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Table 3. Analyses Not Performed

Table 3.	Analyses Not Perio	riormed	
SDG	Sample No.	Note	
1032224	1. CC066SS01	Samples arrived in CT&E Alaska laboratory on day	
	2. CC066BS01	13 after collection. TPH-G, VOC, & herbicide	
	3. CC066BS02	analyses cancelled.	
1032225	1. CC063SS01	Samples arrived in CT&E Alaska laboratory past	
	2. CC063BS01	hold time for all analyses. None of the samples were	
	3. CC058SS01	analyzed.	
	4. CC158SS01		
	5. CC058BS01		
	6. CC056SS01		
	7. CC055SS01		
	8. CC051SS01		
	9. CC057SS01		
	10. CC157SS01		
	11. CC059SS01		
	12. CC067SS01		
	13. CC069SS01		
	14. CC070SS01		
1033197	1. CC059SS01	Samples arrived in Columbia Analytical Services,	
	2. CC056SS01	Redding, but were not logged in. No herbicide	
	3. CC037BS03	analysis was performed on these 8 samples.	
	4. CC037BS04		
	5. CC037BS05		
	6. CC037BS06		
	7. CC137BS06		
	8. CC037BS07		

Table 4. List of Laboratory QC Data

	Date of extraction & analysis	Method blank	Surrogate recovery	Laboratory control sample	Matrix spike
TPH-G	х	x	x	х	х
TPH-D & O	x	x	x	x	х
SVOC	Х	x	x	x	х
Pesticides	x	x	x	x	x
PCBs	x	х	x	х	х
Herbicides	x	х	х	x	х
RCRA 8 Metals	x	х		х	х
Dioxin	x	х		х	х
VOC	x	х	х	Х	х
Malathion	x	х	х	х	х

Method Blanks 3.2

The method blank data were assessed to determine possible laboratory contamination. No method blank problems were encountered for the mercury, TPH-G, pesticides, PCBs, herbicides, and malathion analyses; however, detectable quantities of analytes were found in the following SGS sample delivery groups:

- Chromium and/or barium in metals method blanks for the SDGs 1033166, 1033197, 1033200, 1033211, and 1033224
- TPH-D in method blank samples for the SDGs 1031851, 1031972, 1032164, 1032180, 1032224, 1033071, 1033105, 1033166, 1033197, 1033200, 1033211, and
- TPH-O in method blank samples for 1032224, 1033071, 1033105, 1033200, and
- SVOC [bis-(2-ethylhexyl)phthalate] in method blank samples for 1033071, 1033105, 1033166, 1033197, 1033200, 1033211, and 1033224
- VOC (2-butanone and/or methylene chloride) in method blank samples for 1031972, 1032133, 1032164, and 1032180
- Dioxins in method blank samples for 1031851, 1031972, 1032133, 1032164, 1032180, 1033071, 1033166, 1033197, and 1033211

STL's method blank sample results were not reviewed. The final assessment report will include the review results.

Laboratory Control Samples 3.3

The overall LCS results for metals, TPH, pesticides, PCBs, VOC, herbicides, dioxins, and malathion indicated reasonable precision and reproducibility in the sample results; however, a few LCS failures were found in the SDGs as shown below:

- TPH-D in 1033105
- SVOC in 1032133, 1032164, 1032180, 1032224, and 1033166
- Malathion in 1033105

Laboratory control data not provided in the data packages:

- Herbicides in 1032133, 1032164, and 1032180
- **Dioxins in 1032164**

STL's laboratory control sample data were not reviewed. The final assessment report will include the review results.



