

**Baker**

03.01-7/13/92-02647

**Baker Environmental, Inc.**  
Airport Office Park, Building 3  
420 Rouser Road  
Coraopolis, Pennsylvania 15108

(412) 269-6000  
FAX (412) 269-2002

July 13, 1992

Commanding Officer  
Atlantic Division  
Naval Facilities Engineering Command  
Norfolk, Virginia 23511-6287

Attn: Mr. Byron Brant, P.E.  
Code 1822

Re: Contract N62470-89-D-4814  
CTO-0106, Geophysical Findings for Sites 24, 74, and 78,  
MCB Camp Lejeune, North Carolina

Dear Mr. Brant:

This letter summarizes the conclusions of the Geophysical Investigations that were conducted by Weston Geophysical, Inc., during the period June 15 to June 21, 1992, at Sites 24, 74, and 78, MCB Camp Lejeune, North Carolina. The conclusions drawn by the geophysical investigations will be evaluated to help define the remedial investigation/feasibility study (RI/FS) scope of work at Sites 24, 74, and 78. The Geophysical Report (including all backup information) will be appended to the RI/FS Project Plans.

#### **SCOPE OF WORK**

Geophysical investigations were performed at Site 24 (Former Nursery/Day Care Center), Site 74 (Mess Hall Grease Disposal Area), and Site 78 (Hadnot Point Industrial Area) for purposes of defining subsurface conditions to assist in RI/FS scoping. At all areas of investigation, a survey grid was established and served as a basis for the lines of geophysical coverage. The grids were established parallel to existing nearby linear features such as a fence, building, or roadway. These lines of coverage were referenced to these features and existing monitoring wells. At Sites 24 and 74, dense vegetation and understory dictated final placement of some of the transects.

The geophysical investigations employed electromagnetic terrain conductivity (EM-31), magnetometry, and ground penetrating radar (GPR) techniques. Electromagnetic terrain conductivity and magnetometry were utilized at Sites 24 and 74 to estimate the limits of alleged disposal boundaries and to define areas where buried drums may be present. At Site 78 (Buildings 902, 903, 1202, 1502, 1601, and 1709), GPR was employed to locate suspected underground storage tanks.

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Coraopolis, Pennsylvania 15108

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FAX (412) 269-2002

## **DISCUSSION OF RESULTS**

### **Site 24**

Four suspected disposal areas were previously identified at this site based on existing information. Three areas (spirator sludge, fly ash, and debris disposal) were investigated using EM or magnetometer techniques. Access to the fourth area along Louis Road was restricted because of ongoing construction activities.

The reported area of spirator sludge disposal at the northeast section of the site corresponded to elevated levels of conductivity during the EM survey. The approximate boundary of this disposal area is shown on Figure 1.

Disposal of fly ash was reported south of the sludge disposal area in the central portion of the site. Zones of higher conductivity, interpreted to be due to fly ash and/or other fill material, approximately define the northeastern boundary of the fly ash disposal area, as shown on Figure 1 (i.e., the area south of the boundary line is where disposal activities likely occurred). Due to the dense vegetation and understory, additional geophysical coverage to the west and south of this area was not possible; however, based on existing information, the extent of this disposal area may be limited to the area bordered by the intermittent streams (i.e., tributaries to Cogdels Creek).

Two locations within the northeast portion of Site 24 exhibited buried metal debris based on the EM and magnetometer surveys. These areas are shown on Figure 1.

The third alleged waste disposal area investigated at Site 24 is located southwest of Building 1450 (see Figure 1). An area of high conductivity was measured south of the fenced parking lot to the location of monitoring well 24GW2, confirming the presence of a disturbed area. Dense vegetation and understory restricted additional geophysical coverage south of this area.

### **Site 74 (Mess Hall Grease Disposal Area)**

A large trench reportedly used for the disposal of grease was suspected at this site, based on existing information (ESE, 1990). The Geophysical Investigation employed electromagnetic and ground penetrating radar techniques to locate and define the limits of this former disposal area. Figure 2 shows the layout of Site 74. The investigation originally focused on the area along the dirt roadway, where the disposal area was reported to be. The results of the geophysical survey along this roadway do not correlate with past subsurface or surficial disturbance. Therefore, the disposal may not have occurred in this area, or the hurricane in 1954 may have played a role by washing out any signs of this disposal area, as described in the Site Summary Report (ESE, 1990).

A reconnaissance of the area just north of the entrance to Site 74 noted a small pit containing drums (see Figure 2). EM and GPR techniques were employed to survey

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this area. Based on this survey, a disposal trench may be present between an abandoned dirt road and the main roadway as shown on Figure 2. It is possible that this may be the "grease" pit, or another pit previously unknown. The Site Summary Report indicated that drums and pesticide-soaked bags were disposed of near the grease pit. The disposal trench noted during the Geophysical Investigation may be this area of concern.

#### **Site 78 (Hadnot Point Industrial Area)**

##### **Building 1502**

The Geophysical Investigation conducted at Building 1502 noted two areas where buried tanks may be located. As shown on Figure 3, these areas are located near each corner of the building.

Two tanks are suspected to be present at a depth of three feet on the southeast corner of Building 1502 along East Street (see Figure 4). A third tank is suspected at a depth of six feet along the edge of the building.

Similarly, on the southwest corner of Building 1502 along East Street, two tanks may be present at a depth of three feet. A third tank may be present along the building wall at a depth of five feet (see Figure 5). The shallower tanks are located near two fill caps observed on the ground surface.

##### **Building 1601**

At least one and possibly two tanks are located on the southeast corner of this building along East Street (see Figure 3). These tanks are estimated to be at a depth of approximately five feet and six feet, as shown on Figure 6.

##### **Buildings 902 and 903**

A single small tank at a depth of two feet was detected near monitoring well HPGW24-1 along Building 903. No other tanks were detected between Buildings 902 and 903. The investigation results for this area are depicted on Figures 7 and 8.

##### **Buildings 1202 and 1709**

No buried tanks are believed to be present at these building locations, based on the geophysical survey. The surveys for these buildings are depicted on Figures 9 and 10.

