# FINAL
# REMEDIAL INVESTIGATION REPORT
# EXPANDED
# SITE INVESTIGATION AT LAGARDE PARK
# ANNISTON, ALABAMA

*April 2005*

Submitted to:
U.S. Army Corps of Engineers
Mobile District
109 St. Joseph Street, P.O. Box 2288
Mobile, AL 36628-0001

Prepared by:
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1006 Floyd Culler Court
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Contract No. DACA01-03-D-0010
Delivery Order No. 0003

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## List of Acronyms

| | |
|---|---|
| bgs | below ground surface |
| BRAC | Base Realignment and Closure Commission |
| $Co^{60}$ | cobalt-60 |
| cpm | count per minute |
| $Cs^{137}$ | cesium-137 |
| DCGLs | derived cleanup guideline levels |
| DOD | Department of Defense |
| EODT | EOD Technologies, Inc. |
| EPA | U.S. Environmental Protection Agency |
| ESI | expanded site investigation |
| ft | foot/feet |
| FUDS | Formerly Utilized Defense Site |
| GEL | General Engineering Laboratories |
| GPS | Global Positioning System |
| keV | kiloelectron volts |
| LLRW | low level radiation waste |
| MDC | minimum detectable concentration |
| mrem | milliroentgen equivalent man |
| NaI | sodium iodide |
| NRC | Nuclear Regulatory Commission |
| pCi/g | picocuries per gram |
| PVC | polyvinyl chloride |
| RCT | radiological control technician |
| RSSSL | residential surface soil screening level |
| STEP | Solutions To Environmental Problems, Inc. |
| TCLP | toxicity characteristic leaching procedure |
| USACE | U.S. Army Corps of Engineers |
| UXO | unexploded ordnance |
| $yd^3$ | cubic yards |

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## EXECUTIVE SUMMARY

Solutions To Environmental Problems, Inc. (STEP) under contract with the U.S. Army Corps of Engineers (USACE), Mobile District, has completed an expanded site investigation (ESI) at an area of LaGarde Park in Anniston, Alabama adjacent to the eastern portion of Fort McClellan. The ESI included a surficial site field screening survey, downhole field screening, and surface and subsurface soil sampling. The goal of the site investigation was to determine the lateral and vertical extent of radiological contamination at the site above federal and state guidelines.

### History

In the 1950s the Department of Defense (DOD) decided to consolidate training for all branches of the military service. U.S. Army, Navy, Marine, and Air Force chemical officers and non-commissioned officers, military police, civilian law officers, and various government agencies were sent to Fort McClellan for training. The U.S. Army Chemical School was established at the facility and conducted radiation survey training for all aforementioned branches. Radioactive wastes that resulted from this training were ultimately buried on Fort McClellan property.

In 1995, the Base Realignment and Closure Commission (BRAC) voted to permanently close Fort McClellan. The DOD closed the base in October 1999, making 45,000 acres, building facilities, and fully infrastructured property available for private sector reuse and redevelopment. At the time of closure, Fort McClellan was home to the U.S. Army Chemical School, the U.S. Army Military Police School, the Training Brigade, and the Department of Defense Polygraph Institute.

### Previous Investigations

Interviews with personnel knowledgeable about operational and waste disposal activities at various sites at Fort McClellan indicated that radioactive wastes were deposited on Iron Mountain. It was reported that a laboratory building, consisting of cinder blocks and sand bags, was located on the "northwest side of Iron Mountain" in "Rattlesnake Gulch." This laboratory was reportedly used to prepare training "sources" of Cobalt-60 ($Co^{60}$) and Cesium-137 ($Cs^{137}$). The laboratory compound was reportedly 140-ft long x 80-ft wide and was enclosed in a barbed-wire fence with warning signs. Information gathered from previous reports on the area is unclear as to the exact location of the former laboratory site; however, historical aerial photographs show a rectangular area on the northwest side of Iron Mountain that roughly corresponds to the

reported size of the laboratory compound. At some point in the late 1960s the laboratory building was demolished, the barbed wire fencing was removed, and the debris was evidently deposited in a waste disposal area further east and higher up on Iron Mountain. In 1971, a radiation survey was conducted on Iron Mountain and 22 contaminated spots were identified on the ground surface. In the summer of 1971, five containers of radioactive $Co^{60}$ and $Cs^{137}$ waste and eighteen 55-gallon drums of contaminated soils were removed from an area approximately 400 ft southeast of the former laboratory site and were reportedly taken to Pelham Range for disposal. Anecdotal information indicates that building debris (i.e., concrete blocks and fencing) was included in the debris removed. The removal area was cleared for surface military use by the Fort McClellan Health Physics Office; however, no official closeout survey was found in the records. In 1974, approximately 185 acres (which included the former "Rattlesnake Gulch" laboratory site) were deeded as a public park to the City of Anniston. This acreage was subsequently named the John B. LaGarde Interpretive Park.

In order to terminate the Chemical School Radiation License as part of the BRAC proceedings, the Nuclear Regulatory Commission (NRC) required assurances that no radioactive material was left behind. The Army performed an aerial survey in October 2001 that indicated the presence of a radioactive "hot spot" about 100 ft outside Fort McClellan's fence line on property formerly occupied by the training site, but now within the boundaries of LaGarde Park. On February 5, 2002, a team consisting of the Chemical School's radiation protection officer, the NRC, the Alabama Department of Public Health Radiation Office, and the U.S. Environmental Protection Agency visited the "hot spot" identified by the aerial survey to measure the radiation and determine the area involved. The area of investigation measured approximately 100 ft x 100 ft. The Alabama Department of Public Health representative took soil samples and tree root samples for further analysis. This analysis showed the presence of $Co^{60}$ and $Cs^{137}$. The team reported that the dose rates did not present an external hazard, but that digging or removal of vegetation from the area should not be allowed. Because this property was transferred to the City in the mid-1970s, the Army classified the site as a Formerly Utilized Defense Site. The USACE Mobile District took action in 2002 under the authority of the Defense Environmental Restoration Program/Formerly Utilized Defense Sites and installed fencing around the site to prevent access to the area.

On February 24 and 25, 2003, STEP performed a site investigation at several small areas at LaGarde Park. This site investigation included a surficial site survey, surface and subsurface soil sampling, and vegetation sampling of areas identified with radiological contamination. The area in and around the fence at LaGarde Park (Areas 1, 2, and 3) and the small area near the Lenlock Community Center (Area 4) were investigated.

Based on the results of the investigation, Areas 2, 3, and 4 did not have concentrations of $Cs^{137}$ and $Co^{60}$ exceeding the NRC screening limits; however, $Cs^{137}$ concentrations above the NRC screening levels were found in a relatively small area inside the fence at Area 1. Based on the findings of the investigation, the removal of the $Cs^{137}$ contaminated soils and associated vegetation was recommended. The report also recommended additional soil sampling and screening to further define the extent of soil contamination requiring removal.

In September 2003, STEP mobilized to the site to conduct a Comprehensive Environmental Response, Compensation, and Liability Act, Time Critical Removal Action to excavate and dispose of the $Cs^{137}$ contaminated soil and debris located at the site. The full details of the removal action are contained in *Final Report for Removal Action at LaGarde Park* (STEP, May 2004). Based on the site investigation, the estimated volume of contaminated soil to be removed was approximately 30 $yd^3$. As the removal action progressed, some of the areas had radiation counts that were higher below the ground than at the surface. The native soil at the site is silty clay with weathered limestone fragments; however, a sandy material that did not appear to be natural to the area was observed in several excavations. In addition, concrete blocks, barbed wire fencing, fence posts, metal pipes, and a crushed and rusted metal drum containing empty glass vials were found in the area. Excavation continued until the available project funding for removal and disposal was expended. During this removal action, a total of 170 $yd^3$ of contaminated soil was removed and shipped off site for disposal. The presence of radioactive contamination beneath the ground surface and the greater than expected lateral extent of contamination indicated that the conceptual model of discreet surface radiation sources was inaccurate. Therefore, based on the greater than expected volume of contaminated material, the presence of radioactive contamination at depth, and the possibility that this site corresponded to the former "Rattlesnake Gulch" laboratory site, an ESI was recommended to fully define the lateral and vertical extent of the contamination. The new site conceptual model is that the residual radioactive material was left when the former "Rattlesnake Gulch" laboratory building was removed prior to 1971.

**Expanded Site Investigation**

STEP personnel mobilized to the site on July 12, 2004, to conduct field activities for the ESI that included:

- conducting a surficial site radiation survey,
- establishing a regular grid array over the site,
- surface soil sampling,
- subsurface soil sampling, and

- downhole (subsurface) radiation screening.

## Surficial Radiation Survey

Both of the isotopes of concern at the site (i.e., $Co^{60}$ and $Cs^{137}$) emit gamma radiation. Therefore, a site surficial radiation survey was performed to detect gamma radiation within the fenced area and in an area outside of the fence. The surficial radiological survey was performed by the Environmental Restoration Group, Inc. of Albuquerque, New Mexico, using a Global Positioning System (GPS) coupled to radiological instrumentation. The walk-over gamma survey was performed to identify any areas of the site that had elevated gamma emission rates. The GPS-based radiological data survey system consisted of a Ludlum Model 2221 ratemeter/scaler with a Ludlum Model 44-10 2-inch by 2-inch sodium iodide (NaI) detector coupled to Trimble Pro XRS mapping grade GPS. The Ludlum Model 2221s were operated in ratemeter mode allowing for a coordinate tagged with a corresponding gamma count rate to be collected at 1-second intervals. The unit was carried in a backpack, with the detector held approximately 18 inches above the ground surface, across the survey areas at a pace of approximately 1 meter per second. After each survey the field data was downloaded into a laptop computer and processed on site using a combination of Trimble Pathfinder Office and ESRI ArcView Geographic Information System computer applications. The surface background gamma count rate for the site was determined to be approximately 7,000 counts per minute (cpm). The 10,760 gamma readings collected during the survey ranged from 4,936 cpm to 14,021 cpm with a site mean of approximately 7,200 cpm and a standard deviation of approximately 1,200 cpm.

The surficial radiological survey identified an area roughly 65 feet by 95 feet in the western end of the fenced area that exceeded 9,900 cpm. This area corresponds to the location of the former "Rattlesnake Gulch" laboratory.

## Soil Sampling

A regular grid array, with grid nodes spaced at 25-foot intervals, was established over each area. The grid for Area 1 was established by measuring 40 feet west from the Fort McClellan boundary fence and 5 feet from the north boundary fence. The grid lines were established at 25-foot intervals, with the east-west oriented lines indicated by numbers and the north-south oriented lines indicated by letters. The grid nodes were marked with polyvinylchloride (PVC) pin-flags and labeled. The array for Area 1 consisted of 35 nodes (i.e., 5 east-west lines designated 1 through 5, and 7 north-south lines designated A through G).

The initial point for the grid array for Area 5 was established 40 feet from the post on the northwest corner of the Area 1 boundary fence on a bearing of 350 degrees. The grid was established at an orientation of 15 degrees west of north. This corresponded to the orientation of the rectangular disturbed area on the aerial photographs. The grid lines were established at 25-foot intervals, with the southwest-northeast oriented lines indicated by numbers and the southeast-northwest oriented lines indicated by letters. The grid nodes were marked with PVC pin-flags and labeled. The array for Area 5 consisted of 42 nodes (i.e., 7 southwest-northeast lines designated 1 through 7, and 6 southeast-northwest lines designated A through F).
Surface and subsurface soil samples were collected at selected grid nodes to determine the extent of surface and subsurface radiological contamination. Soil borings were installed using a track mounted Geoprobe drilling unit. During the advancement of the boring, a continuous soil core was collected at each sampling location using a soil sampling tube with plastic liners. The core was retrieved in 4-foot intervals to geoprobe refusal or to a maximum total depth of 20 feet below ground surface (bgs). The soil core was scanned using a Ludlum Model 44-10 gamma scintillater probe. No elevated readings were observed in the scan of any of the soil cores. Soil samples for laboratory analyses were collected at the surface in each boring and a biased soil sample was collected at the corresponding depth in each boring where the highest gamma measurement was recorded in the downhole radiation scan. If the gamma measurements along the boring were uniform, then a soil sample was collected at the bottom of the hole.

Laboratory analyses consisted of isotopic analyses for $Cs^{137}$ and $Co^{60}$ only. All the samples were submitted to General Engineering Laboratories (GEL) of Charleston, South Carolina, for analyses. The analytical packages provided by GEL were subjected to third party data validation to confirm that all method procedures had been properly completed and to verify that data were of acceptable quality for use.

Soil samples were collected at 34 of the 35 grid nodes in Area 1. The boring at grid node LPA1N2A had to be abandoned due to the loss of the downhole magnetometer in the boring. Three additional sampling locations (LPA1SB1, LPA1SB2, and LPA1SB3) were selected to provide information for determining the volume of contaminated soil possibly requiring removal. The additional soil borings were installed surrounding the area where a confirmatory sample (LPRA-16) from the removal action, had indicated $Cs^{137}$ concentrations of potential concern remained at depth.

Soil samples were collected at 14 of the 42 grid nodes in Area 5. Four grid nodes were selected to cover the corners of the array and ten grid nodes were selected in the center of the array.

## Derived Concentration Guidelines Levels

The material from the Rattlesnake Gulch laboratory was reportedly transported to the burial mound at Rideout Field, Pelham Range, Area 24C at Fort McClellan for disposal. Derived Cleanup Guideline Levels (DCGLs) were developed during the remediation and decommissioning process for the Pelham Range Burial Mound [*Burial Mound Decommissioning Plan, Appendix 6 – Development of Derived Cleanup Guidelines for the Pelham Range "Burial Mound"*, Allied Technology Group, (September 1999)]. The DCGL process evaluated receptor exposures for different land-use scenarios. The land use scenario that was judged to produce the greatest exposure potential was the residential scenario with backyard garden and cow. This scenario was used to evaluate the exposures from unrestricted release at the site. The soil concentrations that would not exceed the 25 millirem per year allowable exposure limit for $Co^{60}$ and $Cs^{137}$ were found to be:

- 2.3 picoCuries per gram (pCi/g) for $Co^{60}$ (Resulting Risk $6 \times 10^{-5}$) and
- 9.2 pCi/g for $Cs^{137}$ (Resulting Risk $9 \times 10^{-5}$).

Because the contaminants were identical and the same exposure scenario applied to both sites, the DCGLs developed for the Pelham Range Burial Mound, were selected for the purposes of evaluating the soil concentrations at the LaGarde Park site. The analytical results for the soil samples collected at the LaGarde Park site were compared to the DCGLs of 9.2 pCi/g for $Cs^{137}$ and 2.3 pCi/g for $Co^{60}$. None of the soil samples in either area of LaGarde Park had concentrations exceeding the corresponding DCGLs for $Cs^{137}$ or $Co^{60}$.

## Downhole Radiation Survey

Upon reaching total depth in each boring, a 3.25-inch diameter temporary casing was driven to total depth or geoprobe refusal and then removed. A downhole radiation scan was then performed in each borehole. The scan was performed using a Ludlum Model 2221 meter attached to a Ludlum Model 44-2 (with 1-inch diameter NaI detector) gamma scintillater probe with a 22-ft cable. The probe and cable were attached to a 20-ft length of 1-inch diameter PVC pipe and inserted in the borehole. Gamma radiation was measured in 1-ft intervals in each borehole from the ground surface to the maximum depth accessible with the probe assembly. In some cases the borehole collapsed before downhole measurements could be completed. The gamma emission rate varied at different depths in many of the holes.

A gamma spectrum was collected at the depth exhibiting the highest gross gamma count to provide a real time determination of the nature of any elevated measurements observed in the borehole. "Elevated measurements" were defined as elevated count rates as compared to other depths in the same hole or when compared to nearby holes. Eleven spectra were collected from ten boreholes. Visual analysis of the spectra in the field did not reveal the presence of the characteristic 662 kiloelectron volt (keV) peak for $Cs^{137}$, nor the 1,173 or 1,332 keV peaks that would identify $Co^{60}$. The spectra were subsequently analyzed mathematically by capturing the gross counts in a region of interest that corresponded to the 662 keV peak for $Cs^{137}$. The background was subtracted from the counts in the region of interest to calculate the net counts in the region. No discernible activity indicating the presence of $Cs^{137}$ could be identified in these spectra.

The minimum detectable concentration (MDC) for $Cs^{137}$ during the subsurface scan was 2.7 pCi/g based on using the Ludlum Model 44-2 in fixed count mode. The maximum detected concentration of $Cs^{137}$ detected in laboratory analyses of the surface soil samples (0-1 ft) was 3.29 pCi/g (0-1 ft, boring SB-03 in Area 1). The maximum detected concentration of $Cs^{137}$ in the subsurface soil samples was 0.105 pCi/g (3-4 ft, boring 3G in Area 1). The maximum concentration of $Cs^{137}$ detected in the downhole soil samples is less than the MDC calculated for the downhole radiation scan; therefore, the elevated downhole gamma measurements are most likely attributable to naturally occurring sources.

Examining the raw data curves provided by the laboratory and comparing them to the incremental gamma log of the boreholes indicates that the elevated gamma readings tended to occur when Radium-226 and or Radium-228 were above 1 pCi/g. This would explain why elevated gamma measurements were encountered downhole, but no concentrations of $Cs^{137}$ in excess of 0.105 pCi/g were detected in the subsurface soil samples. In other words, the elevated gamma measurements encountered downhole were attributable to naturally occurring sources.

Based on the results of the surface radiation scan and surface soil analytical results, the initial removal action was successful in reducing the overall surface concentrations of $Co^{60}$ and $Cs^{137}$ below the corresponding DCGLs. No further action is proposed for the surface soils at the site.

**Conclusions and Recommendations**

Based on the results of the confirmatory samples collected during the removal action, and the subsurface soil samples and downhole radiation scans conducted during the ESI, it appears that only two areas of subsurface

contamination remain. These two areas are isolated and relatively small in dimension. STEP proposes that an additional removal action be conducted in these two areas.

The first area, centered between grid nodes LPA1N3E and LPA1N3F, corresponds to the location of confirmatory soil sample LPRA18 (40.3 pCi/g $Cs^{137}$) from the initial removal action. This area encompasses roughly 10 feet x 10 feet to a maximum depth of 6 feet bgs.

The second area, centered on grid node LPA1N4E, corresponds to the location of confirmatory soil sample LPRA16 (113 pCi/g $Cs^{137}$) from the initial removal action. This area encompasses roughly 10 feet x 10 feet to a maximum depth of 12 to 15 feet bgs.

All soils removed from the excavations should be spread on the ground surface adjacent to the excavations and field scanned with radiation detection instruments. Any soils that have field measurements indicating the concentration of $Cs^{137}$ is less than the DCGLs will be stockpiled on site for use as backfill. Soils that have field measurements indicating the concentration of $Cs^{137}$ is greater than the DCGLs should be placed in low level radiation waste (LLRW) boxes for off-site disposal.

The base and sidewalls of the excavations should also be screened for radiation. Excavation should continue until the field screening radiation levels in the excavations indicate concentrations of $Cs^{137}$ are less than the DCGLs. Based on these parameters, an estimated 45 $yd^3$ (approximately 15 LLRW boxes) of contaminated soil may require off-site disposal. Confirmatory soil samples should be collected for laboratory analyses from the base of the excavations when field screening indicates that all the contaminated soils have been removed.

# 1. INTRODUCTION

Solutions To Environmental Problems, Inc., (STEP) under contract with the U.S. Army Corps of Engineers (USACE), Mobile District (Contract DACA01-03-D-0010) has completed an expanded site investigation (ESI) at an area of LaGarde Park in Anniston, Alabama adjacent to the eastern portion of Fort McClellan. The ESI included a surficial site field screening survey, downhole field screening, and surface and subsurface soil sampling. The goal of the site investigation was to determine the lateral and vertical extent of radiological contamination at the site above federal and state guidelines.

# 2. PURPOSE

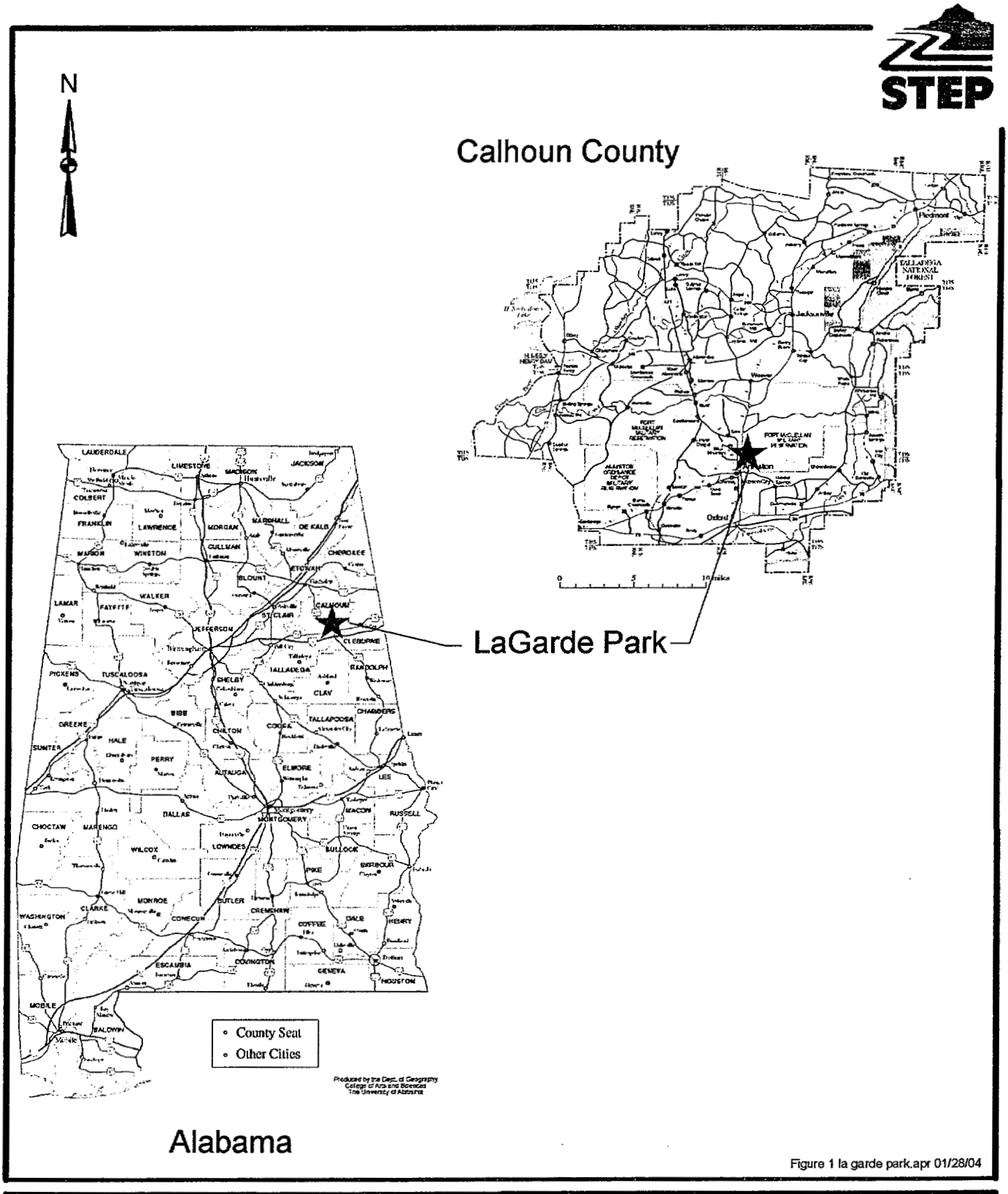
This completion report summarizes the results of previous investigations and removal actions at the site, describes the activities conducted during the field investigation for the ESI, presents the combined results of the radiation surveys and analyses of soil samples, and presents recommendations for future action.

# 3. BACKGROUND

Located in the southern foothills of the Appalachian Mountains, Fort McClellan is a former U.S. Army training base located just off Interstate 20 in Anniston, Alabama, approximately halfway between Birmingham, Alabama, and Atlanta, Georgia. LaGarde Park is located adjacent to Fort McClellan on the east side of Anniston. A location map is shown in Figure 3-1.

## 3.1 FACILITY HISTORY

In the 1950s the Department of Defense (DOD) decided to consolidate training for all branches of the military service. U.S. Army, Navy, Marine, and Air Force chemical officers and non-commissioned officers, military police, civilian law officers, and various government agencies were sent to Fort McClellan for training. The U.S. Army Chemical School was established at the facility and conducted radiation survey training for all aforementioned branches. Radioactive wastes that resulted from this training were ultimately buried on Fort McClellan property.




LEGEND

Site Location

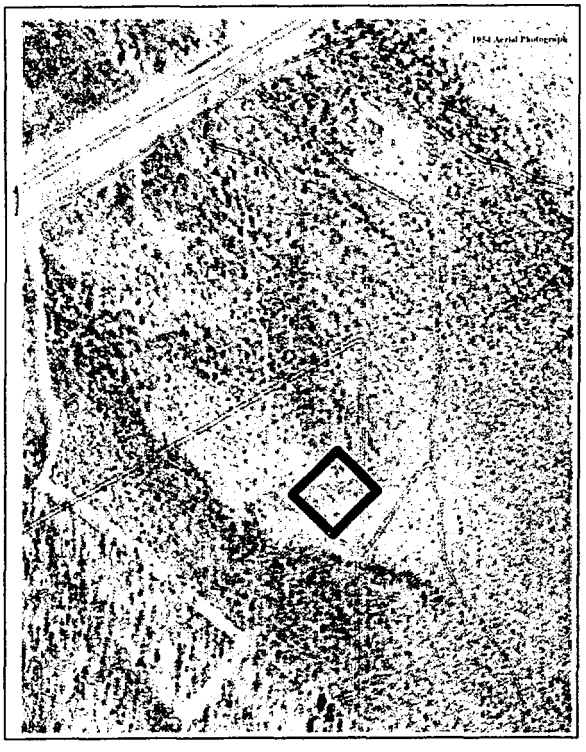
Source: University of Alabama
Prepared By: STEP, Inc. Oak Ridge, TN
Work Plan for Expanded
Site Investigation at LaGarde Park
Anniston, Alabama

Figure 1-1 LaGarde Park Location Map

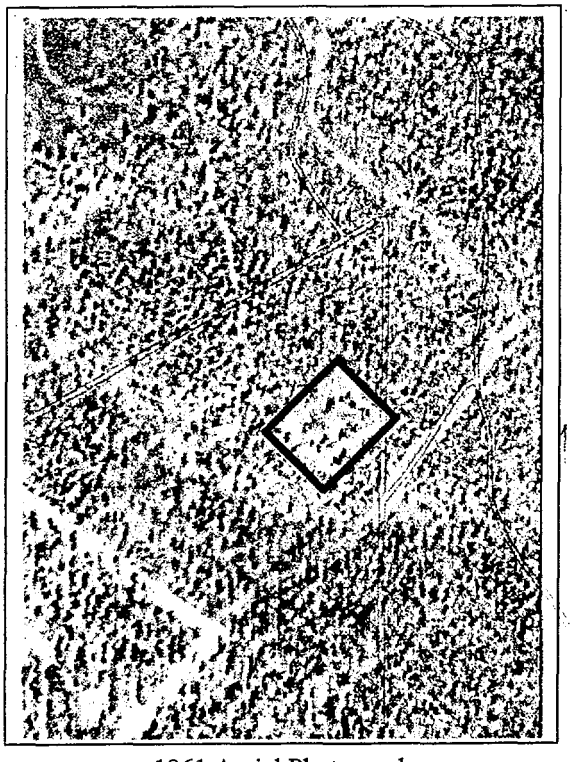
## 3.2 PREVIOUS INVESTIGATIONS

Interviews with personnel knowledgeable about operational and waste disposal activities at various sites at Fort McClellan indicated that radioactive wastes were deposited on Iron Mountain. It was reported that a laboratory building, consisting of cinder blocks and sand bags, was located on the "northwest side of Iron Mountain" in "Rattlesnake Gulch." This laboratory was reportedly used to prepare training "sources" of Cobalt-60 ($Co^{60}$) and Cesium-137 ($Cs^{137}$). The laboratory compound was purportedly 140-ft long by 80-ft wide and was enclosed in a barbed-wire fence with warning signs. Information gathered from previous reports on the area is unclear as to the exact location of the former laboratory site; however, historical aerial photographs show a rectangular area on the northwest side of Iron Mountain that roughly corresponds to the reported size of the laboratory compound. Figure 3-2 presents four aerial photographs of the same area of Iron Mountain from different years. The rectangular area does not appear in the photograph from 1954; however, in the 1961 and 1969 photographs, the area is clearly shown. By the time of the 1997 aerial photograph, the area is still slightly discernable but has become less prominent. The information gathered from previous reports in conjunction with the aerial photographs, indicates that this is the likely location of the former "Rattlesnake Gulch" laboratory. At some point in the late 1960s the laboratory building was demolished, the barbed wire fencing was removed, and the debris was evidently deposited in a waste disposal area further east and higher up on Iron Mountain. In 1971, a radiation survey was conducted on Iron Mountain and identified 22 contaminated spots on the ground surface. In the summer of 1971, five containers of radioactive $Co^{60}$ and $Cs^{137}$ waste and eighteen 55-gallon drums of contaminated soils were removed from an area approximately 400 feet southeast of the former laboratory site and reportedly taken to Pelham Range for disposal. Anecdotal information indicates that building debris (i.e., concrete blocks and fencing) was included in the debris removed. The removal area was cleared for surface military use by the Fort McClellan Health Physics Office; however, no official closeout survey was found in the records (*Final Environmental Baseline Survey, Fort McClellan, Alabama*, U.S. Army Environmental Center, January 1998).

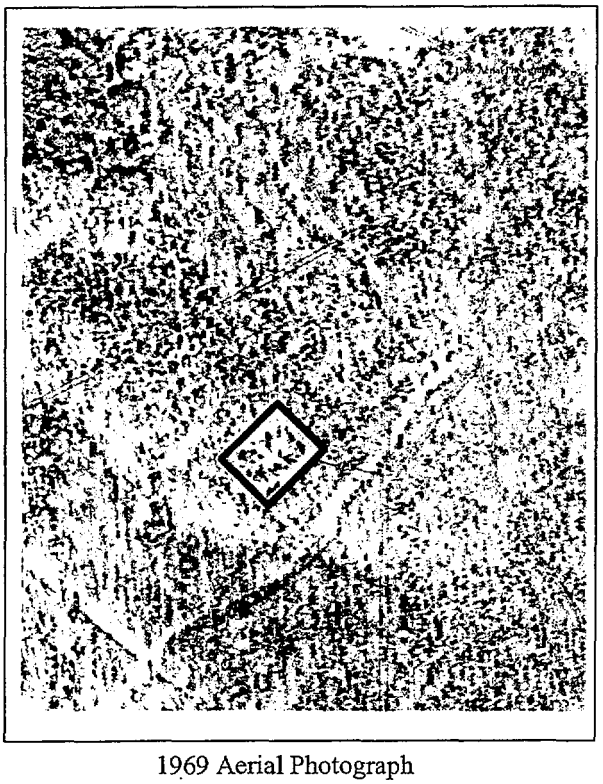
In 1974, approximately 185 acres, which included the former "Rattlesnake Gulch" laboratory site, were deeded as a public park to the City of Anniston. This acreage was subsequently named the John B. LaGarde Interpretive Park.



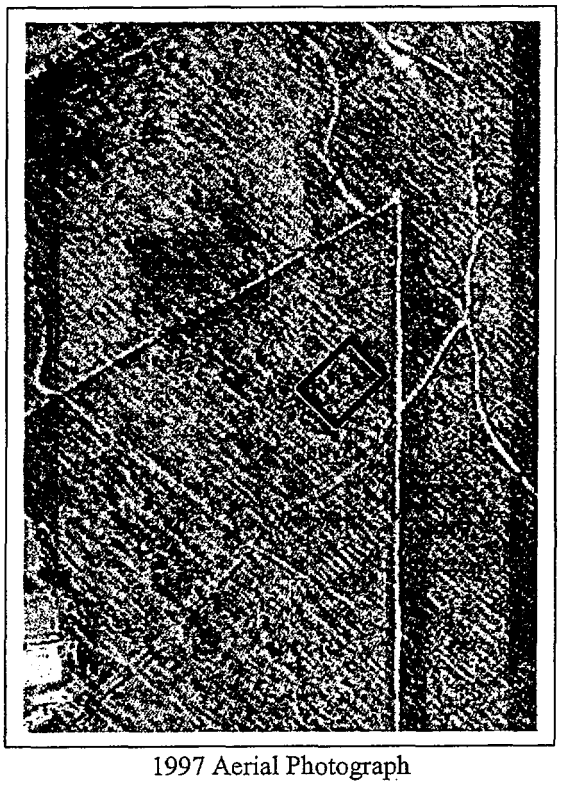

1954 Aerial Photograph



1961 Aerial Photograph



1969 Aerial Photograph



1997 Aerial Photograph

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◇ Possible "Rattlesnake Gulch" Laboratory Location

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Job Title: Expanded Site Investigation
LaGarde Parke, Anniston Alabama

Figure 3-2 LaGarde Park Aerial Photographs

In 1995, the Base Realignment and Closure Commission (BRAC) voted to permanently close Fort McClellan. The DOD closed the base in October 1999, making 45,000 acres, building facilities, and fully infrastructured property available for private sector reuse and redevelopment. At the time of closure, Fort McClellan was home to the U.S. Army Chemical School, the U.S. Army Military Police School, the Training Brigade, and the Department of Defense Polygraph Institute.

In order to terminate the Chemical School Radiation License as part of the BRAC proceedings, the Nuclear Regulatory Commission (NRC) required assurances that no radioactive material was left behind. In October 2001, the Army performed an aerial survey that indicated the presence of a radioactive "hot spot" about 100 ft outside Fort McClellan's fence line on property formerly occupied by the training site, but now within the boundaries of LaGarde Park. No immediate connection was made between this "hot spot" and the former location of the "Rattlesnake Gulch" laboratory.

On February 5, 2002, a team consisting of the Chemical School's radiation protection officer, the NRC, the Alabama Department of Public Health Radiation Office, and the U.S. Environmental Protection Agency (EPA) visited the "hot spot" to measure the radiation and determine the area involved. The area of investigation measured approximately 100 ft x 100 ft. The Alabama Department of Public Health representative took soil samples and tree root samples for further analysis. This analysis showed the presence of $Co^{60}$ and $Cs^{137}$. The team reported that the dose rates did not present an external hazard, but that digging or removal of vegetation from the area should not be allowed.

Because this property was transferred to the City of Anniston in the mid-1970s, the Army classified the site as a Formerly Utilized Defense Site (FUDS). The USACE is responsible for executing the FUDS program; therefore, the USACE Mobile District took action in 2002 under the authority of the Defense Environmental Restoration Program/Formerly Utilized Defense Sites and installed fencing around the site to prevent access to the area.

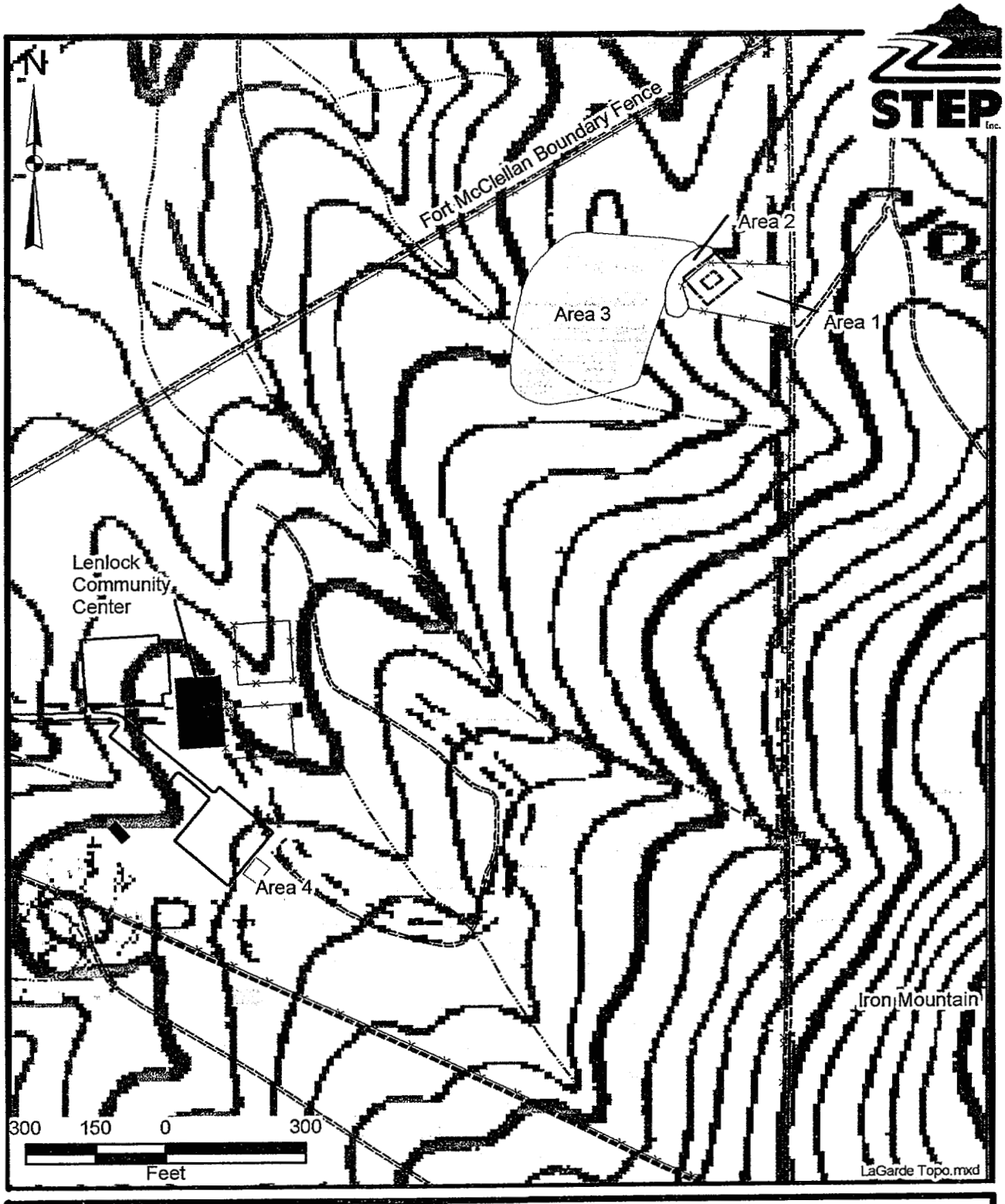
On February 24 and 25, 2003, STEP performed a site investigation at several small areas at LaGarde Park. This site investigation included a surficial site survey, surface and subsurface soil sampling, and vegetation sampling of areas identified with radiological contamination. The area in and around the fence at LaGarde Park (Areas 1, 2, and 3) and the small area near the Lenlock Community Center (Area 4) were investigated. Laboratory analyses of samples collected during this investigation consisted of gross

alpha/beta and isotopic analyses for cesium, cobalt, thorium, uranium, and the toxicity characteristic leaching procedure (TCLP). Figure 3-3 is a site map showing the areas included in the investigation.

The site conceptual model for the investigation was that radioactive "sources" had been left in the woods from training exercises during the 1950s and had been identified by the flyover survey. A site surface walkover survey was performed for the fenced area (Area 1), the area of disturbed soil outside of the fenced area (Area 2), the area along drainage paths downgradient of the fenced area (Area 3), and at a small area near the parking lot of the Lenlock Community Center (Area 4). The surficial survey identified 20 locations where readings were greater than twice the background count of 6,040 counts per minute (cpm). Eighteen of the locations (R1 to R18) were within Area 1, one location (R20) was within Area 3, and one location (R22) was within Area 4. Figure 3-4 presents the locations and field screening readings collected during the surface survey.

Following the survey, confirmatory soil sampling was performed to determine the nature and extent of the contamination and to collect data to support the evaluation of remedial alternatives. Surface soil samples were collected at three locations (R1, R2, and R9) with high screening level values to determine surface contamination. Subsurface soil samples were collected at 15 locations using a direct push technology sampler to a depth of 4 feet below ground surface (bgs). At each location, a continuous 4-foot core of soil was removed from the borehole and scanned for radioactivity. Samples for laboratory analyses were collected from the zone in each core that had the highest field screening reading. Figure 3-5 presents the location and concentration of radionuclides detected in the laboratory analyses. Nine subsurface samples were collected in Area 1 and one subsurface sample each was collected in Area 2, Area 3, and Area 4. Three subsurface soil samples (LGPBS01, LGPBS02, and LGPBS03) were collected outside the area of radioactive contamination defined by the surface screening, and were intended to establish background concentration in the soils not impacted by the site. For disposal purposes, TCLP analysis was performed on the soil samples, and the results indicated that the soil would not be classified as Resource Conservation and Recovery Act hazardous waste.

Five samples of plant material were collected from Area 1. The samples included three tree trunk tissue samples (near locations R1, R9, and R14) and two root samples (near locations R1 and R9). None of the tree bark samples exceeded the screening values. Only one root sample (LGPR1RO near R1) exceeded the screening level for $Cs^{137}$.



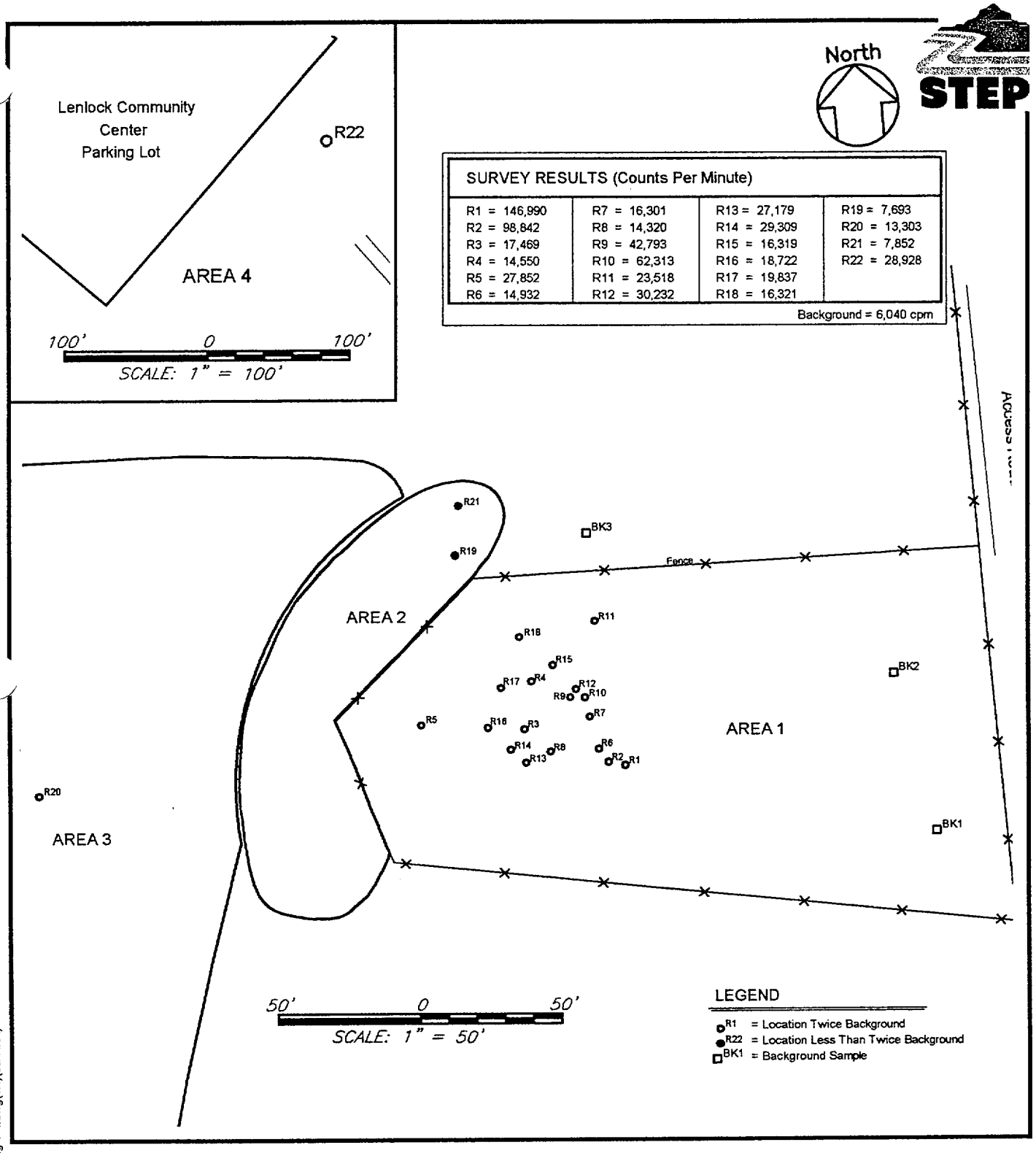

LEGEND

Areas of Investigation

Former Laboratory Location

Source: Alabama GIS, Site Survey
Job Title: Project Report Expanded Site Investigation at LaGarde Park
Anniston, Alabama

Figure 3-3 Previously Investigated Areas at LaGarde Park




Prepared For: USACE
Mobile District

Source: Site Survey
Job Title:Project Report Expanded
Site Investigation at LaGarde Park
Anniston, Alabama

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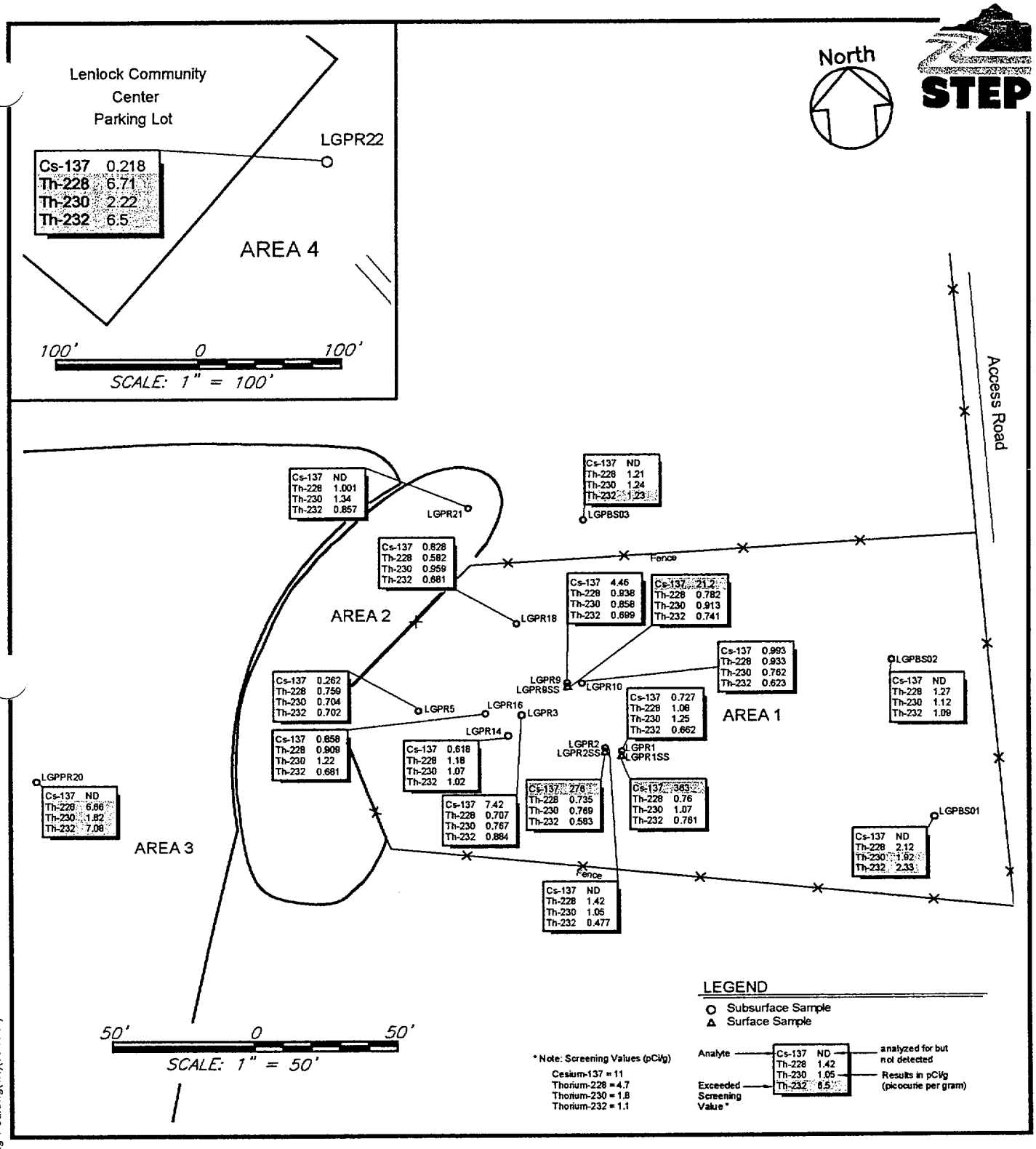
Figure 3-4 Field Screening Readings from Initial Site Investigation




Prepared For: USACE Mobile District

Source: Site Survey
Job Title: Project Report Expanded Site Investigation at LaGarde Park
Anniston, Alabama

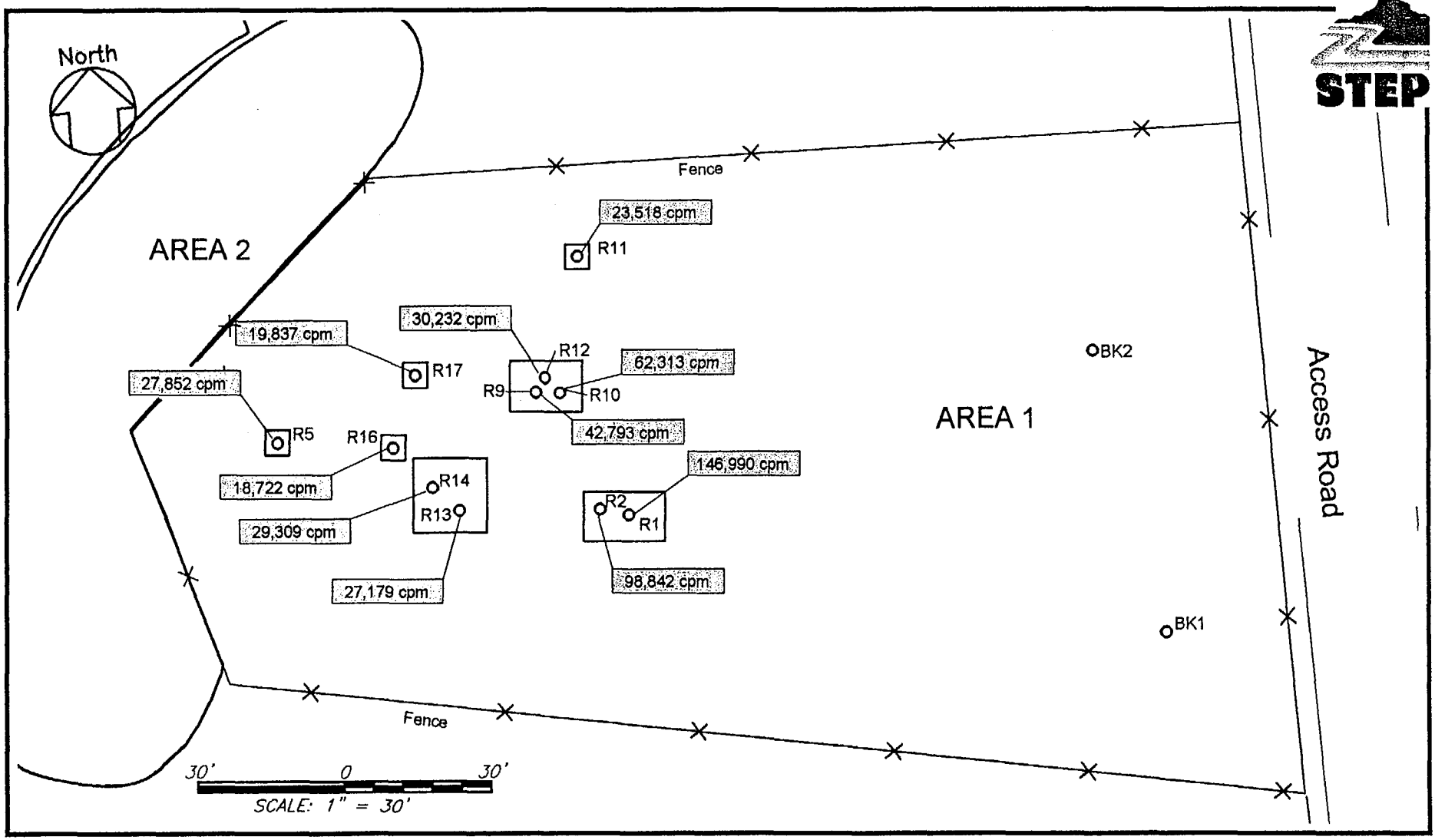
Figure 3-5 Radionuclides Detected During Initial Site Investigation

The data collected during the investigation indicated that $Cs^{137}$ contamination had not spread outside of the fence at Area 1, and the majority of $Cs^{137}$ was surficial in nature. $Cs^{137}$ was not detected above the NRC residential surface soil screening level (RSSSL) in any of the subsurface direct push samples. Thorium isotopes were detected above the NRC RSSSL in the sample collected next to the Lenlock Community Center parking lot and in one location outside of Area 1. Thorium isotopes were also detected above the NRC RSSSLs in two of the three background samples; however, based on information provided from other areas at Fort McClellan and Pelham Range, the presence of the thorium isotopes was evaluated as naturally occurring and appeared to be unrelated to the $Cs^{137}$ contamination from activities at the LaGarde Park site.

The results of the investigation indicated that Areas 2, 3, and 4 did not have concentrations of $Cs^{137}$ or $Co^{60}$ exceeding the NRC RSSSLs; however, $Cs^{137}$ was detected at concentrations above regulatory screening levels in the soil samples from a relatively small area inside the fence at Area 1. Based on this evaluation, the removal of the $Cs^{137}$ contaminated soils and associated vegetation followed by additional soil sampling and screening to fully define the extent of soil contamination was recommended.

In September 2003, STEP mobilized to the site to conduct a Comprehensive Environmental Response, Compensation, and Liability Act, Time Critical Removal Action to excavate and dispose of the $Cs^{137}$ contaminated soil and debris located at the site. For the removal action, contaminated areas exceeding the NRC RSSSLs and areas three times the background radiation count of 6,040 cpm (i.e., greater than 18,000 cpm) were planned for removal. Figure 3-6 shows the location of field screening values exceeding the three times background count threshold and the areas proposed for excavation and removal. Based on the site investigation, the estimated volume of contaminated soil to be removed was approximately 30 cubic yards ($yd^3$).

Excavation began at areas that had exceeded screening values during the site investigation. As the soil removal progressed, the excavations were scanned with a gamma scintillation probe (Ludlum Model 44-10) and a Micro "R" meter (Ludlum Model 19). In each excavation, the plan was to continue soil removal until the radiation monitoring indicated a level less than three times the background count (i.e., 18,000 cpm). When the scan of the excavation indicated a reading less than the screening level, a confirmatory soil sample was to be collected from the area of the excavation with the highest remaining radioactivity.