Matrix Spike Samples 3.4

The overall matrix spike recovery results for metals, TPH-G, PCBs, VOC, and malathion indicated reasonable precision and reproducibility in the sample results; however, matrix spike failures were found in the SDGs as shown below:

- Metals in 1032224
- TPH-D in 1031972 and 1032224
- TPH-O in 1031972
- Pesticides in 1031851, 1031972, 1032164, 1032180, and 1033224
- SVOC in all SDGs
- VOC in 1031851, 1032133, and 1033164
- Herbicides in 1033166, 1033200, and 1033211

Matrix spike recovery data not provided in the data packages:

- TPH-D in 1033071, 1033105, 1033166, 1033200, and 1033211
- TPH-O in 1032180, 1033071, 1033105, 1033166, 1033200, and 1033211
- TPH-G in 1032180
- Pesticides in 1033071, 1033105, 1033166, 1033200, and 1033211
- PCBs in 1033071, 1033105, 1033166, 1033200, and 1033211
- SVOC in 1033105, 1033166, and 1033211
- VOC in 1031972, 1033166, 1033200, and 1033211
- Herbicides in 1031972, 1032133, 1032164, 1032180, 1033071, and 1033105
- Dioxin in all SDGs

STL's matrix spike results were not reviewed. The final assessment report will include the review results.

Surrogate Recoveries 3.5

Surrogate recovery data indicate the ability of the laboratory to execute a particular method with reasonable proficiency. The overall recovery results were good; however, surrogate failures were found in nine pesticide, one TPH-D&O, and one SVOC analyses.

Surrogate recovery failures:

- Pesticides CC030SS01, CC031SS01, CC066SS0, CC040SS01, CC051SS01, CC055SS01, CC059SS01, CC056SS01, and CC037BS03
- TPH-D&O CC066SS01
- SVOC CC039WS01

STL's surrogate data were not reviewed. The final assessment report will include the review results.

4. OVERALL DATA QUALITY

SGS Laboratory Data: The matrix spike recovery failures were not clearly explained by the laboratory; however, laboratory control sample results indicated reasonable precision and reproducibility in the sample results. The surrogate recovery failures do have negative impact on the sample results; therefore, the following results should be considered not usable.

- Pesticides CC030SS01, CC031SS01, CC066SS0, CC040SS01, CC051SS01, CC055SS01, CC059SS01, CC056SS01, and CC037BS03
- TPH-D&O CC066SS01
- SVOC CC039WS01

STL Laboratory Data: STL's laboratory quality control data were not reviewed for this draft report. The final assessment report will include the review results.

Appendix H

Response to Review Comments

Response to Review Comments Camp Carroll Area D and Area 41 Site Investigations – Final Draft Dated September 2003

Item	Page No.	Comment	Response
No. 1	General	The report should be separated into two parts: Area D and Area 41 unless those areas have identical environmental situation and/or close enough to consider as one spatial regime.	Each of the areas was discussed separately under specific headings. Spatial regime is one of many considerations for the report organization. We chose our format based on the similarity of objectives, site conditions, and target contaminants, etc.
2	General	Avoid repetition unless it's very important to emphasize on the matter repeatedly.	Comment noted.
3	Executive Summary	The executive summary must be concise and summarize what is the scope and what is the purpose of work and what you got from the investigation, and recommendation. Site background and site history should be removed here in executive summary, those are repeatedly appeared in other sections.	The scope of work has been added to the executive summary as requested. The background material was left intact so the executive summary would standalone for readers.
4	ES-4	Conceptual Site Model, 2nd par. line 2: the term "aqueous phase contaminants", does it mean the contaminants are liquid phase? Or dissolved in groundwater? Clarify this.	The term "aqueous phase" refers to compounds dissolved in water. The term "non-aqueous phase liquid" or "NAPL" is generally used for liquid phase contaminants. The term "dissolved" has been substituted for the term "aqueous phase" in the text as requested.
5	1-6	1.2. Scope and Objectives, line 3: Change to read to as "as drum storage yard (Area	Text changed as suggested.