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## **RECOMMENDATIONS**

Based on the results and evaluation of the investigations, the following recommendations are provided.

### **Site 24**

Areas where buried metal are suspected should be investigated via test pitting to identify the contents of buried metal (i.e., drums versus debris).

The fly ash disposal area has been defined to some extent (The northern extent has been defined; other boundaries may be defined by the contour of the area and the presence of intermittent streams). Soil sampling can therefore focus on characterizing the contents of fill material, along with confirming the areal extent of this disposal area.

The spirator sludge disposal area has been well defined, which should reduce the number of soil borings required to characterize the contents and extent of this area.

The alleged waste disposal area southwest of Building 1450 was detected by geophysical techniques. Soil sampling should be performed within this area to characterize subsurface materials. Limited soil sampling around this area should be conducted to confirm the areal extent of the disposal area.

### **Site 74**

Test pits should be excavated to estimate the number of drums buried in the area believed to be the former disposal trench. The drums contents should be sampled, if possible. The soil investigation should focus on the trench area to characterize and determine the extent of potential soil contamination. Limited soil sampling should be conducted where the grease pit was reportedly located (this pit was not located via geophysical techniques), and in the area east of the dirt road where stressed vegetation was noted.

### **Site 78**

The areas where underground tanks are suspected should be further investigated. If the tanks are not in use, which is reportedly the case, their contents should be disposed of and the tanks removed or filled with sand or other material. Soil sampling at each tank area is recommended to determine whether these areas are acting as a source of shallow groundwater contamination. If the tanks are removed, soil samples should be taken from the floor and walls of the excavation while the tanks are being removed to verify that all potentially contaminated soil has been removed.

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The results of the Geophysical Investigation will be evaluated during the RI/FS scoping for Sites 24, 74, and 78. The recommendations identified above also will be discussed in more detail and documented in the RI/FS Project Plans for Operable Unit No. 1 and No. 5.

Because of the large areas these sites encompass, the geophysical investigations were successful in limiting the areas requiring further investigation during the RI. This may result in overall reduced field and analytical costs and time savings. If you have any questions or comments, please call me at (412) 269-2016.

Sincerely,

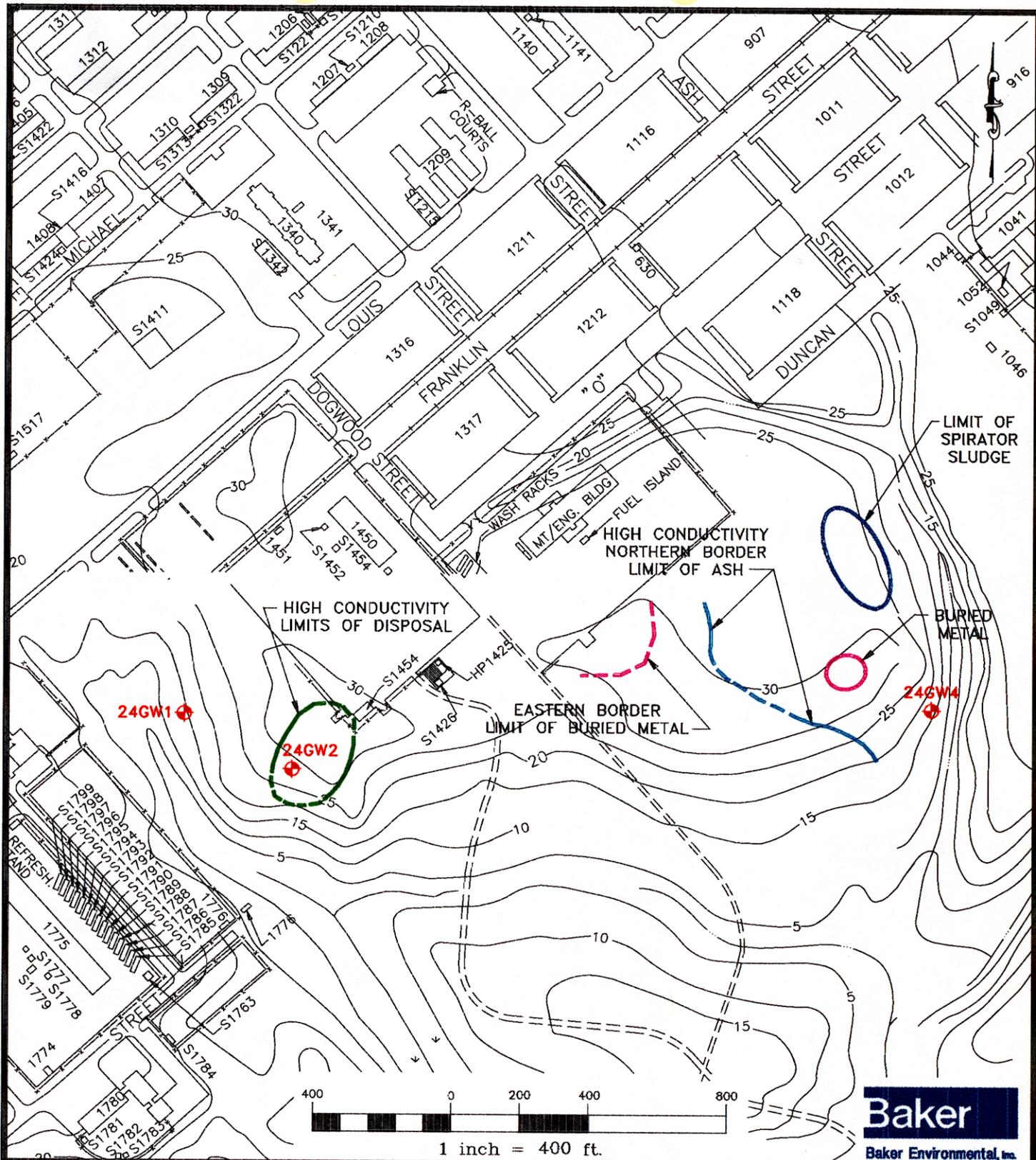
BAKER ENVIRONMENTAL, INC.