## Legend

| | | |
|---|---|---|
| R5 | Area Proposed for Removal | |
| 27,852cpm | Field Radiation Survey | Note: Background Radiation at 6,040cpm |
| cpm | Counts Per Minute | |

Prepared For: USACE
Mobile District

Source: Site Survey
Job Title: Project Report Expanded
Site Investigation at LaGarde Park
Anniston, Alabama

Figure 3-6 Proposed Excavation Areas

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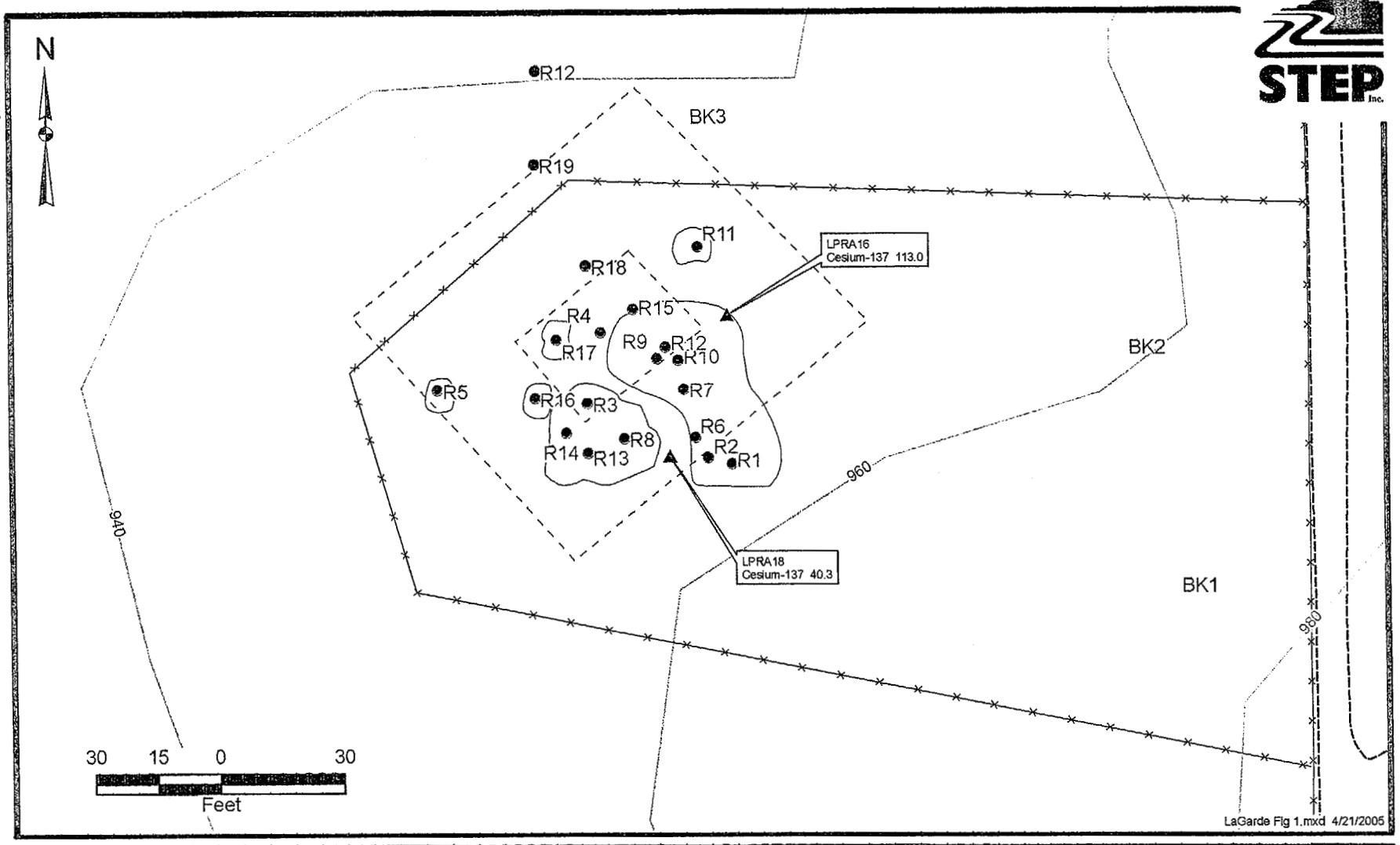
As the removal action progressed, some areas had radiation counts that were higher below the ground than at the surface. The native soil at the site is silty clay with weathered limestone fragments; however, a sandy material that did not appear to be natural to the area was observed in several of the excavations. In addition, concrete blocks, barbed wire fencing, fence posts, metal pipes, and a crushed and rusted metal drum containing empty glass vials were found buried in the area. The excavations continued until the available project funding for removal and disposal was expended. During this removal action, a total of 170 $yd^3$ of contaminated soil was removed and shipped off site for disposal. Field screening and soil sampling results indicated that residual contamination remained at the site, but was deeper and more widely spread than previously identified. Figure 3-7 shows the areas excavated during the removal action and the results of the laboratory analysis of confirmatory soil samples exceeding screening values.

The presence of radioactive contamination beneath the ground surface and the greater than expected lateral extent of contamination indicated that the conceptual model of discreet surface radiation sources was inaccurate. During the course of the removal action, further research by representatives of the USACE uncovered the historic aerial photographs and conversations with individuals familiar with the previous removal actions on Iron Mountain revealed that there was a possibility that greater volumes of radioactive material had been handled at the site than was previously suspected. Based on the greater than expected volume of contaminated material, the presence of radioactive contamination at depth, and the possibility that this site corresponded to the former "Rattlesnake Gulch" laboratory site, an ESI was recommended to fully define the lateral and vertical extent of the contamination. The new site conceptual model is that the residual radioactive material was left when the former "Rattlesnake Gulch" laboratory building was removed prior to 1971.

### 3.3 DERIVED CONCENTRATION GUIDELINE VALUES

The material removed from the Rattlesnake Gulch laboratory was reportedly transported to the burial mound at Rideout Field, Pelham Range, Area 24C at Fort McClellan for disposal. Derived Cleanup Guideline Levels (DCGLs) were developed during the remediation and decommissioning process for the Pelham Range Burial Mound [*Burial Mound Decommissioning Plan, Appendix 6 – Development of Derived Cleanup Guidelines for the Pelham Range "Burial Mound,"* Allied Technology Group, (September 1999)]. The DCGL process evaluated receptor exposures for different land-use scenarios.




LEGEND

- Soil Sample Location
- Former "Rattlesnake Gulch" Lab Location
- Area Removed
- Elevaton Contour Line
- Confirmatory Sample

Notes:
1. Results = pCi/g (picocurie per gram)
2. Screening value for Cesium-137 = 11pCi/g

Source: Site Survey
Job Title: Project Report Expanded Site Investigation at LaGarde Park Anniston, Alabama

Figure 3-7 Excavated Areas and Confirmatory Samples Exceeding Screening Values

The land use scenario that was judged to produce the greatest exposure potential was the residential scenario with backyard garden and cow. This scenario was used to evaluate the exposures from unrestricted release at the site.

The computer code RESRAD 5.82 (Argonne National Laboratory, 1993) was used to evaluate the potential dose and long term risk from the scenario activities to a resident adult and resident child. The soil concentrations that would not exceed the 25 millirem per year allowable exposure limit for $Co^{60}$ and $Cs^{137}$ were found to be:

- **Resident Adult –**
  - $Co^{60}$ 2.9 picoCuries per gram (pCi/g) (Resulting Risk $9 \times 10^{-5}$)
  - $Cs^{137}$ 12 pCi/g (Resulting Risk $3 \times 10^{-4}$)
- **Resident Child –**
  - $Co^{60}$ 2.3 pCi/g (Resulting Risk $6 \times 10^{-5}$)
  - $Cs^{137}$ 9.2 pCi/g (Resulting Risk $9 \times 10^{-5}$)

For the purposes of evaluating the soil concentrations at the LaGarde Park site, the more conservative values of 2.3 pCi/g for $Co^{60}$ and 9.2 pCi/g for $Cs^{137}$ developed for the Pelham Range Burial Mound, were selected as the DCGLs.

## 4. EXPANDED SITE INVESTIGATION FIELD ACTIVITIES

STEP personnel mobilized to the site on July 12, 2004, to conduct field activities for the ESI. The activities performed during the course of the ESI included:

- establishing a regular grid array over the site,
- conducting a surficial site radiation survey,
- surface soil sampling,
- subsurface soil sampling, and
- downhole (subsurface) radiation screening.

All field activities were coordinated with the USACE representative and with other appropriate entities. An unexploded ordnance (UXO) specialist provided by EOD Technologies, Inc. (EODT) of Lenoir City, Tennessee, was on site throughout the field effort and provided continuous coverage of field activities to

ensure that any potential UXO was avoided. A Schonstedt Magnetic Locator was used to locate subsurface anomalies that could be UXO.

During field operations, a radiological control technician (RCT) from Auxier and Associates of Knoxville, Tennessee, periodically screened personnel and equipment for elevated radiation readings. All personnel were issued personal dosimeters at the beginning of the field effort. The RCT retrieved the dosimeters whenever personnel left the site and at the end of each work day. The RCT redistributed the dosimeters at the beginning of each work day before personnel entered the site. The RCT tracked the dosimeters throughout the field effort and submitted them to Landauer, Inc. for analyses when the field effort was completed. The analyses of the personal dosimeters indicate two individuals received a radiation dose above the minimum detectable quantity of one milliroentgen equivalent man (mrem). The individuals received a dose of four mrem and one mrem, respectively. The collective "person- roentgen equivalent man" maximum allowable exposure for the project was 500 mrem (*Final Radiation Safety Plan*, STEP 2004). Field activities for the ESI were documented in the field logbook and by photographs of activities. Appendix A contains a copy of the field logbook and Appendix B contains photographs of the field effort.

## 4.1 DEVIATIONS FROM APPROVED PROJECT PLANS

In general, the field activities followed the approved project plans. The following sections detail the deviations from the plans as approved during the field activities.

### 4.1.1 Correction in Scale on Project Maps

During the development of the project plans for the ESI, aerial photographs were superimposed on topographic maps of the area; however, no surveyed data points were available for reference during the development of the project plans. Due to this lack of reference survey data points, an error in scale occurred that resulted in the rectangular disturbed area (the presumed "Rattlesnake Gulch" laboratory location) on the aerial photographs shown as being outside and to the north of Area 1. In the project plans, this rectangular area was designated Area 5, and the intent was to investigate the possibility of contamination in the area. The surface radiation survey conducted during the ESI provided global positioning system (GPS) coordinates that corresponded to the surface data points. When this survey information was plotted onto the topographic map and aerial photographs for the area, it was found that

the site was larger relative to the surrounding area, and the location of the disturbed area on the aerial photographs was mostly within the fenced perimeter of Area 1. The maps for this ESI report have been corrected for scale. Because of this, the area designated "Area 5" is actually located outside the perimeter of the presumed location of the laboratory.

### 4.1.2 Modification to Unexploded Ordnance Scanning Procedure

In accordance with the project plans, each location was scanned for magnetic anomalies by the UXO specialist before intrusive activities began. The *Unexploded Ordnance Avoidance Plan for the Site Investigation at LaGarde Park (*EODT, 2002) also called for magnetometer scanning in the borings at each 2-foot interval from surface to total depth. After consultation with the UXO specialist and the project team, this procedure was modified to:

- conducting a UXO surface scan,
- driving the soil sample probe to 4 ft bgs,
- scanning at the bottom of the 4-ft interval, and
- then proceeding with sampling to total depth.

The project team agreed that this would expedite the sampling process and still provide for sufficient protection from UXO.

### 4.1.3 Reduction in the Number of Grid Nodes to Sample in Area 5

On Friday, July 16, 2004, Mr. Rick Button (EPA), Mr. Terry Williams (Alabama Department of Environmental Management), and Mr. Jeffrey Devine (USACE) visited the site to observe field operations. After touring the site and examining the preliminary results of the surface radiation screening, the decision was reached to sample only five grid nodes in Area 5 based on the results of the surface radiation screening that showed no areas of radiation above the background levels. These nodes were to be selected in a cross pattern to include the four corners of the grid and one node at the center of the grid. The regulatory representatives and the USACE representative agreed that this would be acceptable. After further consultation with the USACE technical team, the USACE Project Manager directed STEP to increase the number of grid nodes to be sampled in Area 5 to a total of 14. The nodes selected included the four corners of the grid and ten additional nodes in and around the center of the grid.

## 4.2 SITE SURFICIAL SURVEY

Both isotopes of concern at the site, $Co^{60}$ and $Cs^{137}$, emit gamma radiation; therefore, a site surficial radiation survey was performed to detect gamma radiation within the fenced area at LaGarde Park (Area 1) and in an area outside of the fence (designated Area 5). The survey was performed on July 11 and 12, 2004, by a representative of the Environmental Restoration Group, Inc. The radiological survey was performed using a GPS coupled to radiological instrumentation.

### 4.2.1 Methodology

The walk-over gamma survey was performed to identify any areas of the site that had elevated gamma emission rates. The GPS-based radiological data survey system consisted of a Ludlum Model 2221 ratemeter/scaler with a Ludlum Model 44-10, 2-inch by 2-inch; sodium iodide (NaI) detector coupled to a Trimble Pro XRS mapping grade GPS. The Ludlum Model 2221s were operated in ratemeter mode allowing for a coordinate tagged with a corresponding gamma count rate to be collected at 1-second intervals. The unit was carried in a backpack, with the detector held approximately 18 inches above the ground surface, across the survey areas at a pace of approximately 1 meter per second. After each survey, the field data was downloaded into a laptop computer and processed on site using a combination of Trimble Pathfinder Office and ESRI ArcView Geographic Information System computer applications.

### 4.2.2 Quality Control

All radiological instrumentation was calibrated within a six month period prior to use using National Institute of Standards and Technology traceable sources and pulser. The instrumentation was also function checked at a designated background location before and after use each day. Function check forms and calibration sheets are included in Appendix C.

### 4.2.3 Results

The surface background gamma count rate for the site was determined to be approximately 7,000 cpm. The 10,760 gamma readings collected during the survey ranged from 4,936 cpm to 14,021 cpm with a site mean of approximately 7,200 cpm and a standard deviation of approximately 1,200 cpm. The minimum detectable concentration (MDC) for $Cs^{137}$ during the surface scan was calculated as 7.6 pCi/g based on using the Ludlum Model 44-10 in scan mode. Table 4-1 presents the calculations used to derive the

MDC. Figure 4-1 presents the location of the survey points. Figure 4-2 presents isocontours generated by the measurements. Figure 4-3 presents the areas where the surface scan detected a count rate greater than 10,000 cpm, indicating areas that could equal or exceed the DCGL of 9.2 pCi/g for $Cs^{137}$ or the 2.3 pCi/g DCGL for $Co^{60}$.

**Table 4-1 Minimum Detectable Concentration for Site Surface Survey Instrument**

| Variable Description | Variable | Value | Units | Equations and Comments |
|---|---|---|---|---|
| Background count rate per minute | Rmb | 7,000 | c/min | Nominal site background |
| Scanning speed | Sd | 1 | m/s | Typical detector scan speed |
| Time the source spends under detector during observation | Ts | 0.50 | s/o | ts = 2 x radius of detector (0.25 meters)/Sd |
| Conversion factor | CF1 | 0.017 | min/sec | Constant |
| Background counts | Rsb | 59.5 | c/o | Rsb = Rmb x ts x CF1 |
| Index of detectablility | d' | 1.38 | Unitless | Based on 95% false negative, 60% false positive, (Source: NUREG-1507*. Table 6.1) |
| Surveyor efficiency | Es | 0.5 | Unitless | Conservative assumption, typically ranges from 0.5 to 0.75 |
| Net Source Count Rate | Rns | 15 | c/o | Rns = d' x SQRT[Rsb] / SQRT[Es] (Source: NUREG-1507 Equation 6-8) |
| Minimum Detectable Net Count Rate | MDNCR | 1,800 | c/min | MDNCR = Rns x (60sec/min) / ts (Source: NUREG-1507, Equation 6-6) |
| Gross instrument response rate | Rigr | 8,800 | c/min | Rigr = Rmb + MDNCR |
| Detector response to $Cs^{137}$ | DR($Cs^{137}$) | 900 | c/min / µR/h | Ludlum, 44-10 specification sheet |
| Minimum detectable exposure rate | MDE | 2.0 | µR/h | MDE = MDNCR/ DR($Cs^{137}$) (Source: NUREG-1507, EQ 6-18) |
| Activity to exposure rate constant for $Cs^{137}$ | A2X | 3.8 | pCi/g/µR/h | A2X = 5(pCi $Cs^{137}$/gm soil) / 1.307(mR/h) (Source: NUREG-1507, Equation 6-19) |
| Scan Minimal Detectable Concentration for $Cs^{137}$ | MDC($Cs^{137}$) | 7.6 | pCi/g | MDC($Cs^{137}$) = MDE x A2X (Source: NUREG-1507, Equation 6-20) |

*NUREG-1507 = *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions* (NUREG-1507, NRC, June 1998)

c/min / µR/h = counts per minute per microRoentgen per hour
c/min = counts per minute
c/o = counts per observation
$Cs^{137}$ = Cesium - 137
m/s = meter per second
min/sec = minutes per second
pCi/g = picoCuries per gram
pCi/g/µR/h = picoCurie per gram per microRoentgen per hour
s/o = seconds per observation
µR/h = microRoentgen per hour

**Figure 4-1 Surface Radiation Survey Points**

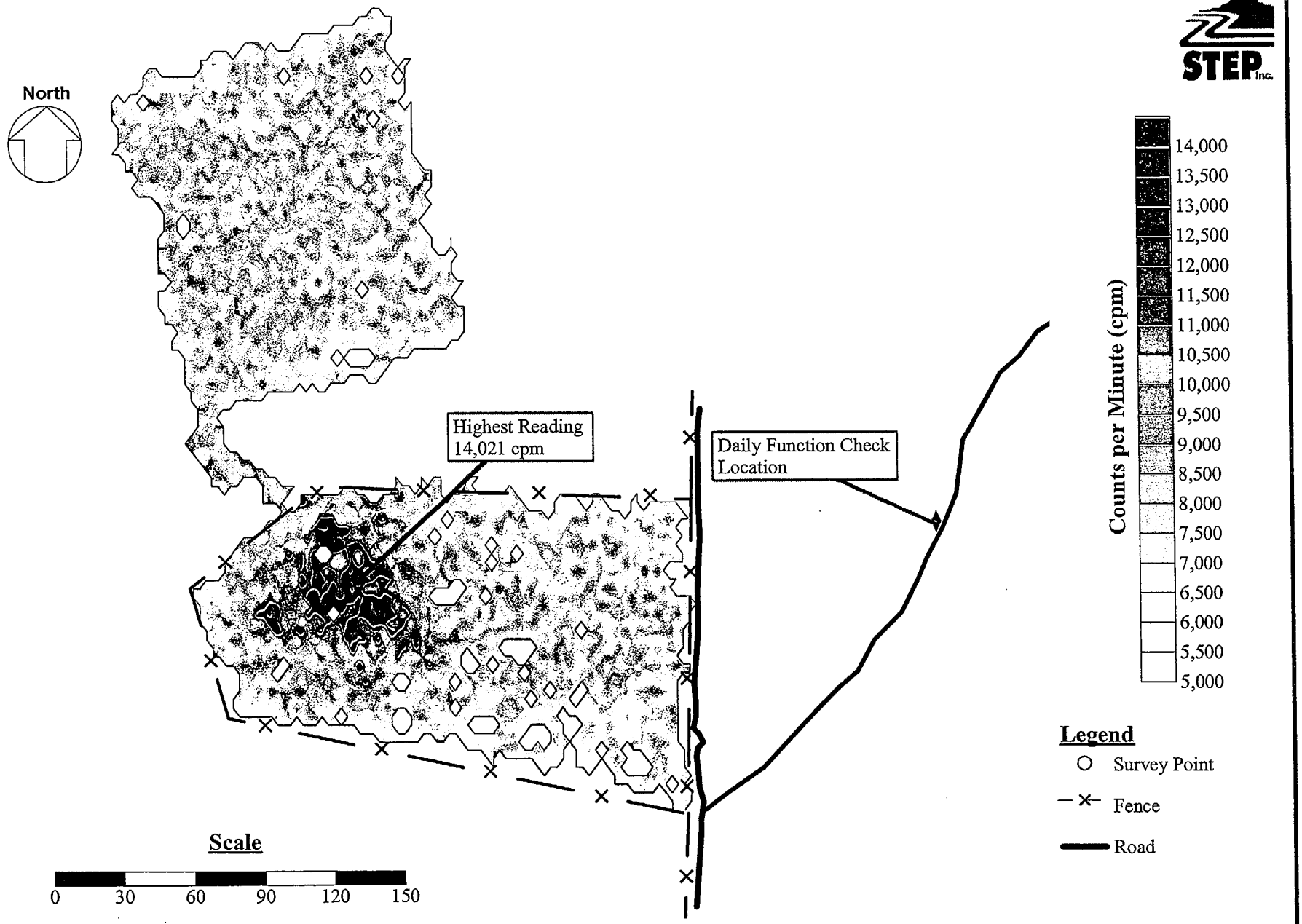
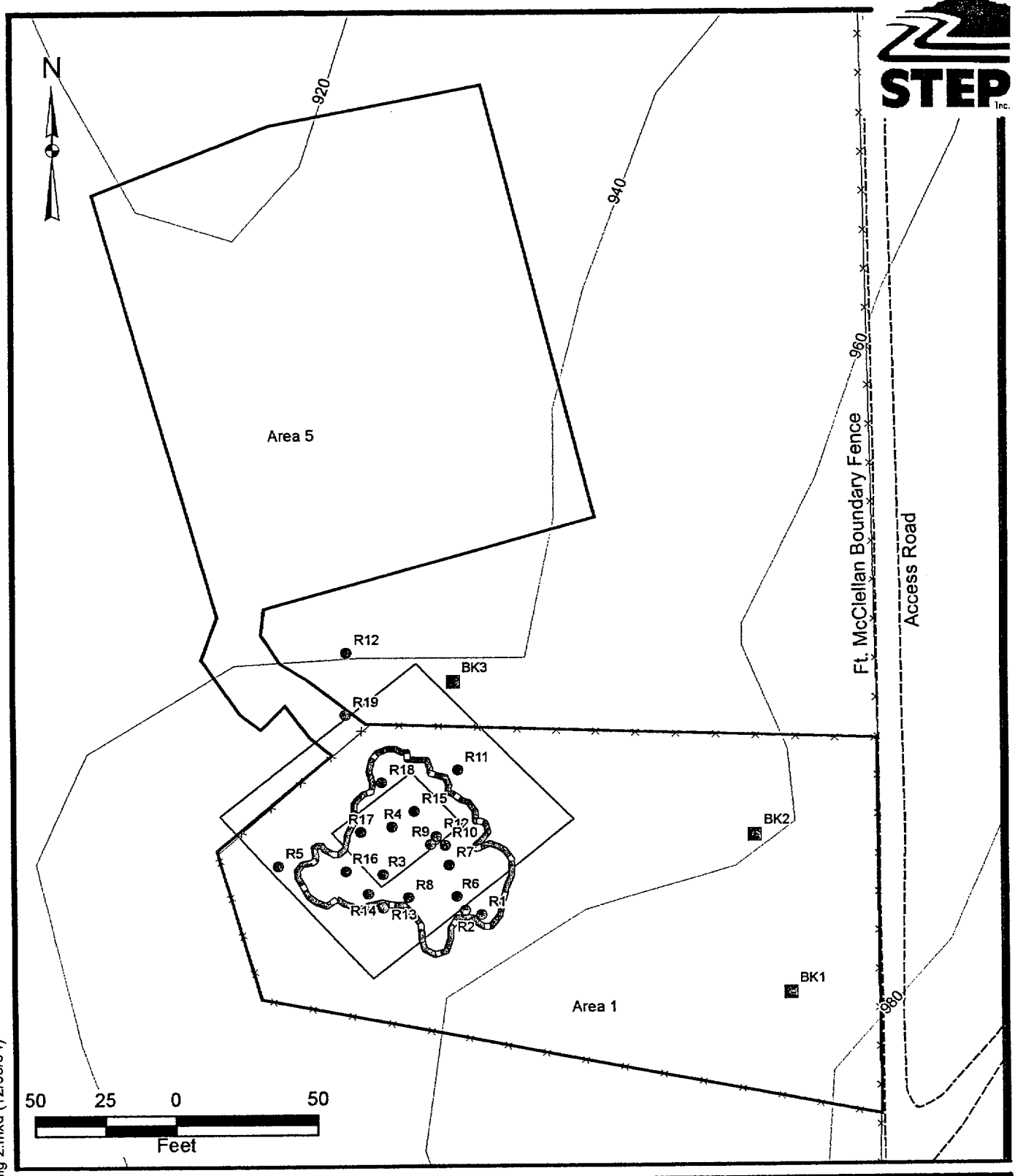



**Figure 4-2 Surface Radiation Survey Contours**




LEGEND

- Background Boring Location From Initial Site Investigation
- Sampling Location From Initial Site Investigation
- Area Greater Than 10,000 CPM on Surface Radiation Scan
- Former "Rattlesnake Gulch" Lab Location
- Elevaton Contour Line

Source: Site Survey
Job Title: Project Report Expanded Site Investigation at LaGarde Park Anniston, Alabama

Figure 4-3 Surface Radiation Survey Areas Potentially Exceeding the DCGLs

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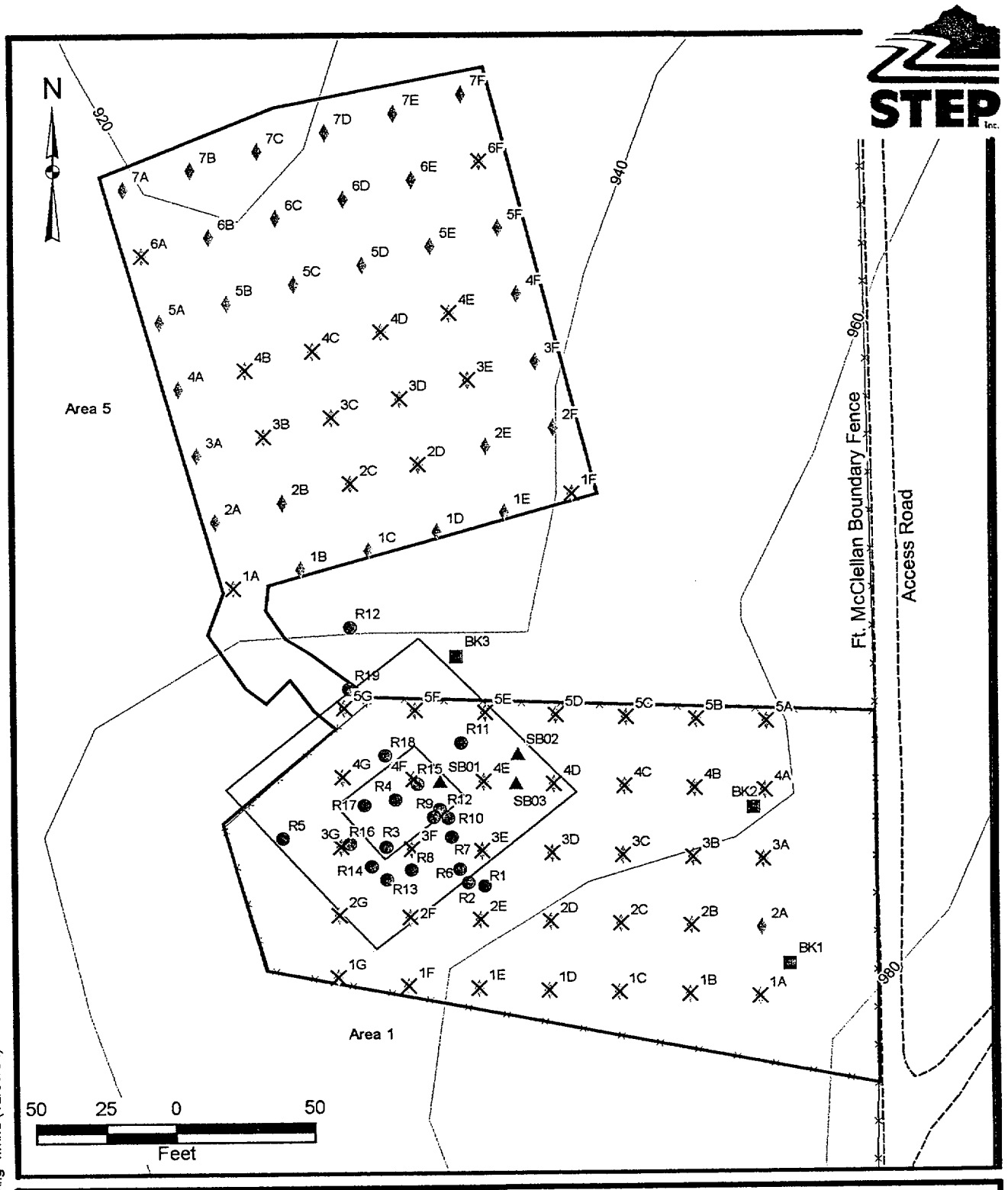
## 4.3 GRID ARRAY

A regular grid array with grid nodes spaced at 25-ft intervals was established over each area. The grid for Area 1 was established by measuring 40 ft west from the Fort McClellan boundary fence and 5 ft from the north boundary fence. The grid lines were established at 25-ft intervals with the east-west oriented lines indicated by numbers and the north-south oriented lines indicated by letters. The grid nodes were marked with polyvinyl chloride (PVC) pin-flags and labeled. The array for Area 1 consisted of 35 nodes (5 east-west lines designated 1 through 5, and 7 north-south lines designated A through G).

The initial point for the grid array for Area 5 was established 40 ft from the post on the northwest corner of the Area 1 boundary fence on a bearing of 350 degrees. The grid was established at an orientation of 15 degrees west of north. This corresponded to the orientation of the rectangular disturbed area on the aerial photographs. The grid lines were established at 25-ft intervals, with the southwest-northeast oriented lines indicated by numbers and the southeast-northwest oriented lines indicated by letters. The grid nodes were marked with PVC pin-flags and labeled. The array for Area 5 consisted of 42 nodes (7 southwest-northeast lines designated 1 through 7, and 6 southeast-northwest lines designated A through F). Figure 4-2 shows the arrangement of the grids and the corresponding grid node designations.

## 4.4 SOIL SAMPLING

Surface and subsurface soil samples were collected at selected grid nodes to determine the extent of surface and subsurface radiological contamination. Soil borings were installed using a track mounted Geoprobe drilling unit. During advancement of the boring, a continuous soil core was collected at each sampling location using a soil sampling tube with plastic liners. The core was retrieved in 4-ft intervals to geoprobe refusal or to a maximum total depth of 20 ft bgs. The soil core was scanned using a Ludlum Model 44-10 gamma scintillater probe. No elevated readings were observed in the scan of any of the soil cores. Soil samples for laboratory analyses were collected at the surface in each boring and a biased soil sample was collected at the corresponding depth in each boring where the highest gamma measurement was recorded in the downhole scan (as described in Section 4.5). If the gamma measurements along the boring were uniform, then a soil sample was collected at the bottom of the hole. Drilling logs for the borings are contained Appendix D.




LEGEND

- Background Boring Location From Initial Site Investigation
- Sampling Location From Initial Site Investigation
- Soil Sampling Location
- Soil Boring
- Grid Node
- Former "Rattlesnake Gulch" Lab Location
- Elevaton Contour Line

Source: Site Survey
Job Title: Project Report Expanded Site Investigation at LaGarde Park Anniston, Alabama

Figure 4-4 Soil Sample Grid Array

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Laboratory analyses consisted of isotopic analyses for cesium and cobalt. All the samples were submitted to General Engineering Laboratories (GEL) of Charleston, South Carolina, for analyses. The analytical packages provided by GEL were subjected to third party data validation to confirm that all method procedures had been properly completed and to verify that data were of acceptable quality for their intended use. The data validation report and laboratory analytical forms are contained in Appendix E.

### 4.4.1 Area 1 Soil Samples

Soil samples were collected at 34 of the 35 grid nodes in Area 1. The boring at grid node LPA1N2A had to be abandoned due to the loss of the downhole magnetometer in the boring. Three additional sampling locations (LPA1SB1, LPA1SB2, and LPA1SB3) were selected to provide information for determining the volume of contaminated soil possibly exceeding the DCGLs. The additional soil borings were installed surrounding the area where a confirmatory sample (LPRA-16) from the removal action, had indicated $Cs^{137}$ concentrations exceeding the DCGL remained at depth. Table 4-2 presents the concentrations of $Cs^{137}$ and $Co^{60}$ found in the soil samples from Area 1. None of the soil samples had concentrations exceeding the DCGLs of 9.2 pCi/g for $Cs^{137}$ or 2.3 pCi/g for $Co^{60}$. Figure 4-5 presents the location of the soil samples and the detectable concentrations of $Cs^{137}$ and $Co^{60}$.

### 4.4.2 Area 5 Soil Samples

Soil samples were collected at 14 of the 42 grid nodes in Area 5. Four grid nodes were selected to cover the corners of the array and ten grid nodes were selected in the center of the array. Table 4-3 presents the concentrations of $Cs^{137}$ found in the soil samples from Area 5. $Co^{60}$ was not detected in any of the Area 5 soil samples. None of the soil samples had concentrations exceeding the DCGLs of 9.2 pCi/g for $Cs^{137}$. Figure 4-6 presents the location of the soil samples and the detectable concentrations of $Cs^{137}$.

## Table 4-2 Area 1 Soil Analytical Results

| Area 1 Grid Node Location | Sample No. | Sample Depth (feet) | Cesium-137 (pCi/g) | | Cobalt-60 (pCi/g) | |
|---|---|---|---|---|---|---|
| 1A | LPA1N1A1 | 0-1 | 0.195 | | 0.00231 | U |
| | LPA1N1A1 DUP | 0-1 | 0.191 | | 0.00321 | U |
| | LPA1N1A2 | 10-11 | -0.0109 | U | -0.00228 | U |
| 3A | LPA1N3A1 | 0-1 | 0.0453 | U | 0.00562 | U |
| | LPA1N3A2 | 7-8 | 0.00844 | U | 0.0132 | U |
| 4A | LPA1N4A1 | 0-1 | 0.00 | U | 0.00553 | U |
| | LPA1N4A2 | 15-16 | -0.0147 | U | -0.00693 | U |
| 5A | LPA1N5A1 | 0-1 | 0.0221 | U | -0.0019 | U |
| | LPA1N5A2 | 14-15 | 0.000491 | U | -0.00233 | U |
| 1B | LPA1N1B1 | 0-1 | 0.0177 | U | 0.00456 | U |
| | LPA1N1B2 | 19-20 | 0.00192 | U | 0.0016 | U |
| 2B | LPA1N2B1 | 0-1 | 0.124 | | 0.00365 | U |
| | LPA1N2B2 | 10-11 | -0.00661 | U | -0.00543 | U |
| 3B | LPA1N3B1 | 0-1 | 0.0187 | U | 0.00814 | U |
| | LPA1N3B2 | 19-20 | -0.0262 | U | -0.00476 | U |
| 4B | LPA1N4B1 | 0-1 | 0.445 | | 0.000408 | U |
| | LPA1N4B2 | 19-20 | -0.000732 | U | 0.00966 | U |
| 5B | LPA1N5B1 | 0-1 | 0.00 | U | -0.00584 | U |
| | LPA1N5B2 | 14-15 | 0.00221 | U | -0.00251 | U |
| 1C | LPA1N1C1 | 0-1 | 0.0406 | | 0.020 | U |
| | LPA1N1C2 | 4-5 | 0.00485 | U | 0.0132 | U |
| 2C | LPA1N2C1 | 0-1 | -0.00285 | U | 0.00196 | U |
| | LPA1N2C1 DUP | 0-1 | 0.0329 | U | 0.007 | U |
| | LPA1N2C2 | 4-5 | -0.00519 | U | -0.00562 | U |
| 3C | LPA1N3C1 | 0-1 | 0.00 | U | -0.00452 | U |
| | LPA1N3C2 | 4-5 | -0.0277 | U | 0.00844 | U |
| 4C | LPA1N4C1 | 0-1 | 0.0482 | | -0.0127 | U |
| | LPA1N4C2 | 19-20 | -0.00311 | U | -0.00795 | U |
| 5C | LPA1N5C1 | 0-1 | 0.0975 | | 0.00476 | U |
| | LPA1N5C2 | 19-20 | 0.0102 | U | -0.000188 | U |

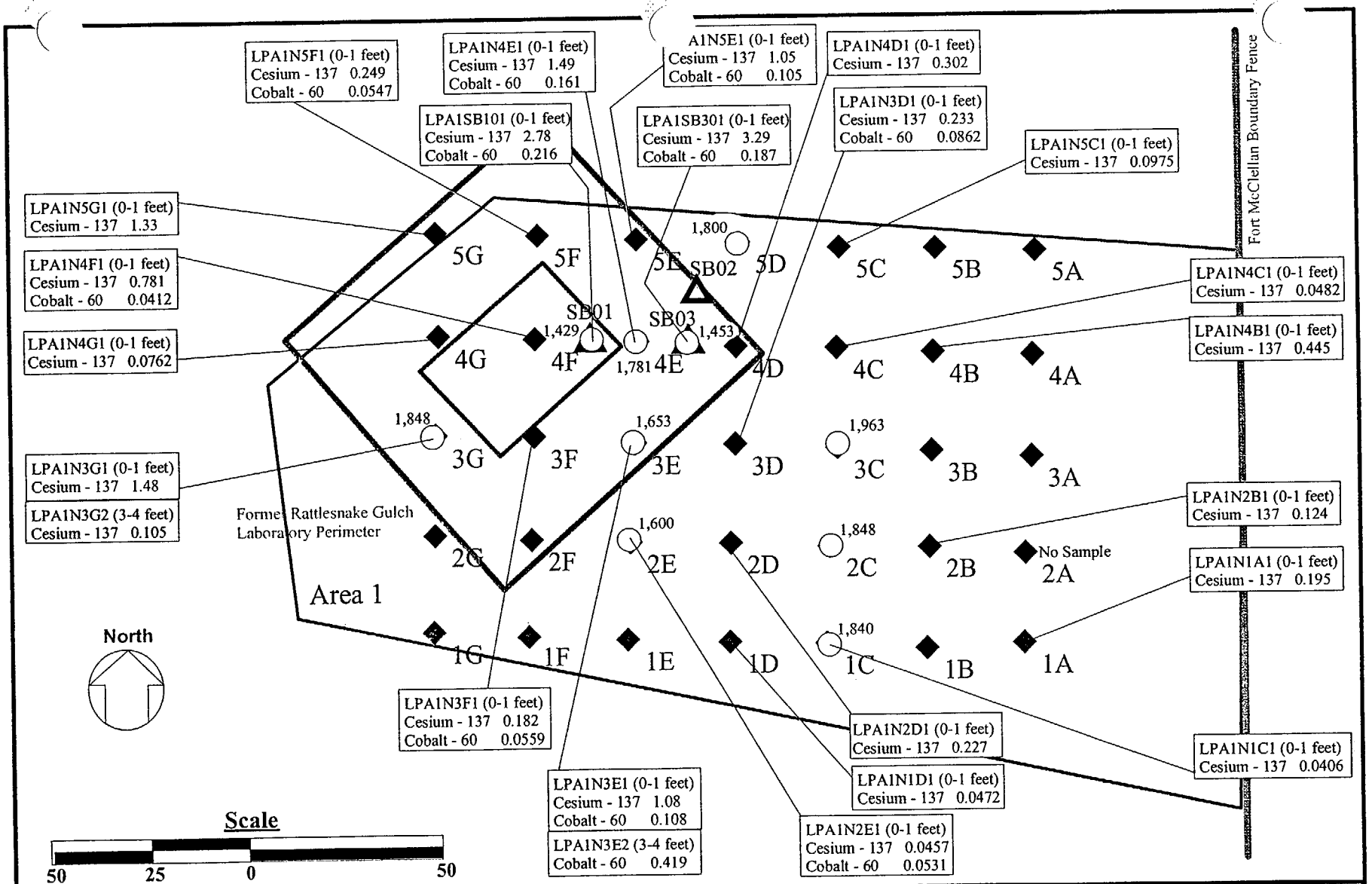
**Table 4-2 (Continued)**

| Area 1 Grid Node Location | Sample No. | Sample Depth (feet) | Cesium-137 (pCi/g) | Cobalt-60 (pCi/g) |
|---|---|---|---|---|
| 1D | LPA1N1D1 | 0-1 | 0.0472 | 0.001 U |
| | LPA1N1D2 | 19-20 | -0.000215 U | 0.00646 U |
| 2D | LPA1N2D1 | 0-1 | 0.227 | -0.0077 U |
| | LPA1N2D2 | 19-20 | -0.0141 U | 0.00 U |
| 3D | LPA1N3D1 | 0-1 | 0.233 | 0.0862 |
| | LPA1N3D1 DUP | 0-1 | 0.301 | 0.0902 |
| | LPA1N3D2 | 19-20 | 0.102 U | -0.0528 U |
| | LPA1N3D2 DUP | 19-20 | 0.00 U | 0.0198 U |
| 4D | LPA1N4D1 | 0-1 | 0.302 | 0.0426 U |
| | LPA1N4D2 | 19-20 | -0.0207 U | -0.00482 U |
| 5D | LPA1N5D1 | 0-1 | 0.0244 U | -0.000167 U |
| | LPA1N5D1 DUP | 0-1 | 0.0326 U | -0.00611 U |
| | LPA1N5D2 | 14-15 | 0.00592 U | 0.000672 U |
| | LPA1N5D2 DUP | 14-15 | 0.00927 U | -0.00322 U |
| 1E | LPA1N1E1 | 0-1 | 0.00196 U | 0.00164 U |
| | LPA1N1E2 | 19-20 | 0.000472 U | -0.00224 U |
| 2E | LPA1N2E1 | 0-1 | 0.0457 | 0.0531 |
| | LPA1N2E1 DUP | 0-1 | 0.0311 U | 0.0463 |
| | LPA1N2E2 | 11-12 | 0.00113 U | 0.00802 U |
| | LPA1N2E2 DUP | 11-12 | 0.000449 U | -0.00871 U |
| 3E | LPA1N3E1 | 0-1 | 1.08 | 0.108 |
| | LPA1N3E2 | 3-4 | -0.0169 U | 0.419 |
| 4E | LPA1N4E1 | 0-1 | 1.49 | 0.161 |
| | LPA1N4E1 DUP | 0-1 | 1.15 | 0.0969 |
| | LPA1N4E2 | 10-11 | 0.0286 U | 0.00 U |
| | LPA1N4E2 DUP | 10-11 | 0.00 U | -0.00404 U |
| | LPA1N4E3 | 19-20 | 0.00987 U | 0.0123 U |
| | LPA1N4E3 DUP | 19-20 | 0.00553 U | 0.0438 U |
| 5E | LPA1N5E1 | 0-1 | 1.05 | 0.105 |
| | LPA1N5E2 | 19-20 | 0.0197 U | 0.00645 U |

Table 4-2 (Continued)

| Area 1 Grid Node Location | Sample No. | Sample Depth (feet) | Cesium-137 (pCi/g) | | Cobalt-60 (pCi/g) | |
|---|---|---|---|---|---|---|
| 1F | LPA1N1F1 | 0-1 | 0.00466 | U | -0.00203 | U |
| | LPA1N1F2 | 19-20 | -0.0024 | U | -0.00657 | U |
| 2F | LPA1N2F1 | 0-1 | 0.0235 | U | -0.00817 | U |
| | LPA1N2F2 | 19-20 | -0.00136 | U | 0.0148 | U |
| 3F | LPA1N3F1 | 0-1 | 0.182 | | 0.0559 | |
| | LPA1N3F2 | 19-20 | 0.00569 | U | 0.00388 | U |
| 4F | LPA1N4F1 | 0-1 | 0.781 | J | 0.0412 | |
| | LPA1N4F1 DUP | 0-1 | 1.04 | | 0.0914 | J |
| | LPA1N4F2 | 12-13 | 0.0215 | U | 0.00147 | U |
| | LPA1N4F2 DUP | 12-13 | 0.0016 | U | 0.00855 | U |
| 5F | LPA1N5F1 | 0-1 | 0.249 | | 0.0547 | |
| | LPA1N5F2 | 19-20 | -0.013 | U | 0.0233 | U |
| 1G | LPA1N1G1 | 0-1 | 0.00354 | U | 0.00302 | U |
| | LPA1N1G2 | 19-20 | -0.00225 | U | 0.000695 | U |
| 2G | LPA1N2G1 | 0-1 | 0.00324 | U | -0.00941 | U |
| | LPA1N2G2 | 19-20 | 9.500E-05 | U | 0.0078 | U |
| 3G | LPA1N3G1 | 0-1 | 1.48 | | 0.0415 | U |
| | LPA1N3G2 | 3-4 | 0.105 | | 0.0155 | U |
| 4G | LPA1N4G1 | 0-1 | 0.0762 | | 0.00895 | U |
| | LPA1N4G2 | 19-20 | -0.00904 | U | -0.00141 | U |
| 5G | LPA1N5G1 | 0-1 | 1.33 | | 0.0749 | U |
| | LPA1N5G2 | 19-20 | 0.00259 | U | 0.0181 | U |
| SB01 | LPA1SB101 | 0-1 | 2.78 | | 0.216 | |
| | LPA1SB102 | 8-9 | 0.00217 | U | -0.00455 | U |
| | LPA1SB103 | 19-20 | -0.0277 | U | -0.00469 | U |
| SB02 | LPA1SB201 | 0-1 | 0.00 | U | -0.00945 | U |
| | LPA1SB202 | 7-8 | -0.00344 | U | 0.00526 | U |
| SB03 | LPA1SB301 | 0-1 | 3.29 | | 0.187 | |
| | LPA1SB302 | 6-7 | -0.0123 | U | 0.00887 | U |
| | LPA1SB303 | 13-14 | -0.0304 | U | -0.00334 | U |

J = estimated value.
pCi/g = picoCuries per gram
U = validated as not detected




## Legend

1,000○ Downhole Radiation
Total Gamma Detection (counts per minute)

1A◆ Grid Node

SB01△ Soil Boring

Note: Analytical values in picoCuries per gram (pCi/gm)

STEP Inc.

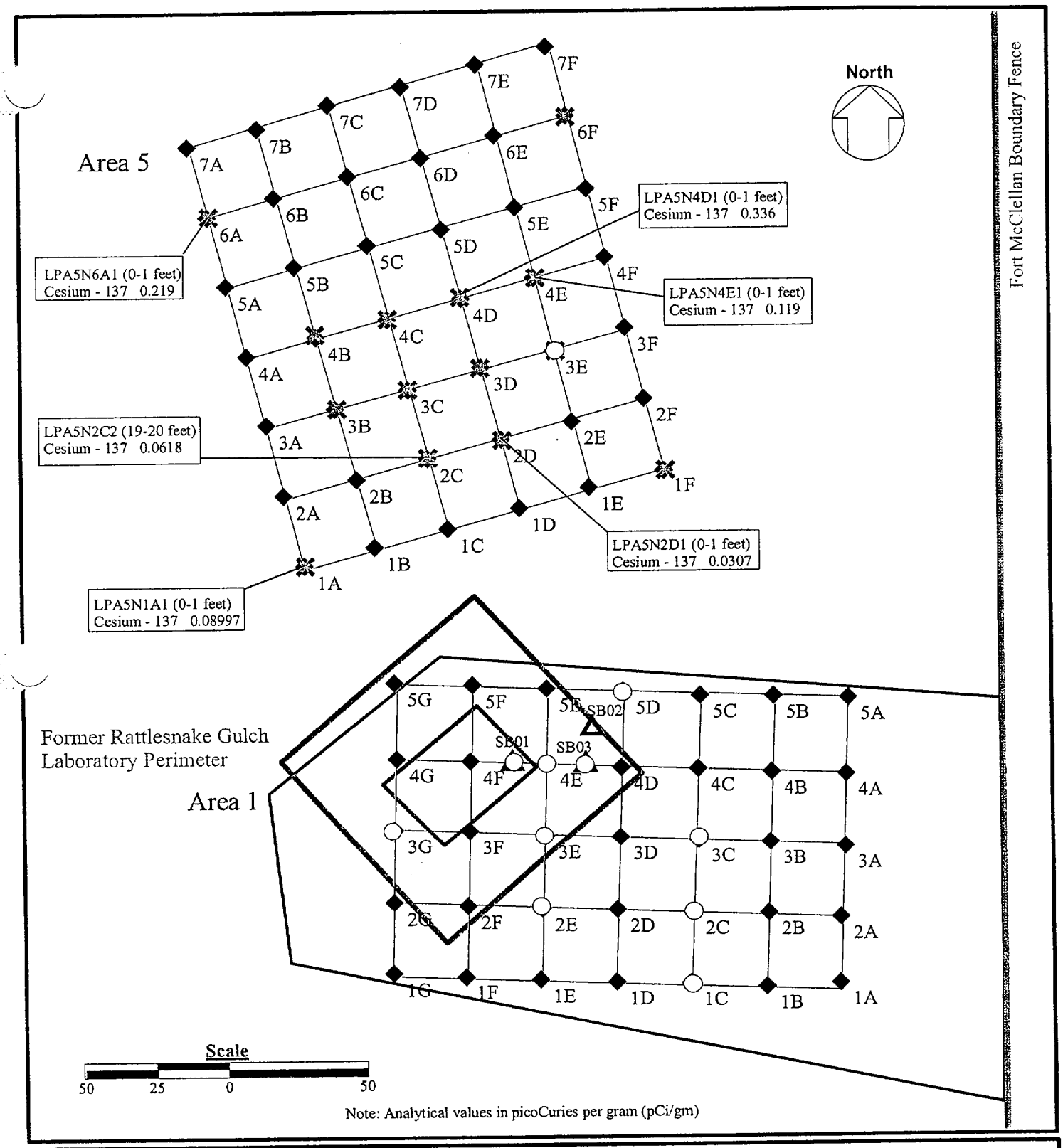
Source: Alabama GIS
Prepared By: STEP Inc. Oak Ridge, TN
Job Title: Expanded Site Investigation
at La Garde Park
Anniston, Alabama

**Figure 4-5 Area 1 Radionuclide Detections in Soil Samples**

## Table 4-3 Area 5 Soil Analytical Results

| Area 5 Grid Node Location | Sample No. | Sample Depth (feet) | Cesium-137 (pCi/g) | Cobalt-60 (pCi/g) |
|---|---|---|---|---|
| 1A | LPA5N1A1 | 0-1 | 0.0897 | 0.00795 U |
| | LPA5N1A2 | 15-16 | 0.00255 U | -0.00445 U |
| 6A | LPA5N6A1 | 0-1 | 0.219 | 0.0088 U |
| | LPA5N6A2 | 19-20 | -0.00302 U | -0.00488 U |
| 3B | LPA5N3B1 | 0-1 | 0.0212 U | 0.00255 U |
| | LPA5N3B2 | 19-20 | -0.00829 U | 0.00687 U |
| 4B | LPA5N4B1 | 0-1 | 0.0122 U | -0.00421 U |
| | LPA5N4B2 | 19-20 | -0.00509 U | -0.00575 U |
| 2C | LPA5N2C1 | 0-1 | 0.0161 U | 0.0024 U |
| | LPA5N2C2 | 19-20 | 0.0618 | 0.00778 U |
| 3C | LPA5N3C1 | 0-1 | 0.0316 U | 0.015 U |
| | LPA5N3C2 | 19-20 | -0.00235 U | 0.00228 U |
| 4C | LPA5N4C1 | 0-1 | -0.0278 U | -0.0244 U |
| | LPA5N4C2 | 19-20 | 0.0119 U | 0.00341 U |
| 2D | LPA5N2D1 | 0-1 | 0.0307 | -0.00513 U |
| | LPA5N2D2 | 10-11 | 0.00 U | -0.00124 U |
| 3D | LPA5N3D1 | 0-1 | 0.0113 U | -0.00493 U |
| | LPA5N3D2 | 19-20 | 0.00083 U | 0.015 U |
| 4D | LPA5N4D1 | 0-1 | 0.336 | 0.0295 U |
| | LPA5N4D2 | 19-20 | 0.0126 U | 0.000451 U |
| 3E | LPA5N3E1 | 0-1 | -0.00528 U | -0.00666 U |
| | LPA5N3E2 | 12-13 | -0.000388 U | 0.00291 U |
| 4E | LPA5N4E1 | 0-1 | 0.119 | 0.0169 U |
| | LPA5N4E2 | 19-20 | 0.00797 U | 0.00321 U |
| 1F | LPA5N1F1 | 0-1 | 0.00 U | -0.00249 U |
| | LPA5N1F2 | 10-11 | -0.0111 U | -0.0127 U |
| 6F | LPA5N6F1 | 0-1 | 0.0234 U | -0.00501 U |
| | LPA5N6F2 | 19-20 | 0.0012 U | -0.00105 U |

J = estimated value.
pCi/g = picoCuries per gram
U = validated as not detected




## Legend

- ○ Downhole Radiation Survey Detection
- ✕ Grid Node Sampled in Area 5
- 1A ◆ Grid Node
- SB01 △ Soil Boring

STEP

Source: Alabama GIS
Prepared By: STEP Inc. Oak Ridge, TN
Job Title: Expanded Site Investigation
at La Garde Park
Anniston, Alabama

**Figure 4-6 Area 5 Radionuclide Detections in Soil Samples**

## 4.5 DOWNHOLE RADIATION SCAN

A total of 52 boreholes were placed in Areas 1 and 5 as part of the ESI activities. The boreholes were installed to a maximum depth of 20 ft bgs or to geoprobe refusal. Upon reaching total depth in each boring, a 3.25-inch diameter temporary casing was driven to total depth or geoprobe refusal and then removed. A downhole radiation scan was then performed in each borehole. The scan was performed using a Ludlum Model 2221 meter attached to a Ludlum Model 44-2 (with 1-inch diameter NaI detector) gamma scintillater probe with a 22-ft cable. The probe and cable were attached to 20-ft length of 1-inch diameter PVC pipe and inserted in the borehole. Gamma radiation was measured in 1-ft intervals in each borehole from the ground surface to the maximum depth accessible with the probe assembly. In some cases the borehole collapsed before downhole measurements could be completed. The gamma emission rate varied at different depths in many of the holes. The gamma log curves generated from the downhole radiation surveys are contained in Appendix F.

A gamma spectrum was collected at the depth exhibiting the highest gross gamma count to provide a real time determination of the nature of any elevated measurements observed in the borehole. "Elevated measurements" were defined as elevated count rates as compared to other depths in the same hole or when compared to nearby holes. Eleven spectra were collected from 10 boreholes. Visual analysis of the spectra in the field did not reveal the presence of the characteristic 662 kiloelectron volt (keV) peak for $Cs^{137}$, nor the 1,173 or 1,332 keV peaks that would identify $Co^{60}$. The spectra were subsequently analyzed mathematically by capturing the gross counts in a region of interest that corresponded to the 662 keV peak for $Cs^{137}$. The background was subtracted from the counts in the region of interest to calculate the net counts in the region. No discernible activity indicating the presence of $Cs^{137}$could be identified in these spectra.

The MDC for $Cs^{137}$ during the subsurface scan was 2.7 pCi/g based on using the Ludlum Model 44-2 in fixed count mode. Table 4-4 presents the calculations used to derive the MDC. The maximum detected concentration of $Cs^{137}$ detected in laboratory analyses of the surface soil samples (0-1 ft) was 3.29 pCi/g (0-1 ft, boring SB-03 in Area 1). The maximum detected concentration of $Cs^{137}$ in the subsurface soil samples was 0.105 pCi/g (3-4 ft, boring 3G in Area 1). The maximum concentration of $Cs^{137}$ detected in the downhole soil samples is less than the MDC calculated for the downhole radiation scan; therefore, the elevated downhole gamma measurements are most likely attributable to naturally occurring sources.

