COMPLETE RADAR STUDY

January 23, 2017

Larry Weedon
540-207-8313

Subject: Ground Penetrating Radar (GPR) scanning w/ Larry Weedon

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1. Overview of GPR

Ground Penetrating Radar (GPR) is a non-destructive testing technology that sends a series of radar pulses into the surface which reflect back off of anomalies below. As the radar pulses through the ground, the waves bend slightly when encountering a material with differing physical properties, particularly density and conductivity. Thousands of pulses are sent and received in a small area, and the received signals are combined to form a real-time image of what is in the ground. The various places where the radar waves bend are displayed as anomalies which can be interpreted as reinforcing steel, steel pipes, PVC conduits, underground storage tanks, voids, foundations, etc. One of the many advantages of the technology is the ability to locate metal and non-metallic objects as well as determining depth to the object. GPR data acquisition is very fast and results are available immediately, allowing any discovered anomalies to be marked directly in the field. Although confused with X-Ray, GPR uses less than 1% of your cell phones radiation emissions and is safe to work with human presence in close proximity.

2. Equipment and Capabilities

Ground Penetrating Radar (GPR)

- **GSSI SIR-3000**

-GPRS uses a Geophysical Survey Systems Inc. (GSSI) SIR-3000 radar unit. This is the most advanced GPR available. It allows for on-site interpretation, as well as stored data for later processing. This equipment is self-calibrating, allowing more precise depth and location measurements.

-GSSI is the world's leading GPR designer and manufacturer. Information can be found at www.geophysical.com.

- **400 MHZ GSSI Antenna**

-For portions of projects involving utility locating, we use a 400MHz antenna with the SIR-3000 GPR head unit. This antenna allows data collection to a maximum depth of approximately 8-10 feet, depending on the condition of the soil.

3. Site Description

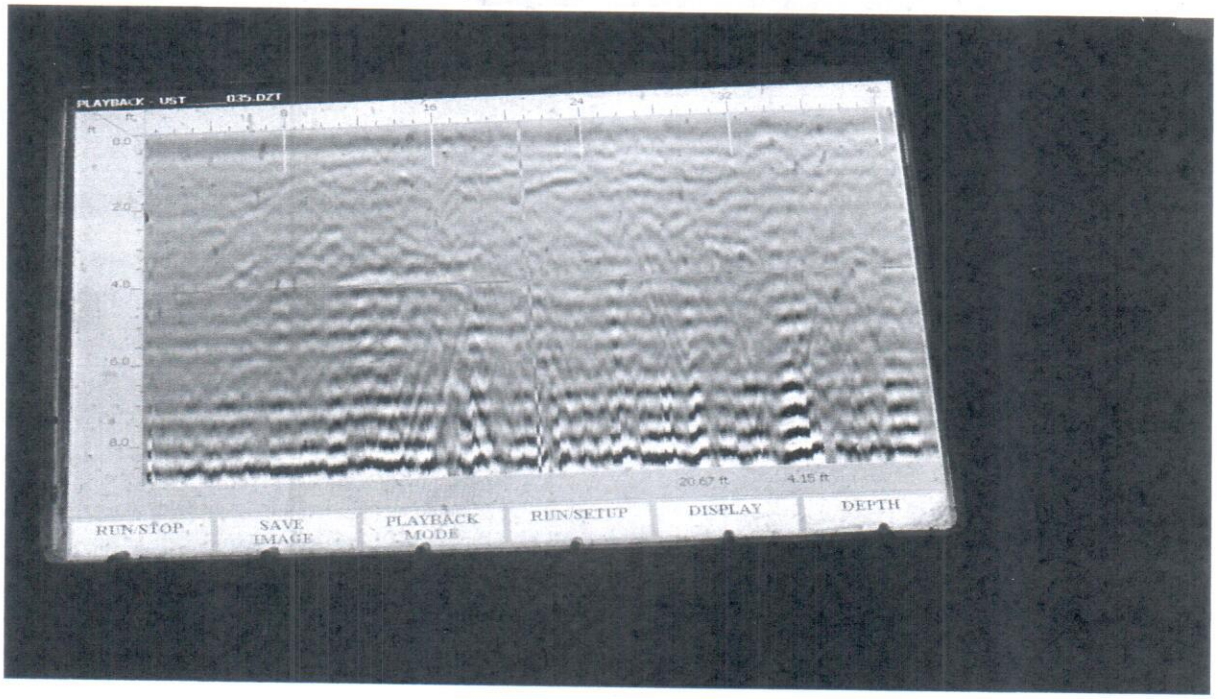
The site is the location of a property being purchased by Mr. Larry Weedon in Port Royal, VA.