Raymond P. Wattras  
Project Manager

RPW/nd  
Attachments

cc: Mr. Marc Lambert, P.E. (w/o attachments)  
Mr. George Radford (CLEJ EMD)



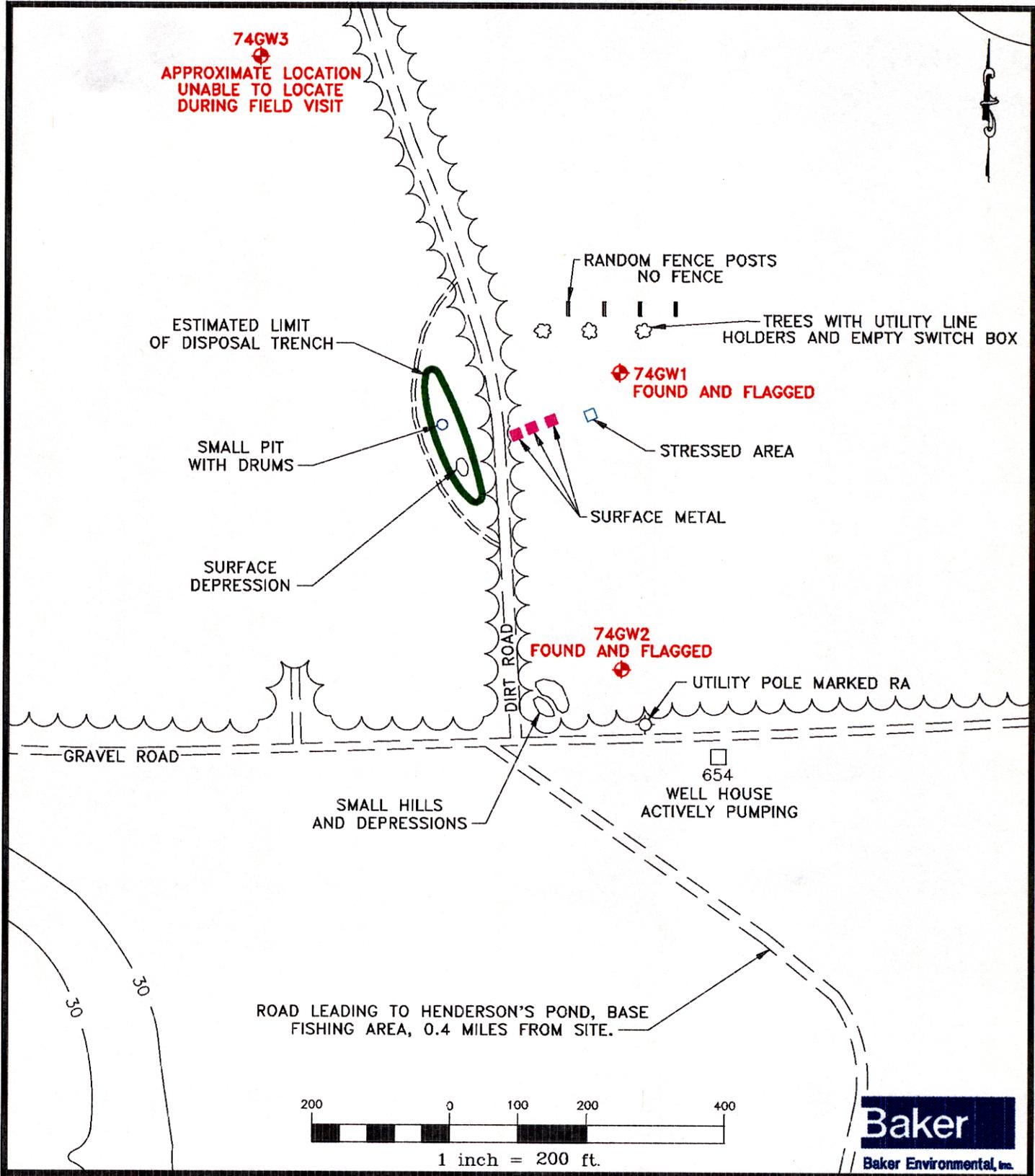
**LEGEND**

**24GW1**  **EXISTING WELL**

**FIGURE 1**  
**POTENTIAL AREAS OF CONCERN**  
**SITE 24**

SOURCE: LANTDIV, OCT. 1991