## Table 4-4 Minimum Detectable Concentration for Subsurface Survey Instrument

| Variable Description | Variable | Value | Units | Equations and Comments |
|---|---|---|---|---|
| Background count rate per minute | Rmb | 1,200 | c/min | Nominal downhole background |
| Time the detector spends at selected depth | Ts | 30 | s/o | Fixed measurement. Typical downhole count time. |
| Conversion factor | CF1 | 0.017 | min/sec | Constant |
| Background count rate per interval | Rsb | 600 | c/o | Rsb = Rmb x ts x CF1 |
| Index of detectablility | d' | 2.48 | Unitless | Based on 95% false negative, 60% false positive. |
| Surveyor efficiency | Es | 1 | Unitless | Not a scan. Series of fixed measurements |
| Net Source Count Rate | Rns | 61 | c/o | Rns = d' x SQRT[Rsb] / SQRT[Es] (Source: NUREG-1507 Equation 6-8) |
| Minimum Detectable Net Count Rate | MDNCR | 121 | c/min | MDNCR = Rns x (60sec/min) / ts (Source: NUREG-1507, Equation 6-6) |
| Gross instrument response rate | Rigr | 1,321 | c/min | Rigr = Rmb + MDNCR |
| Detector response to $Cs^{137}$ | DR($Cs^{137}$) | 175 | c/min / µR/h | Ludlum, 44-2 specification sheet |
| Minimum detectable exposure rate | MDE | 0.7 | µR/h | MDE = MDNCR/ DR($Cs^{137}$) (Source: NUREG-1507, EQ 6-18) |
| Activity to exposure rate constant for $Cs^{137}$ | A2X | 3.8 | pCi/g/µR/h | A2X = 5(pCi $Cs^{137}$/g soil) / 1.307(mR/h) (Source: NUREG-1507, Equation 6-19) |
| Scan Minimal Detectable Concentration for $Cs^{137}$ | MDC($Cs^{137}$) | 2.7 | pCi/g | MDC($Cs^{137}$) = MDE x A2X (Source: NUREG-1507, Equation 6-20) |

*NUREG-1507 = *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions* (NUREG-1507, NRC, June 1998)

c/min / µR/h = counts per minute per microRoentgen per hour
c/min = counts per minute
c/o = counts per observation
$Cs^{137}$ = Cesium - 137
m/s = meter per second
min/sec = minutes per second
pCi/g = picoCuries per gram
pCi/g/µR/h = picoCurie per gram per microRoentgen per hour
s/o = seconds per observation
µR/h = microRoentgen per hour

Examining the raw data curves provided by the laboratory and comparing them to the incremental gamma log of the boreholes indicates that the elevated gamma readings tended to occur when Radium-226 and or Radium-228 were above 1 pCi/g. This would explain why elevated gamma measurements were encountered downhole, but no concentrations of $Cs^{137}$ in excess of 0.105 pCi/g were detected in the subsurface soil samples.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 SURFACE SOILS

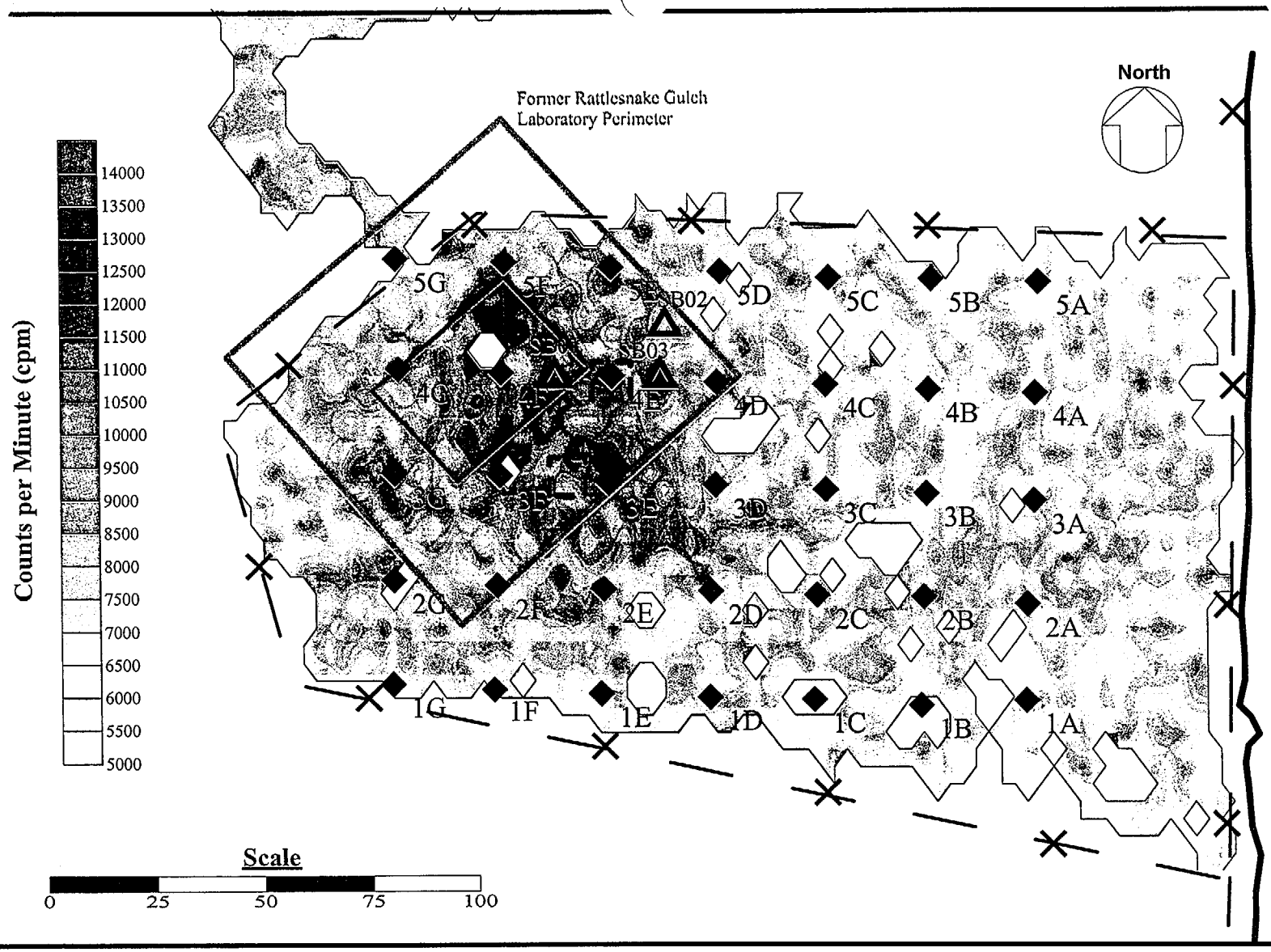
Based on the results of the surface radiation scan and surface soil analytical results, the initial removal action was successful in reducing the overall surface concentrations of $Co^{60}$ and $Cs^{137}$ below the corresponding DCGLs. No further action is proposed for the surface soils at the site.

### 5.2 SUBSURFACE SOILS

Based on the results of the confirmatory samples collected during the removal action, and the subsurface soil samples and downhole radiation scans conducted during the ESI, it appears that only two areas of subsurface contamination remain. These two areas are isolated and relatively small in dimension. STEP proposes that an additional removal action be conducted in these two areas. Figure 5-1 shows the areas proposed for additional removal action.

The first area, centered between grid nodes LPA1N3E and LPA1N3F, corresponds to the location of confirmatory soil sample LPRA18 (40.3 pCi/g $Cs^{137}$) from the initial removal action. This area will encompass roughly 10 feet x 10 feet to a maximum depth of 6 feet bgs, or until the depth of the previous excavation is reached and the radiation scans indicate no further contamination.

The second area, centered on grid node LPA1N4E, corresponds to the location of confirmatory soil sample LPRA16 (113 pCi/g $Cs^{137}$) from the initial removal action. This area will encompass roughly 10 feet x 10 feet to a maximum depth of 15 feet bgs, or until the depth of the previous excavation is reached and the radiation scans indicate no further contamination.




**Legend**

1A◆ Grid Node

SB01△ Soil Boring

—X— Fence

Proposed removal area

STEP Inc.

Source: Alabama GIS
Prepared By: STEP Inc. Oak Ridge, TN
Job Title: Expanded Site Investigation
at La Garde Park
Anniston, Alabama

**Figure 5-1 Proposed Areas for Additional Removal Action**

All soils removed from the excavations will be spread on the ground surface adjacent to the excavations and field scanned with radiation detection instruments. Any soils that have field measurements indicating concentration of $Cs^{137}$ less than 9 pCi/g will be stockpiled on site for use as backfill. Soils that have field measurements indicating concentrations of $Cs^{137}$ greater than 9 pCi/g will be placed in low level radiation waste (LLRW) boxes for off-site disposal. The base and sidewalls of the excavations will also be screened for radiation. Excavation will continue until the field screening radiation levels in the excavations indicate concentrations of $Cs^{137}$ are less than 9 pCi/g. Based on these parameters, an estimated 45 $yd^3$ (approximately 15 LLRW boxes) of contaminated soil may require off-site disposal. Confirmatory soil samples will be collected for laboratory analyses from the base of the excavations when field screening indicates that all the contaminated soils have been removed.

## 6. REFERENCES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USEPA (U.S. Environmental Protection Agency), January 2001. 10 *CFR* Part 20 Section 1402.

# Appendix A

# Copy of Field Logbook

LA GARDE PARK
ANNISTON, AL
CONTRACT NO.
DACA 01-03-D-0010
DO # 0003
STEP
PROJ NO. 114-113/114010
STE P, INC.
EXPANDED SITE INVES.
JULY 12 TO 21, 2004

NATIONAL
408
MINING TRANSIT BOOK
BOOK 1 OF 1

LINDA MANN (256) 236-2011
(SECRETARY) JPA
MIKI SCHNEIDER (256) 310-0267
SECURITY
GARY HARVEY (256) 848-3847
TIM GLIDEWELL (256) 848
ALLEN THOMAS ((317)-504-2357 DRILLER)

Property of STEP, INC

Address 1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Telephone (865) 481-7837

JEFF CARTER CELL # (865) 388-1529
ROY HUEKSTRA (865) 740-3518
ROB SHERLES (865) 755-2863
DOUG HAWN (865) 740-2907
CELL (785)-761-5122
EODT - (865) 988-6053 (JIM MILITY RM 212)
ERG - (505) 298-4224 [CHUCK FARR]
(505) 604-6290
JASON FADDIS (AUXIER) (865) 675-3669
CELL (865) 414-0379

This Book is manufactured of a High Grade 50% Rag Paper having a Water Resisting Surface, and is sewed with Nylon Waterproof Thread.

WINGATE INN (256) 831-1921
143 COLONIAL DR
OXFORD, AL 36203

5 RM 310

# INDEX

Pg 1 - 81 EXPANDED SITE INVESTIGATION FIELD ACTIVITIES (7/12-7/21/4)

[LISA HOLSTEIN]

JEFFREY DEVINE (COE) (251) 690-3376
RICK BUTTON (EPA) (678) 520-3272
TERRI WILLIAMS (ADEM) (334) 850-5295
JULIE PETERSON (OMAHA COE) (402) 212-5956

LAGARDE PARK (MON)
114-113/114-010 ESI 7/12/04 ①

ON POST 0915*
*(ALL TIMES CENTRAL)

ATTEND UXO TRAINING VIDEO
@ JPA OFFICE
(JOINT PROGRAM AUTHORITY)

BOART LONGYEAR ALLEN THOMAS
JOE HYRF

ERG - CHUCK FARR
EOBT - JIM MILBY
AUXIER & ASSOC - JASON FABDIS
STEP - JEFF CARTER, SCOTT HOCHSTRA
ROB SHERLES

(251) 848 8437 - FT MCCLELLAN

SAW VIDEOS "UXO & BRAC"
AND "ADULT UXO AWARENESS"

1045 @ SITE ALA DOT REPAIRED
ACCESS ROAD

1300 AFTER LUNCH WHOLE CREW
ON SITE

7/12/04 Jeff Carter

(MON) LAGARDE PARK 114-113/114/010
(2) 7/12/04 EST

JASON FADDIS DISTRIBUTED DOSIMETERS & CONDUCTED RADIATION SAFETY TALK
- FRISKING (PERSONAL & EQUIPMENT)
- DOSIMETRY HANDLING
- RADIATION RISKS

JEFF CARTER ADDED TOOLBOX SAFETY TALK DISCUSSED
- SLIP TRIPS FALLS
- SPIDERS, SNAKES
- HEAT STRESS

1350 BEGAN RAD SURVEY INSIDE FENCE. BEGAN UXO SURVEY OUTSIDE FENCE (AREA 5)

1510 COMPLETED LAYING OUT GRID IN AREA 5
CIVIL ALERT SIREN SOUNDED T-STORM WARNING. ALL PERSONNEL HALTED WORK

Jeff Carter 7/12/04

114-113/114-010 LAGARDE PARK MON
EST 7/12/04 (3)

1530 RELEASED DRILLERS FOR THE DAY
RESUMED MARKING GRIDS & DOING UXO/RAD SURVEYS

1730 COMPLETED SETTING GRIDS

1800 ALL PERSONNEL LEAVING SITE. SITE SECURED

INTENTIONALLY BLANK

7/12/04 Jeff Carter

(4) TUE 7/13/04 LAGUNA PARK EST

TEMP 73°F
BARO 965

0645 ON SITE
SET UP ON
LPAINA~~01~~1A

ON SITE JEFF CARTER, ROB SHARLES
SCOTT HOEKSTRA (STEP)
JASON FADDIS (AUXIER)
JIM MILBY (FOOT)
CHUCK FARR (ERG)
ALLEN THOMAS > (BOART)
JOE HURE

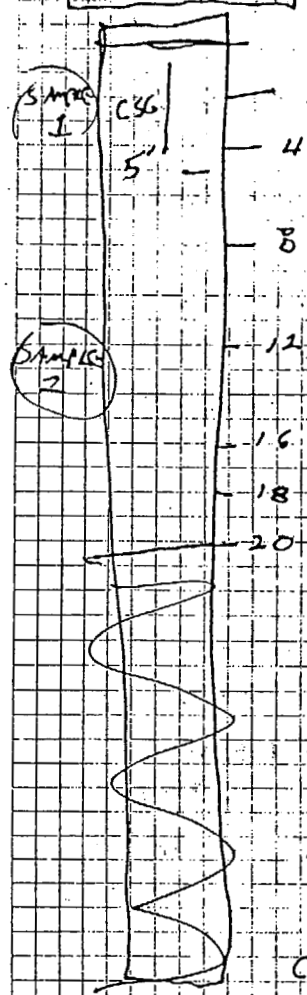
0730 COMMENCE DRILLING
LPAINA1
VERY HARD DRILLING
SAMPLING 2' CHECK FOR UXO

0845 REACHED TOTAL
DEPTH (20') BEGAN
ADVANCE CASING TO
TD. ADVANCE CASING (3.25)
TO 5' COULD NOT GO
FURTHER. PULLING OUT TO
TRY & LOG HOLE. COULD ONLY
GET PROBE TO 5'

Jeff Carter 7/13/04

LAGUNA PARK TUE
ESI 7/13/04 (5)

LPAINA~~1~~
LPAINA




(0-2')
SAMPLE LPAINA~~02~~ 1
CL - 2.5YR 5/8 VSLTY SCAT GRAVEL VSDY

CL - VSDY ABNDT GRAVEL MOTTLED GY/RD SNDST CHT

SLT/SND - 2GLEY 8/5PB GY/WHITE VSLTY VSDY TR GRAVEL

SLT - GY/WH VSDY SCAT GRAVEL RB CL BOTTOM 0.2'

18-19 CL - BRICK RD (10R, 4/6) VSLTY DRY

19-20 - SLT - GY/WH (2GLEY 8/5PB) SDY, DRY

FLUMES NO READINGS ON SCAN OF CORE

COLLECT SAMPLE LPAINA~~02~~ 2 (18-12')

7/13/04 Jeff Carter

(6) TUG 7/13/04 | LAGARDIA PARK ESI

0930 BEGAN PROBE LPAIN2A
PROBE TO 8' LOST
UXO PROBE IN HOLE
ABANDON HOLE MOVE TO

0945 LPAIN3A BEGIN DRILL

JIM MILBY GOT AGREEMENT
FROM TIFFANY MULLINS (EODT)
TO ALTER UXO AVOIDANCE
PLAN.
NEW PROCEDURE
- SCAN SURFACE
- GEOPROBE TO 4'
- SCAN @ 4' DEPTH
- IF CLEAR GEOPROBE TO TOTAL DEPTH (20')
- IF DETECTION ABANDON HOLE & OFFSET & REDRILL

EODT REPRESENTATIVE JIM MILBY

Jeff Cart 7/13/04

LAGARDIA PARK TUG (7)
ESI 7/13/04

LPAIN3A

SAMPLE 1

0 (0-6) CL- MOTTLED TN/RB (7.5YR 7/6) VSLTY SNDY MOIST

2

CSG

3

(6-7) SLT- MOTTLED TN PINK (5YR

6 (7-8.5) SLT-MTLD TN PINK VSNDY DRY

8' SAMPLE 2

9 (8.5-9) LS- TN GY SUCROSIC

10 DRILL REFUSAL 9'

1040 MOVE OFF HOLE
PUSHED 3.25 CSG TO 8'
RAD PROBE HOLE, NO ELVATED READINGS
SET UP TO DRILL LPAIN4A

SAMPLE LPAIN3A2 COLLECTED (7-8')

1050 GEOPROBE HOLE LPAIN4A

1105 REFUSAL @ 16'

7/13/04 Jeff Cart

7/13/04 TUE LAGARD PARK ESI 114-110 114-010

LPA1N4A

SAMPLE 1

CSG

PUSHED 3.25 CSG TO 5'

HOLE RAD LOGGED TO 4.5 FT

NO ELEVATED READINGS

0 (0-1) CL - TN BRN VSLTY MOIST GRAVEL

2 (2-6) CL - W/LS FRAGS VSLTY MOTTLED RD/BRN

5' (6-8) CL - MOTTLED BRN-RD/WH ABNDT LS FRAGS

8 8-16 LS - H WEATHERED SCAT GRAVEL VHD PINK TO GY WHITE

10

SAMPLE 2

TD 16'

GEOPROBE REFUSAL

20

11:25 BREAK FOR LUNCH

7/13/04

LAGARDE PARK GSI 7/13/04

12:40 MOVE TO SET UP ON LPA1N5A

12:55 BEGIN DRILLING LPA1N5A

LPA1N5A

SAMPLE 1

PUSHED 3.25 CSG TO 6' (REFUSAL)

6' CSG

HOLE RAD LOGGED TO 6' NO ELEVATED READINGS

SAMPLE 2 TD 16'

0 (0-1) SLT - TN BRN (7.5YR DRY 7/2)

1-5 CL - MOTTLED RD/BRN TR MOIST (7.5YR VSLTY 6/8 GRADING INTO SLT @ 5-5 FT

5 (5-7) SLT - MOTTLED GY/RD ABNT GRAVEL

(7-7.5) LS - H WEATHERED LT GY

(7.5-8.5) CL - MOTTLED RD/BRN

8.5 CL & WEATHERED LS TO TN BRN TO LT GY

16 DRY HARD GEOPROBE REFUSAL

12:35 TD @ 16'

20

7/13/04

(10) 7/13/04 LAGARDE PARK GSI

1330 MOVE TO SET UP ON LPA1N5B

1350 BEGIN DRILLING

LPA1N5B

(VERY LITTLE RECOVERY 2-4')

(CSG REFUSED @ 8.5 FT)

RAD LOG HOLE NO ELEVATED READINGS

SAMPLE 1

0 — (0-2) CL-TN BRN VSLTY MOIST

(2-8.5) CL-BRN/RD MOTTLED YELLOW VSLTY ABNT GRAVEL

(8.5-10) SLT-MOTTLED RD BRN W/YELLOW ORNG STRKS ABNT GRAVEL DRY

10 — (10-13) CL-W/LS LS VWEATHERED PINK TO WH CL PINK TO TN W/ORNG STRKS ABNT GRAVEL

@13' 0.5' OF DK BRN TO BLK SLT W/VEGETATION LEAVES, ETC.

SAMPLE 2

TD 15'

(13.5-15) SLT & WEATHERED LS RD/PINK TO WH

15' GEOPROBE REFUSAL

14.5 TO 15' LS-VWEATHERED WH, W/S DK ORNG STRKS

Jeff Carter 7/13/04

114-113/114-010 LAGARDE PARK GSI 7/13/04 (11)

1415 COMPLETED DRILLING LPA1N5B

DRIVING 3.25 CSG. REFUSAL @ 8.5 FT

1420 MOVE TO SET UP ON LPA1N4B

LPA1N4B — 0 — SAMPLE 1

1450 COMPLETED GEOPROBE PUSHING 3.25

COLLECTED SAMPLED LPA1N4B1 @ SURFACE BESIDE BORING

8.5' CSG

NO RETURNS (0-4')

5 — (4-11) SLT ~~CL~~ - MOTTLED TN TO BRIGHT RD ~~VSLTY~~

(11-20) LS - VWEATHERED MOTTLED PINK/WH W/SCAT ORNG STRK TN

10

15

SAMPLE 2 @ 19-20'

TD — 20 — SAMPLE 2

7/13/04 Jeff Carter

(12) TUES 7/13/04

LAGARDE PARK
ESI

1520 MOVG TO SET UP ON
LPA1N3B

SAMPLE 1

0 (0-3.5) SLT - LTTN BRN SCAT GRAVEL

(3.5-10.3) SLT - RD/ BRN SCAT GRAVEL DRY HARD

1605 COMPLETED GEOPROBE PUSHING 3.25 INCH CSG

PUSHED CSG TO 10'

RAD LOGGING HOLE NO ELEVATED READINGS

10 CSG

10 (10.5-14) SLT - ORNG TN TO RD NO GRAVEL MOTTLED

(14-17.5) SLT - TN/ORNG TO BRICK RD SCAT GRAVEL V DRY

(17.5-19) SLT - DK BRN W/WH STRKS

SAMPLE 2

TD - 20

(19-20) SLT - LTTN W/RD-ORNG STRIATIONS DRY, ND

J M Cash 7/13/04

LAGARDE PARK
ESI

(13) TUE 7/13/04

COMPLETED HOLE LPA1N3B
MOVG TO SET UP ON LPA1N2B

1715 ALL PERSONNEL LEAVING SITE
SITE SECURED

COMPLETED HOLES:
(2) LPA1N1A
(2) LPA1N2A
(2) LPA1N4A
(2) LPA1N5A
(2) LPA1N5B
(2) LPA1N4B
(2) LPA1N3B

14 SAMPLES

INTENTIONALLY BLANK

7/13/04 J M Cash

WED (14) 7/14/04 LAGARDE PARK ESI 114-113 114-010

0645 ON POST
TEMP 72°F CLEAR

CONDUCTED TOOL BOX TALK
DISCUSSED:
- TICKS & OTHER BIO HAZ
- FRISKING IN/OUT OF AREA
- WET GROUND
- HARD HATS

ON SITE
STEP - JEFF CARTER SCOTT HOEKSTRA
AUXILR - JASON FADDIS
GSDT - JIM MILBY
BOART - ALLEN THOMAS
JOE HYRE

0700 START PROBING LPA1N1B

0715 COMPLETED GEOPROBE PUSH 3.25" CSG.

0725 PUSHED CSG TO 8'

Jeff Carter 7/14/04

LA GARD PARK ESI WED 7/14/04 (15)

LPA1N1B

SAMPLE 1

NO ELEVATED READING ON SURFACE SCAN OF CORE

NO ELEVATED READING ON DOWN HOLE RAD SCAN 8'

CSG

SAMPLE 2

0 (0-3) CL-LT TAN SILTY MOIST
(3-4.5) CL-BRN/RD MOTTLED SILTY MOIST
5 (4.5-6) CL TN/RD ~~WITH~~ WITH CL ABNT LS FRAGS DRY
(6-7) LS-H WTH LT TN WHERE WEATHERED LS FRAGS TN TO GY/BRN
10 (7-11.5) LS-WTH LT TN WHITE PINK
TD 11.5'
GEOPROBE REFUSAL

0730 MOVE TO SET UP ON LPA1N1B

0745 COMMENCE GEOPROBE LPA1N1B

0815 COMPLETE GEOPROBE PUSHING 3.25" CSG.

0825 PUSHED CSG TO 6' MOVING TO SET UP ON LPA1N1C

0845 GEOPROBE BEGIN ON LPA1N1C

7/14/04 Jeff Carter

(16) WED 7/14/04

LAGARDE PARK GSI

LPA1N1B

SAMPLE 1

0 (0-2) CL-LT/BRN VSLTY MOIST

(2-12) CL-ORNG/RD BRN VSLTY MOIST

6' CSG

6

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

10

(12-14) SND-TN TO LT BNK ABNT GRAVEL

(14-18) CL-MOTTLED YELLOW RD/ORNG SCAT GRAVEL

(18-20) CL-TN TO RD/BRN VSLTY ABNT LSFRAGS

SAMPLE 2

20

J M Curtis 7/14/04

NO ELEVATED READING ON SURFACE SCAN OF CORE

RAD READING 1840

SAMPLE 2

(9-9.5) WEATHERED GYLS 0.5'

9 CSG

0910 COMPLETED GEOPROBE PUSHING CSG

0920 PUSHED CSG TO 9'

0925 MOVE TO SET UPON LPA1N2C TD

DOWNHOLE RAD PROBE NOT WORKING

ATTACHING REPLACEMENT

RAD SCAN HOLE TO 8.5'

~~NO ELEVATED READINGS~~

LAGARDE PARK GSI WED 7/14/04 (17)

LPA1N1C

0 SAMPLE 1 (0-2) CL-TN TO LT BRN SLTY MOIST

(2-5) CL-DK RD VSLTY TR GRAVEL MOIST

5 (5-9) CL-MOTTLED RD TO ORNG VSLTY ABNT GRAVEL

(9.5-14) CL-MOTTLED RD/ORNGE YELLOW VSLTY DRY

10

(14-15) LS-TN/WH HWEATH

15 (15-17) CL-TN/ORNG MOTTLED MOIST

(17-18) LS-GY VWEATH

(18-19.5) CL-TN/ORNG BRN MOTTLED

(19.5-20) CL/WEATH LS LT TN TO BRN

20

7/14/04 J M Curtis

(18) WED 7/14/04 LAGARDE PARK ESI

LPA1N2C

0930 COMMENCE GEOPROBE 2C

SAMPLE 1

0955 COMPLETE GEOPROBE PUSH CSG

SAMPLE 2

RAD READING 1248

1005 POSITIONED CSG TO 8'

CSG

1030 BEGIN GEOPROBE LPA1N3C

1056 COMPLETE GEOPROBE PUSH CASING IN LPA1N3C

PUSH TO 6' CSG

TD 20

1110 BREAK FOR LUNCH

0 (0-2) CL-TN TO RD-BRN SCAT GRAVEL VSLTY

(2-7) CL-DK RD TO ORNG MOTTLED ABNT GRAVEL VSLTY DRY

(7-8.5) CL-RD TO LT TN STRIATED VSLTY

(8.5-15) LS-VWEATH BROKEN LT TN TO WH

10

(15-17) CL-RD/ORNG STRIATED VSLTY SCAT FRAGS

(17-20) LS-WHT TN VERY BROKEN

7/14/04

LAGARDE PARK ESI WED 7/14/04 (19)

LPA1N3C

SAMPLE 1

CSG

DOWNHOLE RAD READING (1,763/2MIN)

SAMPLE 2

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

0 (0-3) CL-TN BRN VSLTY MOIST SCAT GRAVEL

(3-12) CL-MOTTLED RD/ORNG VSLTY SCAT GRAVEL

5

10 (12-20) SILT-LT TAN TO BRN W/ORNG STRIATIONS DRY HD VSNDY

15

TD 20

7/14/04

WED
(20) 7/14/04
LA GARDE PARK
ESI

1220 RESUME OPERATONS

1230 BEGIN GEOPROBE
LPA1N5C

SAMPLE 1

PUSHED CSG TO 7'

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

1314 COMPLETED PUSHING CSG MOVE TO LPA1N5C

SAMPLE 2

TD

0
(0-3) CL - BRN TO TN VSLTY MOIST
(3-9) CL - DK BRN RD TO TN/ORNG MOTTLED VSLTY ABNT GRAVEL
CSG
7'
(9-17) SND - WH TO LT GY W/ORNG STRIATIONS VSLTY SCAT GRAVEL
10
(17-19) SLT - TN TO ORNG BRN ABNT FRAGS & GRAVEL
20

J. Cat 7/14/04

LA GARDE PARK
ESI
7/14/04 (21)

1320 BEGIN GEOPROBE LPA1N5C

1400 COMPLETED PUSHING CSG TO 10'

1415 RIG DOWN HAMMER BROKEN

RIG HAS TO BE TAKEN OFF SITE TO REPAIR

WE WILL BE DOWN AT LEAST ONE DAY.

RESUME OPERATION FRIDAY AM

DOWNHOLE RAD SURVEY SHOWED NO ELEVATED READINGS TO TO 10'

7/16/04

LPA1N5C

SAMPLE 1

(0-2) CL - BRN TO TN VSLTY DRY
(2-5) CL - RD BRN MOTTLED ORANGE ABNT GRAVEL VSLTY
5
(5-9) CL - MOTTLED RD BRN/ORNG W/ WH STRIATIONS
(9-14.5) LS - LTTN/WH WEATHER ABNT FRAGS
10
CSG
(14.5-20) CL - TN TO MBRN ABNT LS FRAGS
15
SAMPLE 2
20

7/14/04 J. Cat

(22) WED 7/14/04 LAGARDE PARK ESI

TALK TO ROY HOEKSTRA (STEP) INFORMED HIM OF RIG PROBLEMS.

ALLEN THOMAS (BOART LONGYEAR) SAID THE PLAN IS TO LOAD UP DRILL RIG & DRIVE TO THE HUNTSVILLE BOART OFFICE AND REPLACE THE DRIVE HAMMER. AT BEST THE EARLIEST WE COULD RE-START WOULD BE FRIDAY MORNING (7/16)

1530 RIG SCANNED OUT BY JASON FADDIS (AUXIGEN)

1545 ALL PERSONNEL LEAVING SITE

COMPLETED TODAY:

LPA1N2B (2 SAMPLES)
LPA1N1B (2 SAMPLES)
LPA1N1C (2 SAMPLES)
LPA1N2C (2 SAMPLES)
LPA1N3C (2 SAMPLES)
LPA1N4C (2 SAMPLES)

DROVE LPA1N5C (COLLECTED 1 SAMPLE)

13 SAMPLES

JW Cat 7/14/04

LAGARDE PARK ESI FRI 7/16/04 (23)

0700 C. SUMMERALL GATE
MET W/ RICK BUTTON (EPA)
TERRY WILLIAMS (ADEM)

67°F, CLEAR

ON SITE SCOTT HOEKSTRA
JEFF CARTER (STEP)
JASON FADDIS (AUXIGEN)
JIM MILBY (EDT)

0740 JEFFREY DEVINE (ROC) ON SITE

DISCUSSED OPERATIONS W/ REGULATORS EPA & ADEM BOTH AGREED THAT AREA 5 COULD BE EXAMINED WITH 5 GEOPROBE POINTS IN THE PATTERN:

JEFFREY ALSO REQUESTED THAT WE EXAMINE THE PIPE EXPOSED @ SURFACE.

0840 DRILL RIG ON SITE
0845 BOTH REGULATORS & J. DEVINE LEFT SITE

7/16/04 JW Cat

(24) FRI 7/16/04 LAGARDE PARK ESI

0900 RESUMED DRIVING 3.25 CSG ON LPA1N5C

0925 COMPLETED PUSHING CSG TO 10' IN LPA1N5C

0940 BEGIN PROBING LPA1N5D

1000 COMPLETED PROBING TO 20' PUSH CSG

NO ELEVATED READINGS ON SURFACE SCAN OF CORE FROM LPA1N5D

1010 DRIVE HAMMER ON RIG LOSING POWER. RIG DOWN

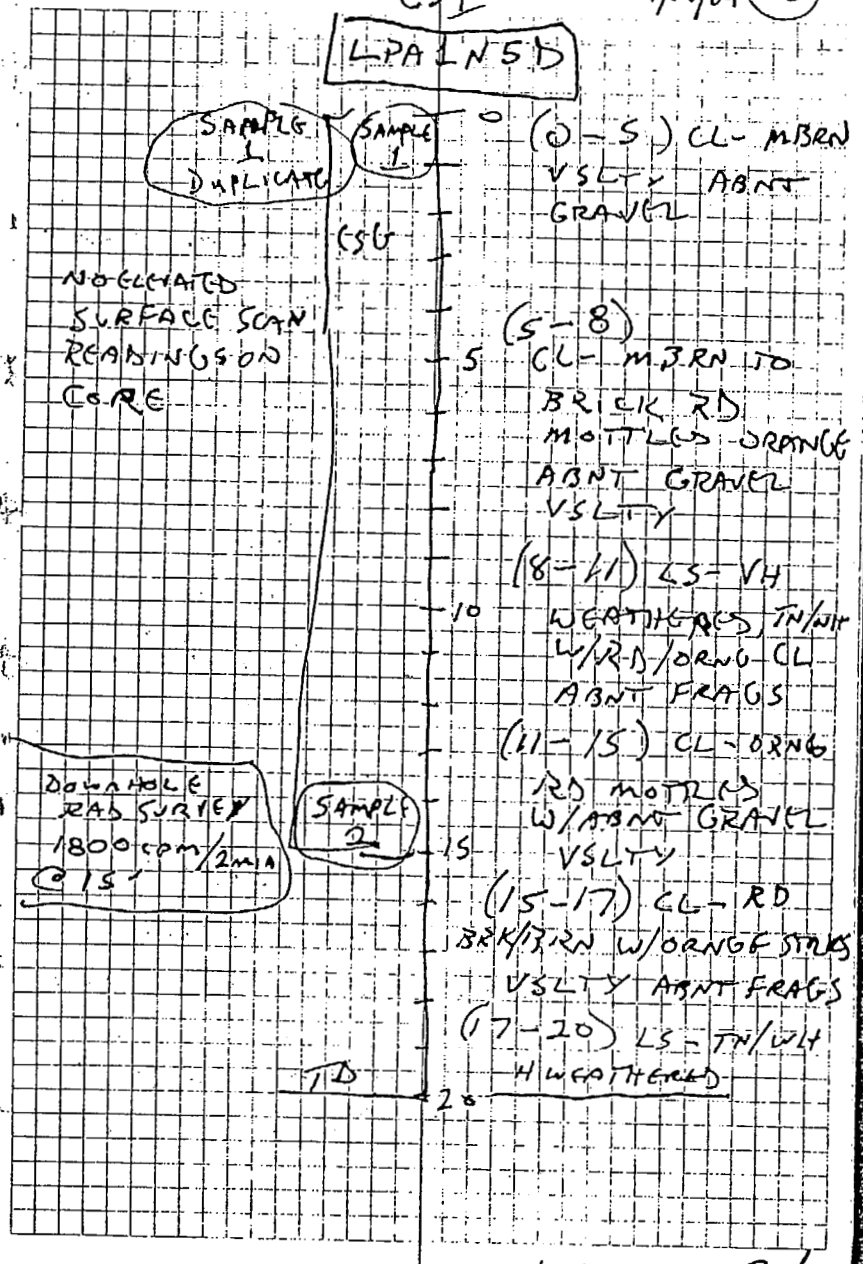
1110 RIG CANNOT BE REPAIRED. REPLACEMENT RIG ON THE WAY.

1200 ALL PERSONNEL LEAVING SITE FOR THE DAY

J M Carto 7/16/04

LAGARDE PARK ESI FRI 7/16/04 (25)

LPA1N5D




7/16/04 J M Carto

(26) SAT 7/17/04 LAGARDE PARK 114/113 ESI 114/010

TEMP° 65°F, CLOUDY, SCAT T-STORMS

0700

NEW RIG ON SITE

PERSONNEL ON SITE

STEP - JEFF CARTER SCOTT HOEKSTRA

DRILLER - JASON FRODIS

EDDY - JIM MILBY

BOART LONGYEAR - ALLEN THOMPS

JOE HYER

0730

TOOLBOX SAFETY TALK

DISCUSSED: ○ WET SURFACES

○ INCREASED RISK OF RADIATION IN NEXT GROUP OF HOLES

0745 RESUME PUSHING CSG IN LPA1N5D

HP MOVED "FRISK OUT" POINT FURTHER DOWN HILL BASED ON NO RAD READINGS IN UPPER AREA

0809 COMPLETED PUSHING CSG TO 15' IN LPA1N5D. MOVE TO LPA1N4D

Jeff Carter 7/17/04

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1-173/114-015 LAGARDE PARK 7/17 of SAT (27)

ESI

0820 BEGIN PROBING LPA1N4D

LPA1N4D

0850 COMPLETED SAMPLING PUSHING CSG

SURFACE SCAN OF CORE STOWED NO ELEVATED READINGS

0940 MOVING TO LPA1N3D

0945 BEGIN SAMPLING

NO ELEVATED READINGS ON DOWNHOLE RAD SCAN

SAT I

CSG

0 — (0-3.5) CL-TN TO MTRN VSLTY SCAT GRAVEL

(3.5-6) CL-RD/BRN TO TN SL MOTTLED SCAT GRAVEL

5

(6-7.5) SND-TN TO LT ORNG CL-STRIATIONS (BKRD) VSLTY ABNDT GRAVEL

7.5

(7.5-10) LS-HNEATH TN TO WH TR PINK VSLTY, VSDY ABNT FRAGS

10

(10-12) CL-MOTTLED RD-ORNG VSLTY

NO RECOVERY 12-16

13

16

(16-17) SND-TN TO ORNG BRN VSLTY ABNDT GRAVEL

(17-20) CL-TN TO RD BRN MOTTLED ORNG VSLTY TR SND SCAT GRAVEL

SAMPLE 2 T.D.

20

TOTAL SAMPLES DUP

7/13 14 1

7/14 13 1

27 4 = 31

7/17/04 Jeff Carter

(40) SAT 7/17/04 LA GRANGE PARK 114/113 ESI

LPA1N3D

1020 COMPLETED PROBING LPA1N3D PUSHING CSG TO 20'

1030 COMPLETED PUSH CSG MOVE TO LPA1N2D

NO ELEVATED READINGS ON RAD SCAN OF CORE

1040 TRACK THROWN ON GEOPROBE. BREAK FOR LUNCH DRILLER GONE TO GET PARTS TO FIX TRACK.

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

SAMPLE 1 & DUP

SAMPLE 2 & DUP

TD

0

(0-3.5) CL-TN TO MBRN VSLTY SCAT GRAVEL

(3.5-7) CL-MD RD BRN SCAT GRAVEL SL SILTY MOIST

(7-8.5) CL-BRICK RD TO ORANG MOTTLED SLTY

CSG

(8.5-17) CL-RD ORNG MOTTLED VSLTY SCAT GRAVEL

10

(17-20) CL-YL ORNGE WRD STKS SCAT WHEATH PINK TO LT TN LS

20

1200 BACK FROM LUNCH DRILLERS WORKING ON TRACK

Jeff Cart 7/17/04

114-173/114-010 LAGRANGE PARK ESI 7/17/04 (29)

SPOKE W/ JEFFREY DEVINE (COE). HE SAID THAT JULIE PETERSON (COE OMAHA ARW) ASKED THAT WE DO THE FOUR CORNER BORINGS IN AREA 5 AS AGREED WITH THE REGULATORS BUT ALSO ADD 10 BORINGS IN THE MIDDLE OF THE AREA TO INVESTIGATE THE POSSIBLE FORMER BUILDING LOCATION.

WE NOW PLAN TO DO A TOTAL OF 14 GEOPROBE BORINGS IN AREA 5.

UNABLE TO REPAIR TRACK. DRILLER CALLING REPAIR COMPANIES NO ONE WILLING TO COME OUT ON SATURDAY. HE WILL CONTINUE TO TRY

1630 RELEASED PERSONNEL FROM SITE & SECURED AREA.

7/17/04 Jeff Cart

7/18/04 LA GRANDE PARK
SUN ESI

1300 ON SITE W/ CURRY SMITH
of Thompson REPAIRMAN
POWER SYSTEMS

ALSO ON SITE
STEP - JEFF CARTER, SCOTT HOEKSTRA
AUXILIER - JASON FADDIS
BOART - ALLEN THOMAS, JOE HYER

1330 STILL NOT REPAIRED
S. HOEKSTRA & J. MILBY
LEAVE SITE

1630 TRACK REPAIRED
ALL PERSONNEL LEAVING
SITE

J M Carter 7/18/04

114-113/114-010 LA GRANDE PARK ESI MON 7/19/04 (31)

0630 ON SITE 67°F CLEAR

PERSONNEL SCOTT HOEKSTRA JEFF CARTER
(STEP)
(AUXILIER) JASON FADDIS
(CODT) JAMES MILBY
(BOART) ALLEN THOMAS
JOE HYER

SET UP ON LPA1N2D

0645 COMMENCE GEOPROBE
LPA1N2D

0710 COMPLETED GEOPROBE
DRIVING CSG

0720 COMPLETED DRIVING
CSG TO 9'

0725 MOVE TO LPA1N1D

0750 COMPLETED PROBE LPA1N1D
DRIVING CSG TO 8'

0755 MOVING TO LPA1N1E

0800 START PROBE LPA1N1E

0820 COMPLETE PROBE LPA1N1E
PUSH CSG TO 9'

7/19/04 J M Carter

(32) 7/19/04 MON

LAGARDE EST

LPA1N2D

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

SURFACE SCAN OF CORE HAS NO ELEVATED READINGS

SAMPLE 1

CSG

9'

(0-4.5) CL-TN TO MBRN VSLTY MOIST

(4.5-6) CL-DK BRN TO BRK RD, VSLTY ABNT GRAVEL

(6-8.5) CL-BRN TO YELLOW/ORNG MOTTLES SCAT GRAVEL SLTY

(8.5-12) CL-BRN TO ORNG Y/L MOTTLES W/PINK STRKS ABNT WEATH LS FRAGS VSLTY

(12-20) LS-HWEATH PNK TO WH/TN VSLTY

TD SAMPLE 2 20

7/19/04

LAGARDE PARK EST MON 7/19/04 (33)

LPA1N1D

DOWNHOLE RAD SCAN NO ELEVATED READINGS

SURFACE SCAN OF CORE HAS NO ELEVATED READINGS

SAMPLE 1

CSG

0

5

8

10

15

(0-1) CL-LT TN TO BRN VSLTY MOIST

(1-9) CL-MBRN BRICK RD SLTY SCAT GRAVEL (SND ZONE 6.5-7)

(9-13) SND-TN BRN TO RD VSLTY

(13-20) SND-LT TN TO WH VSLTY VFN GRN

TD SAMPLE 2 20

7/19/04

94) 7/19/04 MON

LAGRANGE PARK
EST

114-113
14-010

LPA1N1E

SAMP 1 (0-1) CLLT.TN MBRN VSLTY

DOWNHOLE RAD SCAN HAD NO ELEVATED READINGS

CSG

(1-7) CL-BK BRN/RD SLTY TR ORNG SCAT GRAVEL

(7-12) CL-MOTTLED ORNG/RD VSLTY SDY ABNT GRAVEL

SURFACE SCAN OF CORE HAD NO ELEVATED READINGS

(12-14) SND-VSLTY TN/WH TO LT BRN ABNT GRAVEL

(14-16) CL-RD/ORNG MOTTLED VSDY SLTY

(16-19) SND-TNTO ORNG BRN VSLTY TR GRAVEL

(19-20) SND-TAN TO WH VSLTY

TD SAMP 2

0
9
10
20

J. M. Carter 7/19/04

LA GRANGE PARK
ESI

7/19/04 MON

35

0855 BEGIN PROBE LPA1N1F

SAMPLES COLLECTED TODAY:
LPA1N2D1 (0-1)
2D2 (19-20)
LPA1N1D1 (0-1)
1D2 (19-20)
LPA1N1E1 (0-1)
1E2 (14-20)

0940 COMPLETED PROBING DRIVING CASING. SAND CAUSING LINERS TO STICK IN SAMPLE TUBES. DROVE CSG TO 20'

0955 PULL OFF HOLE TO MOVE TO LPA1N1G

1000 START PROBING LPA1N1G

1040 COMPLETE PROBE PUSHING CSG TO 20'

1100 SET UP ON LPA1N2E

LUNCH

7/19/04 J. M. Carter

(35) 7/19/04 MON — LAGARD PARK GSI

1130 BEGIN PROBE LPA1N2E

1210 PUSH CSG TO 12' MOVE TO SET UP ON LPA1N2F

1215 BEGIN GEOPROBE LPA1N2F

12:30 COMPLETE PROBING PUSHING CSG IN LPA1N2F PUSH CSG TO 9' PULL OFF TO SET UP ON LPA1N2G

12:45 BEGIN PROBING LPA1N2G

1300 COMPLETE PROBING PUSH CSG IN LPA1N2G TO 20'

1325 BEGIN PROBING LPA1N3G

Jeff Cutts 7/19/04

LAGARDE PARK ESI 7/19/04 MON (37)

LPA1N1G

SAMPLE 1 — 0

(0-1) CL - MBRN TN SLTY TR GRAVEL

(1-6) CL - BRICK RD SLTY SDY TR GRAVEL

5 (6-6.5) SND - VSLTY TN/ORNGE BRN/RD

(6.5-9) CL - MOTTLED RD/ORNGE SCAT GRAVEL SLTY OCCASIONAL SND STRINGERS

10

(9-15) CL - TN MBRN VSDY SCAT GRAVEL

(15-18) CL-RD BRN MOTTLED ORNG SLTY TR GRAVEL

15

(18-20) CL - MBRN TO TN SLTY SL SND

SAMPLE 2 — 20

CSG

SURFACE SCAN OF CORE HAD NO ELEVATED READINGS

DOWNHOLE RAD SCAN HAD NO ELEVATED READINGS

7/19/04 Jeff Cutts

38 7/19/04 MON LAGARDE PARK ESI

LPA1N1E

SURFACE SCAN OF CORE HAD NO ELEVATED READINGS

DOWN HOLE RAD SCAN HAD NO ELEVATED READINGS

0 SAMPLE 1 (0-3) CL-LTN MBRN VSLTY ABNT GRAVEL

(3-5) CL-BRIK RD VSLTY SSV

(5-6) CL-RD TO ORNG VSDY SLTY ABNT GRAVEL

CSG (6-12) CL-DK RD/BRN SLTY SCAT GRAVEL TR SND

10

CSG (12-20) SND-TN TO ORNG BRN VSLTY, ARG IN STREAKS ABNT GRAVEL

LAERS STUCK IN SAMPLE PIPE

TD SAMPLE 2 20

7/19/04

LA GARDE PARK MON ESI 7/19/04 39

LPA1N2E

1' DUP SAMPLE 1 0 (0-3) CL-TN TO MBRN SLTY

(3-9) CL-DK RD-BRN MOTTLED ORANGE, SLTY SCAT GRAVEL

SURFACE SCAN OF CORE HAD NO ELEVATED READINGS

CSG 5

DOWN HOLE RAD SCAN HAD SLIGHT READING @ 11'

(9-13) CL-TN TO DK BRN/RD MOTTLED ORNGE VSDY, SLTY TR GRAVEL

10

DUP 12 SAMPLE 2

(13-14) CL-TN TO RD VSDY ABNT GRAVEL

(14-15) SND-DK GRY W/PURPLE ABNT GRAVEL GEO PROBE REFUSAL

TD 15

20

(40) 7/19/04 MON

LAGARDE PARK
ESI

LPA1N2F

SAMPLE 1 0 (0-2) CL-LT TN MBRN SLTY TR GRAVEL

CSG (2-10) CL-DK RD/BRN MOTTLED ORNG VSLTY SCAT GRAVEL

NO ELEVATED READINGS IN SUBSURFACE

9

(10-11) SND-TN/WH DK RD TO ORNG CL VSLTY

10

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

(11-13) CL-DK RD BRN MOTTLED ORNG VSDY

(13-16) CL-TN TO MBRN VSDY W/SND STRINGERS TN TO WH

(16-20) CL-TN TO DK RD W/SND STRINGERS

SAMPLE 2

TD 20

Jeff Carter 7/19/04

LAGARDE PARK
ESI

7/19/04 MON (41)

LPA1N2G

SAMPLE 1 0 (0-2) CL-TN TO MBRN SLTY TR GRAVEL

(2-8) CL-DK RD BRN MOTTLED ORNG VSLTY SDY SCAT GRAVEL

5

(8-9) SND-TN TO ORNG BRN VSLTY ABNDT GRAVEL

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

10

(9-15) CL-DK RD MOTTLED ORNG VSLTY, SDY SCAT GRAVEL

15

(15-19) SND-TN TO MBRN W/WHITE STRKS ABNDT GRAVEL, SLTY

(19-20) CL-MTN BRN MOTTLED ORNG VSLTY SCAT GRAVEL

TD SAMPLE 2 20

7/19/04 Jeff Carter

(4) 7/19/04 MON LA GARDE PARK ESI

1350 COMPLETED PROBING LPA1N3G PUSHING CSG TO 9.9'

1400 MOVED SET UP ON LPA1N5E

1410 PROBING ON LPA1N5E

1440 COMPLETE PROBE PUSHING CSG TO 20'

1450 COMPLETED PUSHING CSG TO 20' IN LPA1N5E

1515 MOVE TO SET UP ON LPA1N5F

1520 PROBING ON LPA1N5F

1540 COMPLETED PROBING PUSHING CSG IN LPA1N5F

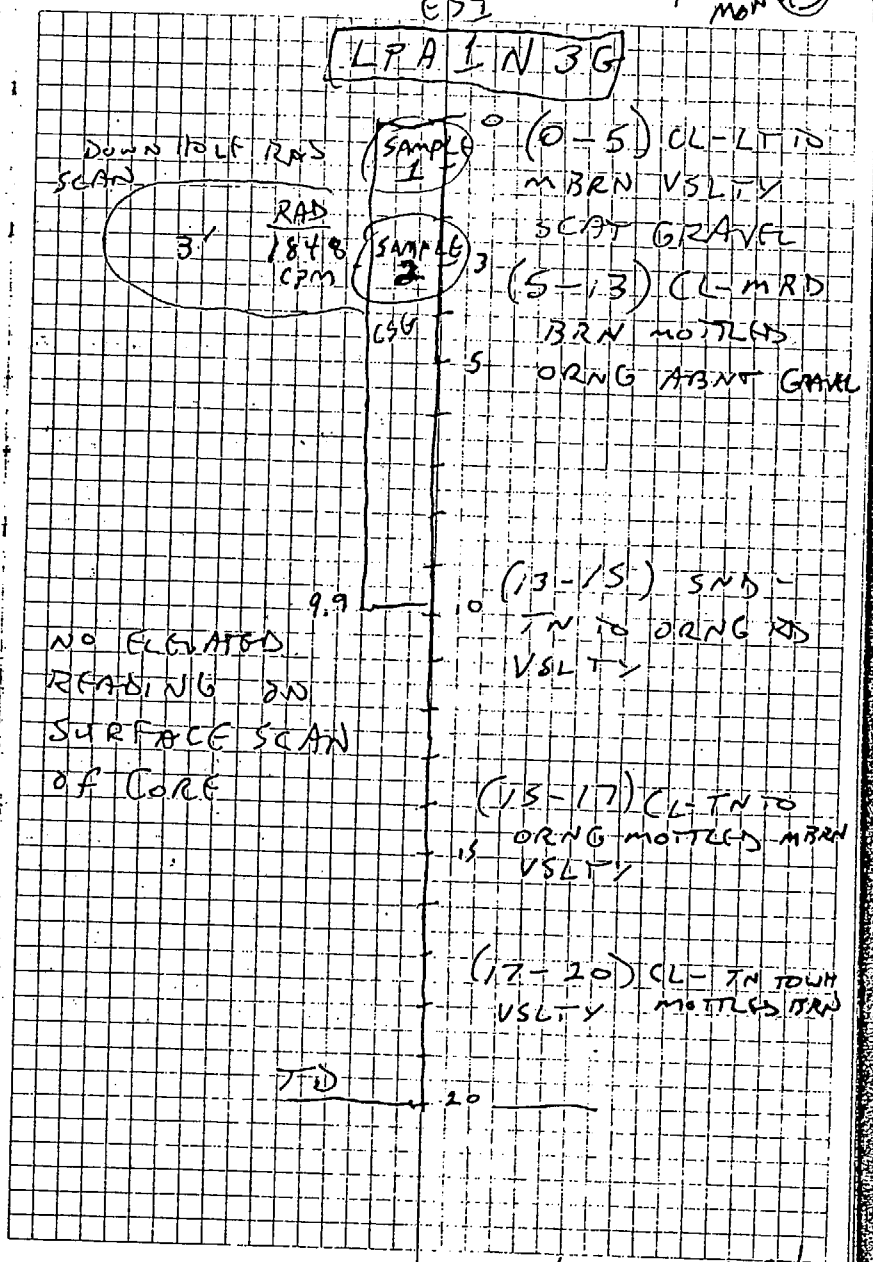
1555 PUSHED CSG TO 15.5'

1610 MOVE TO SET UP ON LPA1N4G

Jeff Carter 7/19/04

LA GARDE PARK ESI 7/19/04 MON (43)

LPA1N3G




NO ELEVATED READING ON SURFACE SCAN OF CORE

7/19/04 Jeff Carter

7/19/04
MON

LA GRANDE PARK
CSI

LPA LN SE

SAMPLE 1

0 (0-3) CL-TN TO MBRN ABNT GRAVEL VSLTY SDY

NO ELEVATED READINGS IN DOWNHOLE READ SCAN

(3-9) CL-BRICK RD MOTTLED ORNGE SCAT GRAVEL SLTY

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

CSG

10

(9-12) CL-TN TO MBRN RD MOTTLED ORNGE VSDY GRADING TO LT TN SND IN PART SLTY ABUNDT GRAVEL

(12-15) CL-STRIATED ORNG TN & PNK/RD SLTY

(15-20) LS-H WEATH PINK TO LT TN VSLTY

SAMPLE 2

20

Jeff Cook 7/19/04

-113
114-010

LA GRANDE PARK
CSI

7/19/04 (3)
MON

LPA LN SH

SAMPLE 1

0 (0-3) CL-TN TO MBRN VSLTY SCAT GRAVEL

(3-13) CL-TN RD TO ORNG BRN MOTTLED ABUNDT GRAVEL VSLTY SND STREAKS

5

CSG

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

(13-18) CL-RD TO ORNG BRN VSDY W/WEATH LS

10

(18-20) CL-TN TO WH W/ORNG RD STRKS VSLTY

15

SAMPLE 2

20

7/19/04 Jeff Cook

(46) 7/19/04 MON — LAGARDE PARK — ESI

1615 BEGIN PROBING LPA1N4G

1630 COMPLETED PROBING PUSHING CSG

1645 PUSHED CSG TO 13' IN LPA1N4G

MOVING TO SCG NO ON LPA1N4F

1650 TRACK ON RIGHT SIDE CAME OFF OF RIG

1740 TRACK REPAIRED BEGIN PROBG ON LPA1N4F

1750 COMPLETE PROBE PUSHING CSG

1800 PUSH CSG TO 13' IN LPA1N4F

19 SAMPLES 2 DUPS

COMPLETED TODAY

| | |
|---|---|
| LPA1N2D (2 SAMPLES) | LPA1N2F (2 SAMPLES) |
| LPA1N1D (2 SAMPLES) | LPA1N2G (2 SAMPLES) |
| LPA1N1E (2 SAMPLES) | LPA1N3G (2 SAMPLES) |
| LPA1N1G (2 SAMPLES) | LPA1N5E (1 SAMPLE) |
| LPA1N1F (2 SAMPLES) | LPA1N5F (0 SAMPLES) |
| LPA1N2E (2 SAMPLES ; 2 DUP) | LPA1N4G (0) |

Jeff Carter 7/19/04

LAGARDE PARK — ESI — 7/19/04 MON (47)

LPA1N4G

SAMPLE 1

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

0 — (0-3) CL-TN MBRN VSLTY SCAT GRAVEL

(3-14) CL-RD TO ORNG BRN MOTTLED SCAT GRAVEL VSLTY

~~SSS~~

~~14~~

CSG

5

10

(14-20) SND-TN TO WH W/ORNGE RD STRKS VSLTY ABNT GRAVEL

15

SAMPLE 2

TD 20

7/19/04 Jeff Carter

(1 (18) 7/19/04 MON LAGARDE PARK ESI

LPA1N4F

DUP1 SAMPLE (0-5) CL-TN TO MBRN VSLTY ABNT GRAVEL

SUBSURFACE SCAN SHOWED NO ELEVATED RAD READINGS

(5-14) CL - MBRN RD TO ORNG MOTTLED VSLTY SAND STRINGER @ 7' & @ 11' VSLTY ABNDT GRAVEL

CSG

10

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

SAMPLE DUP2

13

TD 14

GEOPROBE REFUSAL

20

Jeff Cook 7/19/04

1-113/114-010

LAGARDE PARK GSI 7/19/04 (19)

1800 COMPLETED PUSHING CASING IN LPA1N4F TO 13' MOVE RIG OFF HOLE & SHUT DOWN

1815 DRILLERS & UXO LEFT SITE FOR DAY

1845 ALL PERSONNEL LEAVING SITE. SITE SECURED

7/19/04 Jeff Cook

7/20/04 LAGARDE PARK
TUE CSI
TEMP 63°F, CLEAR
0630 ON SITE
(STEP) JEFF CARTER, SCOTT HOEKSTRA
(AUXILIA) JASON FADDIS
(BOART) ALLEN THOMAS, JOE HYER
(GDT) JIM MILBY