4. Inspection Methods

The Sir-3000 with a 400 MHz antenna was used to scan the designated area. Scans were performed in North-South, East-West, and diagonal directions as the radar picks up anything running perpendicular to the antenna. The area was also swept using the RD-8000 wand which allows us to pick up any live power or communication lines. The main concern of the client was to determine if there are any underground storage tanks present, any large pieces of debris, or any underground utilities that are unknown.

5. Findings

After scanning the designated area, there were a few underground utilities located in the far portion of the property, near the road. There is also a pipe that can visibly be seen running in the ditch alongside the road. Other than those utilities, no other items of concern were able to be located. There is one area in particular that was of major concern, where the septic field will be going. The depth of the radar was maxing out in the 4 ft range in most areas.



This is an image from the Sir 3000 which shows the data produce throughout the majority of the property. The fact that no major anomalies are seen on the screen simply means that this area contains soil and just typical subsurface components.

6. Qualifications

Ground Penetrating Radar Systems, Inc. (GPRS) was founded in October 2001 by Matt Aston, who engrained a philosophy of client service and data accuracy. Matt's primary intent in starting the business was to give contractors a reliable way to scan into concrete and foundational slabs in order to avoid cutting embedded electrical conduits and critical reinforcing steel. These are immensely important services in the construction business as it helps to maintain structural integrity and avoid major human error leading to increasing costs and man hours. Obviously, in a field with such dramatic implications, reliability and credibility are the cornerstones. While GPRS performs this type work on a regular basis, there are many other applications in which our services can be deployed and as we have grown over the past decade, we have become industry leaders in the nuances of GPR in specific circumstances, including the scanning of cemeteries and burial plots.

Since our inception, GPRS has grown to a nationwide enterprise and completed over sixteen thousand projects in 2013 alone. This success is due to our high level of customer service coupled with our unique market position. Unlike many other companies that provide GPR services, GPRS offers no ancillary services and therefore our field operators are able to dedicate 100% of their time and effort in perfecting this particular tradecraft. Indicative of our dedication to this function is the fact that we are the only national GPR Company specializing solely in this service. We perform GPR services every day in a variety of complex and often unique environments. This gives us familiarity with environments and in situations that other firms would find foreign. Further, this is not something we do once in a while; our technicians are in the field every day. We are very proud of this dedication to our craft and of our performance record. Additionally, in our twelve years in business we have maintained a record of zero recordables (essentially remaining incident free). To statistically quantify our reliability, we have had a reported incident of error on less than one percent of the projects we have completed. Our customers have expressed a high level of satisfaction, as evidenced by the fact that in 2012 nearly 80% of our business was either repeat clients or referred by our customers. To demonstrate our environmental experience, GPRS has been involved in projects ranging from small residential jobs to major construction projects with values in excess of $4 Billion.

Every one of our technicians is required to undergo over five months of both classroom and apprentice training to ensure that they are highly proficient in the scanning process and in the interpretation of results. Each member of our team is intensely scrutinized prior to independent field deployment and those individuals who do not meet our standards are not permitted to operate our equipment nor analyze field results. Additionally, we include an internal audit process involving other analysts when dealing with a particularly sensitive job. This is to maintain our high level of standards and ensure the continuing credibility of our services.

7. Closing

Thank you for the opportunity to serve you on this project. I hope this report has answered all the questions you had regarding this survey. However if there is anything you have questions about or feel was omitted, please do not hesitate to contact me.