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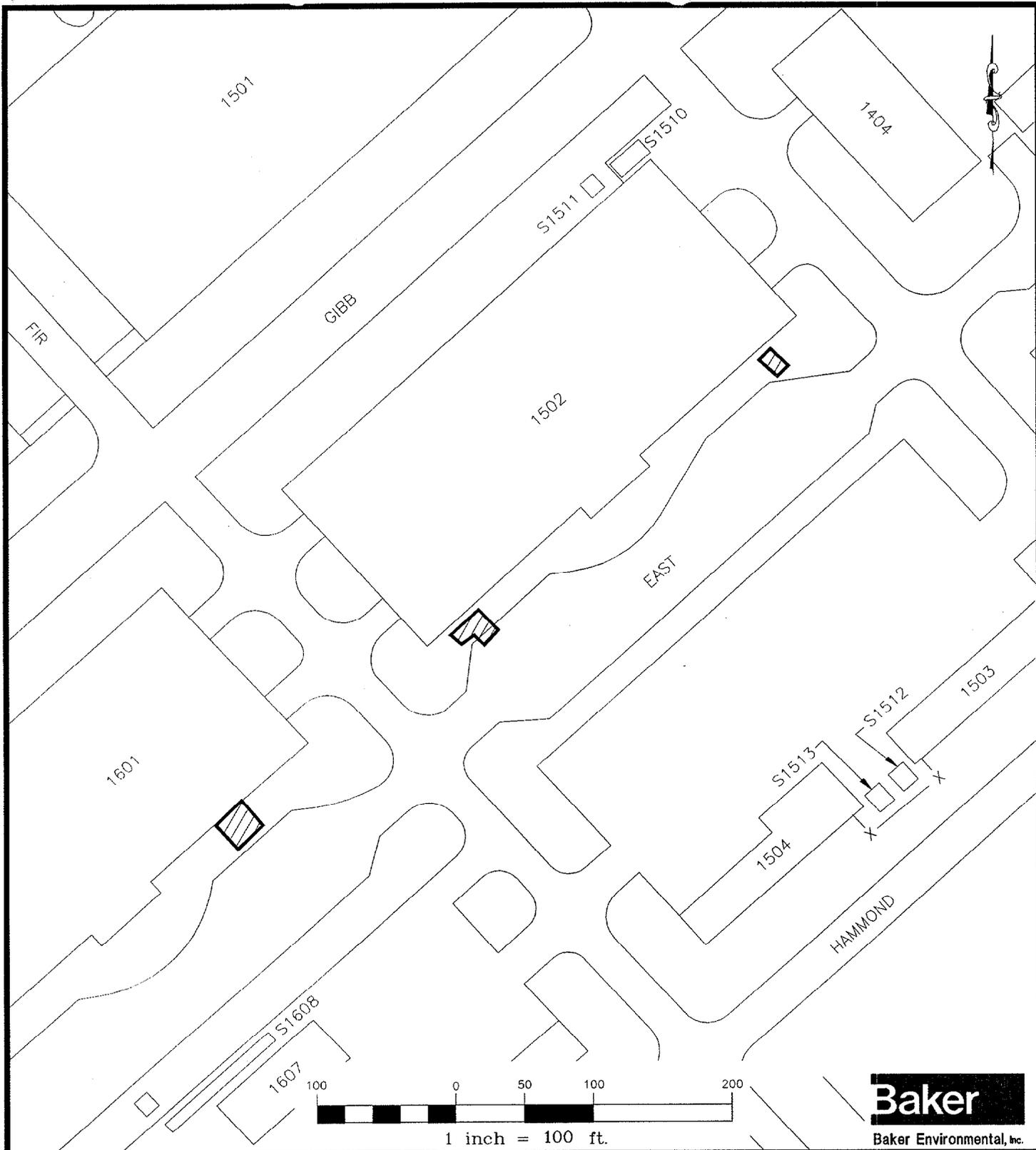


**LEGEND**

**74GW1** EXISTING WELL

**FIGURE 2**  
**POTENTIAL AREAS OF CONCERN**  
**SITE 74**

SOURCE: LANTDIV, OCT. 1991



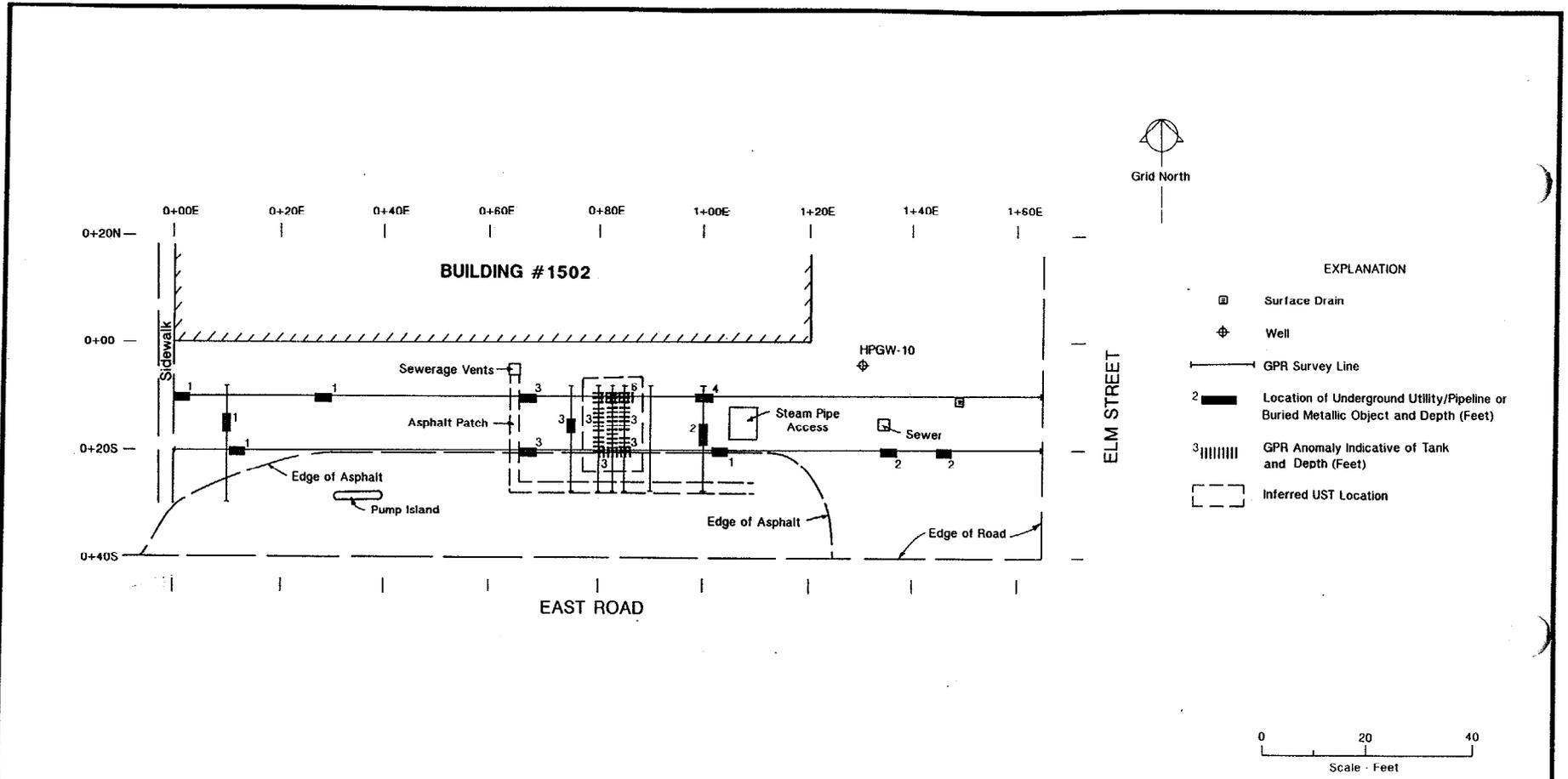
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 TANK AREA