OPEN FENCE SET UP ON
LPA1N5G
0659 BEGIN PROBING
LPA1N5G
0720 COMPLETED PROBING
PUSHING CSG TO 14'
0730 MOVING TO SET UP
ON LPA5N1A

INAREAS DOING 14 HOLES
LPA5N 1A, 2B, 2D, 3B, 3C, 3D, 3E, 4B, 4C, 4D, 4E, ~~5C~~, ~~5D~~, 1F, 6A, 6F

Jeff Carter 7/20/04

LAGARDE PARK 7/20/04
CSI TUE (51)

LPA1N5G

SAMPLE 1 — 0

(0-3) CL-MBRN TO TN VSLTD SCAT GRAVEL

(3-6) CL-BRKRD SLTY TR GRAVEL [2" WEATHLS @ 7']

(6-12) CL-DKRD MOTTLED ORNG VSLTY SCAT GRAVEL

(12-20) CL-TN W/RD STRKS VSLTY SDY SCAT GRAVEL

CSG — 5

10

14

15

SAMPLE 2 — 20 — TD

NO ELEVATED READINGS ON DOWNHOLE RAD SCAN

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

7/20/04 Jeff Carter

(52) 7/20/04 TUE LAGARDE PARK ESI

0800 PROBING ON LPA5N1A

0810 GEOPROBE REFUSAL @ 16' DRIVING 3.25" CSG TO 16'

0815 MOVING TO SETUP ON LPA5N1F

0845 BEGIN PROBING LPA5N1F

0855 GEOPROBE REFUSAL @ 11.5' IN LPA5N1F PUSH CSG TO 9.5'

0905 SETUP ON LPA5N2D BEGIN PROBING

0920 GEOPROBE REFUSAL @ 11'. DRIVING CSG

0925 PUSHED CSG TO 9'. MOVING TO LPA5N3E

Jeff Carter 7/20/04

LA GARDE PARK ESI 7/20/04 TUE (53)

LPA5N1A

NO ELEVATED READINGS IN DOWNHOLE RAD SCREENING

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

SAMPLE 1

SAMPLE 2

CSG

0 (0-4) CL-TN TO MBRN VSLTY SCAT GRAVEL

5 (4-6) CL-DKRD SL MOTTLED ORNG SCAT GRAVEL SLTY

(6-6.5) HWEATH LS

(6.5-9) CL-MRD BRN ORNG STRKS VSLT, VSDY ABNT GRAVEL

10 (9-13) CL-TN W/ABNT HWEATH LS FRAGS VSLTY

15 (13-16) CL-BRK RD VSLT, SDY W/ABNT GRAVEL

16 GEOPROBE REFUSAL

20

7/20/04 Jeff Carter

(54) 7/20/04 LA GARDE PARK
TUE ESI

LPA5N1F

SAMPLE 1 (0-2) CL-MBRN SLTY TR GRAVEL

NO ELEVATED READINGS ON DOWNHOLE RAD SCAN

CSG

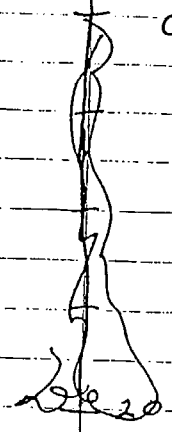
(2-11.5) CL-DK RD MOTTLED ORANGE SLTY SCAT GRAVEL

9.5

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

TD SAMPLE 2 11.5'

GEOPROBE REFUSAL



7/20/04

114-113/114-016 LA GARDE PARK 7/20/04 (55)
ESI TUE

LPA5N2D

SAMPLE 1 (0-2) CL MBRN VSLTY SCAT GRAVEL

NO ELEVATED READINGS ON DOWNHOLE RAD SCAN

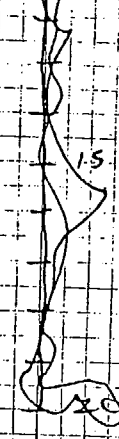
CSG

(2-11) CL-DK RD MOTTLED ORNG SLTY SCAT GRAVEL

TD SAMPLE 11'

GEOPROBE REFUSAL

NO ELEVATED READINGS ON SURFACE SCAN OF CORE



7/20/04

(56) 7/20/04 TUE LAGRANGE PARK GSI

0945 BEGIN PROBING ON LPA5N3E

1005 GEOPROBE REFUSAL @ 18' IN LPA5N3E PUSHING CSG

1020 PUSHED CSG TO 18' IN LPA5N3E. MOVE TO SET UP ON LPA5N3D

1025 BEGIN PROBING LPA5N3D

1045 COMPLETE PROBING PUSHING CSG IN LPA5N3D

1055 PUSHED CSG TO 20' MOVE TO LPA5N3C LUNCH

1210 BEGIN PROBE LPA5N3C

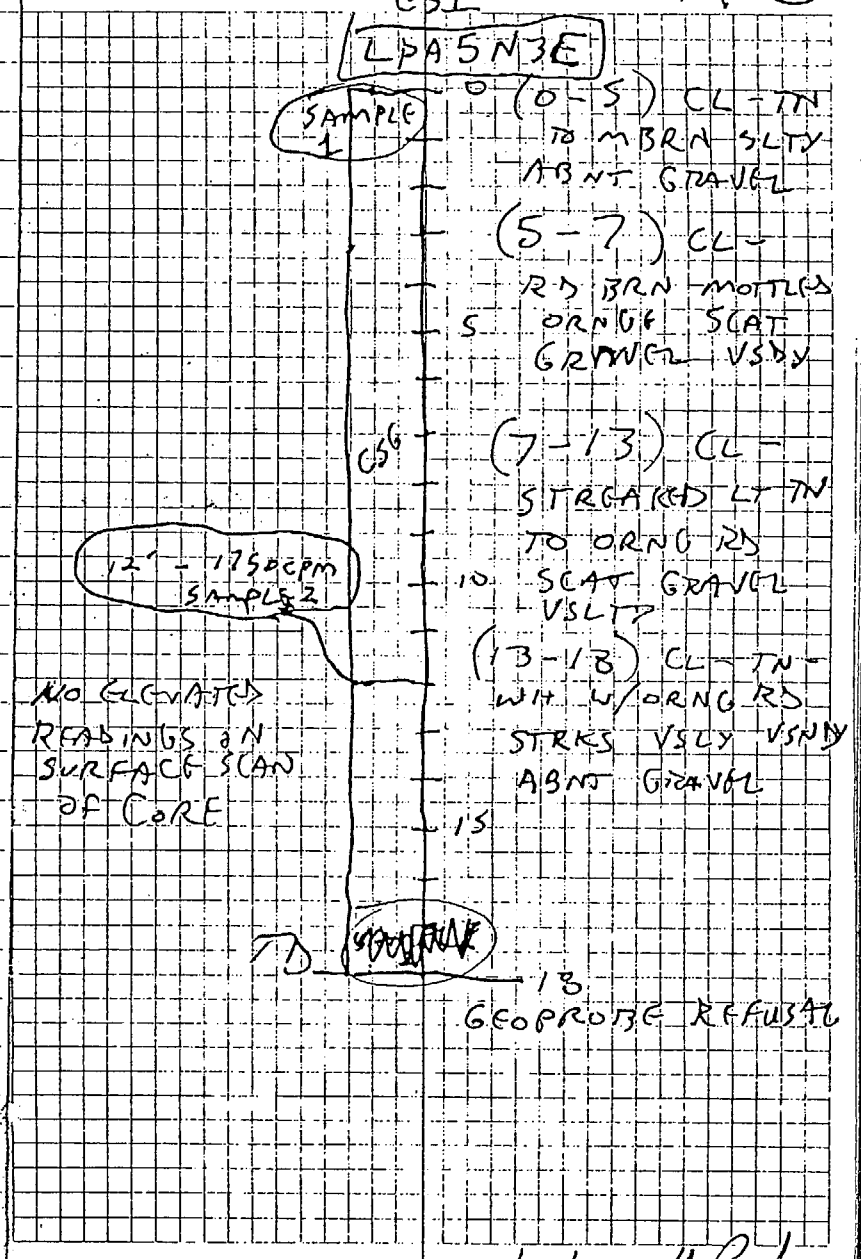
1230 COMPLETE PROBING. PUSHING CSG IN LPA5N3C

1300 MOVE TO LPA5N3B BEGIN PROBING

1330 COMPLETED PROBING PUSHING CSG

Jeff Curtis 7/20/04

LAGRANGE PARK GSI 7/20/04 THE (57)




7/20/04 Jeff Curtis

(58) 7/20/04 TUE

LA GARDS PARK
GSI

LPA5N3D

SAMPLE 1

(0-5) CL-LT BRN SLTY SCAT GRAVEL

(5-12) CL-DK RD TO BRN STRIATED W/ORNG ABNT GRAVEL

(12-20) CL-BRK RD STRIAT ORNG VSDY SLTY SCAT GRAVEL

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

CSG

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

TD

SAMPLE 2

J M Carter 7/20/04

LA GARDS PARK THE
GSI
7/20/04

(59)

LPA5N3C

SAMPLE 1

(0-1) CL-MBRN W/GRAVEL

(1-9) CL-RDBRN MOTTLED ORANGE

(9-10) CL-ORNGE TN/BRN MOTTLED VSDY ABNT GRAVEL

(10-13) CL-RD BRN ORNG MOTTLED SLTY

(13-14) SAND W/SLTY ORNGTN STRKS

(14-20) CL-RD BRN MOTTLED ORNGE SCAT GRAVEL VSLTY

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

CSG

NO ELEVATED READINGS IN SURFACE SCAN OF CORE

TD

SAMPLE 2

7/20/04 J M Carter

7/20/04
TUE

LA GARD PARK
EST

LPA5N3B

SAMPLE 1 0 (0-2) CL-M TO LT BRN VSLTY SCAT GRAVEL

(2-7) CL-DK RD/BRN ORN MOTTLED ABNT GRAVEL VSLTY

NO ELEVATED READINGS IN DOWNHOLE RAD SCAN

CSG

(7-9) CL-DK BRN ORNG STRKS SDY

10 (9-15) CL-M BRN RD W/ORNG STRKS V SDY ABNT GRAVEL

(15-20) CL-MOTTLED ORNG RD SCAT GRAVEL SDY VSLTY

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

TD SAMPLE 2 20

7/20/04

114-113/114-010 LA GARDE PARK EST 7/20/04 TUE (61)

1345 COMPLETED PUSHING CSG IN LPA5N3B TO 19'
PREPARE TO MOVE TO LP5AN2C

1400 SET UP & BEGIN ~~PROBE~~ PROBE LP5AN2C

1445 COMPLETE PROBE PUSH CSG TO 20'

1505 MOVE TO SET UP ON LPA5N4B

1510 BEGIN PROBE LPA5N4B

1550 COMPLETE PROBE PUSHING CSG IN LPA5N4B

1610 COMPLETED PUSHING CSG TO 12'. PREPARE TO MOVE TO LPA5N4C

1630 BEGIN PROBING LPA5N4C

1645 COMPLETED PROBING PUSHING CSG TO 16' IN LPA5N4C

1700 MOVING TO LPA5N4D

1705 BEGIN PROBING LPA5N4D

7/20/04

(62) 7/20/04 TUE

LA GRANDE PARK
ESI

LPA5N2C

SAMPLE 1 (0 - 1) CL - MBRN VSDY

(1 - 4) CL - MBRN SDY ABNT GRAVEL

(4 - 16) CL - RD BRN MOTTLED ORNG VSDY SCAT GRAVEL

NO ELEVATED READINGS IN DOWN HOLE RAD SCAN

GSG

10

NO ELEVATED READINGS IN SURFACE SCAN OF CORE

(16 - 20) CL - TN TO LTBRN STRK ORNG VSLTY W/SND STRINGS SCAT GRAVEL

TD SAMPLE 2 20

Jeff Curtis 7/20/04

LA GRANDE PARK TUE 7/20/04 (63)
ESI

LPA5N4B

SAMPLE 1 0 (0 - 3) CL - MDK BRN VSLTY SCAT GRAVEL

(3 - 12) CL - DKRD MOTTLED ORNGE VSLTY SND STRINGERS SCAT GRAVEL

5

GSG

10

(12 - 16)

12

SAMPLER MAL FUNCTION NO RECOVERY

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

15

(16 - 20) CL - LT TN TO DKRD W/ORNG STRKS, VSNDY SLTY ~~ABNT GRAVEL~~

TD SAMPLE 2 20

7/20/04 Jeff Curtis

(-1) 7/20/04
TUE

LAGRANGE PARK
GSI
LPA5N4C

SAMPLE 1

0 (0-6) CL-
M TO DK BRN
VSDY ABNT
GRAVEL

NO ELEVATED
READINGS
ON DOWNHOLE
RAD SCAN

(6-17) CL-
TN TO MBRN
MOTTLED ORANGE
SDY VSLTY
SCAT GRAVEL

10

NO ELEVATED
READINGS ON
SURFACE SCAN
OF CORE

(17-19) CL-
BRK RD VSLTY
TR GRAVEL

16

(19-20) CL-
TN TO BRN MOTTLED
ORANGE SLTY

TD SAMPLE 2 20

Jeff Curtis 7/20/04

LAGRANGE PARK
GSI
7/20/04 (65)
TUE

LPA5N4D

SAMPLE 1

0

NO RECOVERY
(0-4)

6

(4-12) CL-
TN TO RD YELLOW
MOTTLED SLTY
SCAT GRAVEL

5

8

10 (12-20) CL-TN
TO LT BRN VSLTY
W/STRKS OF GY
GRAVEL

NO ELEVATED
READINGS ON
SURFACE SCAN
OF CORE

15

TD SAMPLE 2 20

7/20/04 Jeff Curtis

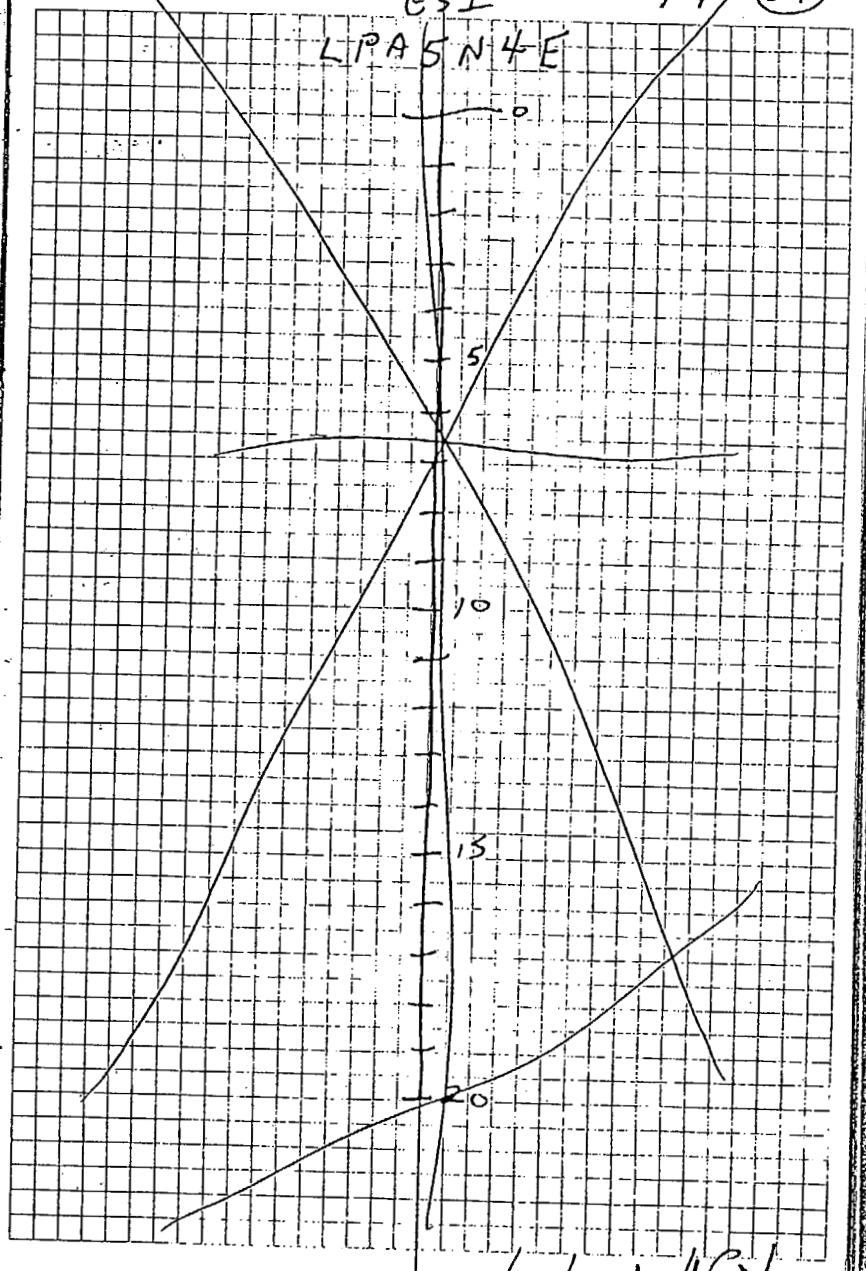
(66) 7/20/04 LAGARDO PARK
JMG ESI

1725 COMPLETE PROBING
LPA5N4D PUSHING
CSG TO 8'
1735 MOVING TO
LPA5N4E
1750 WHEN SETTING UP ON
LPA5N4E THE DRILLER
CRIMPED & BROKE A
HYDRAULIC LINE
RELEASING A SMALL
AMOUNT OF HYDRAULIC
FLUID BUT CREATED A
LEAK THAT LEAKED
FLUID WHEN THE MAST
WAS MOVED.
SHUT DOWN FOR THE DAY.
DRILLERS WILL CONTACT
REPAIRMAN FIRST THING IN
MORNING.

1825 ALL PERSONNEL LEAVING
SITE. SITE SECURED

Jeff Carter 7/20/04

114-113/114-010 LAGARDO PARK
ESI 7/20/04 (67)




7/20/04 Jeff Carter

(0-) 7/21/04 WED LAGARDE PARK ESI

TEMP: 67°F CLEAR

0630 ON SITE

(STEP) JEFF CARTER, SCOTT HOEKSTRA

(AUXIER) JASON FADDIS

(EODT) JIM MILBY

86 + 22 = 108

8 + 3 = 11

0700 CONTACTED DRILLERS THEY ARE TRYING TO GET PARTS OR SERVICE TO FIX BROKEN HYDRAULIC LINE ON RIG.

0830 DRILLERS SAID IT WOULD BE AT LEAST 2 HRS BEFORE REPAIRMAN COULD BE ON SITE. RELEASE FIELD CREW. ALL PERSONNEL LEFT SITE.

1000 REPAIRMAN ON SITE. ACCESS BLOCKED BY ADOT ROAD WORK BUT WAS ABLE TO BYPASS TO GET TO SITE

Jeff Carter 7/21/04

LA GARDE PARK ESI 7/21/04 WED (69)

1030 RIG REPAIRED FIELD CREW BACK ON SITE ESCORTING REPAIRMAN BACK OUT.

1040 GOT BACK TO SITE FOUND OUT RIG STILL NOT FULLY FUNCTIONAL. RAN DRILLERS OUT TO GET ANOTHER PART

1215 RIG REPAIRED BEGIN PROBE LPASN4E

1225 COMPLETED PROBE PUSHING CSG. PUSH CSG TO 7'

1230 MOVE TO SETUP ON LPASN6F

1235 BEGIN PROBING LPASN6F

1250 COMPLETE PROBING PUSHING CSG. PUSH CSG TO 5.5'

1300 BEGIN PROBE LPASN6A

1320 COMPLETE PUSH CASING TO 8' MOVE BACK O AREA (INSIDE FENCE).

7/21/04 Jeff Carter

(0) 7/21/04 WED

LAGARDE PARK
CSI

LPA5N4E

SAMPLE 1

0 (0-3) CL-
TN TO MBRN
VSLTY ABNT
GRAVEL

CSG

(3-7) CL-
TN BRN MOTTLED
ORANGE, VSLTY

7'

(7-18) CL-
TN TO MBRN
TO TN/WH STRKS
VSLTY SNDY
ABNT GRAVEL

(18-19) CL-
TN W/PINK TO
PURPLE STRKS
VSDY ABNT
WEATH LS FRAG

(19-20) CL- TN TO
LT BRN W/MBRN
STRKS SLTY
TR GRAVEL

SAMPLE 2

TD 20

NO ELEVATED READINGS ON DOWNHOLE RAD SCAN OF CORE

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

7/21/04

LAGARDE PARK
CSI

7/21/04 WED (21)

LPA5N6F

SAMPLE 3

0 (0-6) CL-
MTN TO LTBRN
VSDY ABNT
GRAVEL

CSG

5 (6-17) CL-
MTN TO LTBRN
W/TN W/H STRKS
VSLTY VSDY
ABNT GRAVEL

5.5

10

(17-20) CL-
MOTTLED TN
AND BRK RD
W/ORNG STRKS
VSLTY

15

SAMPLE 2

TD 20

NO ELEVATED READINGS ON DOWNHOLE ~~SCAN~~ SCAN ~~of~~ ~~CORE~~

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

7/21/04

(12) 7/21/04 WED

LA GARDE PARK
ESI

LPA5N6A

SAMPLE I

0 (0-5) CL-AMBRN VSLTY ABNT GRAVEL

CSG

(5-7) CL-TN TO MBRN W/ ABNT WEATHLS VSDY

(7-12) CL- STRIATED TN PINK ORNG SLTY SCAT GRAVEL

10

(12-15) CL STRIATED BRN ORNG PINK VSLTY SNDY ABNT WEATH LS

(15-20) CL- MOTTLED ORNG RD & BRN SLTY MOIST TO WET @17'

SAMPLE

TD 20

no elevated readings on surface scan of core

DM Cat 7/21/04

LA GARDE PARK 7/21/04 WED (13)
ESI

1340 BEGIN PROBE LPA1N4E

1400 COMPLETED PROBING PUSHING CSG. PUSHED CSG TO 15'

1405 MOVING TO SET UP ON LPA1N3F

1415 BEGIN PROBE ON LPA1N3F

1440 COMPLETED PROBING LPA1N3F PUSHING CSG TO 11'

1450 SET UP ON LPA1N3E

1520 COMPLETED PROBING PUSH CSG TO 11.5'

1550 MOVE ON TO BOUNDING HOLE LPA1 ~~SB1~~ SB1 BETWEEN GRID NODES 4F & 4E.

1600 COMPLETE PROBE PUSHING CASING IN LPA1SB1 TO 11'

1610 MOVE ONTO LPA1SB3

1620 COMPLETE PROBING LPA1SB3 PUSHING CSG

1630 MOVING TO SET UP ON LPA1SB2

1635 BEGIN PROBE LPA1SB2

7/21/04 DM Cat

(74) 7/21/04 WED

LAGARDE PARK
ESI
LPA1N4E

DUP SAMPLE 1

0 (0-5) CL - TN TO MBRN SLTY VSDY ABNDT GRAVEL

(5-11) CL - BRK RD MOTTLED ORNG TR GRAVEL SLTY

CSG

(11-13) CL - TN ORNGE TO RD MOTTLED SLTY

[10-11' 1781 cpm]

10

DUP SAMPLE 2

(13-19) CL - STRIATED TN ORNG PINK SLTY TR GRAVEL

(19-20) CL - LT PINK ORNG STRIATED SCAT W WEATH LS FRAGS

15

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

DUP SAMPLE 3

TD 20

Jeff Carter 7/21/04

LAGARDE PARK
ESI
LPA1N3E

7/21/04 (75) WED

SAMPLE 1

0 (0-1) CL - TN MBRN SLTY TR GRAVEL

(1-3) CL - BRK RD SLTY

3.0 - DK GY
3.5 BLK MATERIAL

CSG

5

(3.5-8) CL - DK RD SL MOTTLED ORNG SLTY

(8-20) CL - MOTTLED RD ORNG W/WEATH LS ABNT GRAVEL VSLTY

10

11

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

15

TD SAMPLE 2 20

7/21/04 Jeff Carter

(1-) 7/21/04 WED

LA GARDE PARK
ESI

LPA1N3E

SAMPLE 1

1,653 ppm SAMPLE 2

11.5

0 (0-1) CL-TN TO MBRN ABNT GRAVEL VSLTY

(1-4) CL- BRR RD SLTY SCAT GRAVEL

(4-7) CL- MOTTLED ORNG RD VSDY ABNDT GRAVEL

10 (7-8) CL- MOTTLED ORNG RD SLTY

(8-10) CL- STRIPED BRN ORN PNK w/ WH STRKS ABNT GRAVEL VSLTY VSDY

(10-13) CL- MOTTLED ORNG RD SLTY

(13-20) CL- BRN TO PNK w/ WEATHLS VSLTY

TD 20

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

Jeff Curtis 7/21/04

LA GARDE PARK
ESI 7/21/04 (77)

LPA1 SB1

SAMPLE 1

CSG

8-9 1429 ppm 8.5 SAMPLE 2

11

SAMPLE 3

TD

0 (0-5) CL- TN TO MBRN VSLTY ABNT GRAVEL

(5-9) CL- BRK RD SLTY TR GRAVEL

5

(9-10) CL- TN W/ RD STRKS VSLTY SDY

(10-12) CL- MOTTLED RD/ORNGE SLTY

10

(12-15) CL- MOTTLED RD ORNGE LT TN VSLTY

(15-16) CL- STRK ORNG LT TN SL SLTY

15

(16-20) CL- MOTTLED ORNG RD VSLTY

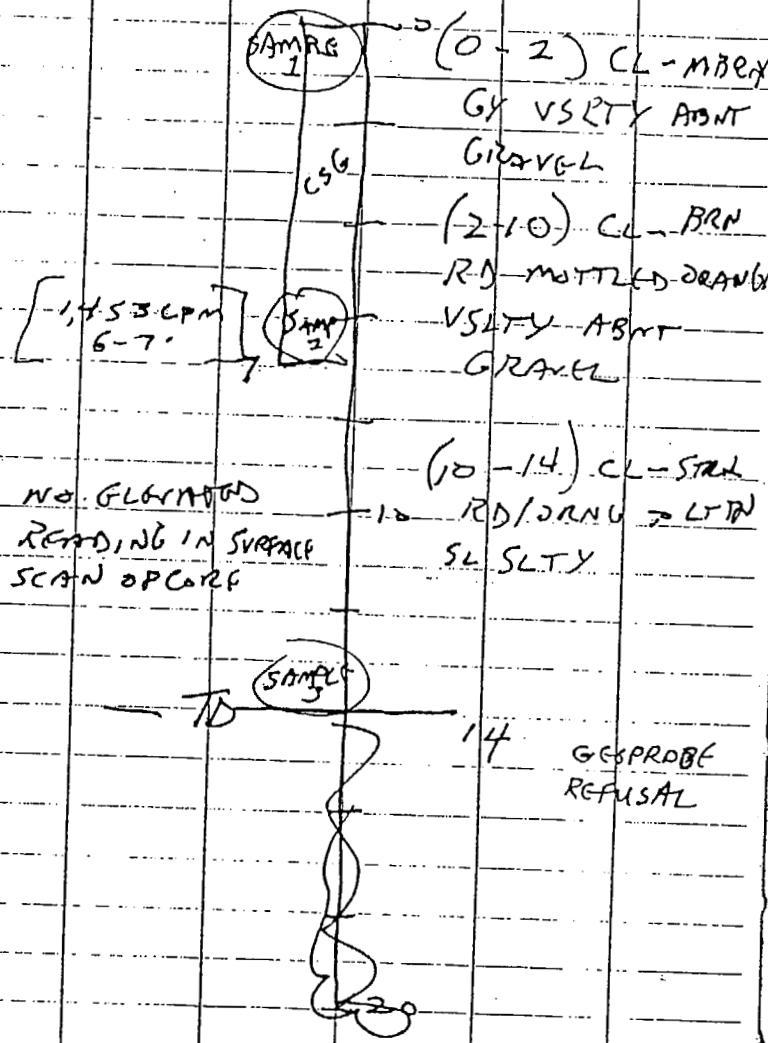
20

NO ELEVATED READINGS ON SURFACE SCAN OF CORE

7/21/04 Jeff Curtis

7/21/04
WED

LAGARDE PARK
ESI
LPA1SB3

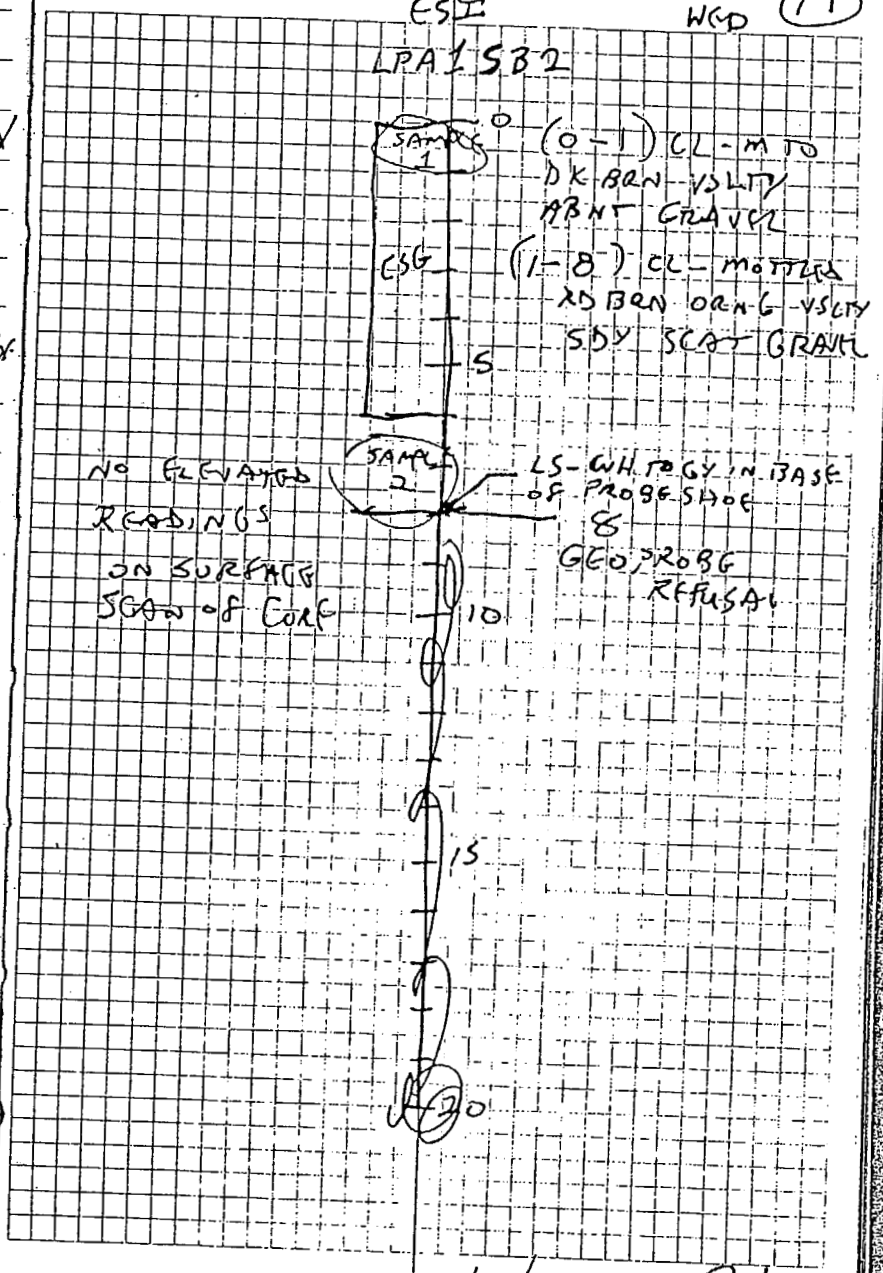



Jeff Curtis 7/21/04

LAGARDE PARK
ESI
LPA1SB2

7/21/04
WED

79




7/21/04 Jeff Curtis

(00) 7/21/04 LAGRANGE PARK
WCP ESI

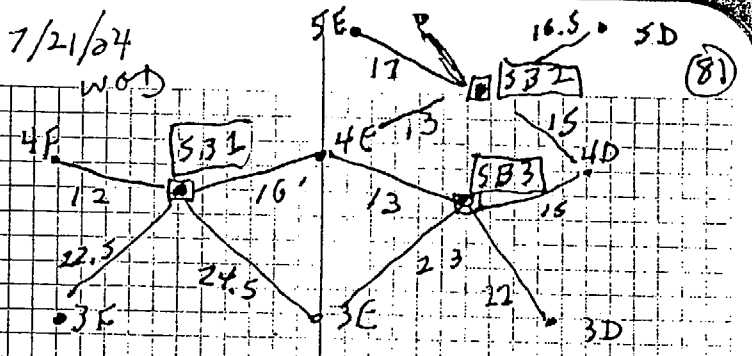
1700 COMPLETED PROBING
LPA15B2 GEOPROBE
REFUSAL @ 8' PUSHED
CSG TO 5'

NOTE:
SPOKE W/ROY HOEKSTRA
(STEP PM) DESCRIBE PLAN
TO PUT A TRIANGLE OF BOUNDING
HOLES AT NE CORNER OF
FORMER EXCAVATION
(BASED ON READINGS FROM
THE DOWNHOLE SCAN OF GRID NO
GEOPROBE POINTS)
HE AGREED THAT 3 POINTS
SHOULD SUFFICIENTLY BOUND
THE REMAINING CONTAMINATION.

1730 HP SCAN GEOPROBE & TOOLS
AND RELEASED RIG FROM SITE
DRILLER & HELPER LEFT
JIM MILBY (EODT) LEFT SITE

7/21/04

7/21/04
WCP




(81)

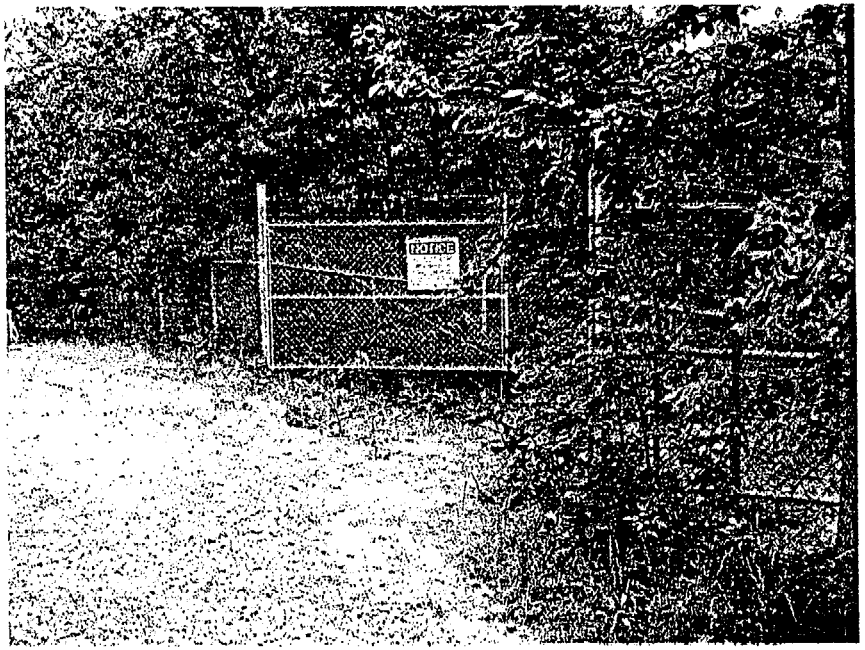
1820 ALL PERSONNEL
LEFT SITE, SITE
SECURED. END OF FIELD EFFORT

INTENTIONALLY
BLANK

7/21/04

# Appendix B

## Photographs of Field Effort



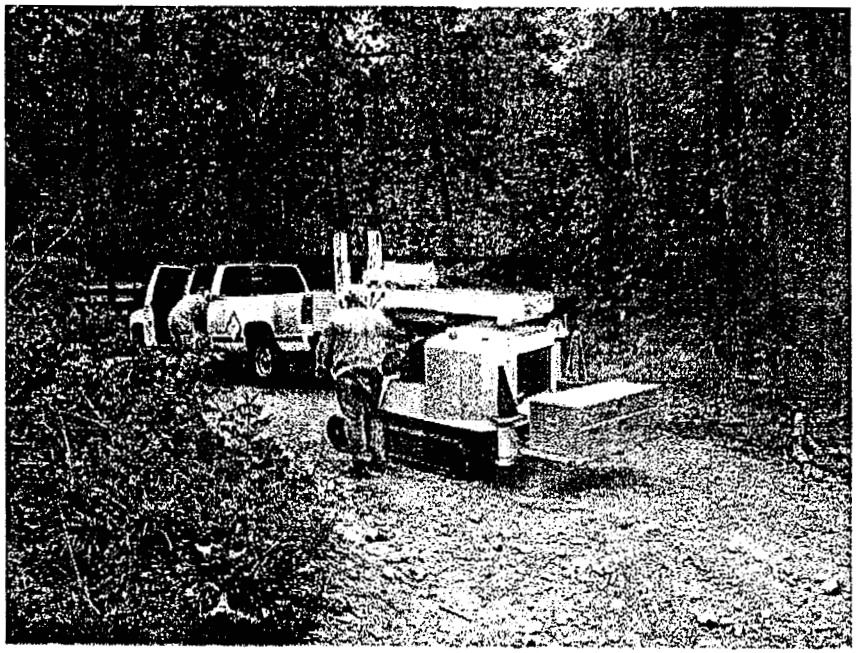
Approaching Site Gate (facing southwest)

View into Site (facing south)

Initial Site Safety and Radiation Briefing

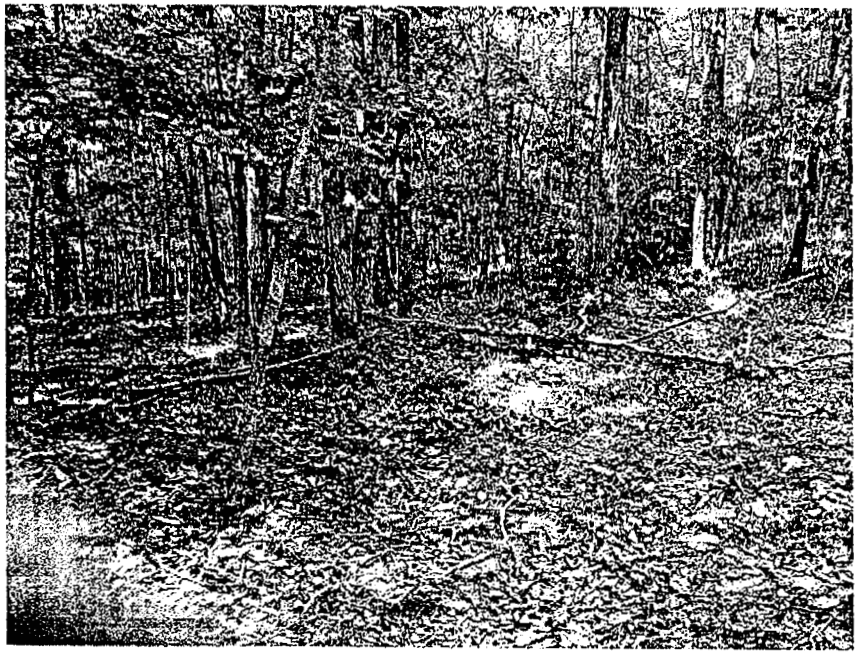
Site Safety Briefing

Moving Geoprobe Rig onto Site



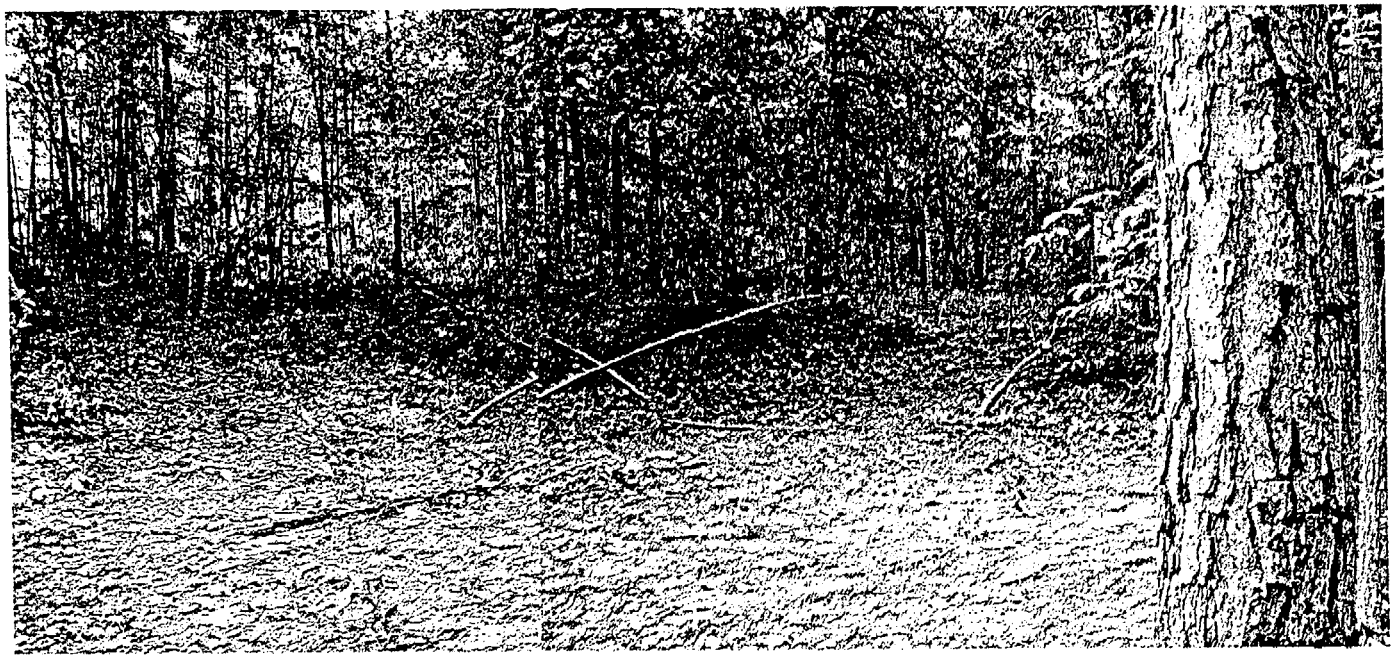
Moving Geoprobe Rig onto Site

View Into Site (facing west)

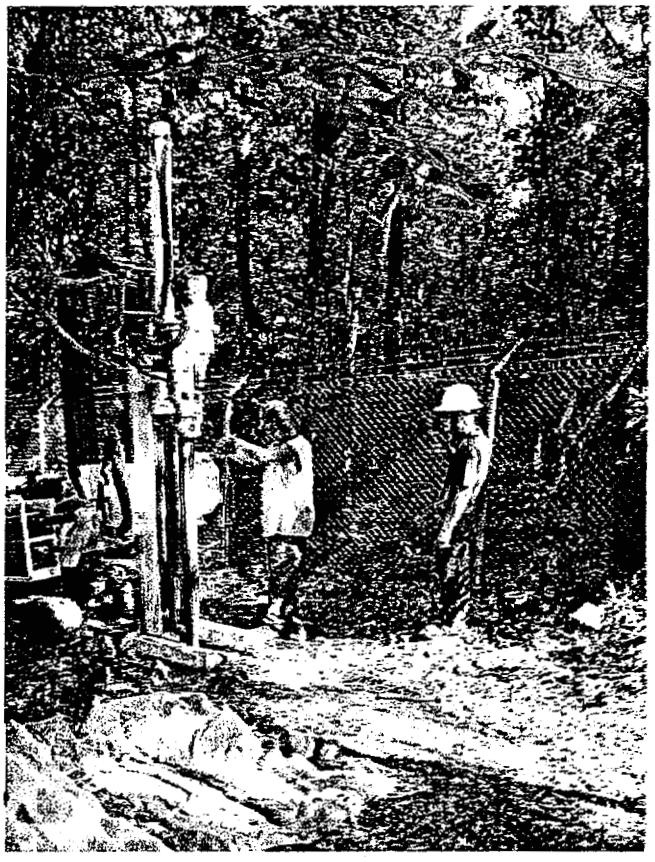


View Into Area 5 (facing north)

Panoramic View of Excavation Area (facing east)

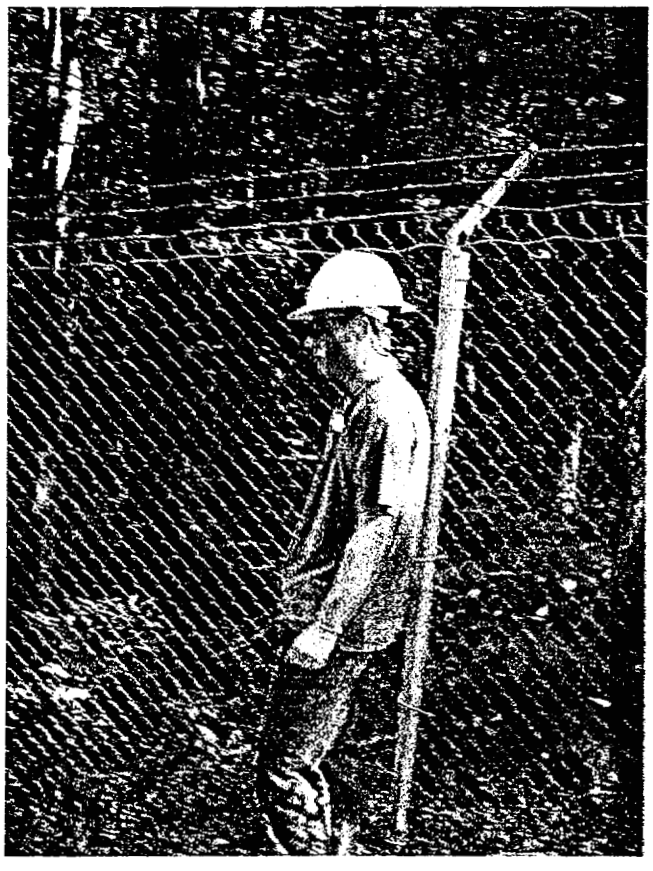


Panoramic View of Excavation Area (facing south)

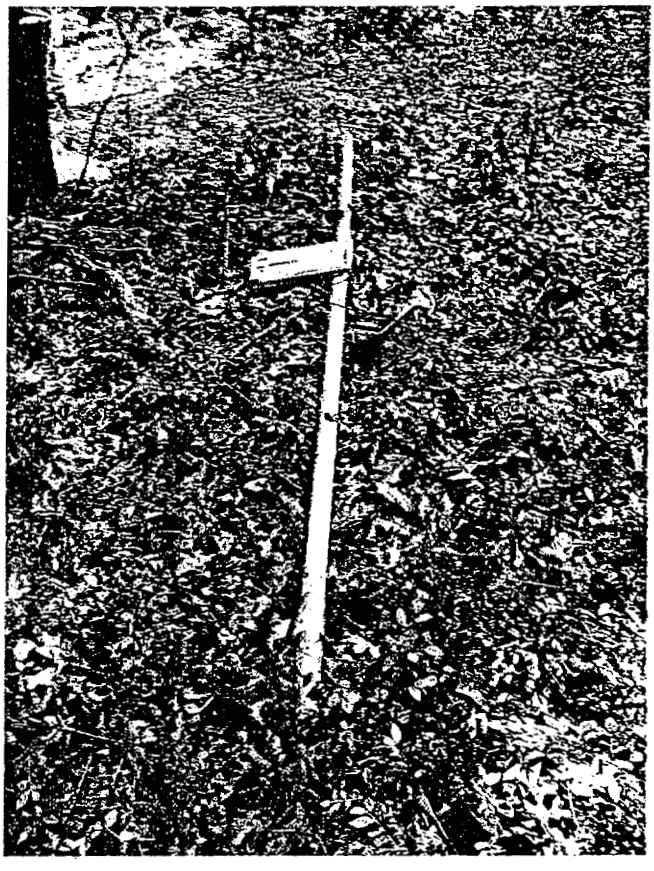


Geoprobe Sampling

ERG Conducting Surface Radiation Survey

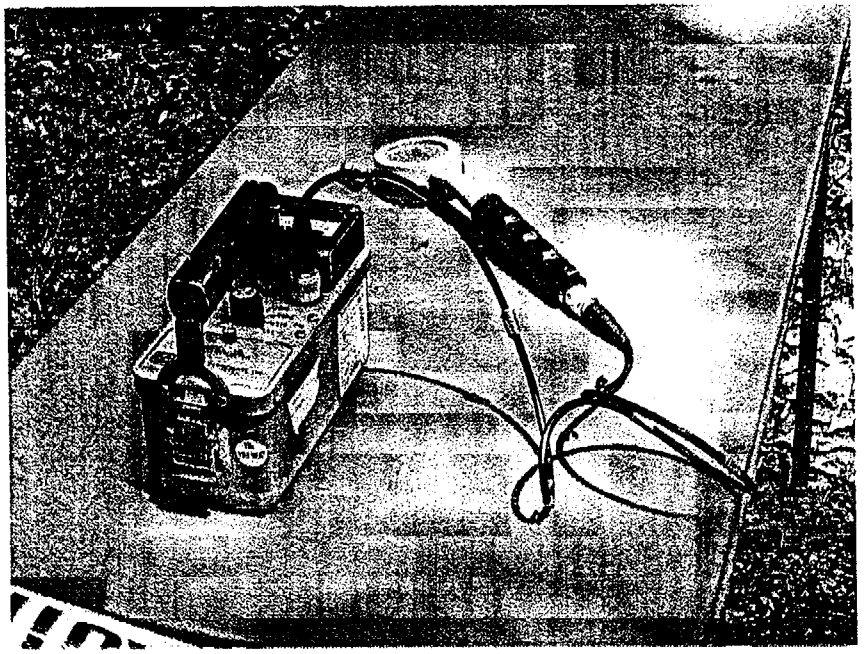


STEP Engineering Technician

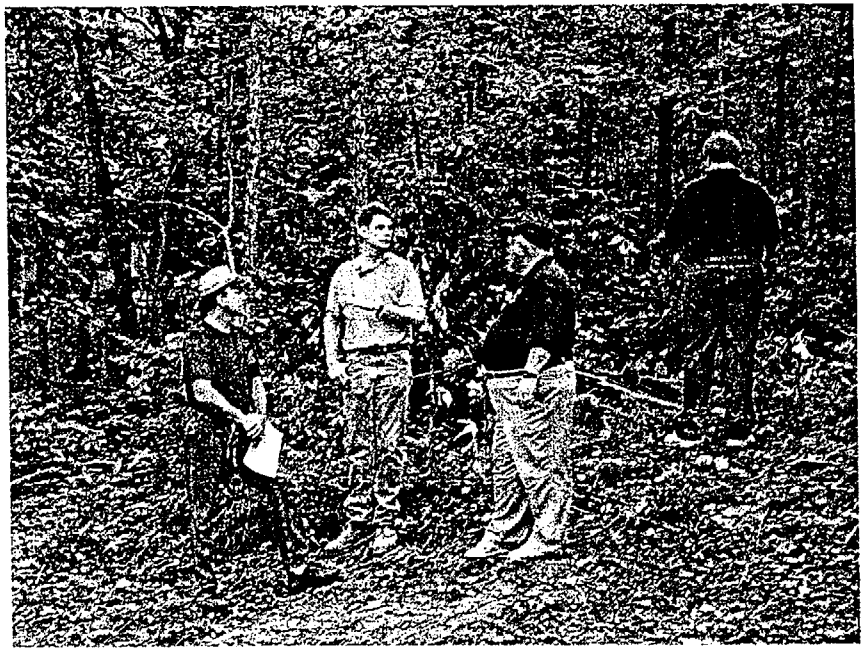


Downhole Radiation Survey Tool

Regulatory and Corps of Eng. Representatives on Site



Field Screening Instrument at Site Egress Point



Regulatory and Corps of Eng. Representatives on Site

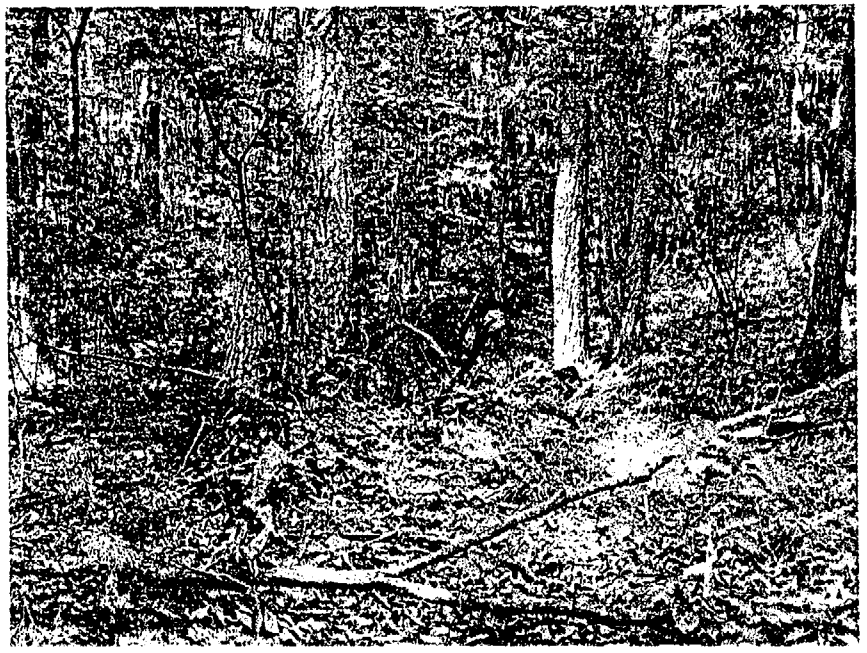
Regulatory and Corps of Eng. Representatives on Site

Establishing Sampling Grid in Area 1

Crushed and Rusted Metal Drum in Area 1

Concrete Block in Area 1

Metal Pipe Near Excavation in Area 1



Metal Pipes and Fencing in Area 5

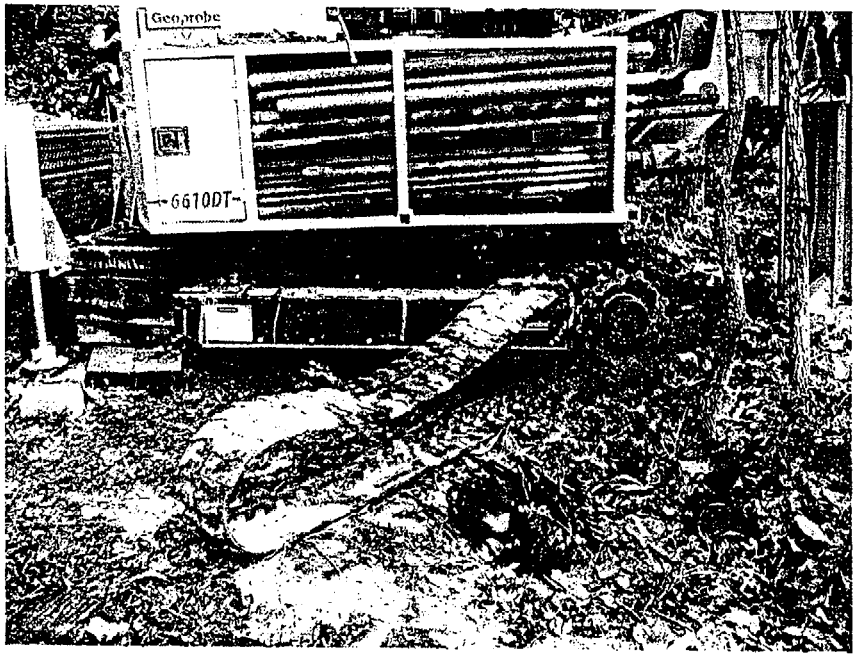
Area 1 (facing northeast)

Location of Second Concrete Block in Area 1

Area 1 Showing Red Magnetometer Anomalies (facing north)

Geoprobe Core

East Bank of Excavation in Area 1




Track Off of Geoprobe

# Appendix C

## Instrument Calibration Sheets

ERG

# Daily Function Check Form

Site: LAGARDE PARK
ANNISTON, AL
STEP, INC.

