackson LA

GPRS appreciates the opportunity to provide this written report for our work completed on 3/27/18 at the above referenced project in Jackson, LA.

PURPOSE

The purpose of this project was to search for underground utilities within the proposed directional bore path provided by the client. The areas were scanned as instructed by the client and as shown within the maps provided.

EQUIPMENT

- **350/400 MHz Hyperstacking GPR Antenna.** The antenna is mounted in a stroller frame which rolls over the surface. The surface needs to be reasonably smooth and unobstructed in order to obtain readable scans. Obstructions such as curbs, landscaping, and vegetation will limit the feasibility of GPR. The data is displayed on a screen and marked in the field in real time. GPR works by sending pulses of energy into a material and recording the strength and the time required for the return of the reflected signal. Reflections are produced when the energy pulses enter into a material with different electrical properties from the material it left. The strength of the reflection is determined by the contrast in signal speed between the two materials. The total depth achieved can be as much as 8' or more with this antenna but can vary widely depending on the conductivity of the materials. The patented hyperstacking antenna has the ability to improve depth penetration and resolution when compared with a traditional GPR antenna. For more information, please visit: Link
- **Electromagnetic Pipe Locator.** The EM locator can detect the electromagnetic fields from live power or radio frequency signals. It can also be used in conjunction with a transmitter to connect directly to accessible, metallic pipes, risers, or tracer wires. A current is sent through the pipe or tracer wire at a specific frequency and the resulting EM field can then be detected by the receiver. The receiver is moved over the surface without coming in contact with the ground so it is not affected by terrain. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. Depths achieved can be as much as 20' depending on the type of signal being traced or methods used. For more information, please visit: Link
- **GPS.** This handheld GPS unit offers accuracy down to 4 inches, however, the accuracy will depend on the satellite environment and obstructions and should not be considered to be survey-grade. Features can be collected as points, lines, or areas and then exported into Google Earth or overlaid on a CAD drawing. For more information, please visit: Link

PROCESS

The scan process began with using the EM pipe locator to locate pipes or utilities throughout the scan area. An initial sweep of all areas with the receiver to detect live power or radio frequency signals was conducted followed by connecting to any visible risers or tracer wires that were present in the area provided and traceable. Location, depth, and direction of utilities were painted and/or flagged on the surface where applicable. Depths cannot always be provided depending on the location method and can be prone to error.

Initial GPR scans were then collected in order to evaluate the data and calibrate the equipment. Based on these findings, a scanning strategy was formed which typically consists of scanning the entire area in a grid-like manner. The scans were placed on approximate 5'-10' centers in order to locate any additional utilities or obstructions that

were not found with the pipe locator. The GPR data was interpreted in real time and anomalies in the data were located and marked on the surface along with their depths using spray paint, pin flags, etc. Depths are dependent on the dielectric of the materials being scanned, so depth accuracy can vary throughout a site. As a result, GPRS recommends probing or safe excavation practices be performed to verify/deny the presence of anomalies marked. Representative data was saved and is provided within this report for reference.