		11 1	
		41) and hazardous waste	
		landfill (Area D),	
		respectively."	1 + 1 1 2 1
6	1-6 to 1-10	Section 1.2.1 and 1.2.2: these	Text deleted as suggested.
		sections should be removed	
		because those are appeared	
		in the field activities again.	
		Introduction section is	
		necessarily to cover the	
		scope of work, historic and	
		existing information, not	
		detail for the field and	
		sampling activities. The	
		activities seem to describe	
		detail in other sections.	
	4 4 4	Figure 1-1. Not legible, and	Figure 1-1 has been replaced as
7	1-11	_	suggested.
		replace with a Base map.	The figures have been revised as
8	Fig. 2-2 and	The number in the grid cell is	suggested.
	2-3	not legible in both graphics.	suggested.
		Legend should explain all	
		objectives in the graphics	
		too, ie., red and yellow in	
		both figures.	The text has been revised to
9	2-5	2.4. Geophysical survey:	
		Was the survey performed	indicate that the landfill
		prior to the Site	boundary was delineated on the
		Reconnaissance? Did you	basis of information provided by
		have clear information where	DPW of Camp Carroll.
		the land fill locates before? If	
		then, describe how the	
		survey was able to perform	
		beforchand. Also be clear	
		when the field activity was	
		started.	
10	2-6	section 2.5, 2.6 and 2.7:	The text has been revised to
'		Those field activities seem to	indicate that the site
		be happened at same time	reconnaissance started before the
		with the preliminary site	geophysical survey to establish a
		reconnaissance. Is that	grid system and site clearance for
		correct understanding?	field activities.
11	2-6	Section 2.5: what was the	The text has been revised to
1 11	220	purpose of trenching? Was	indicate that trenching was
		the trenching performed for	performed only for Area D to
		both areas? On the Figures 2-	identify and locate potential
		1 and 2-2, it appears that the	remaining buried objects.
		trenching was only at Area	ionimining outres objects.
	1	i trenching was only at Airea	1

		D.	
12	2-7	Section 2.7 Rotary Borehole Drilling, 2nd par.: Clarify the CME drill rig does not use an acrylic sleeve for soil sample, it's just a stainless split spoon.	Text revised as suggested.
13	2-6 and 2-7	Describe why the different two sampling equipments were utilized if there is a reason.	The text has been revised to indicate that direct push technology was used to obtain shallow samples quickly and the CME drill rig was used to obtain deeper samples and to install groundwater monitoring wells.
14	General for Section 2	Present a table that show X-Y-Z coordinate for boreholes and monitoring wells, a top of pipe should be appeared for monitoring wells.	The table provided in the text describes the location of monitoring wells by the grid cell identifier. The surveyed well coordinates are provided in the appendices. The "top of pipe" elevation is provided in Table 2-1 as top of casing (TOC) elevation.
15	General for Section 2	For field sampling activities, was the decontamination process performed during each sampling activity? Was any rinsate or duplicate sample collected for QA/QC purpose? If not, describe the reason.	The text has been revised to indicate that Samsung collected duplicate samples and conducted decontamination for all sampling equipment prior to each sampling event. Rinsate samples were not collected because a liner was used during soil sampling activities.
16	ES-1	Spell it out for "WWC"	The acronym WWC has been defined as "Woodward-Clyde Consultants" in the text.
17	3-1	3.1 Geology and Soils: Please double check the basement rock of Camp Carroll. It's known as a Mesozoic Granite if you consider only the Carroll area. And it's hard to believe that granitic gneiss appears intercalation with sedimentary rocks such as schists and limestones.	Text revised to indicate that the basement rock in the vicinity of Camp Carroll is a Mesozoic granite. Text has been revised to indicate other geologic descriptions were reported in previous site assessment reports provided by the client.

r		T	
		Please get a correct geologic information for the area, and	
		describe the subsurface	
		geology according to that	
		information.	
18	3-3	Section 3.3.3 Aquifer	A summary table of calculated
		Testing: This section needs	aquifer parameters has been
		to move to appendix, and	added to the text as requested.
		provide a summary table for	The aquifer testing discussion
		the testing instead of the	has been retained to document
		algorithm.	the analytical methods and
			assumptions used.
19	3-5	Section 3.3.4. Groundwater	Summary tables of the
		elevations and gradients:	groundwater elevations are
İ		Provide a summary table for	provided in Appendix E.
		the groundwater level	remote and the second s
		measurement and it's	
		variation according to the time.	
20	3-7	Section 3.4. Geophysical	Text revised as suggested.
20	3-7	Survey: Remove the 1st	Towns and an angles
		paragraph, it's mentioned	
		previously (Section 2.4.)	La addressed
		already. Avoid repetition!!!	
21	3-9 to 3-14	Improve the figures, the	The figures have been revised as
		numbers are not legible at	suggested.
		all. Put a background	
		drawing in order to see	
		where the wells are located	
		with respect to buildings or	
		any identifiable objects. Use	
		the scaled topo site maps	
	6 17 to 4 24	with coordinates system. Refer to the comments #21.	Refer to response #21.
22	4-17 to 4-34 General for	Appendix F does not have	The raw laboratory data was
23	Section 4	laboratory data, there is only	submitted with the draft report.
	Section 4	sample COC. You have to	The laboratory detection limits
		present the lab method	are provided in the companion
		detection limit at some place	QAPP document.
		else.	-
24	4-49	Table 4-3: Does the residual	The term "residual" has been
		range mean "oil range"?	changed to "oil".
25	5-5	Summary table: indicate	The summary table has been
		which region's PRG was	modified to indicate that USEPA
		applied for	Region 9 PRGs were used.
26	6-1	Section 6: 4th para: it's not	Text revised to indicate that