Ratemeter: LUDLUM 2221 Serial No. 117634 Cal. Due Date 7/7/05

Detector: LUDLUM 44-10 Serial No. PR066864 Cal. Due Date 7/7/05

Source: Cs-137 Activity: 10.07 µCi (4/1/90) Serial No. 90CS1201381

Distance to Source: ~6"

Notes: USED ERG CAL JIG.

| Date | Time | Battery | High Voltage | Threshold (mv) | Gross Counts (CPM) | Background (CPM) | Net Counts (CPM) | Efficiency (CPM/DPM) | Initials | Location |
|---|---|---|---|---|---|---|---|---|---|---|
| 7/7/04 | 17:25 | 6.1 | 899 | 99 | 98078 | 10950 | 87128 | - | cf | ABQ OFFICE |
| 7/8/04 | 8:15 | 6.2 | 898 | 100 | 102835 | 10860 | 91979 | - | cf | ABQ OFFICE |
| | | | | | | | | | | |
| 7/12/04 | 13:50 | 6.0 | 893 | 99 | 112920 | 6747 | 106173 | - | cf | SITE |
| 7/12/04 | 17:10 | 5.9 | 896 | 99 | 112191 | 6643 | 105548 | - | cf | SITE |
| 7/13/04 | 07:00 | 6.0 | 897 | 100 | 112175 | 6649 | 105526 | - | cf | SITE |
| 7/13/04 | 10:00 | 5.9 | 896 | 99 | 113653 | 6868 | 106825 | - | cf | SITE |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Reviewed By: _____ Date: _____

ERG Form 1.01A

# Certificate of Calibration

**Ratemeter / Scaler Certificate of Calibration**

**ERG**
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Manufacturer: Ludlum Model: 2221 Serial No.: 117634

All Ranges Calibrated Electronically; Ludlum Pulser Generator S.N. 97743

Reset ☑ Audio ☑ Mechanical ☐ Battery ☑ Window Operation ☑

High Voltage 500v ☑ 1000v ☐ 1500v ☑

Instrument found within tolerance (+/- 10%) Yes ☑ No ☐

| Reference Setting | Ratemeter | Instrument "As found reading" |
|---|---|---|
| 400 Kcpm | 400 Kcpm | +/- 10% |
| 100 Kcpm | 100 Kcpm | ↓ |
| 40 Kcpm | 40 Kcpm | ↓ |
| 10 Kcpm | 10 Kcpm | ↓ |
| 4 Kcpm | 4 Kcpm | ↓ |
| 1 Kcpm | 1 Kcpm | ↓ |
| 400 cpm | 400 cpm | ↓ |
| 100 cpm | 100 cpm | ✓ |

| Reference Setting | Integrated Counts (1-minute count) | Log Scale Count Rate | Instrument "As found reading" |
|---|---|---|---|
| 400 Kcpm | 399661 | 400 Kcpm | +/- 10% |
| 40 Kcpm | 39968 | 40 Kcpm | ↓ |
| 4 Kcpm | 3994 | 4 Kcpm | ✓ |
| 400 cpm | 399 | 400 cpm | |

Calibrated By: [signature] Calibration Date: 07 JUL 04

Calibration Due: 07 JUL 05

Reviewed By: [signature] Date: 7/7/04

ERG Form 1.02B

# Certificate of Calibration

**Voltage Plateau Form**

**ERG**
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR066864

Counter Mfg.: Ludlum Model: 2221 Serial No.: 117634

Counter Threshold Setting: 10 mV Geometry / Distance to source: 6-inches

Source : ☐ Th230 @ 13,500 dpm sn: 4098-03 ☐ Tc99 @ 18,100 dpm sn: 4099-03

☐ Cs137 @ 6.5 µCi sn: 4097-03 ☑ Other: 90CS120138I 7.66µC. @ 2/1/02

Count Time: 1 minute(s)

| High Voltage | Gross Source Counts | Background Counts |
|---|---|---|
| 600 | 76279 | |
| 700 | 96126 | |
| 800 | 102162 | |
| → 900 | 103879 | * 10745 |
| 1000 | 105078 | |
| 1100 | 107440 | |
| 1200 | 181320 | |
| | | |
| | | |
| | | |

Recommended Operating Voltage: 900 volts

Calibrated By: [signature] Calibration Date: 7/7/04

Calibration Due: 7/7/05

Reviewed By: [signature] Date: 7-7-04

ERG Form 1.03A

THE SOURCE INC.
Radiation standards and check sources
2889 Industrial RD. Santa Fe, NM 87501
(505)473-9538

Ref. PO# Verbal

# Certificate of Calibration
(Gamma Sources)

The Cesium 137 gamma ray emmission rate was compared with a NIST (formerlyNBS) SRM 4200B-134 . The comparison was completed using a Sodium Iodide gamma detector.

The gamma activity of the standard on April 01, 1990 was 10.07uCi.

The uncertainty of the measurement and the activity of the source is ± 7% which is the sum of the uncertainty of the NBS standard and the random error of counting at the 99% confidence interval.

Serial NO. 90CS1201381

Active Diameter(or area) 0.25" Mounting Material plastic

Total Diameter(or area) 1.0"

Calibrated by: Michael A. Ortiz Date Signed: April 18, 1990

Approved by: Charles L. Gonzales

# Appendix D

# Drilling Logs

Hole No. LPA1N1A

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 1A
3. DRILLING AGENCY: BOART - LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N1A
5. NAME OF DRILLER: ALLEN THOMAS (BOART LONGYEAR)
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK: NA
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURERS DESIGNATION OF DRILL: ~~GEOPROBE 6610~~
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5 / UNDISTURBED 5
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED 7/13/04 / COMPLETED 7/13/04
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | 1 | CSG | CLAY - (OH) (2.5YR 4/1) DARK GRAY BROWN VERY SILTY ABUNDANT (>10%) ORGANIC MATERIAL | | | SAMPLE 1 (0-1 FT) [LPA1N1A1] |
| | 2, 3, 4 | | CLAY - RED BROWN (ML) (2.5YR 5/8) VERY SILTY (>20%) SCATTERED GRAVEL VERY SANDY (>10%) | | | |
| | 5, 6, 7, 8, 9, 10, 11 | | CLAY - MOTTLED (ML) GRAY/RED (2.5YR 4/1 TO 5/6) ABUNDANT GRAVEL (SANDSTONE & CHERT) | | | SAMPLE 2 (10-12 FT) [LPA1N1A2] |
| | 12, 13, 14, 15 | | SANDSTONE - GRAY/WHITE (2GLEY 8/5PB) VERY SILTY (>40%) TRACE GRAVEL (SM) | | | |
| | 16 | | SILT - GRAY/WHITE (ML) VERY SANDY (>40%) SCATTERED GRAVEL | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI — HOLE NO. LPA1N1A

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N1A |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | SILT - GRAY/WHITE VERY SANDY (ML) | | | |
| | | 18 | (RED CLAY 17.8 TO 18') | | | |
| | | | CLAY - BRICK RED (2.5YR 4/8) VERY SILTY (720%) DRY (CL) | | | |
| | | 19 | | | | |
| | | | SILT - GREY/WHITE (2 GLEY) 8/5PB) SANDY (10%) DRY (CL) | | | ~~SAMPLE (19-20')~~ ~~[LPA1N1A2]~~ |
| | | 20 | TOTAL DEPTH 20 FT | | | |
| | | | | | | NO ELEVATED READINGS ON SURFACE RADIATION SCAN OF CORE. |
| | | | | | | NO ELEVATED READINGS ON DOWNHOLE RADIATION SCAN (0-5') |
| | | | | | | PUSHED 3.25" TEMP CASING TO 5' |

Hole No. LPA1N3A

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LE GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 3A | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL ~~GEOPROBE 6610~~ |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N3A | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN 3 — DISTURBED — UNDISTURBED 3 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/13/04 — COMPLETED 7/13/04 |
| 7. THICKNESS OF OVERBURDEN 8.5 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK 0.5 FT | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 9.0 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY - DARK BROWN W/ ORGANIC ~~[illegible]~~ DEBRIS (OH) | | | SAMPLE 1 (0-1 FT) [LPA1N3A1] |
| | | 1 | CLAY - (CL) MOTTLED TAN/RED (7.5YR 7/6) VERY SILTY (>20%) SANDY (10%) MOIST | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | CSG | 6 | SILT - MOTTLED TAN/PINK (ML) (5YR 5/2) | | | |
| | | 7 | SILT - (ML) MOTTLED TAN/PINK VERY SANDY (>20%) DRY | | | |
| | | 8 | | | | SAMPLE 2 (7-8 FT) [LPA1N3A2] |
| | | 9 | LIMESTONE - TAN/GRAY | | | |
| | | | TOTAL DEPTH 9 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON SURFACE RADIATION SCAN OF CORE<br>NO ELEVATED READINGS ON DOWNHOLE RADIATION SCAN<br>PUSHED 3.25" TEMP CASING TO 8' |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT LA GARDE PARK ESI — HOLE NO. LPA1N3A

Hole No. LPA1N4A

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 NODE 4A | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N4A | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 3 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE: STARTED 7/13/04; COMPLETED 7/13/04 |
| | 17. ELEVATION TOP OF HOLE: |
| 7. THICKNESS OF OVERBURDEN: 8 FT | 18. TOTAL CORE RECOVERY FOR BORING: |
| 8. DEPTH DRILLED INTO ROCK: 8 FT | 19. SIGNATURE OF INSPECTOR: [signature] |
| 9. TOTAL DEPTH OF HOLE: 16 FT | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - TAN/BROWN (2.5YR 3/2) VERY SILTY (>20%) GRAVEL MOIST | | | SAMPLE 1 (0-1 FT) [LPA1N4A1] |
| | | 2, 3 | CLAY (CL) - MOTTLED RED/BROWN (2.5YR 4/8) VERY SILTY (>20%) WITH LIMESTONE FRAGMENTS | | | |
| | CSG | 4, 5 | | | | PUSHED 3.25" TEMPORARY CASING TO 5 FT |
| | | 6, 7, 8 | CLAY (CL) - MOTTLED RED/BROWN WITH ABUNDANT LIMESTONE FRAGMENTS | | | |
| | | 9, 10, 11, 12, 13, 14, 15 | LIMESTONE - PINK TO GRAY WHITE HIGHLY WEATHERED SCATTERED GRAVEL VERY HARD | | | SAMPLE 2 (15-16 FT) [LPA1N4A2] |
| | | 16 | TOTAL DEPTH 16 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON SURFACE OR DOWNHOLE RADIATION SCANS |

Hole No. LPA1N5A

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 NODE 5A | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N5A | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 4 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE: STARTED 7/13/04; COMPLETED 7/13/04 |
| 7. THICKNESS OF OVERBURDEN: 16 FT | 17. ELEVATION TOP OF HOLE: |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING: |
| 9. TOTAL DEPTH OF HOLE: 16 FT | 19. SIGNATURE OF INSPECTOR: [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | SILT (ML) - TAN/BROWN (2.5YR 7/2) DRY | | | SAMPLE 1 [LPA1N5A1] |
| | | 2, 3, 4 | CLAY (CL) - MOTTLED RED BROWN (7.5YR 6/8) TRACE MOISTURE VERY SILTY (>30%) GRADING INTO SILT (ML) AT 5.5 FT | | | |
| | CSG | 5, 6 | SILT (ML) - MOTTLED GRAY/RED ABUNDANT GRAVEL | | | PUSHED 3.25" TEMP CASING TO 6 FT |
| | | 7 | LIMESTONE - LIGHT GRAY HIGHLY WEATHERED | | | |
| | | 8 | CLAY (CL) - MOTTLED RED BROWN | | | |
| | | 9, 10, 11, 12, 13, 14, 15 | CLAY (CL) ; WEATHERED LIMESTONE TAN BROWN TO LIGHT GRAY DRY HARD | | | SAMPLE 2 [LPA1N5A2] |
| | | 16 | TOTAL DEPTH 16 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCAN |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI — HOLE NO. LPA1N5A

Hole No. LPA 1 N 1B

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 1B | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/14/04 — COMPLETED 7/14/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - LIGHT TAN/BROWN (2.5YR 6/4 TO 5/6) VERY SILTY (>20%) MOIST | | | SAMPLE 1 [LPA1N1B1] |
| | | 2 | CLAY (CL) - ORANGE/RED BROWN (2.5YR 5/8) VERY SILTY (>30%) MOIST | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | PUSHED 3.25" TEMPORARY CASING TO 6FT |
| | CSG | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | SAND (SC) - TAN TO LIGHT PINK (2.5YR 7/3) ABUNDANT GRAVEL | | | |
| | | 13 | | | | |
| | | 14 | CLAY (CL) - MOTTLED YELLOW RED/ORANGE (10YR 8/8 TO 10R 6/8) SCATTERED GRAVEL | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N1B |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - MOTTLED RED/ORANGE AS ABOVE | | | |
| | | 18 | CLAY (CL) - TAN TO DARK RED/BROWN (2.5YR 6/4 TO 4/6) VERY SILTY (> 30%) ABUNDANT LIMESTONE FRAGMENTS | | | SAMPLE 2 [LPA1N1B2] |
| | | 19 | | | | |
| | | 20 | TOTAL DEPTH 20FT | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCAN |

Hole No. LPA1N2B

| DRILLING LOG | DIVISION | INSTALLATION Fort McClellan | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT | La Garde Park ESI |
| 2. LOCATION (Coordinates or Station) | Area 1 Node 2B |
| 3. DRILLING AGENCY | Boart Longyear |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA1N2B |
| 5. NAME OF DRILLER | Allen Thomas |
| 6. DIRECTION OF HOLE | ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. |
| 7. THICKNESS OF OVERBURDEN | 11.5 FT |
| 8. DEPTH DRILLED INTO ROCK | — |
| 9. TOTAL DEPTH OF HOLE | 11.5 FT |
| 10. SIZE AND TYPE OF BIT | Geoprobe 2" |
| 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: — ; UNDISTURBED: 3 |
| 14. TOTAL NUMBER CORE BOXES | |
| 15. ELEVATION GROUND WATER | |
| 16. DATE HOLE | STARTED 7/14/04 ; COMPLETED 7/14/04 |
| 17. ELEVATION TOP OF HOLE | |
| 18. TOTAL CORE RECOVERY FOR BORING | |
| 19. SIGNATURE OF INSPECTOR | [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - LIGHT TAN SILTY (>10%) MOIST (7.5YR 7/4) | | | SAMPLE 1 [LPA1N2B1] |
| | | 3, 4 | CLAY (CL) - BROWN/RED MOTTLED (2.5YR 5/6) VERY SILTY (>30%) MOIST | | | |
| | | 5, 6 | CLAY (CL) - TAN/RED (2.5YR 6/8) ABUNDANT LIMESTONE FRAGMENTS DRY | | | |
| | | 7 | LIMESTONE - HIGHLY WEATHERED LIGHT TAN SOLID FRAGMENTS ARE TAN TO GRAY/BROWN | | | |
| | CSG | 8, 9, 10, 11 | LIMESTONE - HIGHLY WEATHERED LIGHT TAN/WHITE TO PINK | | | PUSHED 3.25" TEMPORARY CASING TO 8 FT<br>SAMPLE 2 [LPA1N2B2] |
| | | | TOTAL DEPTH 11.5 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCANS |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: La Garde Park — HOLE NO. LPA1N2B

Hole No. LPA1N3B

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N3B | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED: 7/13/04 — COMPLETED: 7/13/04 |
| 7. THICKNESS OF OVERBURDEN: – | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK: – | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE: 20 FT | 19. SIGNATURE OF INSPECTOR: Jeff R Cente |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | SILT (ML) - LIGHT TAN TO BROWN (7.5YR 6/6) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N3B1] |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | SILT (ML) - RED/BROWN (2.5YR 8/8) SCATTERED GRAVEL DRY HARD | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | SILT (ML) - TAN/ORANGE TO ~~BRICK~~ RED (2.5YR 6/8 TO ~~8~~ 5/8) VERY DRY ~~SCATTERED~~ NO GRAVEL MOTTLED | | | |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | SILT (ML) - TAN/ORANGE TO BRICK RED (2.5YR 5/8 TO 8/8) SCATTERED GRAVEL VERY DRY | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N3B |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | SILT (ML) - TN/ORNG AS ABOVE | | | |
| | | 18 | SILT (ML) - DARK BROWN WITH WHITE STREAKS (7.5 YR 4/4) | | | |
| | | 19 | SILT (ML) - LIGHT TAN W/ORANGE RED STRIATIONS (10R 5/8) DRY HARD | | | SAMPLE 2 [LPA1N3B2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCAN |

Hole No. LPA1N4B

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LAGARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 4B
3. DRILLING AGENCY: BART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N4B
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: –
8. DEPTH DRILLED INTO ROCK: –
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/13/04; COMPLETED 7/13/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (OL) - DARK BROWN WITH ABUNDANT ROOTS & ORGANIC MATTER VERY SILTY | | | SAMPLE 1 [LPA1N4B1] |
| | | 1 | | | | |
| | | 2 | NO RECOVERY | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | SILT (ML) MOTTLED TAN TO BRICK RED (10R 4/8) | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | CSG | 8 | | | | PUSHED 3.25" TEMPORARY CASING TO 8.5 FT |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | LIMESTONE - HIGHLY WEATHERED MOTTLED PINK/WHITE WITH SCATTERED ORANGE STREAKS (10R 8/3) | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LAGARDE PARK ESI | HOLE NO. LPA1N4B

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N 4B |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 17 | LIMESTONE - HIGHLY WEATHERED MOTTLED PINK/WHITE | | | |
| | | 18 | | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N4B2] |
| | | 20 | TOTAL DEPTH 20FT | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCAN |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67 GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N4B

Hole No. LPA1N5B

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 Node 5B | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N5B | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED 4 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE: STARTED 7/13/04; COMPLETED 7/13/04 |
| 7. THICKNESS OF OVERBURDEN: 15 FT | 17. ELEVATION TOP OF HOLE: |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING: |
| 9. TOTAL DEPTH OF HOLE: 15 FT | 19. SIGNATURE OF INSPECTOR: Jeffrey R Carter |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - TAN BROWN VERY SILTY (>20%) MOIST | | | SAMPLE 1 [LPA1N5B1] |
| | | 2–3 | CLAY (CL) - BROWN/RED MOTTLED YELLOW VERY SILTY ABUNDANT GRAVEL | | | |
| | CSG | 7–8 | | | | PUSHED 3.25" TEMP CASING TO 8.5 FT |
| | | 9 | SILT (ML) - MOTTLED RED BROWN W/YELLOW ORANGE STREAKS ABUNDANT GRAVEL DRY | | | |
| | | 11–12 | CLAY (CL) WITH LIMESTONE LS-HIGHLY WEATHERED PINK TO WHITE CL-PINK TO TAN WITH ORANGE STREAKS ABUNDANT GRAVEL | | | |
| | | 13–14 | SILT (ML) & WEATHERED LIMESTONE RED/PINK TO WHITE | | | SAMPLE 2 [LPA1N5B2] |
| | | 15 | LIMESTONE - WHITE W/ORANGE STREAKS | | | |
| | | | TOTAL DEPTH 15 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCANS |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI — HOLE NO. LPA1N5B

Hole No. LPA1N1C

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 1C | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N1C | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/14/04 — COMPLETED 7/14/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - TAN TO LIGHT BROWN (7.5YR 6/4 TO 4/4) SILTY (>10%) MOIST | | | SAMPLE 1 [LPA1N1C1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - DARK RED (10R 4/8) VERY SILTY (30%) TRACE GRAVEL MOIST | | | |
| | | 4 | | | | |
| | | 5 | | | | RADIATION READING 1,840 cpm @ 5' |
| | | 6 | CLAY (CL) - MOTTLED RED TO ORANGE (10R 5/8 TO 2.5YR 7/8) VERY SILTY (30%) ABUNDANT GRAVEL | | | SAMPLE 2 [LPA1N1C2] |
| | | 7 | | | | |
| | | 8 | | | | PUSHED 3.25" TEMPORARY CASING TO 9 FT |
| | CSG | 9 | LIMESTONE - HIGHLY WEATHERED GRAY | | | |
| | | 10 | CLAY (CL) - MOTTLED RED/ORANGE YELLOW (10R 5/8 TO 7.5YR 7/8) VERY SILTY (40%) DRY | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | LIMESTONE - TAN TO WHITE HIGHLY WEATHERED | | | |
| | | 15 | CLAY (CL) - TAN ORANGE MOTTLED (7.5YR 7/3 TO 7/8) MOIST | | | |
| | | 16 | | | | |
| | | 17 | | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT LA GARDE PARK ESI — HOLE NO. LPA1N1C

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA1N1C

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET 2 OF 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | LIMESTONE - GRAY HIGHLY WEATHERED | | | |
| | | 18 | CLAY (CL) - TAN/ORNGE BROWN MOTTLED (7.5YR 5/8 TO 4/3) | | | |
| | | 19 | CLAY & WEATHERED LIMESTONE LIGHT TAN TO BROWN | | | |
| | | 20 | TOTAL DEPTH 20FT. | | | NO ELEVATED RADIATION READINGS ON SCAN OF SOIL CORE. SLIGHTLY ELEVATED READING (1,640 CPM) AT 5FT. |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67
GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N1C

Hole No. LPA1N2C

| DRILLING LOG | DIVISION | INSTALLATION Fort McClellan | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT La Garde Park ESI | 10. SIZE AND TYPE OF BIT Geoprobe 2" |
| 2. LOCATION (Coordinates or Station) Area 1 Node 2C | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY Boart Longyear | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N2C | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER Allen Thomas | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/14/04 — COMPLETED 7/14/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - TAN TO RED BROWN (2.5YR 6/4 TO 5/6) VERY SILTY (40%) | | | SAMPLE 1 [LPA1N2C1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - DARK RED TO ORANGE MOTTLED (2.5YR 4/3 TO 7/8) ABUNDANT GRAVEL VERY SILTY (30%) DRY | | | |
| | | 4 | | | | |
| | | 5 | | | | RADIATION READING 1,848 CPM @ 5FT |
| | | 6 | | | | SAMPLE 2 [LPA1N2C2] |
| | | 7 | CLAY (CL) - RED TO LIGHT TAN STRIATED VERY SILTY (30%) | | | |
| | CSE | 8 | | | | PUSHED TEMPORARY CASING TO 8FT |
| | | 9 | LIMESTONE - HIGHLY WEATHERED LIGHT TAN TO WHITE | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | CLAY (CL) - RED/ORANGE STRIATED VERY SILTY (30%) SCATTERED LIMESTONE FRAGMENTS | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N2C |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 13<br>14 | LIMESTONE - WHITE TO TAN VERY BROKEN HIGHLY WEATHERED | | | |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED RADIATION READINGS ON SCAN OF SOIL CORE<br>SLIGHTLY ELEVATED RADIATION READING (1,848 CPM) AT 5' |

Hole No. LPA1N3C

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 3C | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N3C | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/14/04 — COMPLETED 7/14/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR Jeffrey R Carter |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - TAN BROWN (7.5YR 6/6) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N3C1] |
| | | 3, 4, 5 | CLAY (CL) - MOTTLED RED/ORANGE VERY SILTY (30-40%) SCATTERED GRAVEL (10R 7/8 TO 4/8) | | | RADIATION READING 1,963 COUNTS/2 MIN @ 5 FT |
| | CSG | 6 | | | | SAMPLE 2 [LPA1N3C2] |
| | | 7 | | | | PUSHED 3.25" TEMPORARY CASING TO 6 FT (5-6 FT) |
| | | 8, 9, 10, 11, 12 | | | | |
| | | 13, 14 | SILT (ML) - LIGHT TAN TO BROWN WITH ORANGE ~~STREAKS~~ STRIATIONS (5YR 7/8 TO 4/4) | | | |
| | | 15, 16, 17 | DRY HARD VERY SANDY (30-40%) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N3C |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SILT (ML) - LIGHT TAN TO BROWN (AS ABOVE) | | | |
| | | 19 | | | | |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE<br>SLIGHTLY ELEVATED RADIATION READING (1,963 COUNTS/2 MIN) @ 5 FT |

Hole No. LPA1N4C

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 NODE 4C | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N4C | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED: 7/14/04 — COMPLETED: 7/14/04 |
| 7. THICKNESS OF OVERBURDEN: — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE: 20 FT | 19. SIGNATURE OF INSPECTOR: [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - BROWN TO TAN (7.5YR 5/4 TO 7/3) VERY SILTY (30%) MOIST | | | SAMPLE 1 [LPA1N4C1] |
| | | 3, 4, 5, 6 | CLAY (CL) - DARK BROWN/RED TO TAN/ORANGE (2.5YR 4/8 TO 6/4) MOTTLED VERY SILTY (30 TO 40%) ABUNDANT GRAVEL | | | |
| | CSG | 7, 8 | | | | PUSHED 3.25" TEMPORARY CASING TO 7FT |
| | | 9, 10, 11, 12, 13, 14, 15, 16, 17 | SAND (SM) - WHITE TO LIGHT GRAY (1 GLEY 8/N TO 7/N) WITH ORANG STRIATIONS VERY SILTY (40 TO 50%) SCATTERED GRAVEL | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N4C |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SILT (ML) - TAN TO ORANGE BROWN (2.5 YR 7/2 TO 5/8) | | | |
| | | 19 | ABUNDANT SANDSTONE FRAGMENTS & LIMESTONE GRAVEL | | | SAMPLE 2 [LPA1N4C] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN RADIATION SCAN OF SOIL CORE OR DOWN HOLE |

Hole No. LPA1NSC

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 5C | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1NSC | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/14/04 — COMPLETED 7/14/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 ft | 19. SIGNATURE OF INSPECTOR Jeff R Curtis |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - BROWN TO TAN (7.5YR 4/4 TO 6/3) VERY SILTY (30%) DRY | | | SAMPLE 1 [LPA1NSC1] |
| | | 2, 3, 4, 5 | CLAY (CL) - RED BROWN MOTTLED ORANGE (2.5YR 3/6 TO 7/8) ABUNDANT GRAVEL VERY SILTY (20 TO 30%) | | | |
| | | 6, 7, 8, 9 | CLAY (CL) - MOTTLED RED BROWN/ORANGE WITH WHITE STRIATIONS (2.5YR 4/6 TO 6/8) | | | |
| | CSG | 10, 11, 12, 13, 14 | LIMESTONE - LIGHT TAN/WHITE HIGHLY WEATHERED ABUNDANT FRAGMENTS | | | PUSHED 3.25" TEMPORARY CASING TO 10 FT |
| | | 15, 16, 17 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 7/4 TO 5/6) ABUNDANT LIMESTONE FRAGMENTS | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N5C |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - TAN TO MEDIUM BROWN AS ABOVE | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 2 [LPA1N5C2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCANS |

Hole No. LPA1N1D

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 1D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N1D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 ft | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - LIGHT TAN TO BROWN (7.5YR 6/2 TO 5/4) VERY SILTY (20-30%) MOIST | | | SAMPLE 1 [LPA1N1D1] |
| | | 1 | CLAY (CL) - MEDIUM BROWN BRICK RED (2.5YR 6/6 TO 4/8) SILTY (20%) SCATTERED GRAVEL | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | INCREASED SAND BY ZONE (30-40%) | | | |
| | | 7 | | | | PUSHED 3.25" TEMPORARY CASING TO 8 FT |
| | CSG | 8 | | | | |
| | | 9 | SAND (SM) - TAN/BROWN TO RED (2.5YR 5/3 TO 5/8) VERY SILTY (40%) | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | SAND (SM) - LIGHT TAN TO WHITE (7.5YR 7/2 TO 8/1) VERY SILTY (30-40%) VERY FINE GRAINED | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N1D |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SAND (SM) - LIGHT TAN TO WHITE (AS ABOVE) | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N1D2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS |

Hole No. LPA1N2D

| DRILLING LOG | DIVISION | INSTALLATION FORT MCCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 2D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N2D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4 | CLAY (CL) – TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) MOIST | | | SAMPLE 1 [LPA1N2D1] |
| | | 5, 6 | CLAY (CL) – DARK BROWN TO BRICK RED (2.5YR 3/3 TO 4/8) VERY SILTY (30%) ABUNDANT GRAVEL | | | |
| | | 7, 8 | CLAY (CL) – BROWN TO YELLOW/ORANGE MOTTLED (7.5YR 4/3 TO 7/8) SCATTERED GRAVEL SILTY (20%) | | | |
| | CSG | 9, 10, 11 | CLAY (CL) – BROWN TO ORANGE/YELLOW MOTTLED WITH PINK STREAKS (7.5YR 4/3 TO 7/8) ABUNDANT WEATHERED LIMESTONE FRAGMENTS VERY SILTY (30-40%) | | | PUSHED 3.25" TEMPORARY CASING TO 9 FT |
| | | 12, 13, 14, 15, 16, 17 | LIMESTONE – HIGHLY WEATHERED PINK TO WHITE/TAN VERY SILTY (40%) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N2D |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | LIMESTONE - ~~MEDI~~ PINK TO WHITE/TAN | | | |
| | | 18 | AS ABOVE | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N2D2] |
| | | 20 | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS IN SOIL CORE OR DOWN HOLE RADIATION SCANS |

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PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N2D

Hole No. LPA1N3D

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|
| 1. PROJECT: LA GARDE PARK ESI | | 10. SIZE AND TYPE OF BIT: GEOPROBE 211 | |
| 2. LOCATION (Coordinates or Station): AREA 1 NODE 3D | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 3. DRILLING AGENCY: BOART LONGYEAR | | 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N3D | | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: | UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | | 14. TOTAL NUMBER CORE BOXES | |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | | 15. ELEVATION GROUND WATER | |
| | | 16. DATE HOLE | STARTED: 7/17/04 | COMPLETED: 7/17/04 |
| 7. THICKNESS OF OVERBURDEN: – | | 17. ELEVATION TOP OF HOLE | |
| 8. DEPTH DRILLED INTO ROCK: – | | 18. TOTAL CORE RECOVERY FOR BORING | |
| 9. TOTAL DEPTH OF HOLE: 20 FT | | 19. SIGNATURE OF INSPECTOR: [signature] | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3 | CLAY (CL) - TAN TO MEDIUM BROWN VERY SILTY SCATTERED GRAVEL (7.5YR 7/4 TO 6/6) | | | SAMPLE 1 [LPA1N3D] & DUPLICATE |
| | | 4, 5, 6 | CLAY (CL) - MEDIUM RED/BROWN (2.5YR 5/6) SCATTERED GRAVEL SLIGHTLY SILTY (< 10%) MOIST | | | |
| | | 7, 8 | CLAY (CL) - BRICK RED TO ORANGE MOTTLED (10R 4/8 TO 7/8) SILTY (10-20%) | | | |
| | | 9, 10, 11, 12, 13, 14, 15, 16, 17 | CLAY (CL) - RED ORANGE MOTTLED (10R 5/8 TO 7/8) VERY SILTY (30-40%) SCATTERED GRAVEL | | | |

ENG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI | HOLE NO. LPA1N3D

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA1N3D

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) – YELLOW ORANGE WITH RED STREAKS (7.5YR 7/8) | | | |
| | | 19 | SCATTERED HIGHLY WEATHERED PINK TO LIGHT TAN LIMESTONE | | | PUSH 3.25" TEMPORARY CASING TO 20 FT |
| | CSG | 20 | | | | SAMPLE 2 [LPA1N3D2 & DUPLICATE] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS. |

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PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N3D

Hole No. LPA1N4D

| DRILLING LOG | DIVISION | INSTALLATION Fort McClellan | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT | La Garde Park ESI |
| 2. LOCATION (Coordinates or Station) | Area 1 Node 4D |
| 3. DRILLING AGENCY | Boart Longyear |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA1N4D |
| 5. NAME OF DRILLER | Allen Thomas |
| 6. DIRECTION OF HOLE | ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. |
| 7. THICKNESS OF OVERBURDEN | — |
| 8. DEPTH DRILLED INTO ROCK | — |
| 9. TOTAL DEPTH OF HOLE | 20 FT |
| 10. SIZE AND TYPE OF BIT | GEOPROBE 2" |
| 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: ; UNDISTURBED: 5 |
| 14. TOTAL NUMBER CORE BOXES | |
| 15. ELEVATION GROUND WATER | |
| 16. DATE HOLE | STARTED 7/17/04 ; COMPLETED 7/17/04 |
| 17. ELEVATION TOP OF HOLE | |
| 18. TOTAL CORE RECOVERY FOR BORING | |
| 19. SIGNATURE OF INSPECTOR | [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1–3 | CLAY (CL)-TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N4D1] |
| | | 4–5 | CLAY (CL)- RED BROWN TO TAN (2.5YR 5/8 TO 7/3) SLIGHTLY MOTTLED SCATTERED GRAVEL | | | |
| | CSG | 6–7 | SAND (SM) - TAN TO LIGHT ORANGE (2.5YR 7/2 TO 7/6) WITH DARK RED CLAY STREAKS VERY SILTY (40%) ABUNDANT GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 7.5 FT |
| | | 8–9 | LIMESTONE - HIGHLY WEATHERED TAN TO WHITE TRACE PINK VERY SILTY (20-30%) VERY SANDY (30%) ABUNDANT FRAGMENTS | | | |
| | | 10–11 | CLAY (CL) MOTTLED RED ORANGE (10R 5/8 TO 7/8) VERY SILTY (40%) | | | |
| | | 12–15 | NO RECOVERY | | | |
| | | 16–17 | CLAY (CL)- TAN TO RED BROWN ~~MOTTLED~~ ~~ORANGE~~ VERY SILTY (30%) | | | |

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA1N4D

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - TAN TO RED BROWN MOTTLED ORANGE (10R 7/2 TO 5/8) VERY SILTY (30-40%) TRACE SAND (<10%) SCATTERED GRAVEL | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N4D2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON SURFACE OR DOWN HOLE RADIATION SCANS |

ENG FORM 1836-A (ER 1110-1-1801)
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PROJECT LAGARDE PARK ESI

HOLE NO. LPA1N4D

Hole No. LPA1N5D

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 5D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N5D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/16/04 — COMPLETED 7/16/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4 | CLAY (CL) - MEDIUM BROWN (7.5YR 5/4) VERY SILTY (30%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1N5D1 & DUPLICATE] |
| | | 5, 6, 7, 8 | CLAY (CL) - MEDIUM BROWN TO BRICK RED MOTTLED ORANGE (7.5YR 5/4 TO 2.5YR 4/8) ABUNDANT GRAVEL VERY SILTY (40%) | | | |
| | | 9, 10, 11 | LIMESTONE - HIGHLY WEATHERED TAN/WHITE WITH RED/ORANGE CLAY ABUNDANT FRAGMENTS | | | |
| | CSG | 12, 13, 14, 15 | CLAY (CL) - ORANGE RED MOTTLED (2.5YR 7/8 TO 4/8) ABUNDANT GRAVEL VERY SILTY (30 TO 40%) | | | PUSHED 3.25" TEMPORARY CASING TO 15 FT<br>RADIATION READING 1,800 COUNTS/2MIN @ 15FT |
| | | 16, 17 | CLAY (CL) - RED BRICK BROWN WITH ORANGE STRIATIONS (2.5YR 3/6 TO 7/8) VERY SILTY (30%) | | | SAMPLE 2 [LPA1N5D2 & DUPLICATE] |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N5D |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | LIMESTONE - TAN/WHITE HIGHLY WEATHERED | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE<br><br>SLIGHTLY ELEVATED READING OF RADIATION (1,800 COUNTS/2 MIN) @ 15 FT |

Hole No. LPA1N1E

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 1E
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N1E
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: –
8. DEPTH DRILLED INTO ROCK: –
9. TOTAL DEPTH OF HOLE: 20 Ft
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/19/04; COMPLETED 7/19/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) LIGHT TAN TO MEDIUM BROWN (7.5YR 8/2 TO 5/6) VERY SILTY (20-30%) | | | SAMPLE 1 [LPA1N1E1] |
| | | 2 | CLAY (CL) – DARK BROWN/RED (5YR 4/6) SILTY (20%) TRACE ORANGE SCATTERED GRAVEL | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | CLAY (CL) – MOTTLED ORANGE/RED (2.5YR 4/8 TO 7/8) VERY SILTY (30-40%) SANDY (10%) ABUNDANT GRAVEL | | | |
| | CSG | 9 | | | | PUSHED 3.25" TEMPORARY CASING TO 9 FT |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | SAND (SM) – TAN WHITE TO LIGHT BROWN (5YR 8/2 TO 6/4) ABUNDANT GRAVEL | | | |
| | | 13 | | | | |
| | | 14 | CLAY (CL) – RED/ORANGE MOTTLED (2.5YR 5/8 TO 7/8) VERY SANDY (30-40%) SILTY (10-20%) | | | |
| | | 15 | | | | |
| | | 16 | SAND (SM) – TAN TO ORANGE BROWN VERY SILTY (30-40%) TRACE GRAVEL | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N1E |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SAND (SM) - TAN TO ORANGE/BROWN (AS ABOVE) | | | |
| | | 19 | SAND (SM) - TAN TO WHITE (2.5YR 8/1 TO 7/4) VERY SILTY (30-40%) | | | SAMPLE 2 [LPA1N1E2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS |

Hole No. LPA1N2E

| DRILLING LOG | DIVISION | INSTALLATION Fort McClellan | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT | La Garde Park ESI |
| 2. LOCATION (Coordinates or Station) | Area 1 Node 2E |
| 3. DRILLING AGENCY | Boart Longyear |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA1N2E |
| 5. NAME OF DRILLER | Allen Thomas |
| 6. DIRECTION OF HOLE | ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. |
| 7. THICKNESS OF OVERBURDEN | 15 FT |
| 8. DEPTH DRILLED INTO ROCK | — |
| 9. TOTAL DEPTH OF HOLE | 15 FT |
| 10. SIZE AND TYPE OF BIT | GeoProbe 2" |
| 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: ; UNDISTURBED: 4 |
| 14. TOTAL NUMBER CORE BOXES | |
| 15. ELEVATION GROUND WATER | |
| 16. DATE HOLE | STARTED 7/19/04 ; COMPLETED 7/19/04 |
| 17. ELEVATION TOP OF HOLE | |
| 18. TOTAL CORE RECOVERY FOR BORING | |
| 19. SIGNATURE OF INSPECTOR | Jeff R Carter |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) SILTY (10-20%) | | | SAMPLE 1 [LPA1N2E1] & DUPLICATE |
| | | 4, 5, 6, 7, 8, 9 | CLAY (CL) - DARK RED BROWN MOTTLED ORANGE (2.5YR 5/8 TO 7/8) SILTY (20%) SCATTERED GRAVEL | | | |
| | CSG | 10, 11, 12 | CLAY (CL) - TAN TO DARK BROWN/RED MOTTLED ORANGE (10R 4/6 TO 7/8) VERY SANDY (30%) SILTY (10%) TRACE GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 12 FT SLIGHTLY ELEVATED RADIATION READING AT 12 FT ON DOWN HOLE SCAN<br>SAMPLE 2 [LPA1N2E2] & DUPLICATE |
| | | 13 | CLAY (CL) TAN TO RED VERY SANDY (30-40%) | | | |
| | | 14 | SAND (SM) - DARK GRAY WITH PURPLE STREAKS (10R 5/1) | | | |
| | | 15 | TOTAL DEPTH 15 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READING ON RADIATION SCAN OF SOIL CORE SLIGHTLY ELEVATED RADIATION READING AT 12 FT ON DOWN HOLE SCAN |

Hole No. LPA1N3E

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 3E
3. DRILLING AGENCY: BART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N3E
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/21/04; COMPLETED 7/21/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: Jeffrey R Curtis

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) TAN TO MEDIUM BROWN (7.5YR 5/4) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1N3E1] |
| | | 2, 3, 4 | CLAY (CL) - BRICK RED (10R 4/8) SILTY (10-20%) SCATTERED GRAVEL | | | RADIATION READING 1,653 CPM @ 3-4 FT SAMPLE 2 [LPA1N3E2] |
| | | 5, 6, 7 | CLAY (CL) - MOTTLED ORANGE RED (10R 5/8 TO 7/8) VERY SANDY (40%) ABUNDANT GRAVEL | | | |
| | | 8 | CLAY (CL) MOTTLED ORANGE RED (10R 5/8 TO 7/8) SILTY (10%) | | | |
| | | 9, 10 | CLAY (CL) - STRIATED BROWN ORANGE TO PINK WITH WHITE STREAKS (10R 4/8 TO 7/8 ; 8/2) ABUNDANT GRAVEL VERY SILTY (30%) VERY SANDY (30%) | | | |
| | CSG | 11, 12, 13 | CLAY (CL) - MOTTLED ORANGE RED (10R 4/8 TO 7/8) SILTY (10%) | | | PUSHED 3.25" TEMPORARY CASING TO 11.5 FT |
| | | 14, 15, 16, 17 | CLAY (CL) - BROWN TO PINK (10R 4/4 TO 7/2) WITH HIGHLY WEATHERED LIMESTONE VERY SILTY (30-40%) | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI | HOLE NO. LPA1N3E

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N3E |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) BROWN TO PINK (AS ABOVE) | | | |
| | | 19 | | | | |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON SOIL CORE RADIATION SCAN<br><br>ELEVATED READING ON DOWNHOLE RADIATION SCAN 1,653 cpm @ 3-4 FT |

Hole No. LPA1N4E

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 4E | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N4E | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/21/04 — COMPLETED 7/21/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) – TAN TO MEDIUM BROWN (7.5YR 7/2 TO 5/6) SILTY (10-20%) VERY SANDY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1N4E1] & DUPLICATE |
| | | 6, 7, 8, 9, 10, 11 | CLAY (CL) – BRICK RED MOTTLED ORANGE (10R 4/8) SILTY (10%) TRACE GRAVEL | | | RADIATION READING 1,781 CPM @ 10-11 FT SAMPLE 2 [LPA1N4E2] & DUPLICATE |
| | | 12, 13 | CLAY (CL) TAN ORANGE RED MOTTLED (2.5YR 7/6 TO 4/8) SILTY (10-20%) | TO | | |
| | CSG | 14, 15, 16, 17 | CLAY (CL) – LIGHT PINK ORANGE STRIATED (2.5YR 8/2 TO 7/8) ~~SCATTERED HIGHLY WEATHERED LIMESTONE FRAGMENTS~~ TRACE SILTY (10%) GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 15 FT ~~RADIATION READING 1,781 CPM @ 10-11 FT~~ |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA 1 N4E |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - STRIATED TAN ORANGE PINK (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | CLAY (CL) - LIGHT PINK ORANGE STRIATED WITH ABUNDANT HIGHLY WEATHERED LIMESTONE FRAGMENTS | | | SAMPLE 3 [LPA 1N4E3] ; DUPLICATE |
| | | 20 | TOTAL DEPTH 20 ft | | | NO ELEVATED READING ON RADIATION SCAN OF SOIL CORE<br><br>ELEVATED READING ON DOWN HOLE RADIATION SCAN (1,780 CPM @ 10-11) |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67
GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA 1 N4E

Hole No. LPA1N5E

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 5E | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N5E | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR Jeffrey R Cate |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 7/4 TO 5/4) ABUNDANT GRAVEL VERY SILTY (30-40%) SANDY (10%) | | | SAMPLE 1 [LPA1N5E1] |
| | | 4, 5, 6, 7, 8, 9 | CLAY (CL) - ~~TAN TO~~ BRICK RED MOTTLED ORANGE (10R 4/8 TO 7/8) SCATTERED GRAVEL SILTY (10-20%) | | | |
| | | 10, 11, 12 | CLAY (CL) - TAN TO MEDIUM BROWN MOTTLED ORANGE (2.5YR 6/3 TO 4/6) VERY SANDY (40%) GRADING TO LIGHT TAN SAND IN PART SILTY (10%) ABUNDANT GRAVEL | | | |
| | | 13, 14, 15 | CLAY (CL) - STRIATED ORANGE TAN & PINK/RED (10R 7/8 TO 8/3) SILTY (10-20%) | | | |
| | | 16, 17 | LIMESTONE - HIGHLY WEATHERED PINK TO LIGHT TAN VERY SILTY (30-40%) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N5E |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | LIMESTONE - PINK TO LIGHT TAN (AS ABOVE) | | | |
| | | 18 | | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | | 19 | | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA1N5E2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READING ON RADIATION SCANS OF SOIL ~~AND~~ CORE AND DOWNHOLE |

Hole No. LPA1N1F

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 1F | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N1F | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN – | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK – | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - LIGHT TAN MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1N1F1] |
| | | 3 | CLAY (CL) - DARK RED (10R 4/8) VERY SILTY (30-40%) SANDY (10%) | | | |
| | | 5 | CLAY (CL) - RED TO ORANGE (2.5YR 5/8 TO 7/8) VERY SANDY (30%) SILTY (10%) | | | |
| | | 6 | CLAY (CL) - DARK RED/BROWN (10R 5/8) SILTY (10-20%) SCATTERED GRAVEL TRACE SAND (<10%) | | | |
| | | 12 | SAND (SM) - TAN TO ORANGE BROWN (2.5YR 7/3 TO 6/8) VERY SILTY (30%) CLAY IN STREAKS ABUNDANT GRAVEL | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N1F |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SAND (SM) - TAN TO ORANGE BROWN (AS ABOVE) | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | | 19 | | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA1N1F2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWN HOLE RADIATION SCANS |

Hole No. LPA1N2F

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 2F | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N2F | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - LIGHT TAN MEDIUM BROWN (7.5YR 7/3 TO 5/6) SILTY (10-20%) TRACE GRAVEL | | | SAMPLE 1 [LPA1N2F1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - DARK RED/BROWN MOTTLED ORANGE (10R 5/8 TO 7/8) VERY SILTY (30%) SCATTERED GRAVEL | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | PUSHED 3.25" TEMPORARY CASING TO 9 FT |
| | CSG | 9 | | | | |
| | | 10 | SAND (SM) - TAN WHITE ~~DARK~~ ~~RED~~ WITH DARK RED/ORANGE CLAY (CL) VERY SILTY (30-40%) | | | |
| | | 11 | CLAY (CL) - DARK RED BROWN MOTTLED (10R 5/8 TO 7/8) ORANGE VERY SANDY (30%) | | | |
| | | 12 | | | | |
| | | 13 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 6/3 TO 5/6) VERY SANDY (30-40%) WITH SAND STONE STRINGERS (SAND - TAN/WHITE) (SM) VERY SILTY | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | CLAY (CL) - TAN TO DARK RED (10R 7/3 TO 3/6) WITH SAND STRINGERS | | | |
| | | 17 | | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT LA GARDE PARK ESI — HOLE NO. LPA1N2F

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N2F |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - TAN TO DARK RED WITH SAND STRINGERS (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 2 [LPA1N2F2] |
| | | | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE OR IN DOWN HOLE SCAN |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67
GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N2F

Hole No. LPA1N3F

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 3F
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N3F
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/21/04; COMPLETED 7/21/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: Jeff R Curtis

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - TAN MEDIUM BROWN (7.5YR 5/4) SILTY (10%) TRACE GRAVEL | | | SAMPLE 1 [LPA1N3F1] |
| | | 2 | CLAY (CL) - BRICK RED MOTTLED ORANGE (10R 4/8) SILTY (10%) | | | |
| | | 3 | DARK GRAY TO BLACK MATERIAL | | | |
| | | 4 | CLAY (CL) - DARK RED SLIGHTLY MOTTLED ORANGE (10R 4/6) SILTY (10%) | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | CLAY (CL) - MOTTLED RED ORANGE : (10R 5/8 TO 7/8) WITH WEATHERED LIMESTONE ABUNDANT GRAVEL | | | |
| | | 10 | | | | |
| | CSG | 11 | VERY SILTY (30-40%) | | | PUSHED 3.25" TEMPORARY CASING TO 11FT |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA 1 N 3 F |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - MOTTLED RED ORANGE (AS ABOVE) | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 2 [LPA1N3F2] |
| | | | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA1N4F

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 4F | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N4F | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 4 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 14 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1N4F1] 3' DUPLICATE |
| | | 6, 7, 8, 9, 10, 11, 12, 13 | CLAY (CL) - MEDIUM BROWN RED TO ORANGE (10R 4/4 TO 5/8) MOTTLED VERY SILTY (30-40%) SAND STRINGERS @ 7FT & 11FT ABUNDANT GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 13FT<br>SAMPLE 2 [LPA1N4F2] 3' DUPLICATE |
| | CSG | 13 | | | | |
| | | 14 | TOTAL DEPTH 14 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS. |

Hole No. LPA1N5F

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARD PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 5F | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N5F | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| | 17. ELEVATION TOP OF HOLE |
| 7. THICKNESS OF OVERBURDEN – | 18. TOTAL CORE RECOVERY FOR BORING |
| 8. DEPTH DRILLED INTO ROCK – | 19. SIGNATURE OF INSPECTOR [signature] |
| 9. TOTAL DEPTH OF HOLE 20 FT | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL)-TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N5F1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL)- TAN RED TO ORANGE BROWN MOTTLED (10R 6/4 TO 5/8) ABUNDANT GRAVEL VERY SILTY (40%) WITH SAND STREAKS | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | CLAY (CL)- RED TO ORANGE BROWN (10R 5/8 TO 4/6) VERY SANDY (40%) WITH WEATHERED LIMESTONE | | | |
| | | 14 | | | | |
| | CSG | 15 | | | | PUSHED 3.25" TEMPORARY CASING TO 15.5 FT |
| | | 16 | | | | |
| | | 17 | | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N5F |
|---|---|---|
| PROJECT LA GARBE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - RED TO ORANGE BROWN (AS ABOVE) | | | |
| | | 18 | | | | |
| | | | CLAY (CL) - TAN TO WHITE ORANGE RED STREAKS (2.5YR 6/8 TO 8/4) VERY SILTY (40%) | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N5F2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS |

Hole No. LPA1N1G

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 1G | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N1G | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| 7. THICKNESS OF OVERBURDEN – | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK – | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM BROWN TAN (7.5YR 5/6 TO 7/2) SILTY (10-20%) TRACE GRAVEL | | | SAMPLE 1 [LPA1N1G1] |
| | | 2 | CLAY (CL) - BRICK RED (10R 4/8) SILTY (20%) SANDY (10%) TRACE GRAVEL | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | SAND (SM) TAN/ORANGE TO BROWN/RED (2.5YR 6/8 TO 4/8) VERY SILTY (30-40%) | | | |
| | | 7 | CLAY (CL) - MOTTLED RED/ ORANGE (10R 6/8 TO 7/3) SCATTERED GRAVEL SILTY (10-20%) | | | |
| | | 8 | OCCASSIONAL SAND STRINGER | | | |
| | | 9 | | | | |
| | | 10 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 7/3 TO 5/4) VERY SANDY (30-40%) | | | |
| | | 11 | SCATTERED GRAVEL | | | |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 15 | CLAY (CL) - RED BROWN MOTTLED ORANGE (2.5YR 5/8 TO 7/3) SILTY (10%) | | | |
| | | 16 | TRACE GRAVEL | | | |
| | | 17 | | | | |

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA1N1G

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - RED BROWN MOTTLED ORANGE (AS ABOVE) | | | |
| | | 18 | | | | |
| | | | CLAY (CL) - MEDIUM BROWN TO TAN (5YR 5/6 TO 7/4) SILTY (10-20%) SLIGHTLY SANDY (<10%) | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | | 19 | | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA1N1G2] |
| | | | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS IN SOIL CORE OR DOWNHOLE RADIATION SCANS |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801) GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI

HOLE NO. LPA1N1G

Hole No. LPA1N2G

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 NODE 2G | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1N2G | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE — STARTED: 7/19/04 — COMPLETED: 7/19/04 |
| 7. THICKNESS OF OVERBURDEN: — | 17. ELEVATION TOP OF HOLE: |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING: |
| 9. TOTAL DEPTH OF HOLE: 20 FT | 19. SIGNATURE OF INSPECTOR: Jeffrey R Curtis |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) SILTY (10%) TRACE GRAVEL | | | SAMPLE 1 [LPA1N2G1] |
| | | 2–7 | CLAY (CL) - DARK RED BROWN MOTTLED ORANGE (10R 4/6 TO 7/8) VERY SILTY (30%) SANDY (10%) SCATTERED GRAVEL | | | |
| | | 8 | SAND (SM) - TAN TO ORANGE BROWN (5YR 7/3 TO 6/8) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | |
| | | 9–14 | CLAY (CL) - DARK RED MOTTLED ORANGE (10R 5/6 TO 7/8) VERY SILTY (30%) SANDY (10%) SCATTERED GRAVEL | | | |
| | | 15–17 | SAND (SM) - TAN TO MEDIUM BROWN WITH WHITE STREAKS (7.5YR 6/3 TO 4/4) ABUNDANT GRAVEL SILTY (10-20%) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N2G |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | SAND (SM) - TAN TO MEDIUM BROWN (AS ABOVE) | | | |
| | | 19 | CLAY (CL) - MEDIUM TAN/BROWN MOTTLED ORANGE (7.5YR 6/3 TO 4/4) VERY SILTY (30-40%) SCATTERED GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | CSG | 20 | | | | SAMPLE 2 [LPA1N2G2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON SOIL CORE OR DOWN HOLE RADIATION SCANS |

Hole No. LPA1N3G

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 3G | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N3G | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| | 17. ELEVATION TOP OF HOLE |
| 7. THICKNESS OF OVERBURDEN — | 18. TOTAL CORE RECOVERY FOR BORING |
| 8. DEPTH DRILLED INTO ROCK — | 19. SIGNATURE OF INSPECTOR [signature] |
| 9. TOTAL DEPTH OF HOLE 20 FT | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) – LIGHT TO MEDIUM BROWN (7.5YR 6/3 TO 4/3) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N3G1] SAMPLE 2 [LPA1N3G2] RADIATION READING of 1,848 cpm @ 3 FT |
| | | 6, 7, 8, 9, 10, 11, 12 | CLAY (CL) – MEDIUM RED BROWN MOTTLED ORANGE (10R 5/6 TO 7/8) ABUNDANT GRAVEL | | | |
| | CSG | | | | | PUSHED 3.25" TEMPORARY CASING TO 9.9 FT |
| | | 13, 14, 15 | SAND (SM) – TAN TO ORANGE RED (2.5YR 7/4 TO 6/8) VERY SILTY (30–40%) | | | |
| | | 16, 17 | CLAY (CL) – TAN TO ORANGE MOTTLED MEDIUM BROWN VERY SILTY (2.5YR 5/6 TO 7/8) (30–40%) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N3G |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - TAN TO WHITE (7.5YR 6/4) | | | |
| | | 18 | MOTTLED BROWN (7.5YR 4/4) | | | |
| | | 19 | VERY SILTY (20-30%) | | | |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE<br>SLIGHTLY ELEVATED READING ON DOWNHOLE RADIATION SCAN (1,848 CPM @ 3 FT) |

Hole No. LPA1 N4G

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 NODE 4G | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1N4G | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/19/04 — COMPLETED 7/19/04 |
| | 17. ELEVATION TOP OF HOLE |
| 7. THICKNESS OF OVERBURDEN — | 18. TOTAL CORE RECOVERY FOR BORING |
| 8. DEPTH DRILLED INTO ROCK — | 19. SIGNATURE OF INSPECTOR [signature] |
| 9. TOTAL DEPTH OF HOLE 20 FT | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5 YR 7/3 TO 5/6) SCATTERED GRAVEL VERY SILTY (30-45%) | | | SAMPLE 1 [LPA1N4G1] |
| | | 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 | CLAY (CL) - RED TO ORANGE BROWN MOTTLED (2.5 YR 4/8 TO 6/8) SCATTERED GRAVEL VERY SILTY (40%) | | | |
| | CSG | 13 | | | | PUSHED 3.25" TEMPORARY CASING TO 13 FT |
| | | 14, 15, 16, 17 | SAND (SM) - TAN TO WHITE WITH ORANGE RED STREAKS (7.5 YR 7/3) VERY SILTY (40%) ABUNDANT GRAVEL | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N4G |
|---|---|---|

PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | SAND (SM) TAN TO WHITE (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 2 [LPA1N4G2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN SOIL CORE OR DOWN HOLE RADIATION SCANS |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67 GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA1N4G

Hole No. LPA1N5G

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 1 NODE 5G
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA1N5G
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/20/04; COMPLETED 7/20/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1–3 | CLAY (CL) - MEDIUM BROWN TO TAN (7.5YR 5/6 TO 7/4) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA1N5G1] |
| | | 3–6 | CLAY (CL) - BRICK RED (10R 4/8) SILTY (10-20%) TRACE GRAVEL | | | |
| | | 6–12 | CLAY (CL) - DARK RED VERY SILTY (30-40%) HIGHLY WEATHERED LIMESTONE — CLAY (CL) - DARK RED (10R 4/6) MOTTLED ORANGE VERY SILTY (30-40%) SCATTERED GRAVEL | | | |
| | CSG | 12–17 | CLAY (CL) - TAN WITH RED STREAKS (7.5YR 7/3) VERY SILTY (40%) SANDY (10-20%) SCATTERED GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 14 FT |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1N5G |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - TAN WITH RED STREAKS (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | SAMPLE 2 [LPA1N5G2] |
| | | 20 | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS IN SOIL CORE OR DOWN HOLE RADIATION SCANS |

Hole No. LPA1SB1

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 SOIL BORING 1 | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1SB1 | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/21/04 — COMPLETED 7/21/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR Jeffrey M Carter |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 5/4) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA 1 SB1 01] |
| | | 6, 7, 8, 9 | CLAY (CL) - BRICK RED (10R 4/8) SILTY (10%) TRACE GRAVEL | | | RADIATION READING 1,429 CPM @ 8-9 FT SAMPLE 2 [LPA1SB1 02] |
| | | 10 | CLAY (CL) - TAN WITH RED STREAKS (10R 6/4) VERY SILTY (30%) SANDY (10%) | | | |
| | CSG | 11, 12 | CLAY (CL) - MOTTLED RED ORANGE (10R 5/8 TO 7/2) SILTY (10%) | | | PUSHED 3.25" TEMPORARY CASING TO 11 FT |
| | | 13, 14, 15 | CLAY (CL) - MOTTLED RED ORANGE TO LIGHT TAN (10R 5/8 TO 7/2) VERY SILTY (30-40%) | | | |
| | | 16 | CLAY (CL) - STRIATED ORANGE & LIGHT TAN (10R 7/8 TO 7/2) SLIGHTLY SILTY (< 10%) | | | |
| | | 17 | CLAY (CL) - MOTTLED ORANGE RED VERY SILTY (40%) (10R 5/8 TO 7/8) | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA1SB1 |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - MOTTLED ORANGE RED (AS ABOVE) | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 3 [LPA1SB103] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE<br><br>ELEVATED READING ON DOWNHOLE RADIATION SCAN<br>1,429 cpm @ 8-9 ft |

ENG FORM 1836-A (ER 1110-1-1801)
JUN 67 GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA1SB1

Hole No. LPA1SB2

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 1 SOIL BORING 2 | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA1SB2 | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 2 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/21/04 — COMPLETED 7/21/04 |
| 7. THICKNESS OF OVERBURDEN 8 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 8 FT | 19. SIGNATURE OF INSPECTOR John R Curtis |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM TO DARK BROWN (7.5YR 4/4) VERY SILTY (40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1SB201] |
| | | 2 | CLAY (CL) - MOTTLED RED BROWN & ORANGE (10R 5/8 TO 7/8) VERY SILTY (30%) | | | |
| | | 3 | SANDY (10%) | | | |
| | | 4 | SCATTERED GRAVEL | | | |
| | | 5 | | | | |
| | CSG | 6 | | | | PUSHED 3.25" TEMPORARY CASING TO 6 FT |
| | | 7 | | | | |
| | | 8 | LIMESTONE - WHITE TO GRAY IN BASE OF DRIVE SHOE | | | SAMPLE 2 [LPA1SB202] |
| | | | TOTAL DEPTH 8 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS IN DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT LA GARDE PARK ESI — HOLE NO. LPA1SB2

Hole No. LPA1SB3

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 1 SOIL BORING 3 | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number): LPA1SB3 | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 4 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED: 7/21/04 — COMPLETED: 7/21/04 |
| 7. THICKNESS OF OVERBURDEN: 14 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE: 14 FT | 19. SIGNATURE OF INSPECTOR: [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM BROWN TO GRAY (2.5YR 4/4 TO 6/1) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA1SB301] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - BROWN RED MOTTLED ORANGE (10R 5/8 TO 7/8) VERY SILTY (40%) ABUNDANT GRAVEL | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | PUSHED 3.25" TEMPORARY CASING TO 7 FT |
| | CSG | 7 | | | | RADIATION READING 1,453 CPM @ 6-7 FT SAMPLE 2 [LPA1SB302] |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | CLAY (CL) - STREAKED RED & ORANGE TO LIGHT TAN (10R 7/6 TO 6/8 & 7/3) SLIGHTLY SILTY (<10%) | | | |
| | | 12 | | | | |
| | | 13 | | | | SAMPLE 3 [LPA1SB303] |
| | | 14 | TOTAL DEPTH 14 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON RADIATION SCAN OF SOIL CORE ELEVATED READING ON DOWNHOLE RADIATION SCAN 1,453 CPM @ 6-7 FT |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT: LA GARDE PARK EST — HOLE NO.