FIGURE 3  
SUSPECTED BURIED TANK AREAS  
BUILDINGS 1502 AND 1601

SOURCE: LANTDIV, OCT. 1991



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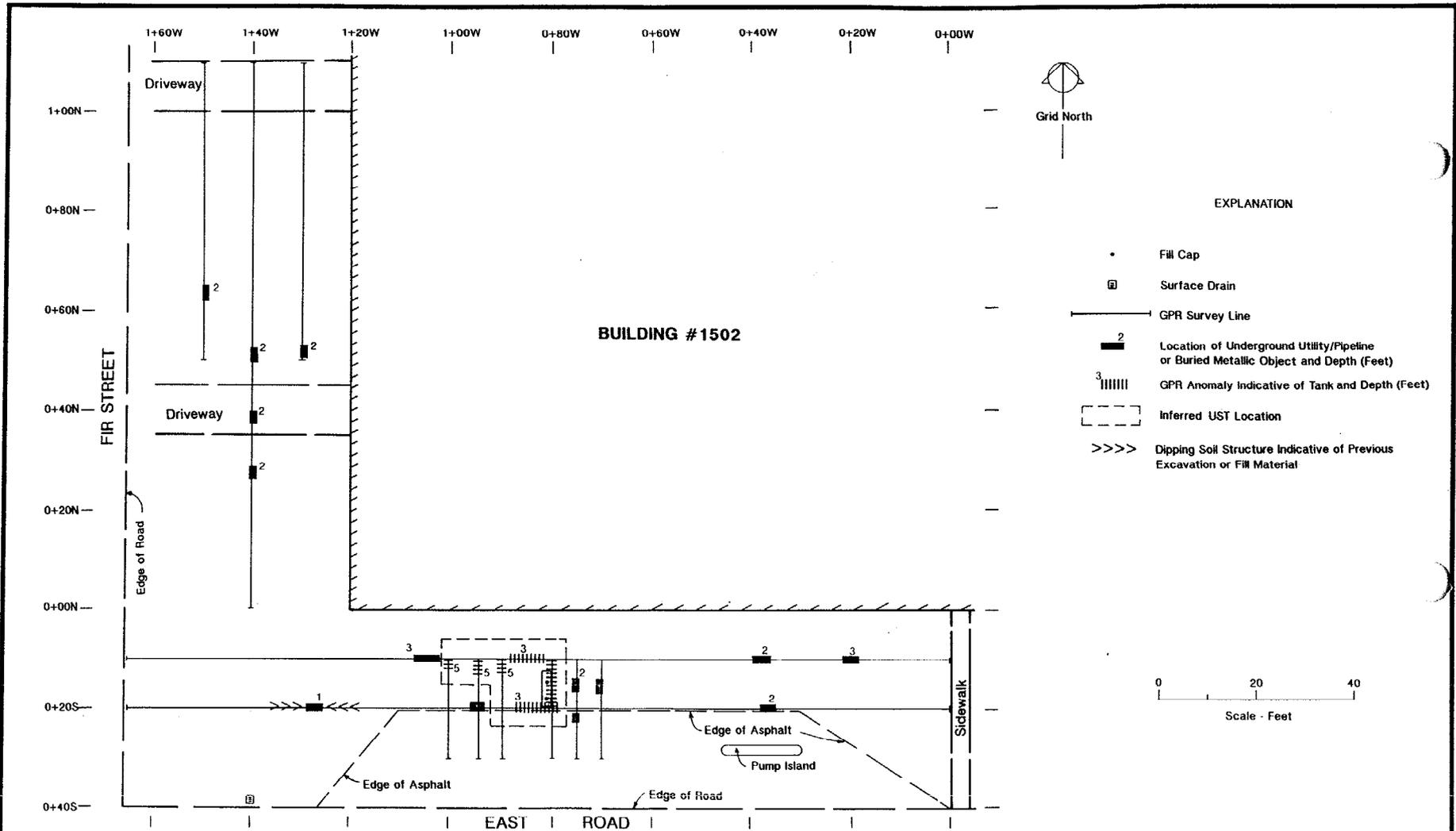
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<p>FIGURE 4 GPR SURVEY - BUILDING 1502 MCB CAMP LEJEUNE, NORTH CAROLINA</p>	
SCALE	DATE