		clear which area you mention here. Is it for both area? Or	discussion refers to Area D.
		one of those?	
27	6-1	No action: This could not be a recommendation if you know the contaminants could possibly impact to site workers. It does not make sense in terms of reducing potential human health risk by exposure to contaminants.	The text has been revised to indicate that to prevent exposure to site contaminants, site access would need to restricted to workers wearing appropriate personal protective equipment (PPE) if the no-action alternative was adopted. In addition, the text and recommendations in this section have been revised in accordance with the results of the PRE conducted and discussed in Section 5.
28	General	Table 4-3 to 4-14: The chemical results should be presented with the sample depth, not in the order but actual depth of sample retrieved.	The summary tables have been revised to include the sample depth information.
29	6-3	Removal of Contaminated Soils: Is this section describing only for Area D? or including both areas? Why was dioxin-contaminates soil only considered for remediation or removal?	Text revised to indicate that the discussion refers to Area D only. The section has also been revised in accordance with the results of the PRE conducted and discussed in Section 5.
30	General	In the SOW for this project, it should be included the extent of contamination for each contaminants. It does not seem to meet the one of Scope. In order to clarify the vertical extent of contamination the sample depth should be presented along with the chemical results. Also all the figures presented in the report can not easily be legible, and need to put an index map at each figure to recognize where the project sites are located with respect to	The summary tables have been revised to include the depth that each sample was obtained. The figures have been revised, providing for clearer viewing.



		known objectives.	
31	ES-5	5th par. It is suggested that the title be changed to Capping with Clay Liner. What is the Subtitle C criteria?	Title changed to "Cap with Clay Liner". Text revised to cite "RCRA Title 35 Subtitle C".
32	ES-2	2nd par. Line 3, Correct typo to read as "through".	Text corrected as suggested.
33	ES-2	2nd par. The contaminated areas appear to be in the confined areas only, two locations at Area 41 and Area D respectively. If this is the case, shouldn't the contaminants be widespread out instead of confining in the two areas only. What is the contaminant of concerns here to address? Dioxin?	Text refers to other potential sources of contamination that may exist the sites in question. The text has been revised to note that all detections of these compounds may not necessarily reflect isolated site conditions and should also be reviewed with respect to local background conditions.
34	ES-2	3rd par. Line 2 referenced the personnel reports. Is the statement here from the results of interviews? Personnel reports sound the personnel records. If Interviews were made, they should be included in this report as a part of report. Who was the eye-witness?	The text has been revised to indicate that the information was provided by interviews with onsite personnel. However, the persons interviewed do not want to be identified by name.
35	ES-5	Aren't the part of surface areas covered with pavement? Do those areas still require liner? The areas recommended for the liner should be either highlighted or located on drawings.	The asphalt paving covering portions of the site was not designed and is not maintained to act as a permanent barrier to the infiltration of water at the ground surface. While these areas may provide some protection, the adequacy of existing structures would need to be evaluated by an engineer during the design process.
36	ES-5	Provide a typical cross section for the capping system.	Typical cross sections have been provided for the two proposed capping systems.
37	ES-6	2nd par., Shipping wastes to the States side is unrealistic and not feasible. Remedial	On-site thermal incineration could be considered but would be a regulatory issue too.