Hole No. LPA5N1A

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 1A | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA5N1A | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 4 |
| 5. NAME OF DRILLER ALLEN THOMES | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/20/04 — COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN 16 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 16 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA5N1A1] |
| | | 4, 5 | CLAY (CL) - DARK RED SLIGHTLY MOTTLED ORANGE (10R 4/8) SCATTERED GRAVEL SILTY (20%) | | | |
| | | 6 | LIMESTONE - HIGHLY WEATHERED | | | |
| | | 7, 8, 9 | CLAY (CL) - MEDIUM RED BROWN (10R 5/6) ORANGE STREAKS VERY SILTY (30-40%) VERY SANDY (30%) ABUNDANT GRAVEL | | | |
| | | 10, 11, 12 | CLAY (CL) - TAN (5YR 6/4) WITH ABUNDANT HIGHLY WEATHERED LIMESTONE FRAGMENTS VERY SILTY (30-40%) | | | |
| | CSG | 13, 14, 15, 16 | CLAY (CL) - BRICK RED (10R 4/8) VERY SILTY (30-40%) SANDY (10%) WITH ABUNDANT GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 16 FT<br>SAMPLE 2 [LPA5N1A2] |
| | | | TOTAL DEPTH 16 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON DOWN HOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA 5N 6A

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK FSI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 6A | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA5N6A | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/21/04 — COMPLETED 7/21/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR Jeff R Coutts |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4 | CLAY (CL) - MEDIUM BROWN (7.5YR 5/4) VERY SILTY (30-40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA5N6A1] |
| | | 5, 6, 7 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 6/4 TO 4/6) ABUNDANT HIGHLY WEATHERED LIMESTONE | | | |
| | CSG | 8, 9, 10, 11, 12 | CLAY (CL) - STRIATED PINK/TAN ORANGE (2.5YR 8/2 TO 6/4) SILTY (10%) SCATTERED GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 8 FT |
| | | 13, 14, 15 | CLAY (CL) STRIATED BROWN ORANGE PINK (2.5YR 8/2 TO 4/3) VERY SILTY (45%) SANDY (10%) ABUNDANT WEATHERED LIMESTONE | | | |
| | | 16, 17 | CLAY (CL) - MOTTLED ORANGE RED & BROWN (10R 6/8 TO 4/3) SILTY (10%) MOIST TO WET @ 17 FT | | | |

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA5N6A

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET 2 OF 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - MOTTLED ORANGE RED & BROWN (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | |
| | | 20 | | | | SAMPLE 2 [LPA5N6A2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801)

GPO 1991-618-759/40491

PROJECT LA GARDE PARK EST | HOLE NO. LPA5N6A

Hole No. LPA5N3B

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT | LA GARDE PARK EST |
| 2. LOCATION (Coordinates or Station) | AREA 5 NODE 3B |
| 3. DRILLING AGENCY | BOART LONG YEAR |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA5N3B |
| 5. NAME OF DRILLER | ALLEN THOMAS |
| 6. DIRECTION OF HOLE | ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. |
| 7. THICKNESS OF OVERBURDEN | — |
| 8. DEPTH DRILLED INTO ROCK | — |
| 9. TOTAL DEPTH OF HOLE | 20 FT |
| 10. SIZE AND TYPE OF BIT | GEOPROBE 2" |
| 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: ; UNDISTURBED: 5 |
| 14. TOTAL NUMBER CORE BOXES | |
| 15. ELEVATION GROUND WATER | |
| 16. DATE HOLE | STARTED 7/20/04 ; COMPLETED 7/20/04 |
| 17. ELEVATION TOP OF HOLE | |
| 18. TOTAL CORE RECOVERY FOR BORING | |
| 19. SIGNATURE OF INSPECTOR | [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM TO LIGHT BROWN (7.5YR 5/6 TO 6/4) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA5N3B1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - DARK RED/BROWN ORANGE MOTTLED (2.5YR 3/6) ABUNDANT GRAVEL VERY SILTY (30-40%) | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | CLAY (CL) - DARK BROWN WITH ORANG STREAKS (2.5YR 3/3 TO 6/6) SANDY (10-20%) | | | |
| | | 8 | | | | |
| | | 9 | CLAY (CL) - MEDIUM BROWN RED WITH ORANGE STREAKS (2.5YR 5/6) VERY SANDY (30-40%) ABUNDANT GRAVEL | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | | | | |
| | | 14 | | | | |
| | | 15 | CLAY (CL) - MOTTLED ORANGE RED (2.5YR 6/8) SCATTERED GRAVEL SANDY (10%) SILTY (10-20%) | | | |
| | | 16 | | | | |
| | | 17 | | | | |

ENG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT LA GARDE PARK EST | HOLE NO.

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA5N3B

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET 2 OF 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) – MOTTLED ORANGE RED (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | CSG | 20 | | | | SAMPLE 2 [LPA5N3B2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801)

GPO 1991-618-759/40491

PROJECT LA GARDE PARK EST

HOLE NO. LPA5N3B

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | Hole No. LPA5N4B |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 4B | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA5N4B | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/20/04 — COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN — | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 20 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1–3 | CLAY (CL) - MEDIUM TO DARK BROWN (7.5YR 5/6 TO 3/4) VERY SILTY (30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA5N4B1] |
| | | 3–12 | CLAY (CL) - DARK RED MOTTLED ORANGE (10R 4/6) VERY SILTY (30-40%) ~~SANDY (10-20%)~~ WITH SAND STRINGERS SCATTERED GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 12FT |
| | CSG | 12–16 | SAMPLER MALFUNCTION NO RECOVERY | | | |
| | | 16–17 | CLAY (CL) - LIGHT TAN TO DARK RED WITH ORANGE STREAKS | | | |

ENG FORM 1836
MAR 71

PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT LA GARDE PARK ESI | HOLE NO. LPA5N4B

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA5N4B |
|---|---|---|
| PROJECT LA GARSE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - LIGHT TAN TO DARK RED (10R 7/3 TO 4/6) WITH ORANGE STREAKS | | | |
| | | 19 | VERY SANDY (30%) SILTY (10-20%) | | | SAMPLE 2 [LPA5N4B2] |
| | | 20 | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA5N2C

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 5 NODE 2C
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA5N2C
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: –
8. DEPTH DRILLED INTO ROCK: –
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/20/04; COMPLETED 7/20/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM BROWN (7.5YR 5/6) VERY SANDY (30-40%) | | | SAMPLE 1 [LPA5N2C1] |
| | | 2, 3, 4 | CLAY (CL) - MEDIUM BROWN (7.5YR 5/6) SANDY (10-20%) ABUNDANT GRAVEL | | | |
| | | 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 | CLAY (CL) - RED BROWN MOTTLED ORANGE (2.5YR 5/6 TO 7/8) VERY SANDY (40%) SCATTERED GRAVEL | | | |
| | | 17 | CLAY (CL) - TAN TO LIGHT BROWN | | | |

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA 5 N 2C |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET 2 OF 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) TAN TO LIGHT BROWN (5YR 7/3 TO 6/6) STREAKED WITH ORANGE | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | | 18 | VERY SILTY (30-40%) | | | |
| | | 19 | WITH SAND STRINGERS SCATTERED GRAVEL | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA5N2C2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA5N3C

| DRILLING LOG | DIVISION | INSTALLATION Fort McClellan | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT | La Garde Park ESI |
| 2. LOCATION (Coordinates or Station) | Area 5 Node 3C |
| 3. DRILLING AGENCY | Boart Long Year |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA5N3C |
| 5. NAME OF DRILLER | Allen Thomas |
| 6. DIRECTION OF HOLE | ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. |
| 7. THICKNESS OF OVERBURDEN | — |
| 8. DEPTH DRILLED INTO ROCK | — |
| 9. TOTAL DEPTH OF HOLE | 20 ft |
| 10. SIZE AND TYPE OF BIT | Geoprobe 2" |
| 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED: ; UNDISTURBED: 5 |
| 14. TOTAL NUMBER CORE BOXES | |
| 15. ELEVATION GROUND WATER | |
| 16. DATE HOLE | STARTED 7/20/04 ; COMPLETED 7/20/04 |
| 17. ELEVATION TOP OF HOLE | |
| 18. TOTAL CORE RECOVERY FOR BORING | |
| 19. SIGNATURE OF INSPECTOR | [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - MEDIUM BROWN (7.5YR 5/6) WITH GRAVEL | | | SAMPLE 1 [LPA5N3C1] |
| | | 1 | CLAY (CL) - RED BROWN (2.5YR 4/8) MOTTLED ORANGE | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | CLAY (CL) - ORANGE TO TAN/BROWN (2.5YR 6/8 TO 5/4) MOTTLED VERY SANDY (30-40%) ABUNDANT GRAVEL | | | |
| | | 10 | CLAY (CL) - ORANGE RED BROWN MOTTLED (2.5YR 6/8 TO 4/4) SILTY (10-20%) | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | SAND (SM) - WHITE WITH ORANGE/TAN STREAKS (2.5YR 8/1 TO 6/6) VERY SILTY (70%) | | | |
| | | 14 | CLAY (CL) - RED BROWN MOTTLED ORANGE (2.5YR 4/8) SCATTERED GRAVEL VERY SILTY (30-40%) | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT La Garde Park ESI | HOLE NO. LPA5N3C

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA5N3C

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - RED BROWN MOTTLED ORANGE (AS ABOVE) | | | PUSHED 3.25" TEMPORARY CASING TO 20 FT |
| | | 19 | | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA5N3C2] |
| | | | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801)

GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA5N3C

Hole No. LPA5N4C

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK ESI
2. LOCATION (Coordinates or Station): AREA 5 NODE 4C
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LPA5N4C
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/20/04; COMPLETED 7/20/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5, 6 | CLAY (CL) - MEDIUM TO DARK BROWN (7.5YR 5/6 TO 4/4) VERY SANDY (40%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA5N4C1] |
| | | 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 | CLAY (CL) - TAN TO MEDIUM BROWN MOTTLED ORANGE (5YR 7/3 TO 5/4) SANDY (10-20%) VERY SILTY (30-40%) SCATTERED GRAVEL | | | |
| | CSG | 16 | | | | PUSHED 3.25" TEMPORARY CASING TO 16 FT |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK ESI | HOLE NO. LPA5N4C

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA5N4C

PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - BRICK RED (10R 4/8) VERY SILTY (30%) TRACE GRAVEL | | | |
| | | 19 | CLAY (CL) - TAN TO MEDIUM BROWN MOTTLED ORANGE (2.5YR 6/3 TO 5/6) SILTY (10-20%) | | | SAMPLE 2 [LPA5N4C2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS IN DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801) GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI | HOLE NO. LPA5N4C

Hole No. LPA5N2D

| DRILLING LOG | DIVISION | INSTALLATION FORT MCCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 2D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA5N2D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 3 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| | 15. ELEVATION GROUND WATER |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 16. DATE HOLE — STARTED 7/20/04 — COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN 11 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 11 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | CLAY (CL) - MEDIUM BROWN (5YR 5/6) VERY SILTY (20-30%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA5N2D1] |
| | | 2 | | | | |
| | | 3 | CLAY (CL) - DARK RED (10R 4/8) MOTTLED ORANGE SILTY (10%) SCATTERED GRAVEL | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | PUSHED 3.25" TEMPORARY CASING TO 8 FT |
| | CSG | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | SAMPLE 2 [LPA5N2D2] |
| | | 11 | TOTAL DEPTH 11 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON DOWN HOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT LA GARDE PARK ESI — HOLE NO. LPA5N2D

Hole No. LPA5N3D

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 5 NODE 3D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA5N3D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE — STARTED: 7/20/04 — COMPLETED: 7/20/04 |
| | 17. ELEVATION TOP OF HOLE: |
| 7. THICKNESS OF OVERBURDEN: — | 18. TOTAL CORE RECOVERY FOR BORING: |
| 8. DEPTH DRILLED INTO ROCK: — | 19. SIGNATURE OF INSPECTOR: J. R. Carta |
| 9. TOTAL DEPTH OF HOLE: 20 FT | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) - LIGHT TO MEDIUM BROWN (7.5YR 6/6 TO 5/6) SILTY (10%) SCATTERED GRAVEL | | | SAMPLE 1 [LPA5N3D1] |
| | | 6, 7, 8, 9, 10, 11, 12 | CLAY - DARK RED (CL) TO BROWN (10R 4/8 TO 5/3) STRIATED WITH ORANGE ABUNDANT GRAVEL | | | |
| | | 13, 14, 15, 16, 17 | CLAY (CL) - BRICK RED (10R 4/8) STRIATED WITH ORANGE VERY SANDY (30-40%) SILTY (10-20%) SCATTERED GRAVEL | | | |

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA 5N3D

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - BRICK RED | | | |
| | | 18 | (AS ABOVE) | | | PUSHED 3.25" TEMPORARY CASING TO 20 ft |
| | | 19 | | | | |
| | CSG | 20 | | | | SAMPLE 2 [LPA5N3D2] |
| | | | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A
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IER 1110-1-1801

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PROJECT LA GARDE PARK ESI | HOLE NO. LPA5N3D

Hole No. LPASN 4D

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET OF: 1 of 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 5 NODE 4D | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPASN4D | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE: STARTED 7/20/04; COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN: — | 17. ELEVATION TOP OF HOLE: |
| 8. DEPTH DRILLED INTO ROCK: — | 18. TOTAL CORE RECOVERY FOR BORING: |
| 9. TOTAL DEPTH OF HOLE: 20 FT | 19. SIGNATURE OF INSPECTOR: John R Carta |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1 | NO RECOVERY | | | SAMPLE 1 [LPASN4D1] SAMPLE TAKEN AT SURFACE BESIDE BORE HOLE |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | CLAY (CL) - TAN TO RED YELLOW MOTTLED (5YR 6/3 TO 5/8) SILTY (10-20%) SCATTERED GRAVEL | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | CSG | 8 | | | | PUSHED 3.25" TEMPORARY CASING TO 8 FT |
| | | 9 | | | | |
| | | 10 | | | | |
| | | 11 | | | | |
| | | 12 | | | | |
| | | 13 | CLAY (CL) - TAN TO LIGHT BROWN (5YR 7/2 TO 6/6) VERY SILTY (40%) WITH STREAKS OF GRAY GRAVEL | | | |
| | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | |

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPA5N4D

PROJECT LA GARDE PARK EST

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - TAN TO LIGHT BROWN (AS ABOVE) | | | |
| | | 18 | | | | |
| | | 19 | | | | |
| | | | | | | SAMPLE 2 [LPA5N4D2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

ENG FORM 1836-A
JUN 67
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PROJECT LA GARDE PARK EST

HOLE NO. LPA5N4D

Hole No. LPA5N3E

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 3E | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) |
| 3. DRILLING AGENCY BOART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL |
| 4. HOLE NO. (As shown on drawing title and title number) LPA5N3E | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER |
| | 16. DATE HOLE — STARTED 7/20/04 — COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN 18 FT | 17. ELEVATION TOP OF HOLE |
| 8. DEPTH DRILLED INTO ROCK — | 18. TOTAL CORE RECOVERY FOR BORING |
| 9. TOTAL DEPTH OF HOLE 18 FT | 19. SIGNATURE OF INSPECTOR [signature] |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 7/4 TO 5/6) SILTY (10%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA5N3E1] |
| | | 6, 7 | CLAY (CL) - RED BROWN (10R 4/6) MOTTLED ORANGE VERY SANDY (20-30%) SCATTERED GRAVEL | | | |
| | | 8, 9, 10, 11, 12, 13 | CLAY (CL) - STREAKED LIGHT TAN TO ORANGE RED (10R 7/2 TO 6/8) SCATTERED GRAVEL VERY SILTY (30%) | | | SLIGHTLY ELEVATE READING ON DOWNHOLE RADIATION SCAN (1,750 CPM @ 12FT) SAMPLE 2 [LPA5N3E2] |
| | | 14, 15, 16, 17 | CLAY (CL) - TAN TO WHITE WITH ORANGE RED STREAKS (10R 7/2 TO 7/8) VERY SILTY (20-30% VERY SANDY (30%) ABUNDANT GRAVEL | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT LA GARDE PARK ESI | HOLE NO. LPA 5N3E

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

Hole No. LPASN3E

PROJECT LA GARDE PARK ESI

INSTALLATION FORT McCLELLAN

SHEET OF 2 of 2 SHEETS

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | CSG | 18 | CLAY (CL) - TAN TO WHITE (AS ABOVE) | | | PUSHED 3.25" TEMP CASING TO 18 FT SAMPLE 2 [LPASN3E2] |
| | | | TOTAL DEPTH 18 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READING ON RADIATION SCAN OF SOIL CORE SLIGHTLY ELEVATED READING ON DOWN HOLE RADIATION SCAN (1,750 CPM @ 12 FT) |

ENG FORM 1836-A JUN 67 (ER 1110-1-1801) GPO 1991-618-759/40491

PROJECT LA GARDE PARK ESI HOLE NO. LPASN3E

Hole No. LPA5N4E

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET OF 1 of 2 SHEETS |
|---|---|---|---|
| 1. PROJECT LA GARDE PARK ESI | | 10. SIZE AND TYPE OF BIT GEOPROBE 2" | |
| 2. LOCATION (Coordinates or Station) AREA 5 NODE 4E | | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) | |
| 3. DRILLING AGENCY BOART LONGYEAR | | 12. MANUFACTURERS DESIGNATION OF DRILL | |
| 4. HOLE NO. (As shown on drawing title and title number) | LPA5N4E | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN | DISTURBED / UNDISTURBED 5 |
| 5. NAME OF DRILLER ALLEN THOMAS | | 14. TOTAL NUMBER CORE BOXES | |
| 6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT. | | 15. ELEVATION GROUND WATER | |
| | | 16. DATE HOLE | STARTED 7/21/04 / COMPLETED 7/21/04 |
| 7. THICKNESS OF OVERBURDEN — | | 17. ELEVATION TOP OF HOLE | |
| 8. DEPTH DRILLED INTO ROCK — | | 18. TOTAL CORE RECOVERY FOR BORING | |
| 9. TOTAL DEPTH OF HOLE 20 FT | | 19. SIGNATURE OF INSPECTOR | |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - TAN TO MEDIUM BROWN (7.5YR 7/3 TO 5/6) VERY SILTY (30%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA5N4E1] |
| | | 3, 4 | CLAY (CL) - TAN BROWN MOTTLED ORANGE (5YR 5/4) VERY SILTY (30%) | | | |
| | | 5, 6 | | | | PUSHED 3.25" TEMPORARY CASING TO 7 ft |
| | CSG | 7 | | | | |
| | | 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 | CLAY (CL) - TAN TO MEDIUM BROWN (5YR 4/4) WITH TAN/WHITE STREAKS VERY SILTY (40%) SANDY (10-20%) ABUNDANT GRAVEL | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT LA GARDE PARK ESI — HOLE NO. LPA5N4E

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA5N4E |
|---|---|---|
| PROJECT LA GARDE PARK EST | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | | CLAY (CL) - TAN TO MEDIUM BROWN (AS ABOVE) | | | |
| | | 18 | CLAY (CL) - TAN W/TH PINK TO PURPLE STREAKS (10R 5/2) VERY SANDY (40%) ABUNDANT WEATHERED LIMESTONE FRAGMENTS | | | |
| | | 19 | CLAY (CL) - TAN TO LIGHT BROWN (2.5YR 7/3 TO 6/4) WITH MEDIUM BROWN STREAKS SILTY (10%) TRACE GRAVEL | | | SAMPLE 2 [LPA5N4E2] |
| | | 20 | TOTAL DEPTH 20 FT | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA5N1F

| DRILLING LOG | DIVISION | INSTALLATION: FORT McCLELLAN | SHEET 1 OF 1 SHEETS |
|---|---|---|---|

| | |
|---|---|
| 1. PROJECT: LA GARDE PARK ESI | 10. SIZE AND TYPE OF BIT: GEOPROBE 2" |
| 2. LOCATION (Coordinates or Station): AREA 5 NODE 1F | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): |
| 3. DRILLING AGENCY: BART LONGYEAR | 12. MANUFACTURERS DESIGNATION OF DRILL: |
| 4. HOLE NO. (As shown on drawing title and title number): LPA5N1F | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 3 |
| 5. NAME OF DRILLER: ALLEN THOMAS | 14. TOTAL NUMBER CORE BOXES: |
| 6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT. | 15. ELEVATION GROUND WATER: |
| | 16. DATE HOLE: STARTED 7/20/04; COMPLETED 7/20/04 |
| 7. THICKNESS OF OVERBURDEN: 11.5 FT | 17. ELEVATION TOP OF HOLE: |
| 8. DEPTH DRILLED INTO ROCK: | 18. TOTAL CORE RECOVERY FOR BORING: |
| 9. TOTAL DEPTH OF HOLE: 11.5 FT | 19. SIGNATURE OF INSPECTOR: Jeffrey R Carter |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2 | CLAY (CL) - MEDIUM BROWN (5YR 5/6) SILTY (10%-20%) TRACE GRAVEL | | | SAMPLE 1 [LPA5N1F1] |
| | | 3, 4, 5, 6, 7, 8, 9, 10, 11 | CLAY (CL) - DARK RED (10R 4/8) MOTTLED ORANGE SILTY (20%) SCATTERED GRAVEL | | | PUSHED 3.25" TEMPORARY CASING TO 9.5 FT; SAMPLE 2 [LPA5N1F2] |
| | CSG | | | | | |
| | | | TOTAL DEPTH 11.5 FT (GEOPROBE REFUSAL) | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

Hole No. LPA5NGF

| DRILLING LOG | DIVISION | INSTALLATION FORT McCLELLAN | SHEET 1 OF 2 SHEETS |
|---|---|---|---|

1. PROJECT: LA GARDE PARK EST
2. LOCATION (Coordinates or Station): AREA 5 NODE 6F
3. DRILLING AGENCY: BOART LONGYEAR
4. HOLE NO. (As shown on drawing title and title number): LAA5NGF
5. NAME OF DRILLER: ALLEN THOMAS
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 20 FT
10. SIZE AND TYPE OF BIT: GEOPROBE 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURERS DESIGNATION OF DRILL:
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: ; UNDISTURBED: 5
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 7/21/04; COMPLETED 7/21/04
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING:
19. SIGNATURE OF INSPECTOR: [signature]

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 1, 2, 3, 4, 5 | CLAY (CL) - MEDIUM TAN TO LIGHT BROWN (7.5YR 6/2 TO 5/4) VERY SANDY (30%) ABUNDANT GRAVEL | | | SAMPLE 1 [LPA5NGF1] |
| | CSG | 5 | | | | PUSHED 3.25" TEMPORARY CASING TO 5.5 FT |
| | | 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 | CLAY (CL) - MEDIUM TO LIGHT BROWN WITH TAN-WHITE STREAK (5YR 4/4) VERY SILTY (30-40%) VERY SANDY (30%) ABUNDANT GRAVEL | | | |

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: LA GARDE PARK EST — HOLE NO.: LPA5NGF

| DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. LPA 5N 6F |
|---|---|---|
| PROJECT LA GARDE PARK ESI | INSTALLATION FORT McCLELLAN | SHEET OF 2 of 2 SHEETS |

| ELEVATION a | DEPTH b | LEGEND c | CLASSIFICATION OF MATERIALS (Description) d | % CORE RECOVERY e | BOX OR SAMPLE NO. f | REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g |
|---|---|---|---|---|---|---|
| | | 18 | CLAY (CL) - MOTTLED TAN AND BRICK RED WITH ORANGE STREAKS (10R 4/8) | | | |
| | | 19 | VERY SILTY (30%) | | | SAMPLE 2 [LPA5N6F2] |
| | | 20 | TOTAL DEPTH 20 ft | | | NO ELEVATED READINGS ON DOWNHOLE OR SOIL CORE RADIATION SCANS |

# Appendix E

# Data Validation Report
# and
# Laboratory Analytical Forms

# DATA VALIDATION REPORT
# LA GARDE PARK EXPANDED SITE INVESTIGATION
# FORT MCCLELLAN, ALABAMA

**Prepared**

**By**

**Solutions To Environmental Problems, Inc.**

**August 28, 2004**

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# La Garde Park

## 1.0 Introduction

The data validation of 105 soil samples from La Garde Park, that were analyzed for cesium-137 and cobalt-60 (EML HASL 300, 4.5.2.3), was completed in August, 2004. Level III data validation was performed on 100% of the environmental samples collected during the remedial investigation activities. General Engineering Labs, Charleston, SC, produced all the analytical data.

## 2.0 Procedures

The sample data were validated following the logic identified in the STEP Data Validation Procedures for "Radiological Analysis" (1995). The data validation qualifiers applied by the reviewer were recorded in a column adjacent and to the right of the laboratory results. A data validation reason code was also added to each of the reviewer's qualifiers to provide the user with a means to identify which results were qualified and the reason for the qualifiers (Table 1, Page 4).

## 3.0 Summary of Data Validation Findings

This data validation report reflects the data validation findings for samples associated with La Garde Park. Overall the data was of excellent quality and all measurements required to satisfy the project QC objectives, PARCC were met. Each of these measures and specific data qualifications are discussed below.

*Accuracy*: Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS) and surrogate recoveries. The overall measure of accuracy for the site was calculated by comparing the number of spike recoveries that exceeded the laboratory limits by the total number of LCS, MS and surrogate spikes. For Cs-137 and Co-60 the accuracy was measured at 100.0%.

*Precision*: Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the RPD between spikes and the RPD for the field duplicate analysis. The overall project QC objective for precision is 90% or greater, and the measurement for La Garde Park is 97.2 %.

*Representativeness*: The measures of representativeness -- sample handling, analytical blank analysis, field blanks – were met for all sites. Designated analytical protocols were followed. Holding times were met. Overall, no major problems were identified resulting from analytical failure.

*Comparability*: All data were analyzed using appropriate approved methods of analysis. All data results were reported correctly and in standard units

*Completeness*: Completeness is the amount of valid data compared to the planned amount and is expressed as a percent of the usable data points divided by the total number of analytes for each parameter analyzed. Out of a total of 230 data points, no data were rejected, resulting in a completeness of 100%.

Data validation summaries, which function as worksheets for the validation task, are included for each parameter in each data package. The following section highlights the key findings of the data validation for each analysis.

## 4.0 Analysis-Specific Data Validation Summaries

### 4.1 Cesium-137 and Cobalt-60 by EML HASL 300, 4.5.2.3

One hundred and five soil samples, that were divided into 4 sample groups (SDGs), were analyzed and validated for Cs-137 and Co-60. Overall, the data are of good quality and are usable as qualified. Data were reviewed for the following:

***Holding Times/Sample Condition.*** No qualifiers were required. All holding times were met.

***Initial and Continuing Calibration.*** All standards were calibrated as required. The CCVS efficiencies were checked and calibration frequencies were met.

***Blanks.*** No elements were noted in the blanks. No qualifiers were required.

***Matrix Spike/Matrix Spike Duplicate(MS/MSD)/Duplicate.*** No MS/MSD were analyzed for any of the SDGs.

***Laboratory Control Sample (LCS).*** LCS analyses were performed for the project samples and all QC criteria were met .

***Field Duplicates.*** Field duplicates were evaluated for SDG 117527,117411 and 117342 and the RPD for Co-60 exceeded the QC limit in SDG 117411. This element was qualified as "J" in samples LPA1N4F1 and LPA1N4F1D.

***Quantitation.*** Some elements were qualified by the laboratory as "UUI" or "UI", indicating a low abundance. The reviewer qualified these results as "U" or not detected.

## 5.0 Data Qualifier Definitions

**Qualifier**

**U** The analyte was analyzed for, but was not detected above the reported sample quantitation limit or the reported analyte value was not detected above 5x or 10x the level reported in laboratory or field blanks.

**J** The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

**UJ** The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

**R** The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.

## 6.0 References

STEP,Inc.Aug.25,1995.Data Validation Program Procedure Manual. Section 8.0 "Radiological Analyses".

## *Table 1: Data Validation Reason Codes*

| Reason Code | Definition |
|---|---|
| 01 | Sample received outside of 4+/-2 degrees Celsius |
| 01A | Improper sample preservation |
| 02 | Holding time exceeded |
| 02A | Extraction |
| 02B | Analysis |
| 03 | Instrument performance – outside criteria |
| 03A | BFB |
| 03B | DFTPP |
| 03C | DDT and/or Endrin % breakdown exceeds criteria |
| 03D | Retention time windows |
| 03E | Resolution |
| 04 | Initial calibration results outside specified criteria |
| 04A | Compound mean RRF QC criteria not met |
| 04B | Individual % RSD criteria not met |
| 04C | Correlation coefficient >0.995 |
| 05 | Continuing calibration results outside specified criteria |
| 05A | Compound mean RRF QC criteria not met |
| 05B | Compound % D QC criteria not met |
| 06 | Result qualified as a result of the 5x/10x blank correction |
| 06A | Method or preparation blank |
| 06B | ICB or CCB |
| 06C | ER |
| 06D | TB |
| 06E | FB |
| 07 | Surrogate recoveries outside control limits |
| 07A | Sample |
| 07B | Associated method blank or LCS |
| 08 | MS/MSD/Duplicate results outside criteria |
| 08A | MS and/or MSD recovery not within control limits (accuracy) |
| 08B | % RPD outside acceptance criteria (precision) |
| 09 | Post digestion spike outside criteria (GFAA) |
| 10 | Internal standards outside specified control limits |
| 10A | Recovery |
| 10B | Retention time |
| 11 | Laboratory control sample recoveries outside specified limits |
| 11A | Recovery |
| 11B | % RPD (if run in duplicate) |
| 12 | Interference check standard |
| 13 | Serial dilution |
| 14 | Tentatively identified compounds |
| 15 | Quantitation |
| 16 | Multiple results available; alternate analysis preferred |
| 17 | Field duplicate RPD criteria is exceeded |
| 18 | Percent difference between original and second column exceeds QC criteria |
| 19 | Professional judgment was used to qualify the data |
| 20 | Pesticide clean-up checks |
| 21 | Target compound identification |
| 22 | Radiological calibration |
| 23 | Radiological quantitation |
| 24 | Reported result and/or lab qualifier revised to reflect validation findings |

SDG: 117342 Project: LaGarde Park

EML HASP 300, 4.5.3.3 Cs-137

Method: Radiological Co-60 Matrix/No. of Samples: Soil-32

Validation Samples: LPAIN3D1 LPAIN3D2DUP LPAIN2E1 LPAIN1F2 LPAIN3G1

LPAIN5E1 LPAIN5D1 LPAIN3D2 LPAIN2F1 LPAIN2E2 LPAIN2F1 LPAIN3G2

LPAIN5C2 LPAIN5D2 LPAIN2D2 LPAIN2G2 LPAIN1E1 LPAIN2F2 LPAIN1G1

LPAIN5D2DUP LPAIN4D1 LPAIN1D1 LPAIN2D1 LPAIN1E2 LPAIN2G1 LPAIN1G2

LPAIN5D1DUP LPAIN4D2 LPAIN3D1DUP LPAIN1D2 LPAIN1F1 LPAIN2G2

Data Validation Report Summary

| | | Status Code | Comments |
|---|---|---|---|
| 1. | Sample Preservation, Handling, and Transport | A | |
| 2. | Chain of Custody | A | |
| 3. | Holding Times | A | |
| 4. | Calibrations | A | |
| 5. | Blanks | A | |
| 6. | ICP/ICS | N/A | |
| 7. | Blank Spike/LCS | A | |
| 8. | Duplicates | A | |
| 9. | Matrix Spike | N/A | None performed |
| 10. | Furnace Atomic Absorption QC | N/A | |
| 11. | ICP Serial Dilution | N/A | |
| 12. | Sample Result Verification | X | |
| 13. | Field QC Samples | A | |
| 14. | Overall Assessment | X | |

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

23 · The laboratory qualified the results "UUI" if the results had low abundance or an invalid peak - the reviewer qualified those results as "U" or nondetect.

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified

Date: 8/25/2004

Validator's Signature: J. Thomas Kitchens

Peer Reviewer:

Page: 1 of 4
Project #: 114-/114-010
GEL Quote #:
COC Number (1): 2
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP INC Phone #: (865) 481-7837
Project/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
Address: 1006 FLOYD CULLER CT, OAK RIDGE, TN 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested (5) (Fill in the number of containers for each test)

| Sample ID 117342 | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code (2) | Field Filtered (3) | Sample Matrix (4) | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | | <- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N5E1 | 7/19/04 | 15:55 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | COBALT & CESIUM |
| LPA1N5C2 | 7/16/04 | 09:50 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N5D2 DUP | 7/16/04 | 09:55 | FD | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N5D1 DUP | 7/16/04 | 09:55 | FD | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N5D1 | 7/16/04 | 09:55 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N5D2 | 7/16/04 | 09:55 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N4D1 | 7/17/04 | 09:15 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N4D2 | 7/17/04 | 09:15 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N3D1 | 7/17/04 | 10:30 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N3D2 | 7/17/04 | 10:30 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) Fax Results: Yes / No
Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (Signed) | Date | Time |
|---|---|---|---|---|---|
| 1 Jeff Carter | 7/20/04 | 0800 | 1 [illegible] | 7/20/04 | 0930 |
| 2 | | | 2 | | |
| 3 | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 22 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Page: 2 of 4
Project #: 114-1 114-010
GEL Quote #:
COC Number (1): 2
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC Phone #: (865) 481-7837
Project/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
Address: 1006 FLOYD CULLER CT, OAK RIDGE TN, 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested (5) (Fill in the number of containers for each test)

| Sample ID 117342 | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code (2) | Field Filtered (3) | Sample Matrix (4) | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N2D2 | 7/19/04 | 0800 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | COBALT/CESIUM |
| LPA1N1D1 | 7/19/04 | 0805 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N3D1 DUP | 7/17/04 | 1030 | FD | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N3D2 DUP | 7/17/04 | 1030 | FD | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N2E1 | 7/19/04 | 1225 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N2E2 | 7/19/04 | 1225 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N2D1 | 7/19/04 | 0700 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N1D2 | 7/19/04 | 0805 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N2E1 | 7/19/04 | 1225 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N2E2 | 7/19/04 | 1225 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (Signed) | Date | Time |
|---|---|---|---|---|---|
| 1 Jeff R Cat | 7/20/04 | 0800 | 1 [illegible] | 7-21-04 | 0930 |
| 2 | | | 2 | | |
| 3 | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 22 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Page: 3 of 4
Project #: 114-1114-01D
GEL Quote #:
COC Number [1]: 2
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC  Phone #: (865) 481-7837
Project/Site Name: LA GARDE PARK ESI  Fax #: (865) 481-0290
Address: 1006 FLOYD CULLEN CT OAK RIDGE TN 37830
Collected by: J. CARTER  Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117342% | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N1E1 | 7/19/04 | 0830 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | CESIUM + COBALT |
| LPA1N1E2 | 7/19/04 | 0830 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N1F1 | 7/19/04 | 0955 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N1F2 | 7/19/04 | 0955 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N2F1 | 7/19/04 | 1250 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N2F2 | 7/19/04 | 1250 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N2G1 | 7/19/04 | 1330 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N2G2 | 7/19/04 | 1330 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N3G1 | 7/19/04 | 1345 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N3G2 | 7/19/04 | 1345 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge)  Fax Results: Yes / No  Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| 1 Jeff R Carter | 7/20/04 | 0800 | 1 [illegible] | 7/21/04 | 0930 |
| 2 | | | 2 | | |
| 3 | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment:  Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 22 C

WHITE = LABORATORY  YELLOW = FILE  PINK = CLIENT

Page: 4 4
Project #: 114- 1114-010
GEL Quote #:
COC Number [1]: 2
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC Phone #(865)481-7837
Project/Site Name: LAGARDE PARK ESI Fax #(865)481-0290
Address: 1006 FLOYD CULLER CT OAK RIDGE TN 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 1173402% | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N1G1 | 7/19/04 | 1055 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | COBALT & CESIUM |
| LPA1N1G2 | 7/19/04 | 1055 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | |

TAT Requested: Normal: X Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| 1 [signature] | 7/20/04 | 0800 | 1 [signature] | 7-21-04 | 0930 |
| 2 | | | 2 | | |
| 3 | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 2.2 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N5E1 | Project: | STEP00402 |
| Sample ID: | 117342001 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 19-JUL-04 15:55 | | |
| Receive Date: | 21-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 1.05 | +/-0.0615 | 0.0348 | 0.100 | pCi/g | | | SRB | 08/12/04 | 2204 | 352598 | 1 |
| Cobalt-60 | | 0.105 | +/-0.0407 | 0.0326 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| hod | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Heather A Cuda
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N5C2
Sample ID: 117342002
Matrix: Soil
Collect Date: 16-JUL-04 09:50
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0102 | +/-0.0175 | 0.029 | 0.100 | pCi/g | u | | SRB | 08/12/04 | 2205 | 352598 | 1 |
| Cobalt-60 | U | -0.000188 | +/-0.0185 | 0.0335 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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H Analytical holding time exceeded.
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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI

Page 1 of 1

Client Sample ID: LPA1N5D2 DUP
Sample ID: 117342003
Matrix: Soil
Collect Date: 16-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

RW

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | 2nd | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00927 | +/-0.0238 | 0.0421 | 0.100 | pCi/g | u | | SRB | 08/12/04 | 2206 | 352598 | 1 |
| Cobalt-60 | U | -0.00322 | +/-0.0298 | 0.0455 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| oil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N5D1 DUP
Sample ID: 117342004
Matrix: Soil
Collect Date: 16-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0326 | +/-0.021 | 0.0371 | 0.100 | pCi/g | U | | SRB | 08/12/04 | 2207 | 352598 | 1 |
| Cobalt-60 | U | -0.00611 | +/-0.0166 | 0.0292 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N5D1
Sample ID: 117342005
Matrix: Soil
Collect Date: 16-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0244 | +/-0.0269 | 0.0296 | 0.100 | pCi/g | U | | SRB | 08/12/04 | 2207 | 352598 | 1 |
| Cobalt-60 | U | -0.000167 | +/-0.0143 | 0.0268 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| oil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5D2
Sample ID: 117342006
Matrix: Soil
Collect Date: 16-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00592 | +/-0.0224 | 0.0417 | 0.100 | pCi/g | U | | SRB | 08/12/04 | 2208 | 352598 | 1 |
| Cobalt-60 | U | 0.000672 | +/-0.0256 | 0.042 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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H Analytical holding time exceeded.
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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heather A Cuda
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4D1
Sample ID: 117342007
Matrix: Soil
Collect Date: 17-JUL-04 09:15
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | 2nd DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.302 | +/-0.103 | 0.0767 | 0.100 | pCi/g | | SRB | 08/12/04 | 2209 | 352598 | 1 |
| Cobalt-60 | U | 0.0426 | +/-0.0556 | 0.104 | 0.100 | pCi/g | u | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4D2
Sample ID: 117342008
Matrix: Soil
Collect Date: 17-JUL-04 09:15
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0207 | +/-0.0193 | 0.027 | 0.100 | pCi/g | u | | SRB | 08/12/04 | 2210 | 352598 | 1 |
| Cobalt-60 | U | -0.00482 | +/-0.0162 | 0.0277 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ...l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heather Cua

Reviewed by

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3D1
Sample ID: 117342009
Matrix: Soil
Collect Date: 17-JUL-04 10:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.233 | +/-0.043 | 0.0329 | 0.100 | pCi/g | | | SRB | 08/12/04 | 2258 | 352598 | 1 |
| Cobalt-60 | | 0.0862 | +/-0.0371 | 0.0285 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3D2
Sample ID: 117342010
Matrix: Soil
Collect Date: 17-JUL-04 10:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | 2nd | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.102 | +/-0.0836 | 0.149 | 0.100 | pCi/g | u | | SRB | 08/12/04 | 2259 | 352598 | 1 |
| Cobalt-60 | U | -0.0528 | +/-0.0828 | 0.133 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N2D2
Sample ID: 117342011
Matrix: Soil
Collect Date: 19-JUL-04 08:00
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0141 | +/-0.0267 | 0.0453 | 0.100 | pCi/g | U | | SRB | 08/12/04 | 2259 | 352598 | 1 |
| Cobalt-60 | UUI | 0.00 | +/-0.109 | 0.0494 | 0.100 | pCi/g | U | 23 | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Heather T Clark
Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N1D1
Sample ID: 117342012
Matrix: Soil
Collect Date: 19-JUL-04 08:05
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0472 | +/-0.0263 | 0.0311 | 0.100 | pCi/g | | | SRB | 08/12/04 | 2300 | 352598 | 1 |
| Cobalt-60 | U | 0.001 | +/-0.0127 | 0.0241 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather Wood

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N3D1 DUP | Project: | STEP00402 |
| Sample ID: | 117342013 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 17-JUL-04 10:30 | | |
| Receive Date: | 21-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.301 | +/-0.0559 | 0.0335 | 0.100 | pCi/g | | | SRB | 08/12/04 | 2301 | 352598 | 1 |
| Cobalt-60 | | 0.0902 | +/-0.0271 | 0.0312 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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H Analytical holding time exceeded.
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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N3D2 DUP | Project: | STEP00402 |
| Sample ID: | 117342014 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 17-JUL-04 10:30 | | |
| Receive Date: | 21-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0496 | 0.0943 | 0.100 | pCi/g | U23 | | SRB | 08/12/04 | 2304 | 352598 | 1 |
| Cobalt-60 | U | 0.0198 | +/-0.0321 | 0.0623 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2E1
Sample ID: 117342015
Matrix: Soil
Collect Date: 19-JUL-04 12:25
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.0457 | +/-0.0232 | 0.0305 | 0.100 | pCi/g | | SRB | 08/12/04 | 2305 | 352598 | 1 |
| Cobalt-60 | | 0.0531 | +/-0.0283 | 0.0297 | 0.100 | pCi/g | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2E2
Sample ID: 117342016
Matrix: Soil
Collect Date: 19-JUL-04 12:25
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qud | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00113 | +/-0.0203 | 0.0366 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0424 | 352598 | 1 |
| Cobalt-60 | U | 0.00802 | +/-0.0327 | 0.0464 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2D1
Sample ID: 117342017
Matrix: Soil
Collect Date: 19-JUL-04 07:00
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | AnalystDate | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.227 | +/-0.0443 | 0.0312 | 0.100 | pCi/g | | | SRB 08/13/04 | 0425 | 352598 | 1 |
| Cobalt-60 | U | -0.0077 | +/-0.0168 | 0.0291 | 0.100 | pCi/g | U | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N1D2
Sample ID: 117342018
Matrix: Soil
Collect Date: 19-JUL-04 08:05
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.000215 | +/-0.0125 | 0.0232 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0425 | 352598 | 1 |
| Cobalt-60 | U | 0.00646 | +/-0.0122 | 0.0248 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N2E1 | Project: | STEP00402 |
| Sample ID: | 117342019 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 19-JUL-04 12:25 | | |
| Receive Date: | 21-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0311 | +/-0.024 | 0.0317 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0426 | 352598 | 1 |
| Cobalt-60 | | 0.0463 | +/-0.0215 | 0.033 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

only on COC.

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N2E2DUP
Sample ID: 117342020
Matrix: Soil
Collect Date: 19-JUL-04 12:25
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.000449 | +/-0.0232 | 0.0415 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0427 | 352598 | 1 |
| Cobalt-60 | U | -0.00871 | +/-0.0237 | 0.0416 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1356 | 351664 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1E1
Sample ID: 117342021
Matrix: Soil
Collect Date: 19-JUL-04 08:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev 9u

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00196 | +/-0.0151 | 0.0273 | 0.100 | pCi/g | u | | SRB | 08/13/04 | 0431 | 352599 | 1 |
| Cobalt-60 | U | 0.00164 | +/-0.0199 | 0.0317 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N1E2
Sample ID: 117342022
Matrix: Soil
Collect Date: 19-JUL-04 08:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units Qual | DF | AnalystDate | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | |
| Cesium-137 | U | 0.000472 | +/-0.0118 | 0.0215 | 0.100 | pCi/g U | | SRB 08/13/04 | 0431 | 352599 | 1 |
| Cobalt-60 | U | -0.00224 | +/-0.0114 | 0.0207 | 0.100 | pCi/g U | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI

Page 1 of 1

Client Sample ID: LPA1N1F1
Sample ID: 117342023
Matrix: Soil
Collect Date: 19-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rw Jul DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | 0.00466 | +/-0.0192 | 0.0303 | 0.100 | pCi/g | u | SRB | 08/13/04 | 0432 | 352599 | 1 |
| Cobalt-60 | U | -0.00203 | +/-0.016 | 0.0287 | 0.100 | pCi/g | u | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Heather Cowell

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# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1F2
Sample ID: 117342024
Matrix: Soil
Collect Date: 19-JUL-04 09:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0024 | +/-0.013 | 0.0238 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0433 | 352599 | 1 |
| Cobalt-60 | U | -0.00657 | +/-0.0126 | 0.022 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| oil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G Cu cas

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N2F1
Sample ID: 117342025
Matrix: Soil
Collect Date: 19-JUL-04 12:50
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0235 | +/-0.0205 | 0.0388 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0433 | 352599 | 1 |
| Cobalt-60 | U | -0.00817 | +/-0.0162 | 0.0283 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2F2
Sample ID: 117342026
Matrix: Soil
Collect Date: 19-JUL-04 12:50
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev 2nd

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | -0.00136 | +/-0.0202 | 0.037 | 0.100 | pCi/g | U | SRB | 08/13/04 | 0434 | 352599 | 1 |
| Cobalt-60 | U | 0.0148 | +/-0.0185 | 0.0386 | 0.100 | pCi/g | U | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2G1
Sample ID: 117342027
Matrix: Soil
Collect Date: 19-JUL-04 13:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Pew

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00324 | +/-0.0139 | 0.0251 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0436 | 352599 | 1 |
| Cobalt-60 | U | -0.00941 | +/-0.013 | 0.0219 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2G2
Sample ID: 117342028
Matrix: Soil
Collect Date: 19-JUL-04 13:30
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 9.500E-05 | +/-0.028 | 0.0417 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0437 | 352599 | 1 |
| Cobalt-60 | U | 0.0078 | +/-0.022 | 0.0396 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| hod | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Hector Cerda

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N3G1
Sample ID: 117342029
Matrix: Soil
Collect Date: 19-JUL-04 13:45
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | AnalystDate | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 1.48 | +/-0.180 | 0.0507 | 0.100 | pCi/g | | | SRB 08/13/04 | 0437 | 352599 | 1 |
| Cobalt-60 | U | 0.0415 | +/-0.064 | 0.0436 | 0.100 | pCi/g | U | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N3G2
Sample ID: 117342030
Matrix: Soil
Collect Date: 19-JUL-04 13:45
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Dil DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.105 | +/-0.0272 | 0.0286 | 0.100 | pCi/g | | SRB | 08/13/04 | 0920 | 352599 | 1 |
| Cobalt-60 | U | 0.0155 | +/-0.040 | 0.0285 | 0.100 | pCi/g | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N1G1
Sample ID: 117342031
Matrix: Soil
Collect Date: 19-JUL-04 10:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00354 | +/-0.0199 | 0.0356 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0920 | 352599 | 1 |
| Cobalt-60 | U | 0.00302 | +/-0.0218 | 0.0354 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 16, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N1G2
Sample ID: 117342032
Matrix: Soil
Collect Date: 19-JUL-04 10:55
Receive Date: 21-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | AnalystDate | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | -0.00225 | +/-0.022 | 0.0341 | 0.100 | pCi/g | U | | SRB 08/13/04 | 0921 | 352599 | 1 |
| Cobalt-60 | U | 0.000695 | +/-0.0226 | 0.0409 | 0.100 | pCi/g | U | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1358 | 351665 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
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H Analytical holding time exceeded.
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UI Uncertain identification for gamma spectroscopy.
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Reviewed by

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117342 Matrix/No. Samples: S-32

| | | | |
|---|---|---|---|
| **I. Sample Management** | | | |
| **A. Sample Preservation, Handling and Transport** | | | |
| 1. Have all samples been preserved with $HNO_3$ to pH <2? | Yes | No | N/A |
| 2. Have sample temperatures been kept at 4° C (+ or - 2 ° C)? | Yes | No | N/A |
| 3. Were all samples received in proper condition? | Yes | No | N/A |
| 4. Were any qualifications required based on this information? | Yes | No | N/A |
| Cooler @ 2.2 | | | |
| **B. Chain of Custody** | | | |
| 1. Were all samples properly recorded on COCs? | Yes | No | N/A |
| 2. Were correct analyses performed on samples? | Yes | No | N/A |
| **C. Holding Times** | | | |
| 1. Were samples analyzed within acceptable holding times? | Yes | No | N/A |
| 2. Were any qualifications required based on this information? | Yes | No | N/A |

| SAMPLED | | PREPPED/ANALYZED |
|---|---|---|
| 7/16, 17, 19 | batch 352598 | 8/12 |
| | batch 352599 | 8/13 |

| | | | |
|---|---|---|---|
| **II. Calibrations** | | | |
| 1. Were proper number of calibration standards used for each analytical instrument used? | Yes | No | N/A |
| 2. Is the calibration correlation coefficient >or = 0.995 for each analytical instrument used? | Yes | No | N/A |
| 3. Are initial and continuing calibration verification %R within ~~10% (+ or - 1%)~~ acceptance window? | Yes | No | N/A |
| 4. Are CRDL Standard %R within 10% (+ or - 1%) acceptance window? | Yes | No | N/A |
| 5. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

8/12 @ 8:37 ff. 8/13 @ 3:15 ff

all ccv values within boundaries

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117342 Matrix/No. Samples: S-32

| III. | Blanks | | | |
|---|---|---|---|---|
| | 1. Are any analytes reported in laboratory prep or calibration blanks above the IDL? | Yes | No | N/A |
| | 2. Are any analytes reported as negative values in laboratory prep or calibration blanks? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 352598 1760 | 352599 1776 |
|---|---|---|
| Cs | u | u |
| Co | u | u |

| IV. | ICP Interference Check Sample (ICS) | | | |
|---|---|---|---|---|
| | 1. Were ICS samples run at the beginning and end of each sample analysis run? | Yes | No | N/A |
| | 2. Are ICS %R within 80-120% acceptable control limits? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| V. | Blank Spike/Laboratory Control Sample (LCS) | | | |
|---|---|---|---|---|
| | 1. Are all aqueous LCS %R within 80-120% control limits? | Yes | No | N/A |
| | 2. Are all solid LCS %R within control limits established by EPA? 75-125 | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 352598 1762 LCS | 352599 |
|---|---|---|
| Cs | 9.81/9.22 = 106.4% | 9.45/9.22 = 102.5% |
| Co | 14.8/14.1 = 105% | 15.0/14.1 = 106.4% |

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117342 Matrix/No. Samples: S-32

| VI. | Duplicates | | | |
|---|---|---|---|---|
| | 1. Were samples used for duplicate sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. For duplicate samples >5x CRDL, were RPDs within control limits of + or - 20% for water, or + or - 35% for soil? <20% | Yes | No | N/A |
| | 3. For duplicate samples <5x CRDL, were duplicate samples within control limit of + or - CRDL for water, or + or - 2xCRDL for soil? | Yes | No | N/A |
| | 4. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications: 352598 - 2001 352599 - 2021

| | | | | |
|---|---|---|---|---|
| Cs-137 | 1.05 | 1.02 | u | u |
| Co-60 | 0.105 | 0.0932 | u | u |

| VII. | Matrix Spike | | | |
|---|---|---|---|---|
| | 1. Were samples used for matrix spike sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. Were spike recoveries within 75-125% limits (limits do not apply when original sample concentration exceeds spike concentration by a factor of 4? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

None performed

| VIII. | ICP Serial Dilution | | | |
|---|---|---|---|---|
| | 1. Were %Ds for ICP serial dilution samples within 10% for analytes with concentrations greater than 50x IDL? | Yes | No | N/A |
| | 2. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
roject: LaGarde Park SDG: 117342 Matrix/No. Samples: S-32

| IX. Sample Result Qualification<br>Not Required For Level III Data Validation | | | |
|---|---|---|---|
| 1. Were sample results reported by laboratory supported by raw data? | Yes | No | N/A |
| 2. Were correct calculations used to determine sample results? | Yes | No | N/A |
| 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications: No raw data review - level III

| X. Field QC | | | |
|---|---|---|---|
| 1. Were any Field Duplicates associated with this SDG? | Yes | No | N/A |
| a. If Yes, were RPDs acceptable (~~50%~~ 35 for water samples, ~~100%~~ 50 for soil samples)? | Yes | No | N/A |
| 2. Were any field blanks or equipment rinsates associated with this SDG? | Yes | No | N/A |
| a. If yes, were any analytes reported in samples >IDL? | Yes | No | N/A |
| b. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

$\frac{.0680}{.267} = 25.5\%$

$4.5\% = \frac{.0040}{.0882}$

| 1N3D1 | 1N3D1 DUP | 1N3D2 | 3D2 DUP |
|---|---|---|---|
| 0.233 | 0.301 | U | U 23 |
| 0.0862 | 0.0902 | U | U |

| 5D1 | 5D1 DUP | 5D2 | 5D2 DUP |
|---|---|---|---|
| U | U | U | U |
| U | U | U | U |

| XI. Overall Assessment of Data | | | |
|---|---|---|---|
| 1. Are there any specific concerns or limitations regarding the data in this SDG? | Yes | No | N/A |

Comments/Qualifications:

SDG: 117411 Project: LaGarde Park

EML HASP 300, 4.5.2.3

Method: Radiological Cs-137 Co-60 Matrix/No. of Samples: Soil -33

Validation Samples: LPAIN4G1 LPASN1F1 LPASN2D1 LPASN4C1 LPASN4B1 LPASN3B1
LPAIN5G1 LPAIN5F1 LPAIN4G2 LPASN1F2 LPASN2D2 LPASN4C2 LPASN4B2 LPASN3B2
LPAIN5G2 LPAIN5F2 LPASN3E1 LPASN3D1 LPASN4D1 LPASN2C1 LPASN3C1 LPASN1A1
LPAIN4F1 LPAIN4F1D LPASN3E2 LPASN3D2 LPASN4D2 LPASN2C2 LPASN3C2 LPASN1A2
LPAIN4F2 LPAIN4F1D LPAIN5E2

Data Validation Report Summary

| | | Status Code | Comments |
|---|---|---|---|
| 1. | Sample Preservation, Handling, and Transport | A | |
| 2. | Chain of Custody | A | |
| 3. | Holding Times | A | |
| 4. | Calibrations | A | |
| 5. | Blanks | A | |
| 6. | ICP/ICS | N/A | |
| 7. | Blank Spike/LCS | A | |
| 8. | Duplicates | A | |
| 9. | Matrix Spike | N/A | None performed |
| 10. | Furnace Atomic Absorption QC | N/A | |
| 11. | ICP Serial Dilution | N/A | |
| 12. | Sample Result Verification | X | |
| 13. | Field QC Samples | X | |
| 14. | Overall Assessment | X | |

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

23 • The laboratory qualified results that had low abundance or no valid peak as "UUI" - rather than reject the data the reviewer qualified the results as "U" or nondetects.