<p>FIGURE NO. <b>4</b></p>
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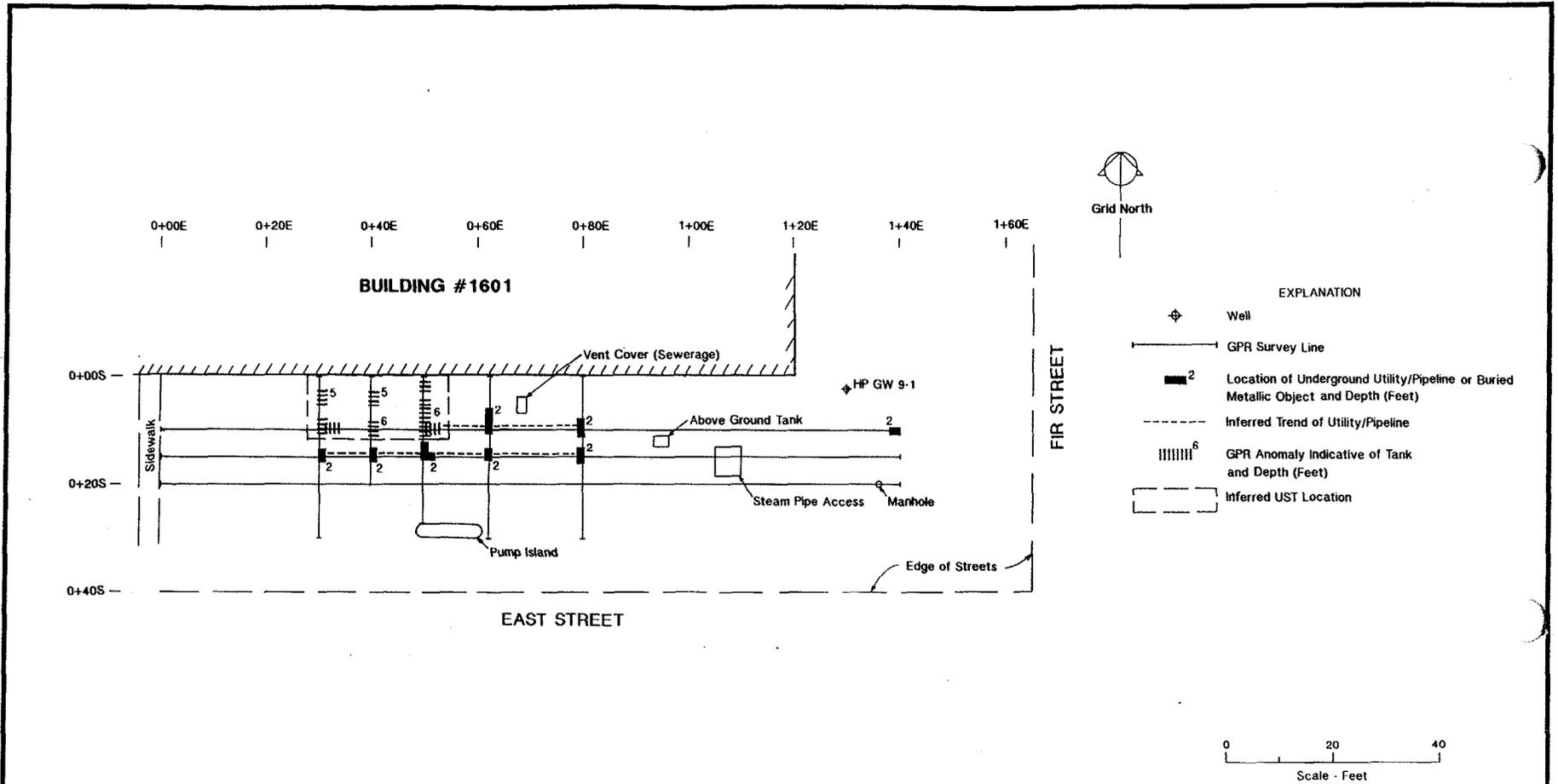
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**FIGURE 5**  
**GPR SURVEY - BUILDING 1502**  
**MCB CAMP LEJEUNE, NORTH CAROLINA**