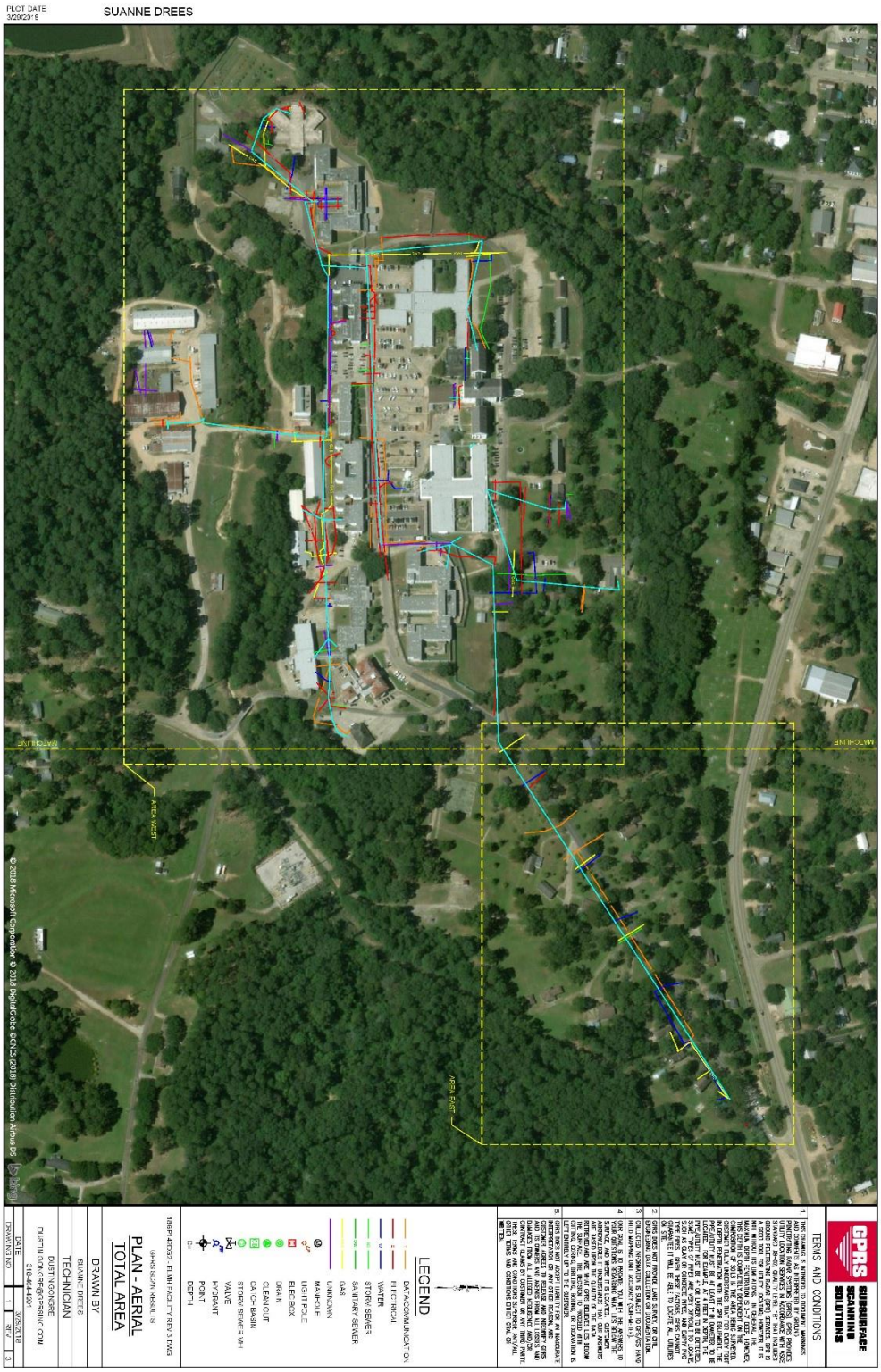
LIMITATIONS

Please keep in mind that there are limitations to any subsurface investigation. The equipment may not achieve maximum effectiveness due to soil conditions, above ground obstructions, reinforced concrete, and a variety of other factors. No subsurface investigation or equipment can provide a complete image of what lies below. Our results should always be used in conjunction with as many methods as possible including consulting existing plans and drawings, exploratory excavation or potholing, visual inspection of above ground features, and utilization of services such as One Call/811.

FINDINGS

The soil and ground coverings for this particular site allowed for maximum GPR depth penetration of about 4' in most areas. Utilities such as electrical, sewer, gas, water, etc. were located using either the GPR or EM equipment. At this site, scans were limited by buildings, landscaping, and vehicles parked in the proposed route for the boring. GPRS covered all accessible areas to the best of our ability.

The following pages will provide relative photos, data, and further explanation of our findings.