17 • Cobalt in samples ...1N4F1 and ...1N4F1DUP had a high %D in the field duplicate and was qualified as "J".

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified.

Date: 8/23/2004

Validator's Signature: J. Thomas Kelly's

Peer Reviewer:

ıge: 4
oject #: 114-11 14-010
EL Quote #:
OC Number [1]: 3
) Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

lient Name: STEP, INC Phone #: (865) 481-7837

oject/Site Name: LAGARDE PARK ESI Fax #: (865) 481-0290

ddress: 1600 FLOYD CULLER CT OAK RIDGE TN 37830

ollected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117411 % | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [3] | Field Filtered [2] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N5G1 | 7/20/04 | 0720 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | CESIUM & COBALT |
| LPA1N5G2 | 7/20/04 | 0720 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4F1 | 7/19/04 | 1800 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4F2 | 7/19/04 | 1800 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N5F1 | 7/19/04 | 1540 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N5F2 | 7/19/04 | 1540 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4F1 DUP | 7/19/04 | 1800 | FD | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4F2 DUP | 7/19/04 | 1800 | FD | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4G1 | 7/19/04 | 1630 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4G2 | 7/19/04 | 1630 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*emarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeffrey R Carter | 7/21/04 | 0800 | 1 T. Brown | 7-22-04 | 0910 |
| | | | 2 | | |
| | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

.) Chain of Custody Number = Client Determined
.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 2.4 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

ge: 2 4
oject #: 114-113, 4-010
EL Quote #:
OC Number [1]: 3
) Number:

# GEL Chain of Custody and Analytical Request

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Fax: (843) 766-1178

ient Name: STEP, INC Phone #: (865) 481-7837
oject/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
ddress: 1006 FLOYD CULLER CT OAK RIDGE TN 37830
ollected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117411 | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA5N3E1 | 7/20/04 | 1005 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | CESIUM/COBALT |
| LPA5N3E2 | 7/20/04 | 1005 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N1F1 | 7/20/04 | 0920 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N1F2 | | 0920 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N3D1 | | 12:25 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N3D2 | | 1225 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N2D1 | | 0940 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N2D2 | | 0940 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N4D1 | | 1800 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N4D2 | | 1800 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) | Fax Results: Yes / No | Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*emarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeffrey R Carter | 7/21/04 | 0800 | T. Blan | 7.22.04 | 0900 |
| | | | 2 | | |
| | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

) Chain of Custody Number = Client Determined
) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 2-8 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

ge: 3 4
oject #: 114-1 4-010
EL Quote #:
OC Number [1]: 3
) Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
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Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

lient Name: STEP, INC Phone #(865) 481-7837
oject/Site Name: LAGARDE PARK ESI Fax #(865) 481-0290
ddress: 1006 FLOYD CULLER CT OAK RIDGE TN 37830
ollected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117411 | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA5N 4C1 | 7/20/04 | 1645 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | | CESIUM/COBALT |
| LPA5N 4C2 | | 1645 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 2C1 | | 1445 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 2C2 | | 1445 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 4B1 | | 1550 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 4B2 | | 1550 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 3C1 | | 1300 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 3C2 | | 1300 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 3B1 | | 1330 | | – | | Y | | 1 | 1 | | | | | | | | | | | |
| LPA5N 3B2 | | 1330 | | – | | Y | | 1 | 1 | | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| 1 [signature] | 7/21/04 | 0800 | 1 [signature] | 7.21.04 | 0910 |
| 2 | | | 2 | | |
| 3 | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 2.8 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Page: 4 4
Project #: 114-112 14-010
GEL Quote #:
COC Number (1): 3
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC Phone #: (865)481-7837
Project/Site Name: LAGARDE PARK ESI Fax #: (865)481-0290
Address: 1006 FLOYD CULLER CT OAKRIDGE TN 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested (5) (Fill in the number of containers for each test)

| Sample ID 117411 / | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code (2) | Field Filtered (3) | Sample Matrix (4) | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA5N1A1 | 7/20/04 | 0910 | N | - | SO | Y | | 1 | 1 | | | | | | | | | | | CESIUM/COBALT |
| LPA5N1A2 | 7/20/04 | 0910 | N | - | SO | Y | | 1 | 1 | | | | | | | | | | | |
| LPA1N5E2 | 7/20/04 | 0655 | N | - | SO | Y | | 1 | 1 | | | | | | | | | | | |

TAT Requested: Normal: X Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| | Relinquished By (Signed) | Date | Time | | Received by (signed) | Date | Time |
|---|---|---|---|---|---|---|---|
| 1 | Jeff Carter | 7/21/04 | 0800 | 1 | T. Brown | 7/21/04 | 0910 |
| 2 | | | | 2 | | | |
| 3 | | | | 3 | | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 28 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N5G1 | Project: | STEP00402 |
| Sample ID: | 117411001 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 07:20 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 1.33 | +/-0.208 | 0.0989 | 0.100 | pCi/g | | SRB | 08/13/04 | 0921 | 352599 | 1 |
| Cobalt-60 | U | 0.0749 | +/-0.083 | 0.160 | 0.100 | pCi/g | u | | | | | |

The following Prep Methods were performed

| | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

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Approved by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5G2
Sample ID: 117411002
Matrix: Soil
Collect Date: 20-JUL-04 07:20
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00259 | +/-0.0206 | 0.0365 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1511 | 352599 | 1 |
| Cobalt-60 | U | 0.0181 | +/-0.0197 | 0.0391 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N4F1 | Project: | STEP00402 |
| Sample ID: | 117411003 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 19-JUL-04 18:00 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.781 | +/-0.0765 | 0.027 | 0.100 | pCi/g | | | SRB | 08/13/04 | 0922 | 352599 | 1 |
| Cobalt-60 | | 0.0412 | +/-0.0377 | 0.0317 | 0.100 | pCi/g | J | 17 | | | | | |

**The following Prep Methods were performed**

| | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: La Garde Park ESI



Client Sample ID: LPA1N4F2
Sample ID: 117411004
Matrix: Soil
Collect Date: 19-JUL-04 18:00
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0215 | +/-0.0264 | 0.0386 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0923 | 352599 | 1 |
| Cobalt-60 | U | 0.00147 | +/-0.0163 | 0.0306 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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B Target analyte was detected in the sample as well as the associated blank.
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5F1
Sample ID: 117411005
Matrix: Soil
Collect Date: 19-JUL-04 15:40
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual Rev DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.249 | +/-0.0464 | 0.0289 | 0.100 | pCi/g | | SRB | 08/13/04 | 0923 | 352599 | 1 |
| Cobalt-60 | | 0.0547 | +/-0.0242 | 0.0209 | 0.100 | pCi/g | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1NF52
Sample ID: 117411006
Matrix: Soil
Collect Date: 19-JUL-04 15:40
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.013 | +/-0.0145 | 0.0238 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0924 | 352599 | 1 |
| Cobalt-60 | U | 0.0233 | +/-0.0162 | 0.0264 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4F1 DUP
Sample ID: 117411007
Matrix: Soil
Collect Date: 19-JUL-04 18:00
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 1.04 | +/-0.0984 | 0.0332 | 0.100 | pCi/g | | | SRB | 08/13/04 | 0924 | 352599 | 1 |
| Cobalt-60 | | 0.0914 | +/-0.030 | 0.0312 | 0.100 | pCi/g | J | 17 | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N4F2 DUP | Project: | STEP00402 |
| Sample ID: | 117411008 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 19-JUL-04 18:00 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0016 | +/-0.0178 | 0.0326 | 0.100 | pCi/g | U | | SRB | 08/13/04 | 0925 | 352599 | 1 |
| Cobalt-60 | U | 0.00855 | +/-0.016 | 0.0311 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| [illegible] | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| [illegible]oil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Re[illegible]wed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4G1
Sample ID: 117411009
Matrix: Soil
Collect Date: 19-JUL-04 16:30
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0762 | +/-0.0253 | 0.0246 | 0.100 | pCi/g | | | SRB | 08/15/04 | 1540 | 352603 | 1 |
| Cobalt-60 | U | 0.00895 | +/-0.0163 | 0.0318 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| d | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| il Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



Client Sample ID: LPA1N4G2
Sample ID: 117411010
Matrix: Soil
Collect Date: 19-JUL-04 16:30
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00904 | +/-0.0155 | 0.0273 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1541 | 352603 | 1 |
| Cobalt-60 | U | -0.00141 | +/-0.013 | 0.0245 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



Client Sample ID: LPA5N3E1
Sample ID: 117411011
Matrix: Soil
Collect Date: 20-JUL-04 10:05
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00528 | +/-0.0208 | 0.0372 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1541 | 352603 | 1 |
| Cobalt-60 | U | -0.00666 | +/-0.0187 | 0.033 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| [illegible]l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N3E2
Sample ID: 117411012
Matrix: Soil
Collect Date: 20-JUL-04 10:05
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | 2nd | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.000388 | +/-0.0202 | 0.0352 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1542 | 352603 | 1 |
| Cobalt-60 | U | 0.00291 | +/-0.0182 | 0.0339 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| il Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N1F1 | Project: | STEP00402 |
| Sample ID: | 117411013 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 09:20 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.029 | 0.029 | 0.100 | pCi/g | u 23 | | SRB | 08/15/04 | 1543 | 352603 | 1 |
| Cobalt-60 | U | -0.00249 | +/-0.0145 | 0.0266 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| [illegible]l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA5N1F2
Sample ID: 117411014
Matrix: Soil
Collect Date: 20-JUL-04 09:20
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0111 | +/-0.0238 | 0.0346 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1543 | 352603 | 1 |
| Cobalt-60 | U | -0.0127 | +/-0.0222 | 0.0369 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N3D1 | Project: | STEP00402 |
| Sample ID: | 117411015 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 12:25 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0113 | +/-0.0182 | 0.0301 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1544 | 352603 | 1 |
| Cobalt-60 | U | -0.00493 | +/-0.0152 | 0.027 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G. Crook

Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N3D2
Sample ID: 117411016
Matrix: Soil
Collect Date: 20-JUL-04 12:25
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00083 | +/-0.0243 | 0.0395 | 0.100 | pCi/g | U | | SRB | 08/15/04 | 1544 | 352603 | 1 |
| Cobalt-60 | U | 0.015 | +/-0.0215 | 0.0408 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N2D1 | Project: | STEP00402 |
| Sample ID: | 117411017 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 09:40 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0307 | +/-0.0141 | 0.0211 | 0.100 | pCi/g | | | SRB | 08/15/04 | 1544 | 352603 | 1 |
| Cobalt-60 | U | -0.00513 | +/-0.0111 | 0.0193 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



Client Sample ID: LPA5N2D2
Sample ID: 117411018
Matrix: Soil
Collect Date: 20-JUL-04 09:40
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0326 | 0.0631 | 0.100 | pCi/g | u | 23 | SRB | 08/15/04 | 1545 | 352603 | 1 |
| Cobalt-60 | U | -0.00124 | +/-0.0203 | 0.0374 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| [illegible]l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N4D1
Sample ID: 117411019
Matrix: Soil
Collect Date: 20-JUL-04 18:00
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.336 | +/-0.0446 | 0.026 | 0.100 | pCi/g | | | SRB | 08/16/04 | 0949 | 352603 | 1 |
| Cobalt-60 | U | 0.0295 | +/-0.0176 | 0.0375 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N4D2 | Project: | STEP00402 |
| Sample ID: | 117411020 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 18:00 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0126 | +/-0.026 | 0.0415 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0949 | 352603 | 1 |
| Cobalt-60 | U | 0.000451 | +/-0.0225 | 0.041 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1344 | 351666 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N4C1
Sample ID: 117411021
Matrix: Soil
Collect Date: 20-JUL-04 16:45
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0278 | +/-0.020 | 0.0327 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0950 | 352603 | 1 |
| Cobalt-60 | U | -0.0244 | +/-0.0193 | 0.0301 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N4C2 | Project: | STEP00402 |
| Sample ID: | 117411022 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 16:45 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0119 | +/-0.0194 | 0.0326 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0950 | 352603 | 1 |
| Cobalt-60 | U | 0.00341 | +/-0.0194 | 0.0362 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| 1 Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather Cu cod

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



Client Sample ID: LPA5N2C1
Sample ID: 117411023
Matrix: Soil
Collect Date: 20-JUL-04 14:45
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0161 | +/-0.0179 | 0.0306 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0950 | 352603 | 1 |
| Cobalt-60 | U | 0.0024 | +/-0.0167 | 0.0318 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| 1 Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn

Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N2C2 | Project: | STEP00402 |
| Sample ID: | 117411024 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 14:45 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0618 | +/-0.0239 | 0.0275 | 0.100 | pCi/g | | | SRB | 08/16/04 | 0951 | 352603 | 1 |
| Cobalt-60 | U | 0.00778 | +/-0.0147 | 0.0289 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| 1 Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N4B1
Sample ID: 117411025
Matrix: Soil
Collect Date: 20-JUL-04 15:50
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0122 | +/-0.0163 | 0.0281 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0951 | 352603 | 1 |
| Cobalt-60 | U | -0.00421 | +/-0.0172 | 0.0266 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| 1 Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N4B2 | Project: | STEP00402 |
| Sample ID: | 117411026 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 15:50 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00509 | +/-0.0204 | 0.036 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0951 | 352603 | 1 |
| Cobalt-60 | U | -0.00575 | +/-0.0226 | 0.0396 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| 1 Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather Carr

Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N3C1 | Project: | STEP00402 |
| Sample ID: | 117411027 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 20-JUL-04 13:00 | | |
| Receive Date: | 22-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0316 | +/-0.0187 | 0.0331 | 0.100 | pCi/g | u | | SRB | 08/16/04 | 0952 | 352603 | 1 |
| Cobalt-60 | U | 0.015 | +/-0.0128 | 0.0269 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G Carroll
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N3C2
Sample ID: 117411028
Matrix: Soil
Collect Date: 20-JUL-04 13:00
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00235 | +/-0.0153 | 0.0271 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0952 | 352603 | 1 |
| Cobalt-60 | U | 0.00228 | +/-0.0144 | 0.027 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| [illegible]l Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
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h Sample preparation or preservation holding time exceeded.

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N3B1
Sample ID: 117411029
Matrix: Soil
Collect Date: 20-JUL-04 13:30
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0212 | +/-0.0274 | 0.0277 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0939 | 352604 | 1 |
| Cobalt-60 | U | 0.00255 | +/-0.0165 | 0.0311 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Heather G. Cocroft
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N3B2
Sample ID: 117411030
Matrix: Soil
Collect Date: 20-JUL-04 13:30
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Raw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00829 | +/-0.0209 | 0.0374 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 0940 | 352604 | 1 |
| Cobalt-60 | U | 0.00687 | +/-0.0212 | 0.041 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N1A1
Sample ID: 117411031
Matrix: Soil
Collect Date: 20-JUL-04 09:10
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0897 | +/-0.068 | 0.0496 | 0.100 | pCi/g | | | SRB | 08/16/04 | 0940 | 352604 | 1 |
| Cobalt-60 | U | 0.00795 | +/-0.0244 | 0.0463 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA5N1A2
Sample ID: 117411032
Matrix: Soil
Collect Date: 20-JUL-04 09:10
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00255 | +/-0.0172 | 0.0284 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 1101 | 352604 | 1 |
| Cobalt-60 | U | -0.00445 | +/-0.0151 | 0.0273 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 18, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N5E2
Sample ID: 117411033
Matrix: Soil
Collect Date: 20-JUL-04 06:55
Receive Date: 22-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | AnalystDate | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | 0.0197 | +/-0.0231 | 0.0303 | 0.100 | pCi/g | u | | SRB 08/16/04 | 1357 | 352604 | 1 |
| Cobalt-60 | U | 0.00645 | +/-0.0138 | 0.0258 | 0.100 | pCi/g | u | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/23/04 | 1435 | 351668 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/23
Project: LaGarde Park SDG: 117411 Matrix/No. Samples: S-33

| I. Sample Management | | | |
|---|---|---|---|
| **A. Sample Preservation, Handling and Transport** | | | |
| 1. Have all samples been preserved with $HNO_3$ to pH <2? | Yes | No | N/A |
| 2. Have sample temperatures been kept at 4° C (+ or - 2 ° C)? | Yes | No | N/A |
| 3. Were all samples received in proper condition? | Yes | No | N/A |
| 4. Were any qualifications required based on this information? | Yes | No | N/A |
| Cooler @ 2.8 °C. | | | |
| **B. Chain of Custody** | | | |
| 1. Were all samples properly recorded on COCs? | Yes | No | N/A |
| 2. Were correct analyses performed on samples? | Yes | No | N/A |
| **C. Holding Times** | | | |
| 1. Were samples analyzed within acceptable holding times? | Yes | No | N/A |
| 2. Were any qualifications required based on this information? | Yes | No | N/A |

| SAMPLED | | PREPPED/ANALYZED |
|---|---|---|
| 7/19, 7/20 | batch 352599 | 8/13 |
| | 352603 | 8/15 |
| | 352604 | 8/16 |

| II. Calibrations | | | |
|---|---|---|---|
| 1. Were proper number of calibration standards used for each analytical instrument used? | Yes | No | N/A |
| 2. Is the calibration ~~correlation coefficient >or = 0.995 for each analytical instrument used~~ time w/i the prescribed period? | Yes | No | N/A |
| 3. Are initial and continuing calibration verification %R within ~~10% (+ or -~~ 1%) acceptance window? | Yes | No | N/A |
| 4. ~~Are CRDL Standard %R within 10% (+ or - 1%) acceptance~~ window? | Yes | No | N/A |
| 5. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

8/13 3:14ff. 8/15 10:44ff. 8/16@ 8:55ff

all w/in the lower/upper windows → → →

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/23
Project: LaGarde Park SDG: 117411 Matrix/No. Samples: S-33

| III. | Blanks | | | |
|---|---|---|---|---|
| | 1. Are any analytes reported in laboratory prep or calibration blanks above the IDL? | Yes | No | N/A |
| | 2. ~~Are any analytes~~ method blank reported as negative values in laboratory ~~prep or calibration blanks~~? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

352599 352603 352604

- 1776 MB 1779 MB 1792 MB

Cs @ u → →

Co @ u → →

| IV. | ICP Interference Check Sample (ICS) | | | |
|---|---|---|---|---|
| | 1. Were ICS samples run at the beginning and end of each sample analysis run? | Yes | No | N/A |
| | 2. Are ICS %R within 80-120% acceptable control limits? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| V. | Blank Spike/Laboratory Control Sample (LCS) | | | |
|---|---|---|---|---|
| | 1. Are all aqueous LCS %R within 80-120% control limits? | Yes | No | N/A |
| | 2. Are all solid LCS %R within lab control limits ~~established by EPA?~~ 75-125 | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

352599. 352603 352604

Cs-137 9.22/9.45 = ~~97.6~~ 102.56 9.22/10.2 = ~~90.4~~ 110.6 9.22/10.0 = 108.5

Co-60 14.1/15.0 = 106.4 14.1/15.3 = 108.5 14.1/15.0 = 106.4

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/23
ject: LaGarde Park SDG: 117411 Matrix/No. Samples: S-33

| VI. | Duplicates | | | |
|---|---|---|---|---|
| | 1. Were samples used for duplicate sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. For duplicate samples >5x CRDL, were RPDs within control limits of + or - 20% for water, or + or - 35% for soil? <20% | Yes | No | N/A |
| | 3. For duplicate samples <5x CRDL, were duplicate samples within control limit of + or - CRDL for water, or + or - 2xCRDL for soil? | Yes | No | N/A |
| | 4. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

| | 352599 | 352603 | | 352604 |
|---|---|---|---|---|
| Cs-137 | u/u | .0762 / .0871 | = .0109 / .08165 = 13.3% | u/u 23 |
| Co-60 | u/u | u / u | | u/u |

| VII. | Matrix Spike | | | |
|---|---|---|---|---|
| | 1. Were samples used for matrix spike sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. Were spike recoveries within 75-125% limits (limits do not apply when original sample concentration exceeds spike concentration by a factor of 4? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

None performed.

| VIII. | ICP Serial Dilution | | | |
|---|---|---|---|---|
| | 1. Were %Ds for ICP serial dilution samples within 10% for analytes with concentrations greater than 50x IDL? | Yes | No | N/A |
| | 2. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/23
Project: LaGarde Park SDG: 117411 Matrix/No. Samples: S-33

| IX. Sample Result Qualification<br>Not Required For Level III Data Validation | | | |
|---|---|---|---|
| 1. Were sample results reported by laboratory supported by raw data? | Yes | No | N/A |
| 2. Were correct calculations used to determine sample results? | Yes | No | N/A |
| 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications: No raw data check - level III

| X. Field QC | | | |
|---|---|---|---|
| 1. Were any Field Duplicates associated with this SDG? | Yes | No | N/A |
| a. If Yes, were RPDs acceptable (~~50~~ 80% for water samples, ~~100~~ 50% for soil samples)? | Yes | No | N/A |
| 2. Were any field blanks or equipment rinsates associated with this SDG? | Yes | No | N/A |
| a. If yes, were any analytes reported in samples >IDL? | Yes | No | N/A |
| b. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 1N4F1 | | F1DUP | 1N4F2 | F2DUP |
|---|---|---|---|---|---|
| .259 / .9105 = 28.4% | 0.781 | Cs | 1.04 | U | U |
| 76.7% = .0502 / .0663 | 0.0412 (J) | Co | 0.0914 | U | U |

XI. Overall Assessment of Data

| | | | |
|---|---|---|---|
| 1. Are there any specific concerns or limitations regarding the data in this SDG? | Yes | No | N/A |

Comments/Qualifications:

SDG: 117527 Project: LaGarde Park

EML HASL 300, 4.5.2.3 Cs-137

Method: Radiological Co-60 Matrix/No. of Samples: Soil - 23

Validation Samples: LPA1SB201 LPA1SB103 LPA1N4E2 LPA1N4E1D LPA5N6F2
LPA1N3F2 LPA1SB303 LPA1SB102 LPA1N4E1 LPA1N3E1 LPA5N6A1
LPA1N3F1 LPA1SB302 LPA1SB101 LPA1N4E3D LPA1N3E2 LPA5N4E1
LPA1SB202 LPA1SB301 LPA1N4E3 LPA1N4E2D LPA5N6F1 LPA5N4E2

Data Validation Report Summary

| | | Status Code | Comments |
|---|---|---|---|
| 1. | Sample Preservation, Handling, and Transport | A | |
| 2. | Chain of Custody | A | |
| 3. | Holding Times | A | |
| 4. | Calibrations | A | |
| 5. | Blanks | A | |
| 6. | ICP/ICS | N/A | |
| 7. | Blank Spike/LCS | A | |
| 8. | Duplicates | A | |
| 9. | Matrix Spike | N/A | None performed |
| 10. | Furnace Atomic Absorption QC | N/A | |
| 11. | ICP Serial Dilution | N/A | |
| 12. | Sample Result Verification | ~~X~~ | |
| 13. | Field QC Samples | A | |
| 14. | Overall Assessment | ~~X~~ | |

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

23 • The laboratory designated some sample results as UI - data rejected to low abundance or no valid peak - the reviewer qualified these data as "u" or non detected.

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified.

Date: 8/24/2004

Validator's Signature: J. Thomas Kilgus

Peer Reviewer:

Page: 1 / 3
Project #: 114-11 14-010
GEL Quote #:
COC Number (1): 4
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC Phone #: (865) 481-7877
Project/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
Address: 1006 FLOYD CULLER CT OAK RIDGE TN 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested (5) (Fill in the number of containers for each test)

| Sample ID 117527 F | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code (2) | Field Filtered (3) | Sample Matrix (4) | Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N3F2 | 7/21/04 | 1440 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | CESIUM / COBALT |
| LPA1N3F1 | 7/21/04 | 1440 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| PA1SB202 | | 1700 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB201 | | 1700 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB303 | | 1620 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB302 | | 1620 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB301 | | 1620 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB103 | | 1600 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB102 | | 1600 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1SB101 | | 1600 | N | — | | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: *Are there any known hazards applicable to these samples? If so, please list the hazards*

## Chain of Custody Signatures

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeff R Cuto | 7/22/04 | 1500 | 1 D. Kendle | 7/23/04 | 0910 |
| | | | 2 | | |
| | | | 3 | | |

## Sample Shipping and Delivery Details

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1) Chain of Custody Number = Client Determined
2) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. *8260B - 3, 6010B/7470A - 1*).
6) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* *YES* *NO*
*Cooler Temp:* 24 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 2 / 3
Project #: 114-11 / 114-010
GEL Quote #:
COC Number (1): 4
PO Number:

Client Name: STEP, INC  Phone #: (865) 481-7837
Project/Site Name: LA GARDE PARK ESI  Fax #: (865) 481-0290
Address: 1600 FLOYD CULLER CT OAK RIDGE TN 37830
Collected by: J. CARTER  Send Results To: D. HAWN

Sample Analysis Requested (5) (Fill in the number of containers for each test)

| Sample ID 117527 / | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code (2) | Field Filtered (3) | Sample Matrix (4) | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N4E3 | 7/21/04 | 1400 | N | — | SO | Y | | 1 | 1 | | | | | | | | | | CESIUM / COBALT |
| LPA1N4E2 | | 1400 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4E1 | | 1400 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4E3 DUP | | 1400 | FD | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4E2 DUP | | 1400 | FD | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N4E1 DUP | | 1400 | FD | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N3E1 | | 1520 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA1N3E2 | | 1520 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N6F1 | | 1255 | N | — | | Y | | 1 | 1 | | | | | | | | | | |
| LPA5N6F2 | | 1255 | N | — | | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X  Rush: ____  Specify: ____ (Subject to Surcharge)  Fax Results: Yes / No  Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| | Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|---|
| 1 | Jeff R Carter | 7/22/04 | 1500 | M. Kendall | 7/23/04 | 0910 |
| 2 | | | | | | |
| 3 | | | | | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment:  Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. *8260B - 3, 6010B/7470A - 1*).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* 24 C

WHITE = LABORATORY  YELLOW = FILE  PINK = CLIENT

Page: 3 3
Project #: 114- 114-010
GEL Quote #:
COC Number [1]: 4
PO Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LL
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: STEP, INC. Phone #: (865) 481-7837
Project/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
Address: 1006 FLOYD CULLER CT OAK RIDGE, TN 37830
Collected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117527 % | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | Gamma | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPASN6A1 | 7/21/04 | 1315 | N | – | SO | Y | | 1 | 1 | | | | | | | | | | CESIUM / COBALT |
| LPASN6A2 | | 1315 | N | – | | Y | | 1 | 1 | | | | | | | | | | |
| LPASN4E1 | | 1230 | N | – | | Y | | 1 | 1 | | | | | | | | | | |
| LPASN.4E2 | | 1230 | N | – | | Y | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

*Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| | Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|---|
| 1 | Jeff R Carter | 7/22/04 | 1500 | [illegible] | 7/23/04 | 0960 |
| 2 | | | | | | |
| 3 | | | | | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. *8260B* - 3, *6010B/7470A* - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* *YES* *NO*
*Cooler Temp:* _____ C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI

Page 1 of 1

| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N3F2 | Project: | STEP00402 |
| Sample ID: | 117527001 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 14:40 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | 0.00569 | +/-0.0137 | 0.0262 | 0.100 | pCi/g | | SRB | 08/16/04 | 1358 | 352604 | 1 |
| Cobalt-60 | U | 0.00388 | +/-0.0308 | 0.0294 | 0.100 | pCi/g | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3F1
Sample ID: 117527002
Matrix: Soil
Collect Date: 21-JUL-04 14:40
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.182 | +/-0.0335 | 0.0278 | 0.100 | pCi/g | | SRB | 08/16/04 | 1358 | 352604 | 1 |
| Cobalt-60 | | 0.0559 | +/-0.0296 | 0.0274 | 0.100 | pCi/g | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1SB202
Sample ID: 117527003
Matrix: Soil
Collect Date: 21-JUL-04 17:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Rev Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00344 | +/-0.0172 | 0.0309 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 1359 | 352604 | 1 |
| Cobalt-60 | U | 0.00526 | +/-0.0168 | 0.0319 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heather G Cr

Reviewed by

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1SB201
Sample ID: 117527004
Matrix: Soil
Collect Date: 21-JUL-04 17:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual Rev | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0168 | 0.0344 | 0.100 | pCi/g | U 23 | | SRB | 08/16/04 | 1359 | 352604 | 1 |
| Cobalt-60 | U | -0.00945 | +/-0.0168 | 0.029 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heather G Cecow
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1SB303 | Project: | STEP00402 |
| Sample ID: | 117527005 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 16:20 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | d | uQ | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0304 | +/-0.0262 | 0.0421 | 0.100 | pCi/g | | U | | SRB | 08/16/04 | 1359 | 352604 | 1 |
| Cobalt-60 | U | -0.00334 | +/-0.0246 | 0.0445 | 0.100 | pCi/g | | U | | | | | | |

**The following Prep Methods were performed**

| thod | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1SB302
Sample ID: 117527006
Matrix: Soil
Collect Date: 21-JUL-04 16:20
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Q | uL | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0123 | +/-0.0205 | 0.0345 | 0.100 | pCi/g | U | | | SRB | 08/16/04 | 1400 | 352604 | 1 |
| Cobalt-60 | U | 0.00887 | +/-0.0167 | 0.0326 | 0.100 | pCi/g | U | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1SB301
Sample ID: 117527007
Matrix: Soil
Collect Date: 21-JUL-04 16:20
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 3.29 | +/-0.238 | 0.0393 | 0.100 | pCi/g | | | SRB | 08/16/04 | 1400 | 352604 | 1 |
| Cobalt-60 | | 0.187 | +/-0.054 | 0.0357 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1SB103
Sample ID: 117527008
Matrix: Soil
Collect Date: 21-JUL-04 16:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0277 | +/-0.0285 | 0.0468 | 0.100 | pCi/g | u | | SRB | 08/16/04 | 1401 | 352604 | 1 |
| Cobalt-60 | U | -0.00469 | +/-0.0282 | 0.0498 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1SB102
Sample ID: 117527009
Matrix: Soil
Collect Date: 21-JUL-04 16:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00217 | +/-0.0158 | 0.0285 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 1401 | 352604 | 1 |
| Cobalt-60 | U | -0.00455 | +/-0.0144 | 0.0255 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1SB101
Sample ID: 117527010
Matrix: Soil
Collect Date: 21-JUL-04 16:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 2.78 | +/-0.208 | 0.0283 | 0.100 | pCi/g | | | SRB | 08/16/04 | 1402 | 352604 | 1 |
| Cobalt-60 | | 0.216 | +/-0.0429 | 0.0205 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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Heather G Crow
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4E3
Sample ID: 117527011
Matrix: Soil
Collect Date: 21-JUL-04 14:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00987 | +/-0.0206 | 0.0369 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 1402 | 352604 | 1 |
| Cobalt-60 | U | 0.0123 | +/-0.0169 | 0.0336 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather [illegible]
Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N4E2 | Project: | STEP00402 |
| Sample ID: | 117527012 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 14:00 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0286 | +/-0.0213 | 0.0389 | 0.100 | pCi/g | U | | SRB | 08/16/04 | 1402 | 352604 | 1 |
| Cobalt-60 | UUI | 0.00 | +/-0.0276 | 0.0368 | 0.100 | pCi/g | U 23 | | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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UI Uncertain identification for gamma spectroscopy.
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Alecia G Cross

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N4E1 | Project: | STEP00402 |
| Sample ID: | 117527013 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 14:00 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 1.49 | +/-0.117 | 0.0308 | 0.100 | pCi/g | | | SRB | 08/16/04 | 1403 | 352604 | 1 |
| Cobalt-60 | | 0.161 | +/-0.0392 | 0.0302 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G Lewis
Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4E3 DUP
Sample ID: 117527014
Matrix: Soil
Collect Date: 21-JUL-04 14:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | 0.00553 | +/-0.0262 | 0.0481 | 0.100 | pCi/g | u | SRB | 08/16/04 | 1403 | 352604 | 1 |
| Cobalt-60 | U | 0.0438 | +/-0.0344 | 0.0486 | 0.100 | pCi/g | u | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N4E2 DUP | Project: | STEP00402 |
| Sample ID: | 117527015 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 14:00 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0408 | 0.0784 | 0.100 | pCi/g | u | 23 | SRB | 08/16/04 | 1404 | 352604 | 1 |
| Cobalt-60 | U | -0.00404 | +/-0.0279 | 0.0496 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4E1 DUP
Sample ID: 117527016
Matrix: Soil
Collect Date: 21-JUL-04 14:00
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units 2nd | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 1.15 | +/-0.0958 | 0.0293 | 0.100 | pCi/g | | SRB | 08/18/04 | 0851 | 352608 | 1 |
| *Cobalt-60* | | 0.0969 | +/-0.033 | 0.0255 | 0.100 | pCi/g | | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather O Cardwell
Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N3E1 | Project: | STEP00402 |
| Sample ID: | 117527017 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 15:20 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 1.08 | +/-0.105 | 0.0362 | 0.100 | pCi/g | | | SRB | 08/18/04 | 0852 | 352608 | 1 |
| Cobalt-60 | | 0.108 | +/-0.0386 | 0.0342 | 0.100 | pCi/g | | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather W Weber
Reviewed by

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# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N3E2
Sample ID: 117527018
Matrix: Soil
Collect Date: 21-JUL-04 15:20
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0169 | +/-0.026 | 0.0383 | 0.100 | pCi/g | u | | SRB | 08/18/04 | 0852 | 352608 | 1 |
| Cobalt-60 | | 0.419 | +/-0.0772 | 0.0365 | 0.100 | pCi/g | | | | | | | |

**following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G Crowe
Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N6F1 | Project: | STEP00402 |
| Sample ID: | 117527019 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 12:55 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0234 | +/-0.0202 | 0.0306 | 0.100 | pCi/g | u | | SRB | 08/18/04 | 0853 | 352608 | 1 |
| Cobalt-60 | U | -0.00501 | +/-0.0138 | 0.0247 | 0.100 | pCi/g | u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1626 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
Ul Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

# Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA5N6F2
Sample ID: 117527020
Matrix: Soil
Collect Date: 21-JUL-04 12:55
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Rad Gamma Spec Analysis* | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | U | 0.0012 | +/-0.0619 | 0.0664 | 0.100 | pCi/g u | | SRB | 08/18/04 | 0853 | 352608 | 1 |
| Cobalt-60 | U | -0.00105 | +/-0.0601 | 0.0612 | 0.100 | pCi/g u | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1627 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heather O Cecil
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA5N6A1
Sample ID: 117527021
Matrix: Soil
Collect Date: 21-JUL-04 13:15
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rad Gamma Spec Analysis | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.219 | +/-0.0387 | 0.0276 | 0.100 | pCi/g | | | SRB | 08/18/04 | 0854 | 352608 | 1 |
| Cobalt-60 | U | 0.0088 | +/-0.0126 | 0.0257 | 0.100 | pCi/g | U | | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1627 | 352091 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Heath A Cook
Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn

Project: La Garde Park ESI



Client Sample ID: LPA5N6A2
Sample ID: 117527022
Matrix: Soil
Collect Date: 21-JUL-04 13:15
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00302 | +/-0.0207 | 0.031 | 0.100 | pCi/g | u | | SRB | 08/18/04 | 0854 | 352608 | 1 |
| Cobalt-60 | U | -0.00488 | +/-0.0195 | 0.0294 | 0.100 | pCi/g | u | | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1627 | 352091 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA5N4E1
Sample ID: 117527023
Matrix: Soil
Collect Date: 21-JUL-04 12:30
Receive Date: 23-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Reviewed

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | |
| Cesium-137 | | 0.119 | +/-0.0412 | 0.0293 | 0.100 | pCi/g | | SRB | 08/18/04 | 0854 | 352608 | 1 |
| Cobalt-60 | U | 0.0169 | +/-0.017 | 0.0339 | 0.100 | pCi/g | u | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1627 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 19, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA5N4E2 | Project: | STEP00402 |
| Sample ID: | 117527024 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 21-JUL-04 12:30 | | |
| Receive Date: | 23-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00797 | +/-0.0215 | 0.039 | 0.100 | pCi/g | U | | SRB | 08/18/04 | 0855 | 352608 | 1 |
| Cobalt-60 | U | 0.00321 | +/-0.0195 | 0.0367 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | MJM1 | 07/26/04 | 1627 | 352091 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
oject: LaGarde Park SDG: 117527 Matrix/No. Samples: S-23

| | | | |
|---|---|---|---|
| **I. Sample Management** | | | |
| **A. Sample Preservation, Handling and Transport** | | | |
| 1. Have all samples been preserved with $HNO_3$ to pH <2? | Yes | No | N/A |
| 2. Have sample temperatures been kept at 4° C (+ or - 2 ° C)? | Yes | No | N/A |
| 3. Were all samples received in proper condition? | Yes | No | N/A |
| 4. Were any qualifications required based on this information? | Yes | No | N/A |
| Cooler @ 2.4°C | | | |
| **B. Chain of Custody** | | | |
| 1. Were all samples properly recorded on COCs? | Yes | No | N/A |
| 2. Were correct analyses performed on samples? | Yes | No | N/A |
| **C. Holding Times** | | | |
| 1. Were samples analyzed within acceptable holding times? | Yes | No | N/A |
| 2. Were any qualifications required based on this information? | Yes | No | N/A |

| SAMPLED | PREPPED/ANALYZED | |
|---|---|---|
| 7/21 | batch 352604 | 8/16 |
| | batch 352608 | 8/18 |

| | | | |
|---|---|---|---|
| **II. Calibrations** | | | |
| 1. Were proper number of calibration standards used for each analytical instrument used? | Yes | No | N/A |
| 2. Is the ~~calibration correlation coefficient >or = 0.995 for each analytical instrument used?~~ calibration time w/in the prescribed period. | Yes | No | N/A |
| 3. Are initial and continuing calibration verification %R within 10% (+ or - 1%) acceptance window? | Yes | No | N/A |
| 4. ~~Are CRDL Standard %R within 10% (+ or - 1%) acceptance window?~~ Bkgrd counts | Yes | No | N/A |
| 5. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

CCV 8/16 @ ~~8:55~~ 9:00 8/18 @ 8:23
peak cent. w/in limits.
Engs.
etc.

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117527 Matrix/No. Samples: S-23

| III. | Blanks | | | |
|---|---|---|---|---|
| | 1. Are any analytes reported in laboratory prep or calibration blanks above the IDL? | Yes | No | N/A |
| | 2. ~~Are any analytes reported as negative values in laboratory prep or calibration blanks?~~ method blank. | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

352604 MB 352608

Cs-137 u → u

Co-60 u → u

| IV. | ICP Interference Check Sample (ICS) | | | |
|---|---|---|---|---|
| | 1. Were ICS samples run at the beginning and end of each sample analysis run? | Yes | No | N/A |
| | 2. Are ICS %R within 80-120% acceptable control limits? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| V. | Blank Spike/Laboratory Control Sample (LCS) | | | |
|---|---|---|---|---|
| | 1. Are all aqueous LCS %R within ~~80-120%~~ control limits? 75-125 | Yes | No | N/A |
| | 2. Are all solid LCS %R within control limits established by ~~EPA?~~ lab 75-125 | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

352604 1794 LCS, Cs-137 9.22/10.0 = ~~92.2%~~ 92% 108.5

Co-60 14.1/15.0 = ~~94.0~~ % 106.4

352608 1805 Cs-137 9.22/9.60 = ~~96.0~~ 104.1%

Co-60 14.1/15.0 = ~~94.6%~~ 106.4

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117527 Matrix/No. Samples: S-23

| VI. | Duplicates | | | |
|---|---|---|---|---|
| | 1. Were samples used for duplicate sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. For duplicate samples >5x CRDL, were RPDs within control limits of + or - 20% for water, or + or - 35% for soil? <20% | Yes | No | N/A |
| | 3. For duplicate samples <5x CRDL, were duplicate samples within control limit of + or - CRDL for water, or + or - 2xCRDL for soil? | Yes | No | N/A |
| | 4. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:** 352604
1029 DUP.
— Cs-137 u/u
Co-60 u/u

352608
7016 DUP. Cs 1.15 121 = 5.12%
.0101 / .10195 = 9.9% Co .0969 0.107

| VII. | Matrix Spike | | | |
|---|---|---|---|---|
| | 1. Were samples used for matrix spike sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. Were spike recoveries within 75-125% limits (limits do not apply when original sample concentration exceeds spike concentration by a factor of 4? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

None performed

| VIII. | ICP Serial Dilution | | | |
|---|---|---|---|---|
| | 1. Were %Ds for ICP serial dilution samples within 10% for analytes with concentrations greater than 50x IDL? | Yes | No | N/A |
| | 2. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117527 Matrix/No. Samples: S-23

| IX. Sample Result Qualification<br>Not Required For Level III Data Validation | | | |
|---|---|---|---|
| 1. Were sample results reported by laboratory supported by raw data? | Yes | No | N/A |
| 2. Were correct calculations used to determine sample results? | Yes | No | N/A |
| 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications: No raw data check - Level III

| X. Field QC | | | |
|---|---|---|---|
| 1. Were any Field Duplicates associated with this SDG? | Yes | No | N/A |
| a. If Yes, were RPDs acceptable (~~50~~ 30% for water samples, ~~100~~ 50% for soil samples)? | Yes | No | N/A |
| 2. Were any field blanks or equipment rinsates associated with this SDG? | Yes | No | N/A |
| a. If yes, were any analytes reported in samples >IDL? | Yes | No | N/A |
| b. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 4E3Req | 4E3D | 4E2Req | 4E2D | 4E1 Req | 4E1 D |
|---|---|---|---|---|---|---|
| C137 | U | U | U | U23 | 1.49 | 1.15 |
| Co60 | U | U | U23 | U | 0.161 | 0.0969 |

.34 / 1.32 = 25.8%

.0641 / .12895 = 49.7%

| XI. Overall Assessment of Data | | | |
|---|---|---|---|
| 1. Are there any specific concerns or limitations regarding the data in this SDG? | Yes | No | N/A |

Comments/Qualifications:

SDG: 117051 Project: LaGarde Park

EML HASP 300, 4.5.3.2 Cs 137

Method: Radiological Co 60 Matrix/No. of Samples: Soil - 27

Validation Samples:

| | | | | | |
|---|---|---|---|---|---|
| | | LPAIN1B1 | LPAIN3B2 | LPAIN1C1 | LPAIN3C2 |
| LPAIN1A1 | LPAIN4A1 | LPAIN1B2 | LPAIN4B1 | LPAIN1C2 | LPAIN4C1 |
| LPAIN1A2 | LPAIN4A2 | LPAIN2B1 | LPAIN4B2 | LPAIN2C1 | LPAIN4C2 |
| LPAIN3A1 | LPAIN5A1 | LPAIN2B2 | LPAIN5B1 | LPAIN2C2 | LPAIN5C1 |
| LPAIN3A2 | LPAIN5A2 | LPAIN3B1 | LPAIN5B2 | LPAIN3C1 | |

Data Validation Report Summary

| | | Status Code | Comments |
|---|---|---|---|
| 1. | Sample Preservation, Handling, and Transport | A | |
| 2. | Chain of Custody | A | |
| 3. | Holding Times | A | |
| 4. | Calibrations | A | |
| 5. | Blanks | A | |
| 6. | ICP/ICS | N/A | |
| 7. | Blank Spike/LCS | A | |
| 8. | Duplicates | A | |
| 9. | Matrix Spike | N/A | None performed. |
| 10. | Furnace Atomic Absorption QC | N/A | |
| 11. | ICP Serial Dilution | N/A | |
| 12. | Sample Result Verification | X | |
| 13. | Field QC Samples | N/A | |
| 14. | Overall Assessment | X | |

Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

23 • The laboratory reported results due to low abundance or invalid peaks as "uu I" – the reviewer qualified these results as non-detects ("u").

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified.

Date: 8/24/2004

Validator's Signature: J. Thomas Kilbriggs

Peer Reviewer:

e: 1 3
ect #: 114-113, 14-010
Quote #: 1
Number [1]:
S Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

ject Name / Site Name: LA GARDE PARK ESI

Name: STEP Phone #: (865) 481-7837 Fax #. (865) 481-0290

ess: 1006 FLOYD CULLER CT OAK RIDGE, TN 37830

lected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Field Sample ID | Should this sample be considered radioactive? (Yes or No) | Date Collected (dd-mm-yy) | Time Collected (Military) (hhmm) | Sample Depth (beginning - ending) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Total Number of Containers | GAMMA | | | | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 117051 | | | | | | | | | | | | | | | | | | | | |
| PA1N1A1 | Y | 7/13/04 | 0725 | 0.2 | N | — | SO | 1 | 1 | | | | | | | | | | | CESIUM & COBALT |
| PA1N1A2 | Y | 7/13/04 | 0730 | 10.12 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N3A1 | Y | 7 | 1040 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N3A2 | Y | | 1040 | 7.8 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N4A1 | Y | | 11:15 | 0.2 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N4A2 | Y | | 11:15 | 15.16 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N5A1 | Y | | 12:35 | 0.2 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N5A2 | Y | — | 12:35 | 14.16 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N1B1 | Y | 7/14/04 | 8:25 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N1B2 | Y | 7/14/04 | 8:25 | 19.20 | N | — | SO | 1 | 1 | | | | | | | | | | | |
| PA1N2B1 | Y | 7/14/04 | 7:25 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | | |

TAT Requested: _____ Normal: X Rush: _____ (Subject to Surcharge) Fax Results: Yes / No Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

omments: (attach compound and/or element list requested)

## Chain of Custody Signatures

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeff R Carter | 7/15/04 | 15:30 | 1. Hawn | 7/16/04 | 09:30AM |
| | | | 2. | | |
| | | | 3 | | |

## Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped: _____
Method of Shipment: _____ Airbill #: _____
Analytical Lab: _____ Location: _____
Lab Recipient: _____ Date: _____ Time: _____

Chain of Custody Number = Client Determined
QC Codes N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
Field Filtered For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste
Sample Analysis Requested. Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES NO
*Cooler Temp:* _____ C

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, Inc.
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

ct #: 114-113, 14-010
Quote #:
Number [1]: 1
Number:

Name / Site Name: LAGARDE PARK ESI
Name: STEP Phone #(865) 481-7837 Fax #: (865) 481-0290
s: 1006 FLOYD CULLER CT, OAK RIDGE, TN 37830
ected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Field Sample ID | Should this sample be considered radioactive? (Yes or No) | Date Collected (dd-mm-yy) | Time Collected (Military) (hhmm) | Sample Depth (beginning - ending) | QC Code [1] | Field Filtered [2] | Sample Matrix [4] | Total Number of Containers | GAMMA | | | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 117051 | | | | | | | | | | | | | | | | | | | |
| PA1N2B2 | Y | 7/14/04 | 7:25 | 10.11 | N | — | SO | 1 | 1 | | | | | | | | | | CESIUM & COBALT |
| PA1N3B1 | Y | 7/13/04 | 16:05 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N3B2 | Y | 7/13/04 | 16:05 | 18.20 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N4B1 | Y | 7/13/04 | 14:50 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N4B2 | Y | 7/13/04 | 14:50 | 19.20 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N5B1 | Y | 7/13/04 | 14:15 | 0.2 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N5B2 | Y | 7/13/04 | 14:15 | 14.15 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N1C1 | Y | 7/14/04 | 9:10 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N1C2 | Y | 7/14/04 | 9:10 | 4.5 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N2C1 | Y | 7/14/04 | 9:55 | 0.1 | N | — | SO | 1 | 1 | | | | | | | | | | |
| PA1N2C2 | Y | 7/14/04 | 9:55 | 4.5 | N | — | SO | 1 | 1 | | | | | | | | | | |

TAT Requested: _____ Normal. X Rush: _____ (Subject to Surcharge) Fax Results: Yes / No Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

mments: (attach compound and/or element list requested)

## Chain of Custody Signatures

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeff McCuts | 7/15/04 | 15:30 | 1. Henry Amos | 7/16/04 | 09:30AM |
| | | | 2. | | |
| | | | 3. | | |

## Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped: _____
Method of Shipment: _____ Airbill #: _____
Analytical Lab: _____ Location: _____
Lab Recipient: _____ Date: _____ Time: _____

Chain of Custody Number = Client Determined
QC Codes N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
Field Filtered For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
Matrix Codes DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste
Sample Analysis Requested. Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

*For Lab Receiving Use Only*
*Custody Seal Intact?* YES ✓ NO
*Cooler Temp:* 18 C

ıge: 3 3
oject #: 114-115, 114-010
EL Quote #:
OC Number [1]: 1
) Number:

# GEL Chain of Custody and Analytical Request

General Engineering Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

lient Name: STEP Phone #: (865) 481-7837
roject/Site Name: LA GARDE PARK ESI Fax #: (865) 481-0290
dress: 1006 FLOYD CULLER CT OAK RIDGE TN 37830
ollected by: J. CARTER Send Results To: D. HAWN

Sample Analysis Requested [5] (Fill in the number of containers for each test)

| Sample ID 117051 | Date Collected (mm-dd-yy) | Time Collected (Military) (hhmm) | QC Code [2] | Field Filtered [3] | Sample Matrix [4] | Should this sample be considered: Radioactive | TSCA Regulated | Total number of containers | GAMMA | | | | | | | | | <-- Preservative Type (6) | Comments Note: extra sample is required for sample specific QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPA1N3C1 | 7/14/04 | 10:55 | N | — | SO | ✓ | | 1 | 1 | | | | | | | | | | CESIUM/COBALT |
| LPA1N3C2 | | 10:55 | N | — | SO | ✓ | | 1 | 1 | | | | | | | | | | |
| LPA1N4C1 | | 13:14 | N | — | SO | ✓ | | 1 | 1 | | | | | | | | | | |
| LPA1N4C2 | | 13:14 | N | — | SO | ✓ | | 1 | 1 | | | | | | | | | | |
| LPA1N5C1 | | 14:00 | N | — | SO | ✓ | | 1 | 1 | | | | | | | | | | |

TAT Requested: Normal: X Rush: ____ Specify: ____ (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

'emarks: *Are there any known hazards applicable to these samples? If so, please list the hazards*

**Chain of Custody Signatures**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| Jeff R Carter | 7/15/04 | 15:30 | 1 Hawn | 7/16 | 09:30 AM |
| | | | 2 | | |
| | | | 3 | | |

**Sample Shipping and Delivery Details**

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

.) Chain of Custody Number = Client Determined
.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
.) Matrix Codes: DW = Drinking Water, GW = Groundwater, SW = Surface Water, WW = Waste Water, W = Water, SO = Soil, SD = Sediment, SL = Sludge, SS = Solid Waste, O = Oil, F = Filter, P = Wipe, U = Urine, F = Fecal, N = Nasal
.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

*For Lab Receiving Use Only*
*Custody Seal Intact?* *YES* *NO*
*Cooler Temp:* ____ C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1A1
Sample ID: 117051001
Matrix: Soil
Collect Date: 13-JUL-04 07:25
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| um-137 | | 0.195 | +/-0.0334 | 0.0275 | 0.100 | pCi/g | | | SRB | 08/10/04 | 1150 | 350626 | 1 |
| alt-60 | U | 0.00231 | +/-0.0157 | 0.0297 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

The above sample is reported on a dry weight basis except where prohibited by the analytical procedure.
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1A2
Sample ID: 117051002
Matrix: Soil
Collect Date: 13-JUL-04 07:30
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0109 | +/-0.0128 | 0.0216 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1150 | 350626 | 1 |
| Cobalt-60 | U | -0.00228 | +/-0.0106 | 0.019 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3A1
Sample ID: 117051003
Matrix: Soil
Collect Date: 13-JUL-04 10:40
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0453 | +/-0.0474 | 0.0507 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1151 | 350626 | 1 |
| Cobalt-60 | U | 0.00562 | +/-0.0226 | 0.0428 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| y Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI

Page 1 of 1

Client Sample ID: LPA1N3A2
Sample ID: 117051004
Matrix: Soil
Collect Date: 13-JUL-04 10:40
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Jul | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gummaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00844 | +/-0.0326 | 0.050 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1154 | 350626 | 1 |
| Cobalt-60 | U | 0.0132 | +/-0.0251 | 0.0482 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Sarah Kozlik.

Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4A1
Sample ID: 117051005
Matrix: Soil
Collect Date: 13-JUL-04 11:15
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Raw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0436 | 0.027 | 0.100 | pCi/g | U | 23 | SRB | 08/10/04 | 1207 | 350626 | 1 |
| Cobalt-60 | U | 0.00553 | +/-0.021 | 0.0309 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| y Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4A2
Sample ID: 117051006
Matrix: Soil
Collect Date: 13-JUL-04 11:15
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0147 | +/-0.0251 | 0.0415 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1207 | 350626 | 1 |
| Cobalt-60 | U | -0.00693 | +/-0.0203 | 0.0351 | 0.100 | pCi/g | U | | | | | | |

The following Prep Methods were performed

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1454 | 350131 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N5A1
Sample ID: 117051007
Matrix: Soil
Collect Date: 13-JUL-04 12:35
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0221 | +/-0.0259 | 0.0252 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1207 | 350626 | 1 |
| Cobalt-60 | U | -0.0019 | +/-0.015 | 0.0275 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
The Qualifiers in this report are defined as follows :

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H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
h Sample preparation or preservation holding time exceeded.