	T	alternatives must be	
İ		economically and technically	
		feasible. What about thermal	
		incineration?	
38	ES-6 and 7-4	Although the selection of	The selection of remedial
		remedial alternatives are not	alternatives for Area 41 was not
		required for the Area 41, isn't	part of the scope of work for this
		it reasonable to assume	project. The report recommends
		almost same	additional site investigation
		recommendations for the	activities in Area 41 to define the
		Area 41 as well?	limits of the contaminants. If the
			findings indicate similar
			concentrations and distributions
			of contaminants as in Area D,
		****	then the same remedial
		58 P. C.	alternatives may be appropriate.
			However, it should be noted that
			the remedial alternatives for
			Area D were predicated on the
			nature of this site as a former
			landfill.
39	6-6	Change title to read as "Cap	Title revised as suggested.
		with Geosynthetic Liner"	
40	6-7	Change title to read as "Cap	Title revised as suggested.
	F. F. A	with Caly Liner" itional Review Comments date	od Tomo 4, 2004
1	5-5 &	For the criteria of PRG	This portion of Section 5 has
1			been rewritten and now includes
	summary tables	applying for soils - before applying the PRG	the results of a PRE conducted
	tables	numbers for the data,	for the sites. The evaluation
		describe what pathway(s) to	criteria has been clarified.
		human was considered for	
		the contaminants. Based on	
		that you could have different	
		PRG numbers, should clarify	
		in the text why you are	
		considering. Only looking at	•
		the number at the summary	
		tables, the PRG numbers	
		seem to be from "the table of	
		direct contact exposure	
		pathways" in PRG Region 9.	
- , 	5 5 O-	For the risk factor of 1.0E-	This parties of Section 5 has
2	5-5 &	04,	This portion of Section 5 has been rewritten to include the
	summary tables	- Multiplying the cancer	results of a PRE conducted for
	tautes	- iviantipiying the cancer	results of a LIVE collanging for

PRG concentrations by 10 or 100 to set "action levels" for triggering remediation or to set less stringent cleanup levels, this practice could lead one to overlook serious noncancer health threats and it is strongly recommended "consult with a toxicologist or regional risk assessor before doing this".

- following issues also need to discuss in the text because the Risk Factor 1.0 E-04 gives a lot higher than PRG. For example, the concentration of Arsenic in the Area D exceeds the PRG, but no action was recommended. So it should be clear why this level of Arsenic contents can be discarded in remedial action.

- 1) Are there potential ecological concerns?
- 2) Is there potential for land use other than those covered by the PRGs (that is, residential and industrial)?
- 3) Are there other likely human exposure pathways that were not considered in development of the PRGs (e.g. impact to groundwater, local fish consumption, raising beef, dairy, or other livestock)?
- 4) Are there unusual site conditions (e.g. large areas of contamination, high fugitive dust levels, potential for indoor air contamination)?
- 5) If any metals should be considered as a target for remediation, should provide

the sites.

		a site-specific background level.	
3	5-5 & summary tables	For the PRG number for dioxins The table seems not to provide the PRG numbers for whole dioxin compounds. Only for 2,3,7,8-TCDD is provided with the number of 1.6E-05 mg/kg in an industrial soil (in the case of direct contact exposure). We prefer to have a summary table of the PRG numbers for dioxins if available as you did for other contaminants.	This portion of Section 5 has been rewritten to include the results of a PRE conducted for the sites.

Appendix A

Geophysical Survey Results

Final Report

Geophysical assessment to a landfill site in Camp Carroll, Waegwan, Korea

May 2003

Submitted to:

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Geophysical assessment to a landfill site in Camp Carroll, Waegwan, Korea

Signature Sheet

Ph.D

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- Figure 7. Schematic diagram for dipole-dipole electrical survey. The larger the spread number (n), the deeper information the data carries.
- Figure 8. Survey lines for HLEM (blue) and DC resistivity method (red)
- Figure 9. Resistivity sections from DC resistivity survey for the four lines shown in figure 8.
- Figure 10. 3-D view of electrical resistivity distribution from DC resistivity survey
- Figure 11. Apparent resistivity contours from HLEM survey
- Figure 12. Integrated interpretation of geophysical methods (HLEM and DC resistivity) with backhoe excavation.