Thank you,

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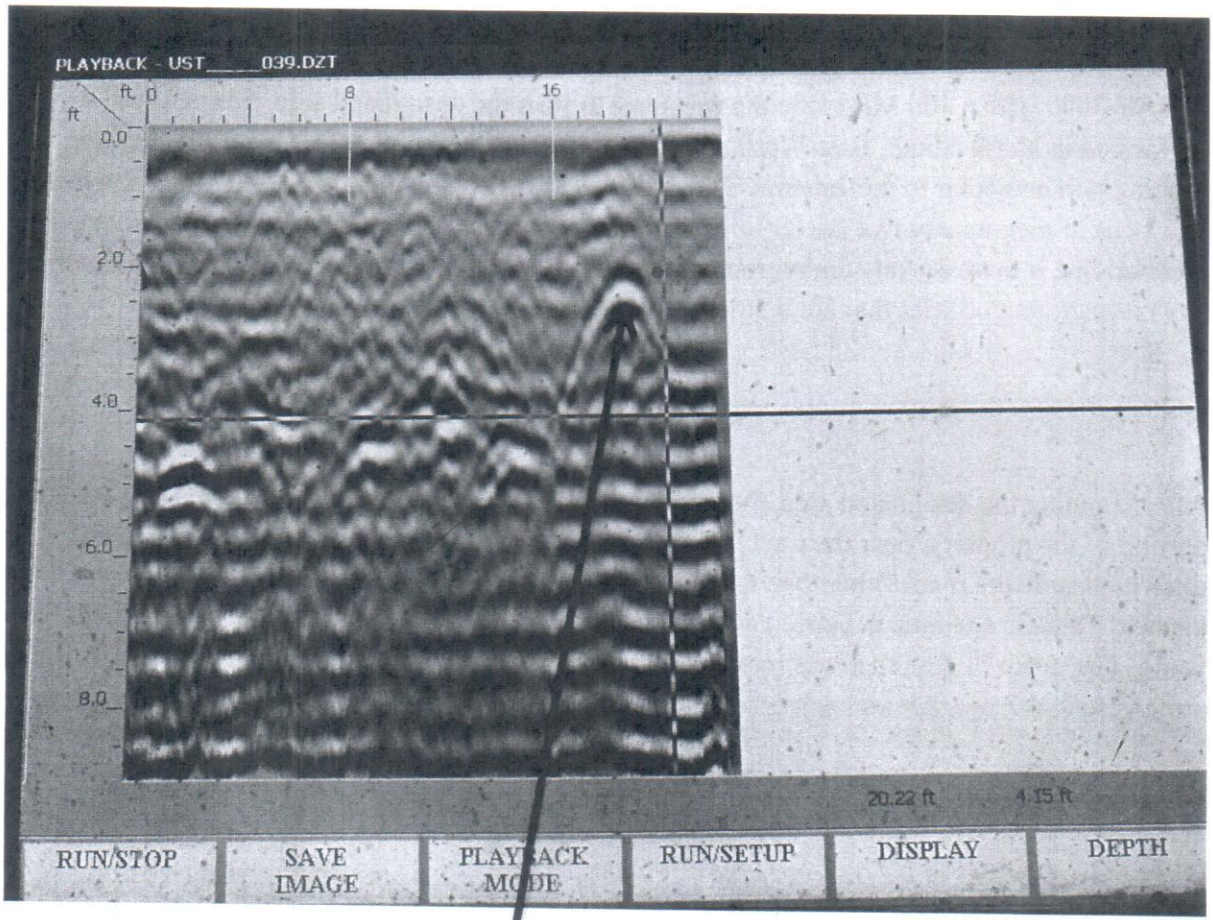
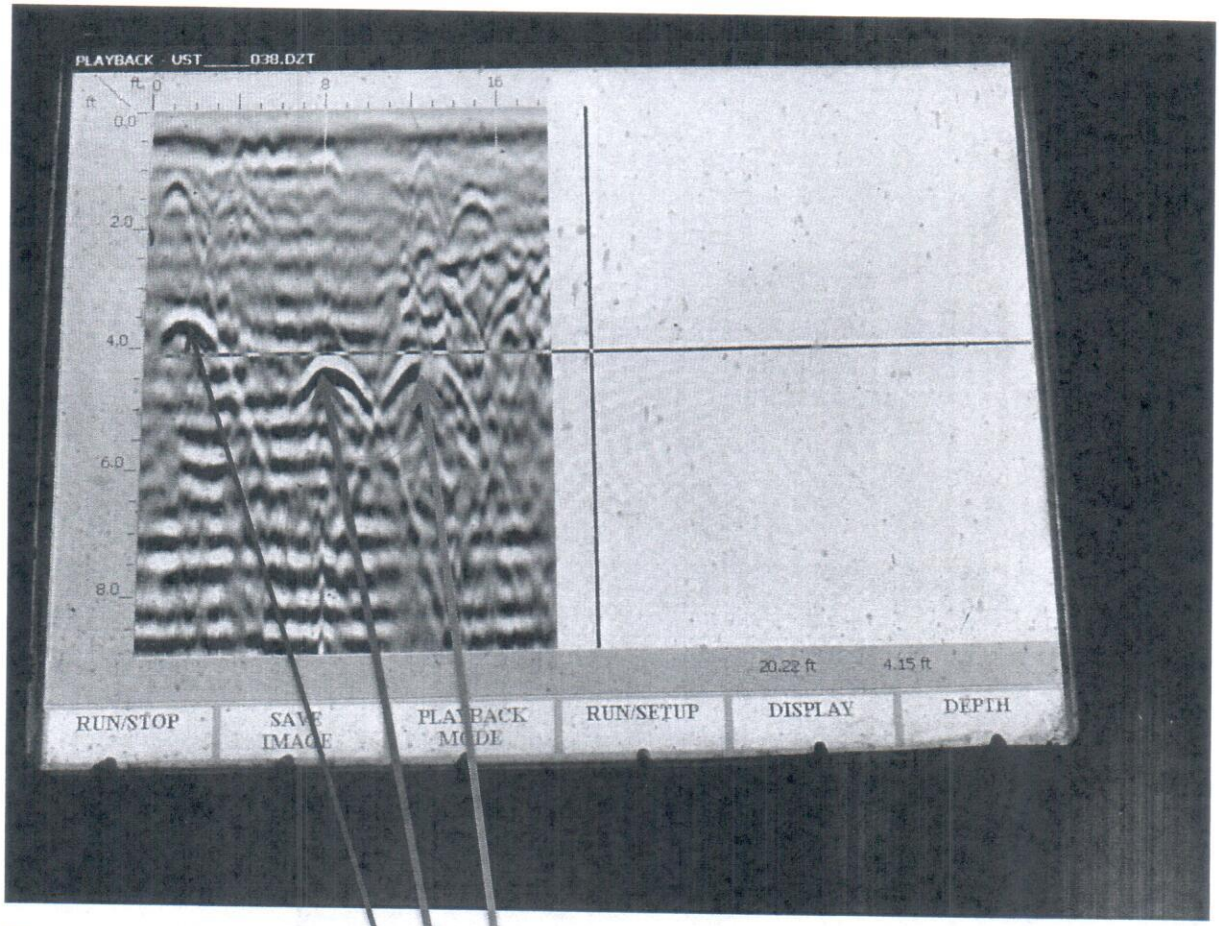


This image is also from the Sir 3000 and shows the reaction produced by the pipe that runs alongside the road. You can see the anomaly that represents the pipe on the right side of the image, roughly 2 ft in depth.

This image shows the pipe running in the ditch alongside the road which was able to be located on the radar.



This image shows the reaction on the SIR 3000 produced when running the radar in the area of the multiple utilities found along the roadside. One of the utilities is definitely the communication line which runs directly to the pole. The other utilities marked in this area are unknown. You can see multiple anomalies in this screenshot which represent the subsurface utilities.

This is just a general photo of the area scanned. The scans went all the way over to the right side of this property as well which got slightly blocked out in this image.

This image shows the communication line located near the road as well. You can see the red paint running straight across the property.

This image shows the two unknown utilities that are marked alongside the other road. The depths of these utilities is marked on the surface of the ground. It's tough to see the green paint but these two utilities run in a straight line alongside the road.