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI

Page 1 of 1

| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N5A2 | Project: | STEP00402 |
| Sample ID: | 117051008 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 13-JUL-04 12:35 | | |
| Receive Date: | 16-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.000491 | +/-0.0212 | 0.0384 | 0.100 | pCi/g | U | | SRB | 08/10/04 | 1208 | 350626 | 1 |
| Cobalt-60 | U | -0.00233 | +/-0.0185 | 0.0336 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather G Cleveland

Reviewed by

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1B1
Sample ID: 117051009
Matrix: Soil
Collect Date: 14-JUL-04 08:25
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0177 | +/-0.0157 | 0.030 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0954 | 350626 | 1 |
| Cobalt-60 | U | 0.00456 | +/-0.0146 | 0.0278 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
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Heather Cooper

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N1B2 | Project: | STEP00402 |
| Sample ID: | 117051010 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 14-JUL-04 08:25 | | |
| Receive Date: | 16-JUL-04 | | |
| Collector: | Client | | |

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00192 | +/-0.0205 | 0.0361 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0955 | 350626 | 1 |
| Cobalt-60 | U | 0.0016 | +/-0.0177 | 0.0324 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N2B1
Sample ID: 117051011
Matrix: Soil
Collect Date: 14-JUL-04 07:25
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.124 | +/-0.0395 | 0.0276 | 0.100 | pCi/g | | | SRB | 08/11/04 | 0955 | 350626 | 1 |
| Cobalt-60 | U | 0.00365 | +/-0.0165 | 0.0308 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2B2
Sample ID: 117051012
Matrix: Soil
Collect Date: 14-JUL-04 07:25
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Dual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00661 | +/-0.0183 | 0.0323 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0955 | 350626 | 1 |
| Cobalt-60 | U | -0.00543 | +/-0.0181 | 0.0319 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Heather G Cerda
Reviewed by

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N3B1
Sample ID: 117051013
Matrix: Soil
Collect Date: 13-JUL-04 16:05
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.0187 | +/-0.0282 | 0.0333 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0956 | 350626 | 1 |
| Cobalt-60 | U | 0.00814 | +/-0.0169 | 0.0328 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3B2
Sample ID: 117051014
Matrix: Soil
Collect Date: 13-JUL-04 16:05
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0262 | +/-0.0326 | 0.0557 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0956 | 350626 | 1 |
| Cobalt-60 | U | -0.00476 | +/-0.0298 | 0.0537 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4B1
Sample ID: 117051015
Matrix: Soil
Collect Date: 13-JUL-04 14:50
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | 2nd | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.445 | +/-0.0524 | 0.0249 | 0.100 | pCi/g | | | SRB | 08/11/04 | 0957 | 350626 | 1 |
| Cobalt-60 | U | 0.000408 | +/-0.0144 | 0.0258 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| ...od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ...ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N4B2
Sample ID: 117051016
Matrix: Soil
Collect Date: 13-JUL-04 14:50
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.000732 | +/-0.0162 | 0.0284 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0957 | 350626 | 1 |
| Cobalt-60 | U | 0.00966 | +/-0.0157 | 0.0291 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5B1
Sample ID: 117051017
Matrix: Soil
Collect Date: 13-JUL-04 14:15
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0412 | 0.0783 | 0.100 | pCi/g | U | 23 | SRB | 08/11/04 | 0958 | 350626 | 1 |
| Cobalt-60 | U | -0.00584 | +/-0.0236 | 0.0421 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5B2
Sample ID: 117051018
Matrix: Soil
Collect Date: 13-JUL-04 14:15
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00221 | +/-0.0109 | 0.0201 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 1427 | 350626 | 1 |
| Cobalt-60 | U | -0.00251 | +/-0.0116 | 0.0206 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

Notes:
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H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1C1
Sample ID: 117051019
Matrix: Soil
Collect Date: 14-JUL-04 09:10
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0406 | +/-0.0198 | 0.0201 | 0.100 | pCi/g | | | SRB | 08/11/04 | 1428 | 350626 | 1 |
| Cobalt-60 | U | 0.020 | +/-0.0138 | 0.0214 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Heather R. Cl, COO
Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N1C2
Sample ID: 117051020
Matrix: Soil
Collect Date: 14-JUL-04 09:10
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | 0.00485 | +/-0.0571 | 0.0653 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 1429 | 350626 | 1 |
| Cobalt-60 | U | 0.0132 | +/-0.0304 | 0.0574 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| *Method* | *Description* | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N2C1
Sample ID: 117051021
Matrix: Soil
Collect Date: 14-JUL-04 09:55
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00285 | +/-0.0183 | 0.0327 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0959 | 350627 | 1 |
| Cobalt-60 | U | 0.00196 | +/-0.0347 | 0.049 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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U Indicates the target analyte was analyzed for but not detected above the detection limit.
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
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Heather Clark

Reviewed by

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



| | | | |
|---|---|---|---|
| Client Sample ID: | LPA1N2C2 | Project: | STEP00402 |
| Sample ID: | 117051022 | Client ID: | STEP001 |
| Matrix: | Soil | | |
| Collect Date: | 14-JUL-04 09:55 | | |
| Receive Date: | 16-JUL-04 | | |
| Collector: | Client | | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00519 | +/-0.0282 | 0.042 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 0959 | 350627 | 1 |
| Cobalt-60 | U | -0.00562 | +/-0.0239 | 0.0419 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N3C1
Sample ID: 117051023
Matrix: Soil
Collect Date: 14-JUL-04 10:55
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | UUI | 0.00 | +/-0.0266 | 0.0276 | 0.100 | pCi/g | U | 23 | SRB | 08/11/04 | 1000 | 350627 | 1 |
| Cobalt-60 | U | -0.00452 | +/-0.0153 | 0.0275 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N3C2
Sample ID: 117051024
Matrix: Soil
Collect Date: 14-JUL-04 10:55
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rw

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.0277 | +/-0.0241 | 0.0331 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 1000 | 350627 | 1 |
| Cobalt-60 | U | 0.00844 | +/-0.021 | 0.0397 | 0.100 | pCi/g | U | | | | | | |

**The following Prep Methods were performed**

| Method | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| Dry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

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| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**

Page 1 of 1

Client Sample ID: LPA1N4C1
Sample ID: 117051025
Matrix: Soil
Collect Date: 14-JUL-04 13:14
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0482 | +/-0.0257 | 0.0326 | 0.100 | pCi/g | | | SRB | 08/11/04 | 1001 | 350627 | 1 |
| Cobalt-60 | U | -0.0127 | +/-0.0229 | 0.0333 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: La Garde Park ESI



Client Sample ID: LPA1N4C2
Sample ID: 117051026
Matrix: Soil
Collect Date: 14-JUL-04 13:14
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | U | -0.00311 | +/-0.0152 | 0.027 | 0.100 | pCi/g | U | | SRB | 08/11/04 | 1001 | 350627 | 1 |
| Cobalt-60 | U | -0.00795 | +/-0.0136 | 0.0231 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ry Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

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| Method | Description | Analyst Comments |
|---|---|---|
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## Certificate of Analysis

Company : Step, Inc.
Address : 1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

Report Date: August 12, 2004

Contact: Mr. Doug Hawn
Project: **La Garde Park ESI**



Client Sample ID: LPA1N5C1
Sample ID: 117051027
Matrix: Soil
Collect Date: 14-JUL-04 14:00
Receive Date: 16-JUL-04
Collector: Client

Project: STEP00402
Client ID: STEP001

Rev

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | Qual | DF | Analyst | Date | Time | Batch | Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rad Gamma Spec Analysis** | | | | | | | | | | | | | |
| *Gammaspec, Gamma, Solid (Standard List)* | | | | | | | | | | | | | |
| Cesium-137 | | 0.0975 | +/-0.0306 | 0.0274 | 0.100 | pCi/g | | | SRB | 08/11/04 | 1002 | 350627 | 1 |
| Cobalt-60 | U | 0.00476 | +/-0.015 | 0.0289 | 0.100 | pCi/g | U | | | | | | |

**following Prep Methods were performed**

| ...od | Description | Analyst | Date | Time | Prep Batch |
|---|---|---|---|---|---|
| ...y Soil Prep | Dry Soil Prep GL-RAD-A-021 | BSW1 | 07/19/04 | 1455 | 350131 |

**The following Analytical Methods were performed**

| Method | Description | Analyst Comments |
|---|---|---|
| 1 | EML HASL 300, 4.5.2.3 | |

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Reviewed by

# DATA VALIDATION WORKSHEET
## RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117051 Matrix/No. Samples: S-27

| I. Sample Management | | | |
|---|---|---|---|
| **A. Sample Preservation, Handling and Transport** | | | |
| 1. Have all samples been preserved with $HNO_3$ to pH <2? | Yes | No | N/A |
| 2. Have sample temperatures been kept at 4° C (+ or - 2 ° C)? | Yes | No | N/A |
| 3. Were all samples received in proper condition? | Yes | No | N/A |
| 4. Were any qualifications required based on this information? | Yes | No | N/A |
| Cooler @ 16°C | | | |
| **B. Chain of Custody** | | | |
| 1. Were all samples properly recorded on COCs? | Yes | No | N/A |
| 2. Were correct analyses performed on samples? | Yes | No | N/A |
| **C. Holding Times** | | | |
| 1. Were samples analyzed within acceptable holding times? | Yes | No | N/A |
| 2. Were any qualifications required based on this information? | Yes | No | N/A |

| SAMPLED | PREPPED/ANALYZED | |
|---|---|---|
| 7/13, 7/14 | batch ~~350131~~ 350626 | 8/10, 8/11 |
| | batch 350627 | 8/11 |

| II. Calibrations | | | |
|---|---|---|---|
| 1. Were proper number of calibration standards used for each analytical instrument used? | Yes | No | N/A |
| 2. Is the calibration correlation coefficient >or = 0.995 for each analytical instrument used? | Yes | No | N/A |
| 3. Are initial and continuing calibration verification %R within 10% (+ or - 1%) acceptance window? | Yes | No | N/A |
| 4. Are CRDL Standard %R within 10% (+ or - 1%) acceptance window? | Yes | No | N/A |
| 5. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

8/10 @ 8:26 ff. 8/11 @ 9:19 ff.
peak energy
-all parameters
w/in bounds.

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117051 Matrix/No. Samples: S-27

| III. | Blanks | | | |
|---|---|---|---|---|
| | 1. Are any analytes reported in laboratory prep or calibration blanks above the IDL? | Yes | No | N/A |
| | 2. Are any analytes reported as negative values in laboratory prep or calibration blanks? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 350626 6861 | 350627 6864 |
|---|---|---|
| Cs-137 | U | U |
| Co-60 | U | U |

| IV. | ICP Interference Check Sample (ICS) | | | |
|---|---|---|---|---|
| | 1. Were ICS samples run at the beginning and end of each sample analysis run? | Yes | No | N/A |
| | 2. Are ICS %R within 80-120% acceptable control limits? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| V. | Blank Spike/Laboratory Control Sample (LCS) | | | |
|---|---|---|---|---|
| | 1. Are all aqueous LCS %R within 80-120% control limits? | Yes | No | N/A |
| | 2. Are all solid LCS %R within control limits established by EPA? 75-125 | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

Comments/Qualifications:

| | 350626 6863 | 350627 6866 |
|---|---|---|
| Cs-137 | 9.77/9.22 = 106.0% | 10.1/9.22 = 109.5% |
| Co-60 | 14.6/14.1 = 103.5 | 15.5/14.1 = 109.9% |

DATA VALIDATION WORKSHEET
RADIOLOGICAL

Reviewer: Kitchings Date: 8/24
Project: LaGarde Park SDG: 117051 Matrix/No. Samples: S-27

| VI. | Duplicates | | | |
|---|---|---|---|---|
| | 1. Were samples used for duplicate sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. For duplicate samples >5x CRDL, were RPDs within control limits of + or - 20% for water, or + or - 35% for soil? <26% | Yes | No | N/A |
| | 3. For duplicate samples <5x CRDL, were duplicate samples within control limit of + or - CRDL for water, or + or - 2xCRDL for soil? | Yes | No | N/A |
| | 4. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

.004 / .193 = 2.1%

| 350626 1001 | | | 350627 1021 |
|---|---|---|---|
| Cs-137 | .195 | .191 | u / u |
| Co-60 | u | u | u / u |

| VII. | Matrix Spike | | | |
|---|---|---|---|---|
| | 1. Were samples used for matrix spike sample analysis identified as field blanks? | Yes | No | N/A |
| | 2. Were spike recoveries within 75-125% limits (limits do not apply when original sample concentration exceeds spike concentration by a factor of 4? | Yes | No | N/A |
| | 3. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

None performed

| VIII. | ICP Serial Dilution | | | |
|---|---|---|---|---|
| | 1. Were %Ds for ICP serial dilution samples within 10% for analytes with concentrations greater than 50x IDL? | Yes | No | N/A |
| | 2. Were any qualifications required based on this information? | Yes | No | N/A |

**Comments/Qualifications:**

DATA VALIDATION WORKSHEET
RADIOLOGICAL

viewer: Kitchings Date: 8/24
roject: LaGarde Park SDG: 117051 Matrix/No. Samples: S-27

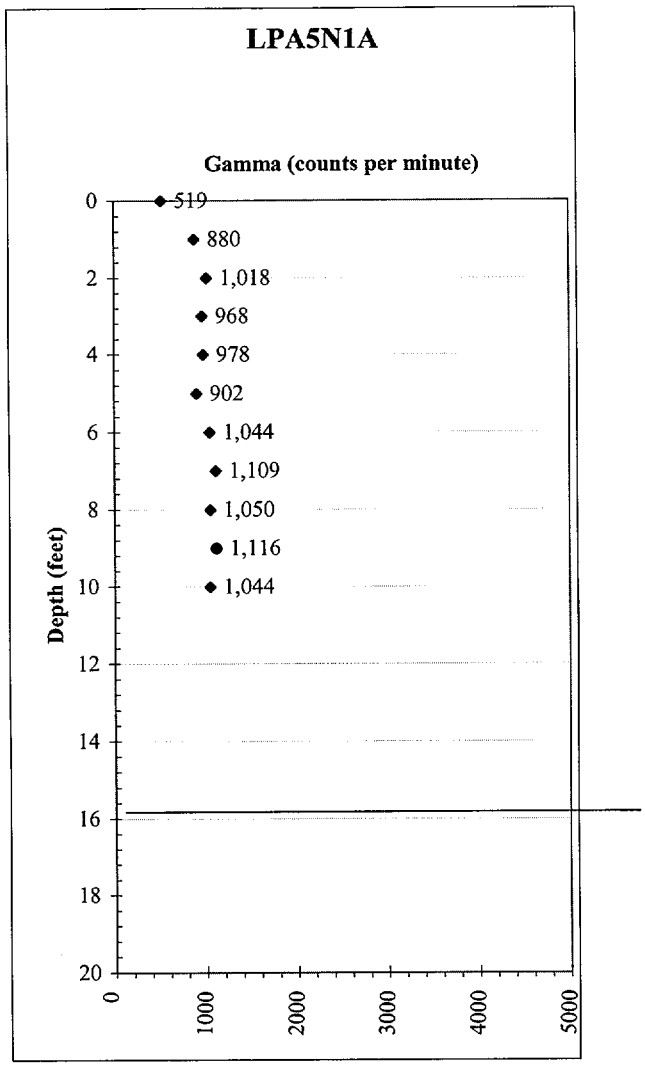
| IX. Sample Result Qualification<br>Not Required For Level III Data Validation | | | |
|---|---|---|---|
| 1. Were sample results reported by laboratory supported by raw data? | Yes | No | N/A |
| 2. Were correct calculations used to determine sample results? | Yes | No | N/A |
| 3. Were any qualifications required based on this information? | Yes | No | N/A |
| Comments/Qualifications: No raw data - level III | | | |

| X. Field QC | | | |
|---|---|---|---|
| 1. Were any Field Duplicates associated with this SDG? | Yes | No | N/A |
| a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)? | Yes | No | N/A |
| 2. Were any field blanks or equipment rinsates associated with this SDG? | Yes | No | N/A |
| a. If yes, were any analytes reported in samples >IDL? | Yes | No | N/A |
| b. Were any qualifications required based on this information? | Yes | No | N/A |
| Comments/Qualifications: | | | |

| XI. Overall Assessment of Data | | | |
|---|---|---|---|
| 1. Are there any specific concerns or limitations regarding the data in this SDG? | Yes | No | N/A |
| Comments/Qualifications: | | | |

# Appendix F

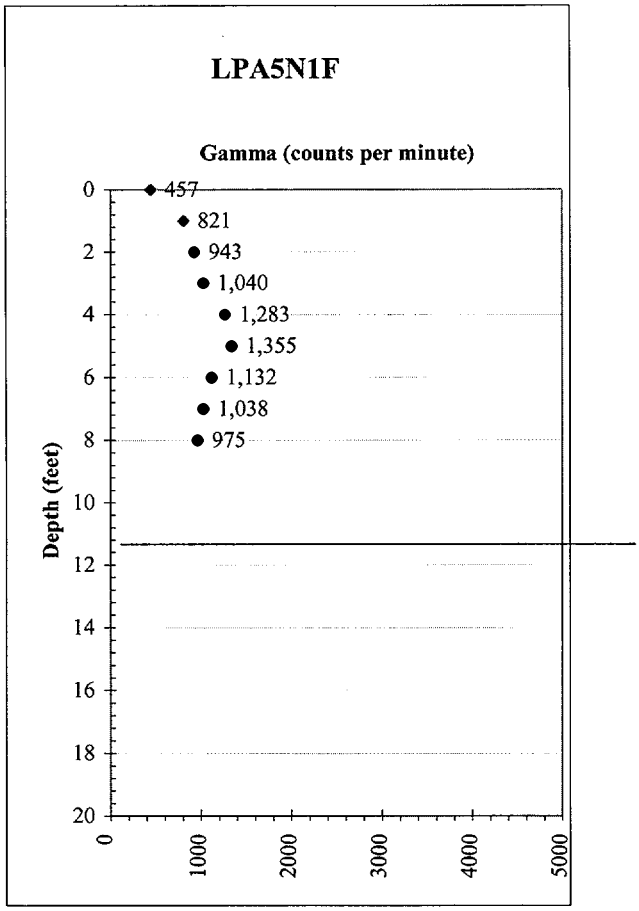
# Downhole Radiation Survey Curves




| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N1A1 | LPA5N1A2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 16.0 | Feet |
| Collection Time | 9:10 | 9:10 | Hours |
| Gamma Counts | 519 | NA | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | 0.01 | 0.00 | pCi/g |
| Cesium-137 | 0.09 | 0.00 | pCi/g |
| Radium-226 | 0.84 | 0.52 | pCi/g |
| Radium-228 | 0.82 | 0.56 | pCi/g |
| Uranium-238 | 0.85 | -0.16 | pCi/g |
| Americium-241 | -0.03 | 0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

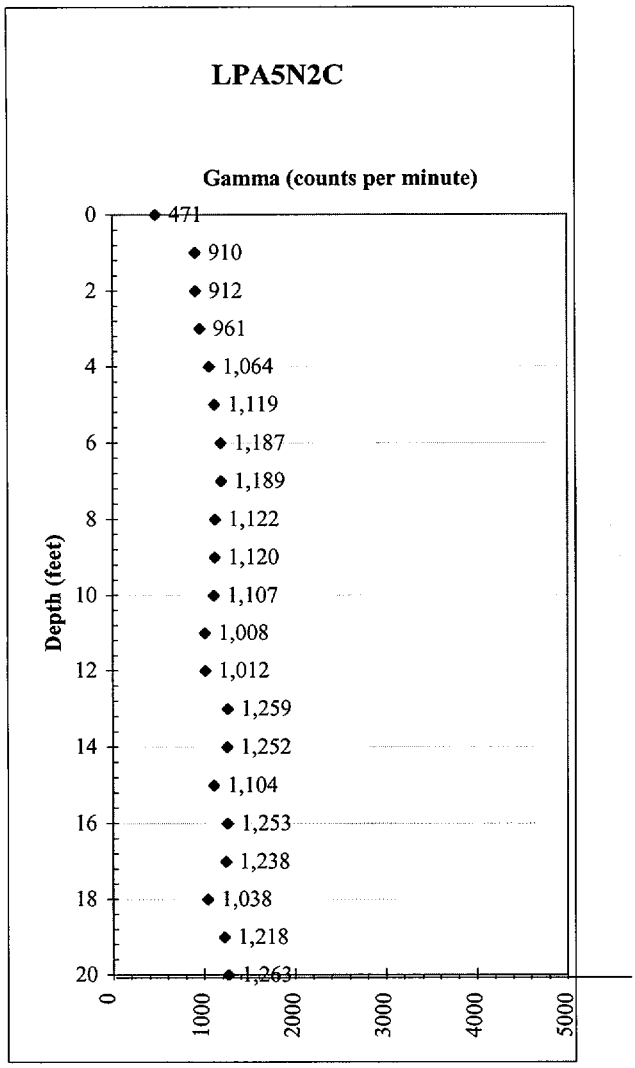
| | |
|---|---|
| Total Boring Depth: | 16.0 feet |
| Maximum Radiation Screening Depth: | 10.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N1F1** | **LPA5N1F2** | **Units** |
| **Collection Date** | 7/20/2004 | 7/20/2004 | |
| **Collection Depth** | 0.0 | 11.0 | Feet |
| **Collection Time** | 9:20 | 9:20 | Hours |
| **Gamma Counts** | 457 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.00 | -0.01 | pCi/g |
| **Cesium-137** | 0.03 | -0.01 | pCi/g |
| **Radium-226** | 0.71 | 1.40 | pCi/g |
| **Radium-228** | 0.88 | 1.24 | pCi/g |
| **Uranium-238** | 0.59 | 0.87 | pCi/g |
| **Americium-241** | -0.03 | 0.10 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

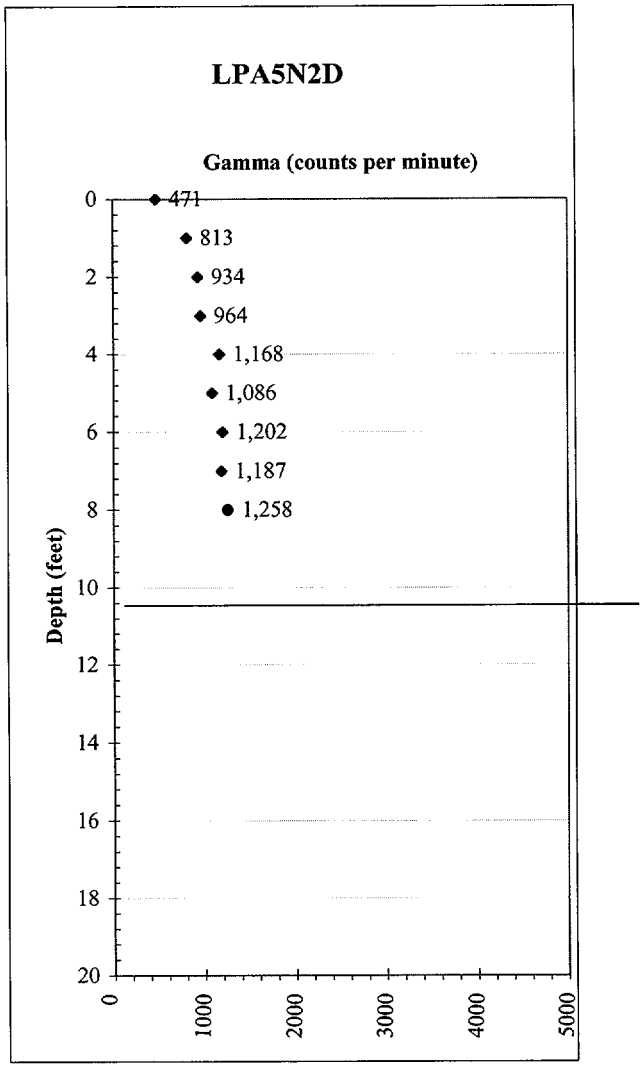
| | |
|---|---|
| **Total Boring Depth:** | 11.5 feet |
| **Maximum Radiation Screening Depth:** | 8.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N2C1** | **LPA5N2C2** | **Units** |
| **Collection Date** | 7/20/2004 | 7/20/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 14:45 | 14:45 | Hours |
| **Gamma Counts** | 471 | 1,263 | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.00 | 0.01 | pCi/g |
| **Cesium-137** | 0.02 | 0.06 | pCi/g |
| **Radium-226** | 0.68 | 0.73 | pCi/g |
| **Radium-228** | 0.66 | 0.71 | pCi/g |
| **Uranium-238** | 0.59 | 0.67 | pCi/g |
| **Americium-241** | 0.04 | -0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

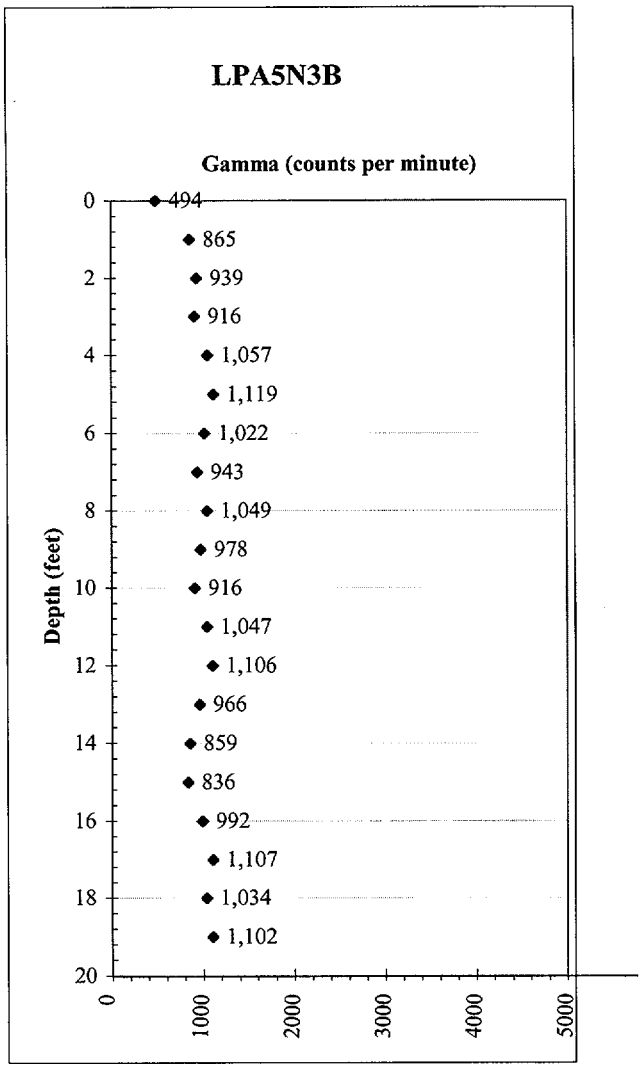
| | |
|---|---|
| **Total Boring Depth:** | 11.5 feet |
| **Maximum Radiation Screening Depth:** | 8.0 feet |




| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N2D1 | LPA5N2D2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 11.0 | Feet |
| Collection Time | 9:40 | 9:40 | Hours |
| Gamma Counts | 471 | NA | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | -0.01 | 0.00 | pCi/g |
| Cesium-137 | 0.03 | 0.00 | pCi/g |
| Radium-226 | 0.65 | 0.79 | pCi/g |
| Radium-228 | 0.60 | 1.24 | pCi/g |
| Uranium-238 | 0.75 | 0.75 | pCi/g |
| Americium-241 | 0.05 | -0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

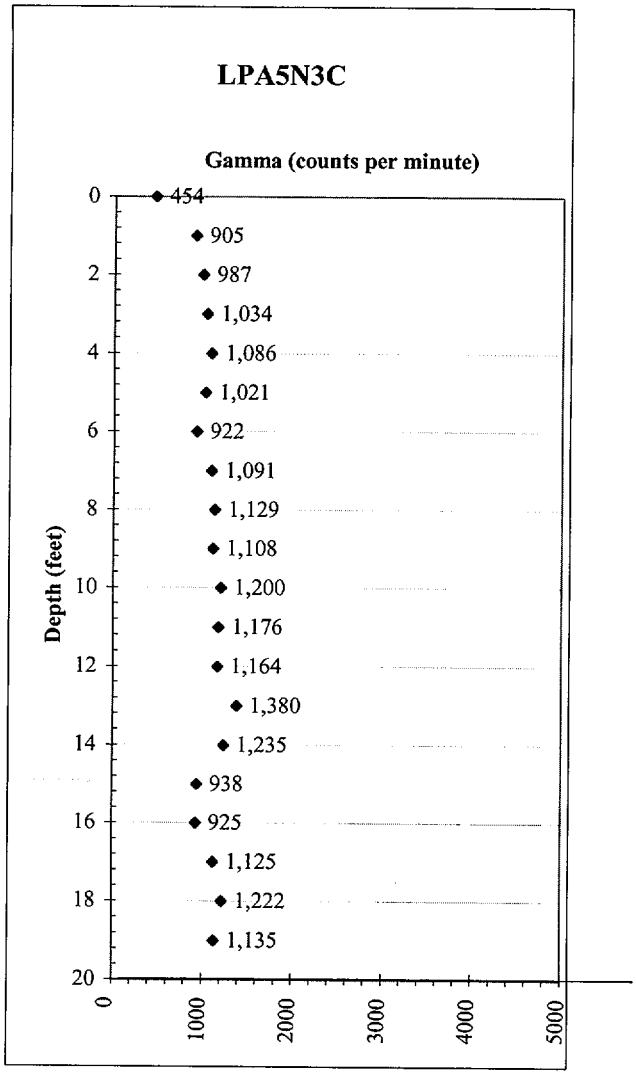
| | |
|---|---|
| **Total Boring Depth:** | 11.0 feet |
| **Maximum Radiation Screening Depth:** | 8.0 feet |




| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N3B1 | LPA5N3B2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 20.0 | Feet |
| Collection Time | 13:30 | 13:30 | Hours |
| Gamma Counts | 494 | NA | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | 0.00 | 0.01 | pCi/g |
| Cesium-137 | 0.02 | -0.01 | pCi/g |
| Radium-226 | 0.79 | 0.82 | pCi/g |
| Radium-228 | 0.81 | 0.77 | pCi/g |
| Uranium-238 | 1.81 | 0.98 | pCi/g |
| Americium-241 | 0.01 | -0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

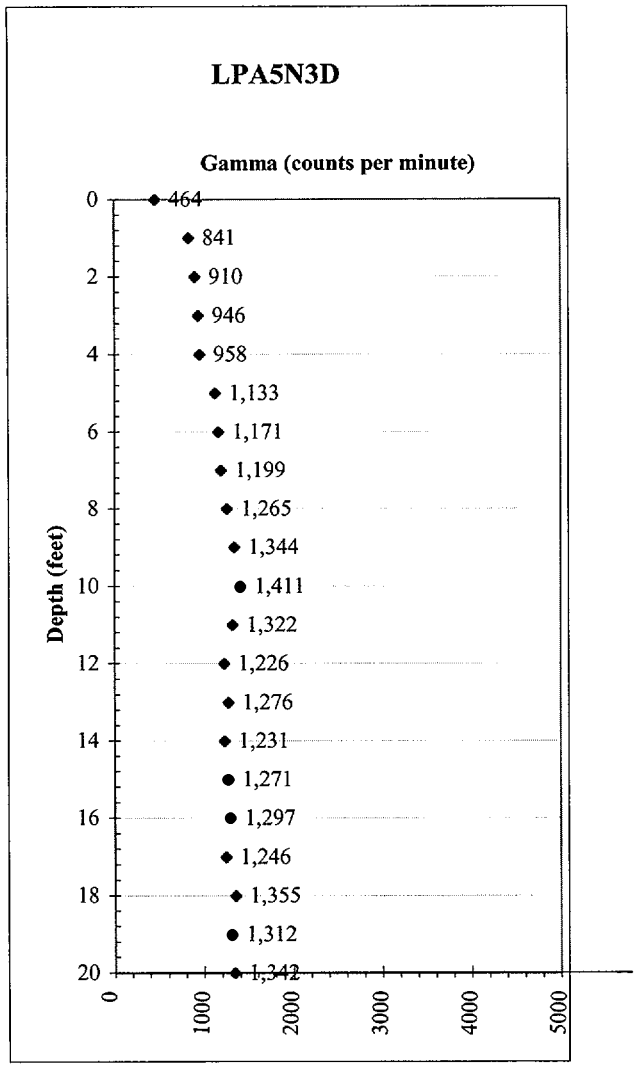
| | |
|---|---|
| Total Boring Depth: | 20.0 feet |
| Maximum Radiation Screening Depth: | 19.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N3C1** | **LPA5N3C2** | **Units** |
| **Collection Date** | 7/20/2004 | 7/20/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 13:00 | 13:00 | Hours |
| **Gamma Counts** | 454 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.02 | 0.00 | pCi/g |
| **Cesium-137** | 0.03 | 0.00 | pCi/g |
| **Radium-226** | 0.68 | 0.62 | pCi/g |
| **Radium-228** | 0.73 | 0.73 | pCi/g |
| **Uranium-238** | 0.94 | 0.45 | pCi/g |
| **Americium-241** | -0.02 | 0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

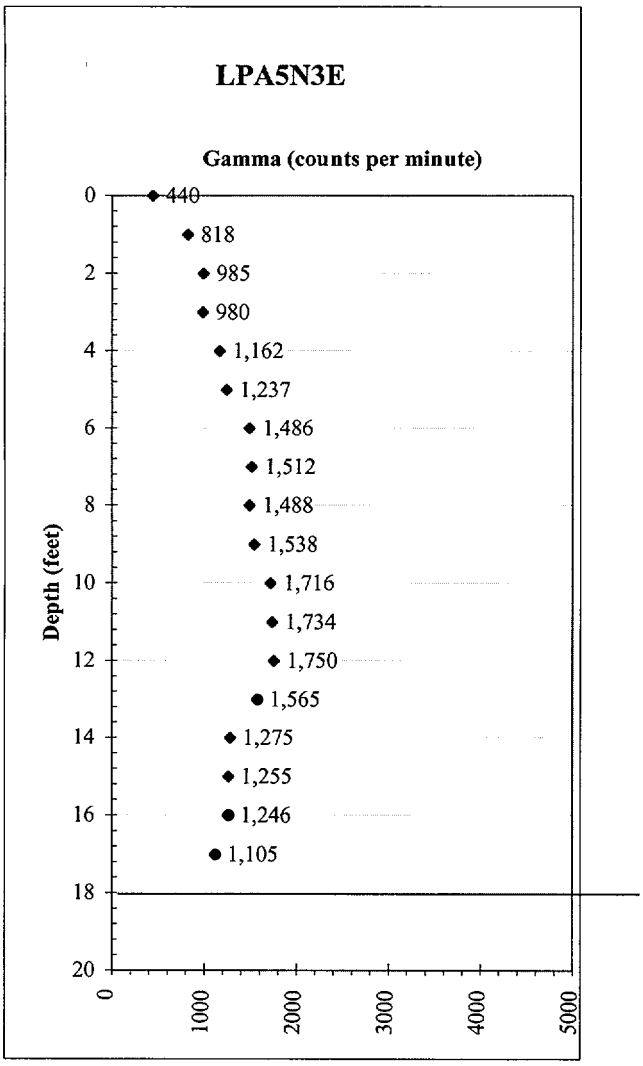
| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 19.0 feet |




| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N3D1 | LPA5N3D2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 20.0 | Feet |
| Collection Time | 12:25 | 12:25 | Hours |
| Gamma Counts | 464 | 1,342 | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | 0.00 | 0.02 | pCi/g |
| Cesium-137 | 0.01 | 0.00 | pCi/g |
| Radium-226 | 0.81 | 1.75 | pCi/g |
| Radium-228 | 0.79 | 0.70 | pCi/g |
| Uranium-238 | 0.72 | 1.81 | pCi/g |
| Americium-241 | 0.02 | 0.03 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

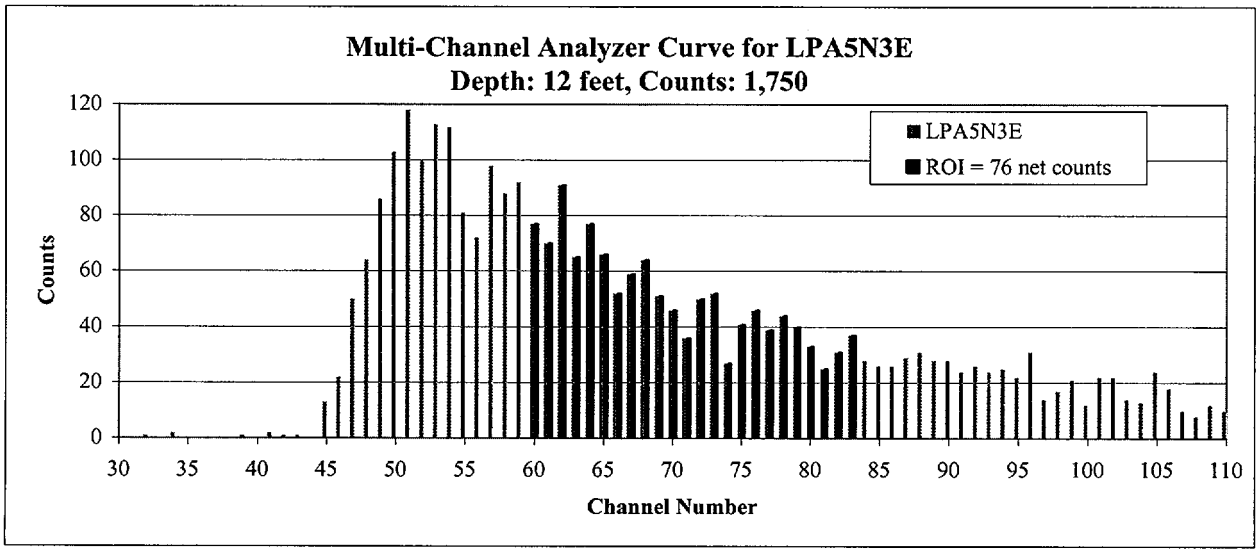
| | |
|---|---|
| Total Boring Depth: | 20.0 feet |
| Maximum Radiation Screening Depth: | 19.0 feet |

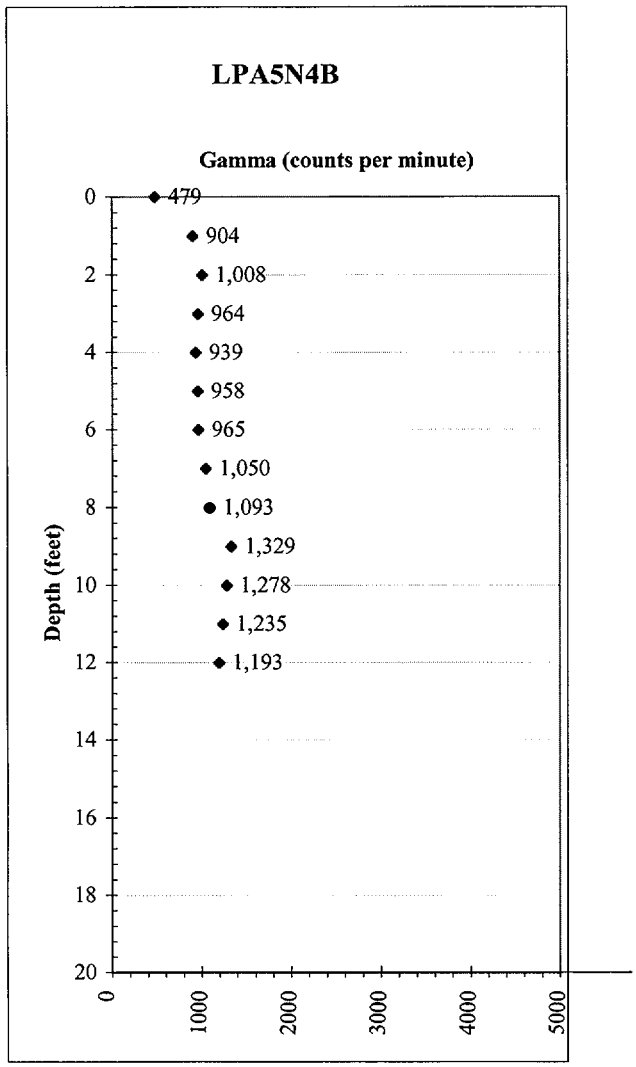



| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N3E1** | **LPA5N3E2** | **Units** |
| **Collection Date** | 7/20/2004 | 7/20/2004 | |
| **Collection Depth** | 0.0 | 12.0 | Feet |
| **Collection Time** | 10:05 | 10:05 | Hours |
| **Gamma Counts** | 440 | 1,750 | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | -0.01 | 0.00 | pCi/g |
| **Cesium-137** | -0.01 | 0.00 | pCi/g |
| **Radium-226** | 0.95 | 0.36 | pCi/g |
| **Radium-228** | 1.10 | 1.86 | pCi/g |
| **Uranium-238** | 2.78 | 0.67 | pCi/g |
| **Americium-241** | 0.10 | -0.07 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

| | |
|---|---|
| **Total Boring Depth:** | 18.0 feet |
| **Maximum Radiation Screening Depth:** | 18.0 feet |

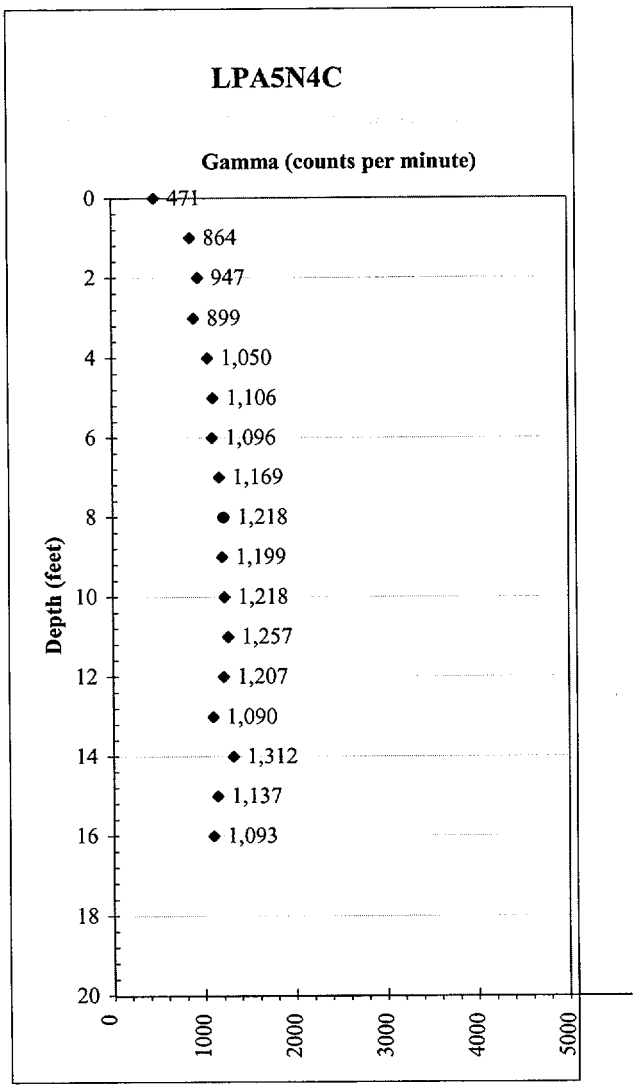





| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N4B1 | LPA5N4B2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 20.0 | Feet |
| Collection Time | 15:50 | 15:50 | Hours |
| Gamma Counts | 479 | NA | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | 0.00 | -0.01 | pCi/g |
| Cesium-137 | 0.01 | -0.01 | pCi/g |
| Radium-226 | 0.75 | 1.06 | pCi/g |
| Radium-228 | 0.92 | 0.90 | pCi/g |
| Uranium-238 | 0.36 | 1.22 | pCi/g |
| Americium-241 | -0.06 | 0.02 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

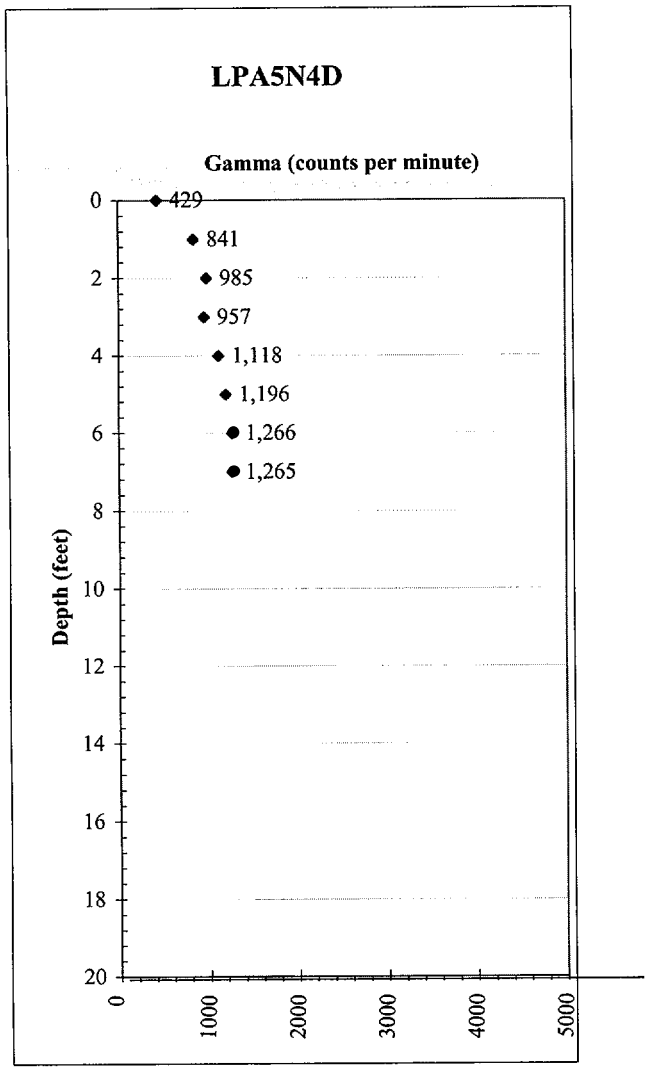
| | |
|---|---|
| Total Boring Depth: | 20.0 feet |
| Maximum Radiation Screening Depth: | 12.0 feet |




| Sample Results | | | |
|---|---|---|---|
| Sample ID | LPA5N4C1 | LPA5N4C2 | Units |
| Collection Date | 7/20/2004 | 7/20/2004 | |
| Collection Depth | 0.0 | 20.0 | Feet |
| Collection Time | 16:45 | 16:45 | Hours |
| Gamma Counts | 471 | NA | cpm |
| Potassium-40 | NA | NA | pCi/g |
| Cobalt-60 | -0.02 | 0.00 | pCi/g |
| Cesium-137 | -0.03 | 0.01 | pCi/g |
| Radium-226 | 0.85 | 0.97 | pCi/g |
| Radium-228 | 1.32 | 0.65 | pCi/g |
| Uranium-238 | 0.38 | 1.17 | pCi/g |
| Americium-241 | -0.02 | -0.07 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

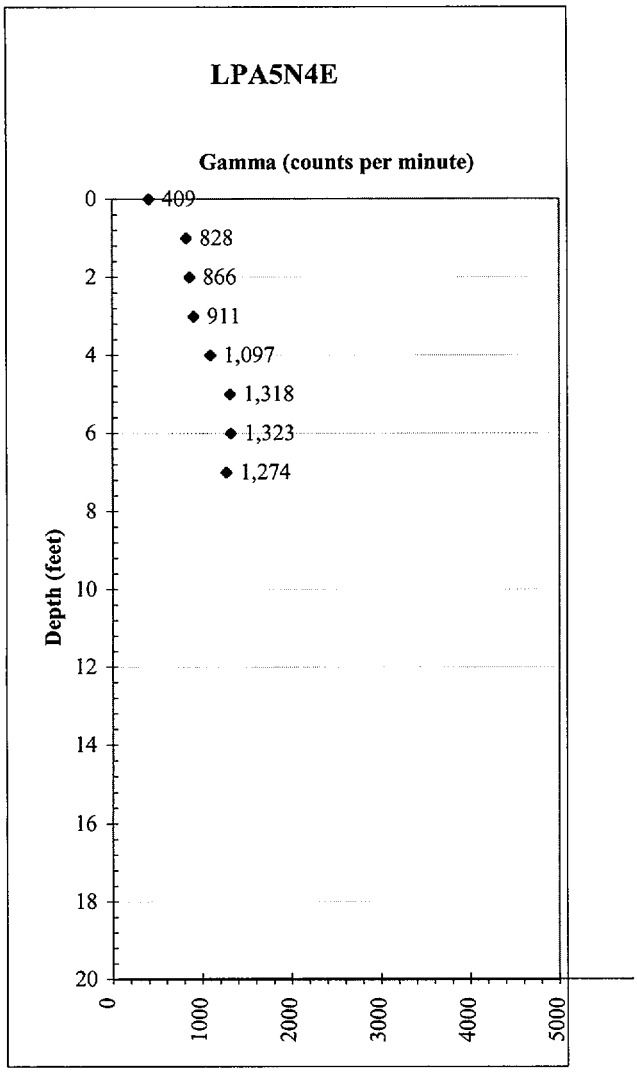
| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 16.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N4D1** | **LPA5N4D2** | **Units** |
| **Collection Date** | 7/20/2004 | 7/20/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 18:00 | 18:00 | Hours |
| **Gamma Counts** | 429 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.03 | 0.00 | pCi/g |
| **Cesium-137** | 0.34 | 0.01 | pCi/g |
| **Radium-226** | 0.61 | 1.80 | pCi/g |
| **Radium-228** | 0.52 | 0.51 | pCi/g |
| **Uranium-238** | 0.97 | 1.22 | pCi/g |
| **Americium-241** | 0.00 | -0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

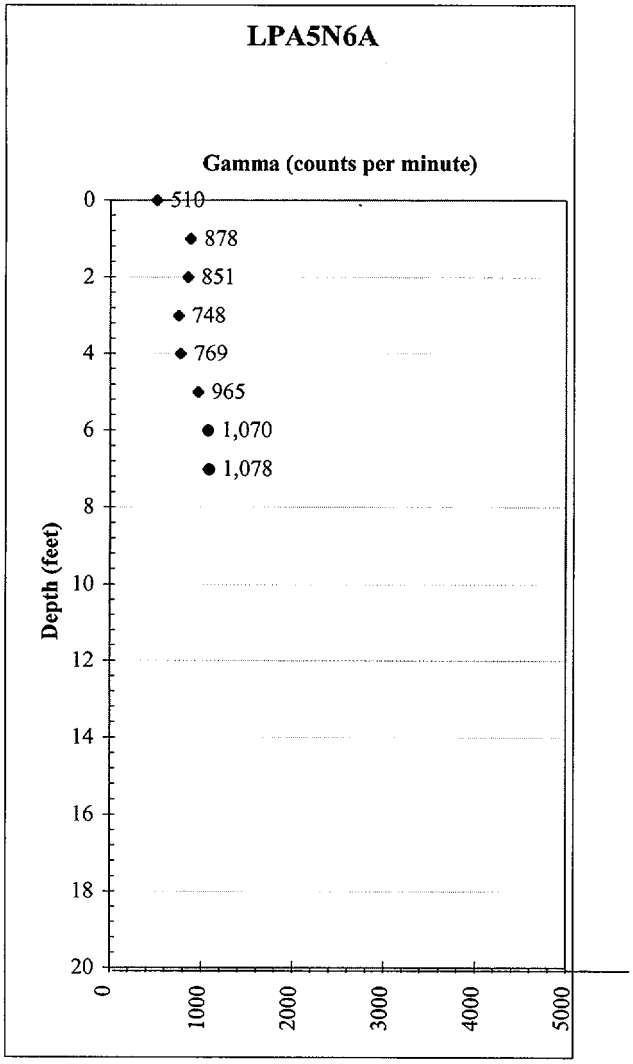
| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 7.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N4E1** | **LPA5N4E2** | **Units** |
| **Collection Date** | 7/21/2004 | 7/21/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 12:30 | 12:30 | Hours |
| **Gamma Counts** | 409 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.02 | 0.00 | pCi/g |
| **Cesium-137** | 0.12 | 0.01 | pCi/g |
| **Radium-226** | 0.78 | 0.91 | pCi/g |
| **Radium-228** | 0.84 | 1.17 | pCi/g |
| **Uranium-238** | 1.01 | 1.49 | pCi/g |
| **Americium-241** | 0.01 | 0.00 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

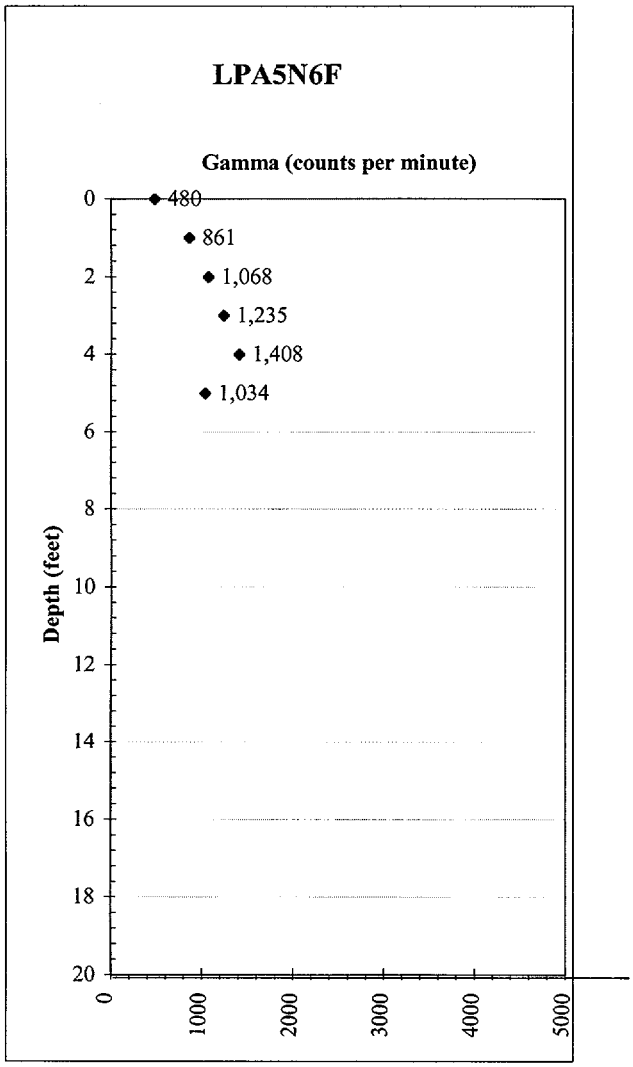
| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 7.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N6A1** | **LPA5N6A2** | **Units** |
| **Collection Date** | 7/21/2004 | 7/21/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 13:15 | 13:15 | Hours |
| **Gamma Counts** | 510 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | 0.01 | 0.00 | pCi/g |
| **Cesium-137** | 0.22 | 0.00 | pCi/g |
| **Radium-226** | 0.68 | 0.48 | pCi/g |
| **Radium-228** | 0.71 | 0.00 | pCi/g |
| **Uranium-238** | 0.52 | 0.25 | pCi/g |
| **Americium-241** | 0.01 | -0.01 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 7.0 feet |




| Sample Results | | | |
|---|---|---|---|
| **Sample ID** | **LPA5N6F1** | **LPA5N6F2** | **Units** |
| **Collection Date** | 7/21/2004 | 7/21/2004 | |
| **Collection Depth** | 0.0 | 20.0 | Feet |
| **Collection Time** | 12:55 | 12:55 | Hours |
| **Gamma Counts** | 480 | NA | cpm |
| **Potassium-40** | NA | NA | pCi/g |
| **Cobalt-60** | -0.01 | 0.00 | pCi/g |
| **Cesium-137** | 0.02 | 0.00 | pCi/g |
| **Radium-226** | 0.71 | 1.18 | pCi/g |
| **Radium-228** | 0.75 | 1.98 | pCi/g |
| **Uranium-238** | 0.62 | 2.30 | pCi/g |
| **Americium-241** | 0.00 | 0.04 | pCi/g |

cpm = counts per minute
NA = not applicable
pCi/g = picoCuries per gram

| | |
|---|---|
| **Total Boring Depth:** | 20.0 feet |
| **Maximum Radiation Screening Depth:** | 5.5 feet |