SITE MAP	**UNDERGROUND UTILTIES INVESTIGATION** **ELMH FACILITY** **JACKSON, LA**	

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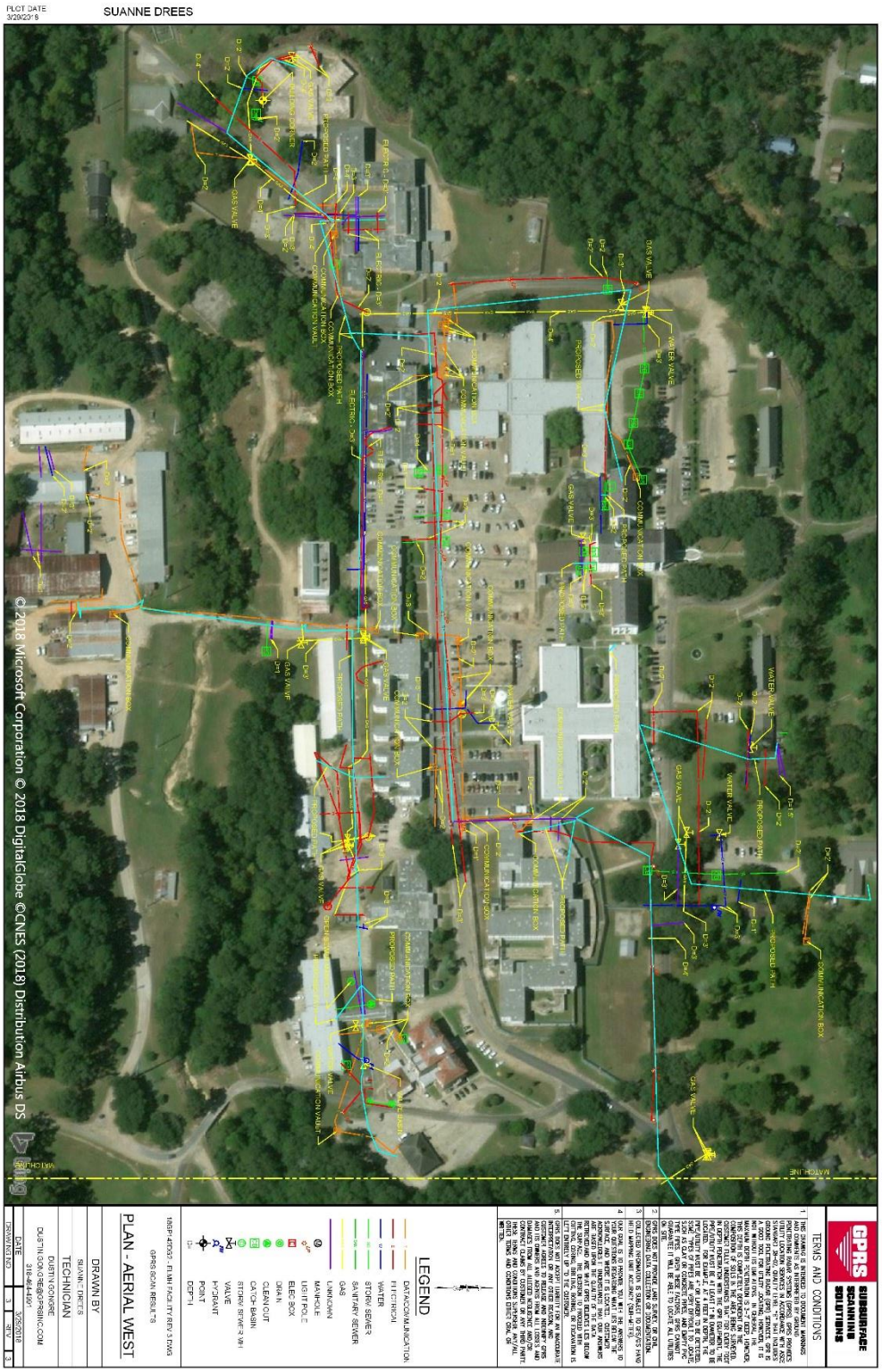
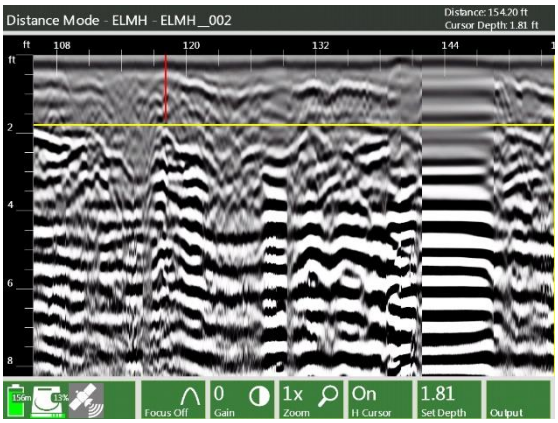