SCALE \_\_\_\_\_ DATE \_\_\_\_\_

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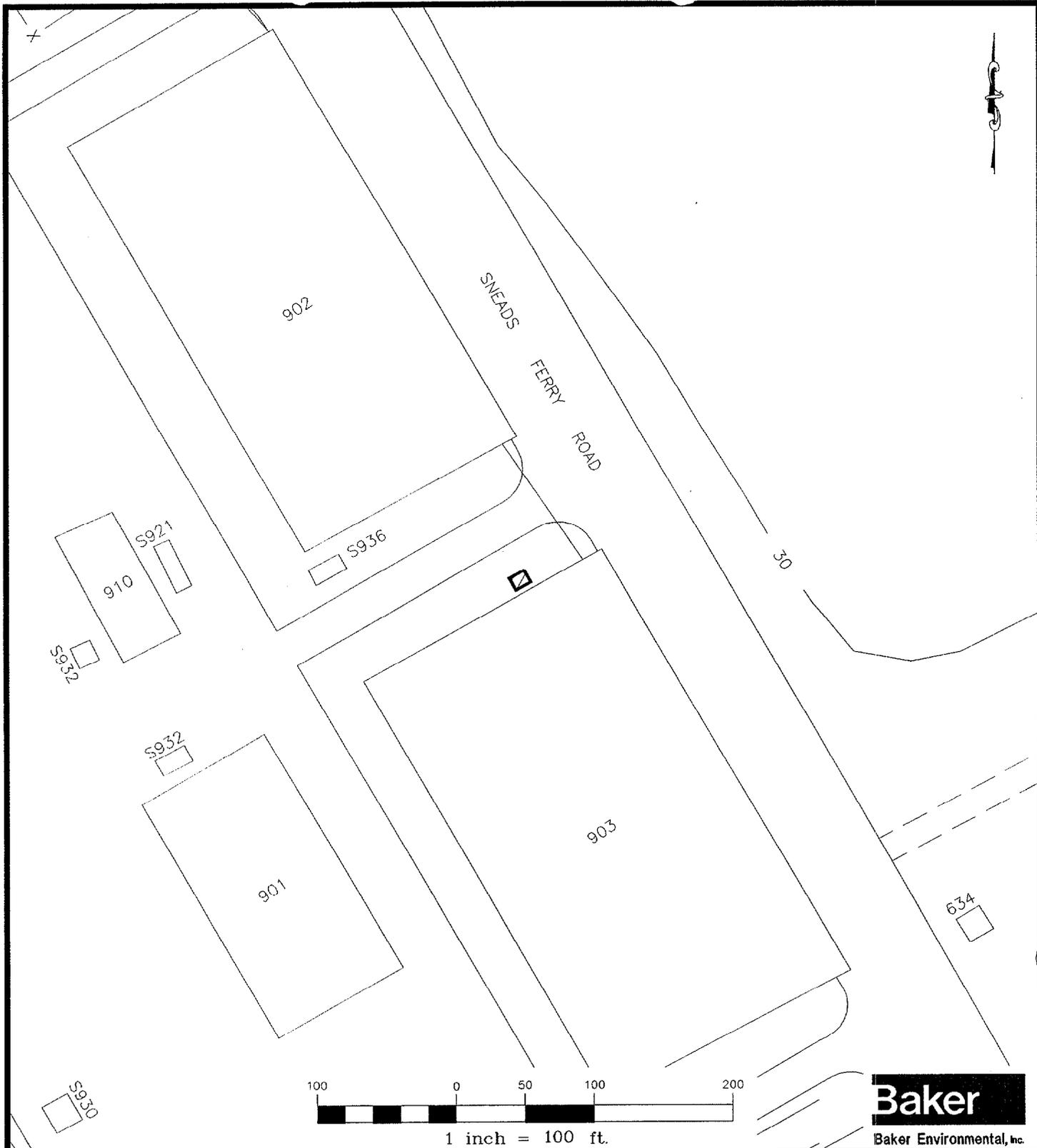
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<b>FIGURE 6</b> GPR SURVEY - BUILDING 1601 MCB CAMP LEJEUNE, NORTH CAROLINA
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FIGURE NO <b>6</b>
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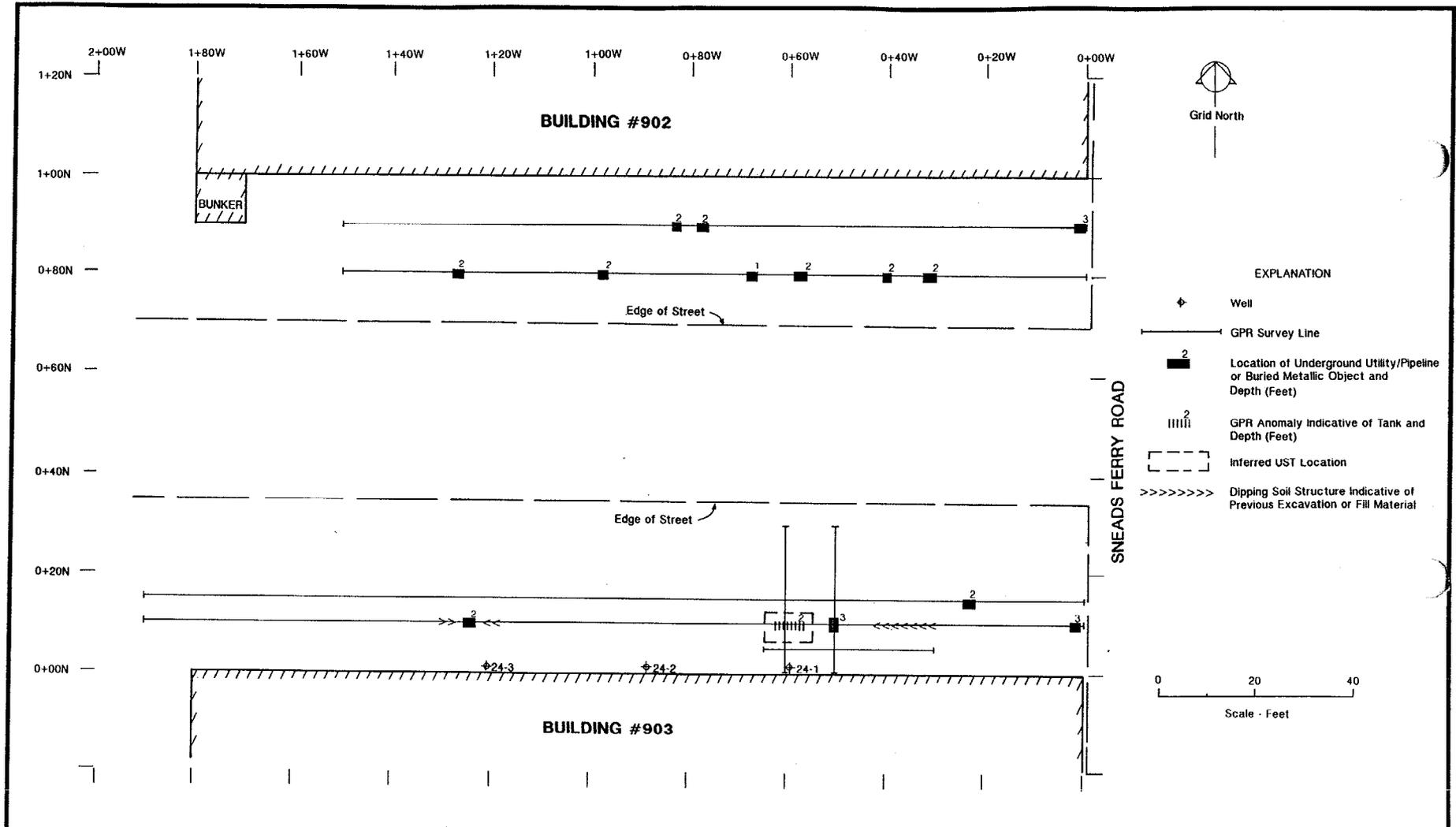
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 TANK AREA