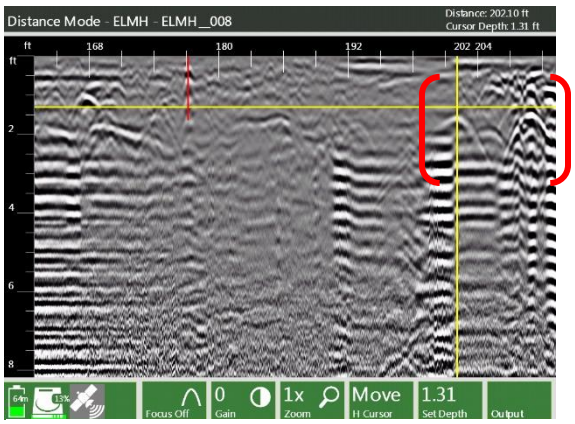
SITE MAP

UNDERGROUND UTILTIES INVESTIGATION
ELMH FACILITY
JACKSON, LA

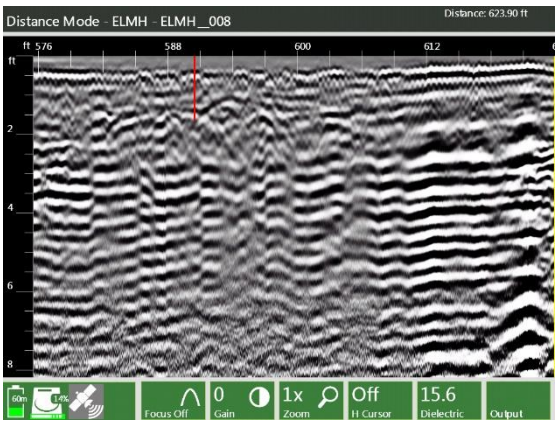


GPR data screenshot taken scanning at this project site with no apparent utility-like anomalies. This type data was used throughout the scanning process as a reference to this particular project.

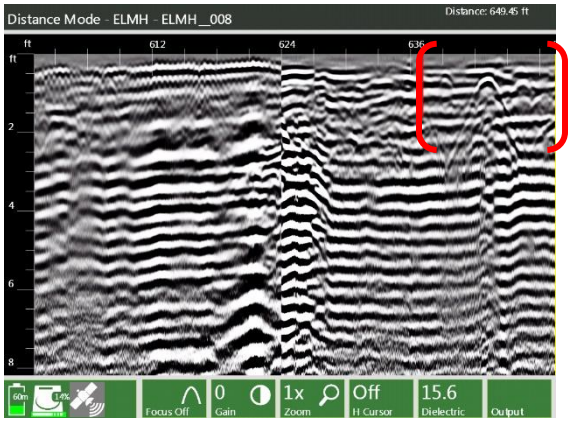
GPR data screenshot with utility-like anomaly shown for comparison to that of the data provided with no apparent utility-like anomaly.



Additional GPR data screenshot with utility-like anomalies for reference.



Additional GPR data screenshot comparing pavement scan to native soil.



Additional GPR data screenshot with utility-like anomalies for reference.

Typical Field Markings

GPR DATA AND SITE PHOTOS	**UNDERGROUND UTILTIES INVESTIGATION ELMH FACILITY JACKSON, LA**	GPRS

Typical Field Markings

Typical Scan Path

Typical Field Markings

Typical Field Markings

Typical Field Markings

Typical Utility Feature

SITE PHOTOS	**UNDERGROUND UTILTIES INVESTIGATION** **ELMH FACILITY** **JACKSON, LA**	GPRS

CLOSING

GPRS, Inc. has been in business since 2001, specializing in underground storage tank location, concrete scanning, utility locating, and shallow void detection for projects throughout the United States. Please visit our website (www.gprsinc.com) and contact any of the numerous references listed.

The results within this report are based on the field findings from the underground utilities investigation conducted. The data included within only represents a portion of the data collected from this site as a representative sample. Based on the accessible areas scanned, GPRS believes underground utilities to be present in the areas scanned as shown within the aerial map, supporting data, and photographs within this report. It should be noted that some underground utilities (i.e. small irrigation lines, utilities deeper than effective depth lines, PVC/terra-cotta lines, etc.), in addition to those located within the area scanned, may have not been located due to soil conditions, ground covering, etc. Additionally, due to some likely non-conducive soils some false-positive readings are likely to have been encountered. Given these limitations, it is our standard practice to mark out all anomalies and reactions when found and where present. GPRS's standard procedure is to over-mark an area to ensure the highest levels of safety and to limit potential shutdown or service interruptions. Additional exploration measures may be required in order to confirm or deny the presence of these anomalies and reactions (i.e. probing, limited excavations, daylighting, etc.).

GPRS appreciates the opportunity to offer our services, and we look forward to continuing to work with you on future projects. Please feel free to contact us for additional information or with any questions you may have regarding this GPR Investigation.

Respectfully submitted,
Ground Penetrating Radar Systems, Inc.

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