FIGURE 7  
SUSPECTED BURIED TANK AREAS  
BUILDING 900 AREA

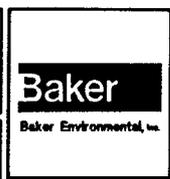
SOURCE: LANTDIV, OCT. 1991



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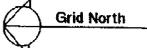
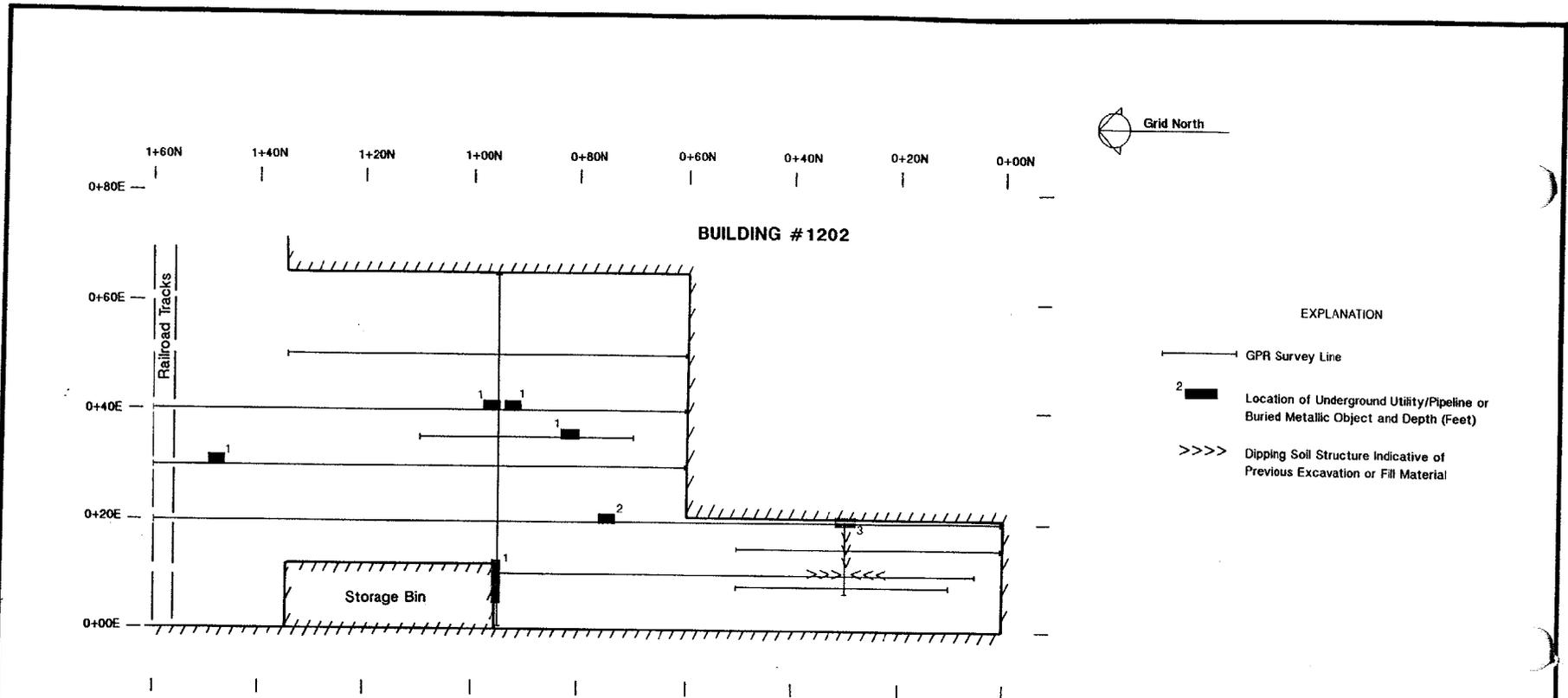
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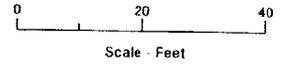


<p><b>FIGURE 8</b></p> <p><b>GPR SURVEY - BUILDINGS 902 &amp; 903</b></p> <p><b>MCB CAMP LEJEUNE, NORTH CAROLINA</b></p>
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<p>FIGURE NO.</p> <p><b>8</b></p>
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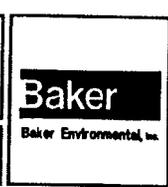
- EXPLANATION
- GPR Survey Line
  - 2 ■ Location of Underground Utility/Pipeline or Buried Metallic Object and Depth (Feet)
  - >>>> Dipping Soil Structure Indicative of Previous Excavation or Fill Material



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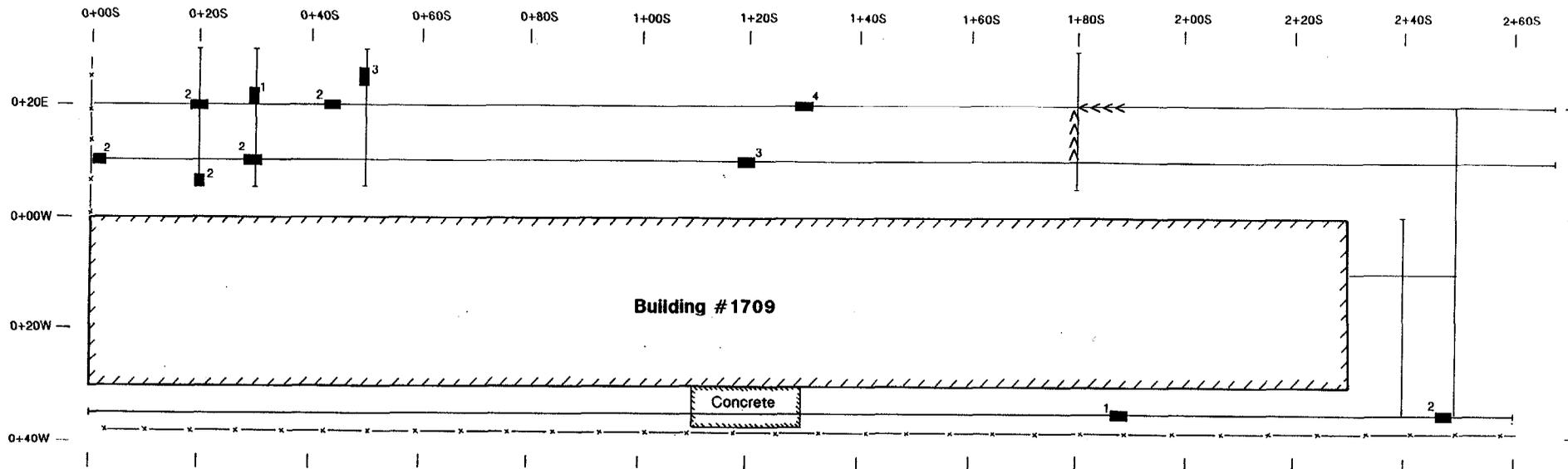
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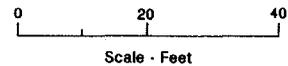
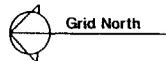
<b>FIGURE 9</b> <b>GPR SURVEY-BUILDING 1202</b> <b>MCB CAMP LEJEUNE, NORTH CAROLINA</b>	
SCALE	DATE

FIGURE NO.
9



EXPLANATION

- Fence
- GPR Survey Line
- Location of Underground Utility/Pipeline or Buried Metallic Object and Depth (Feet)
- Dipping Soil Structure Indicative of Previous Excavation or F# Material



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