1. Introduction

Area D (Figure 1) in Camp Carroll has been identified as a former hazardous waste landfill. Numerous hazardous materials were disposed in this landfill between the years of 1977 and 1982. Personnel interviews indicated that many drummed hazardous materials were transported from Area 41. The landfill dimensions were approximately 500 feet by 250 feet in area; and 20 to 30 feet deep (Figure 2). Reportedly, much of the filled materials and surrounding soil was excavated between 1982 and 1983 and placed into 55-gallon drums. Despite the removal activity, residual amounts of contaminated material may have remained.

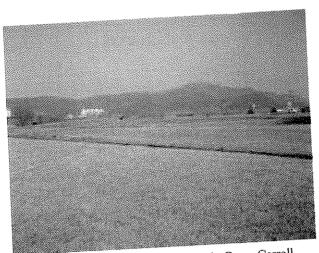


Figure 1. An overview of Area D in Camp Carroll

In this project, two different geophysical approaches have been made to characterize the landfill site. The objectives of geophysical survey can be summarized by following two; 1) defining the thickness of the landfill or the depth to the bedrock, and 2) locating the buried metallic objects such as drums, if they still remains. Two different approaches have been made for each objective; DC resistivity method for the former, and horizontal loop electromagnetic (HLEM) method for the latter.

Electrical properties of a medium are mainly dependent on the ion contents of pore fluid as well as clay contents of the soil (Keller, 1988). Typical waste disposal site shows three layered structure; the landfill on top, residual soil on the middle, and the bedrock on the bottom. Usually the resistivity of the landfill and the residual soil is smaller to the bedrock. Residual soil shows lowest resistivity among them. Residual soils commonly contain much of clay rather than sand. The

landfill, however, commonly contains plenty of sand other than clay, which makes its resistivity larger than that of the residual soils underneath the landfill. DC resistivity method shows very strong features to map the layered earth model (Dobrin, 1976).

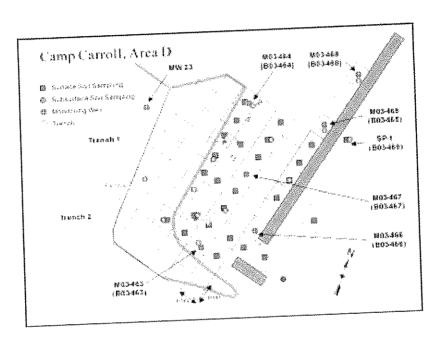


Figure 2. Site map of Camp Carroll landfill area

Electromagnetic (EM) survey, horizontal loop EM (HLEM), can give us an useful information about the location of the metallic objects, if they are within the landfill. The depth of investigation of HLEM ranges up to 20 m depending on the frequency it uses and the conductivity of the medium (Song et al., 2001).

By integrating the two methods in this project, geo-electrical structures for the landfill site as well as the position of potential buried metallic objects (e.g., drums or other containers) can be identified.

2. Theories & Methods

2.1 Horizontal Loop Electro-Magnetic method (HLEM)

HLEM transmits HF band (kHz \sim tens of kHz) electromagnetic waves. The transmitted primary electromagnetic (EM) fields induce the eddy currents in the metallic (conductive) objects beneath the earth. The eddy currents, in turn, make secondary EM fields as shown in figure 3. Measuring the secondary field with small loops on the surface, one can figure out the location of the anomalous body as well as the conductivity of the ground.

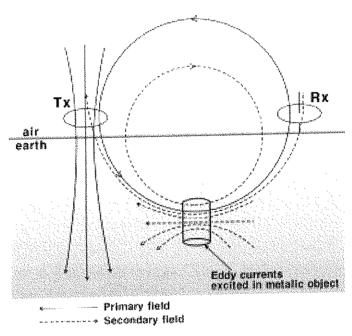


Figure 3. Theory of horizontal loop electromagnetic (HLEM) method.

Figure 4 and Figure 5 shows typical HLEM survey procedure and typical responses of buried metallic sphere, respectively. EM31 provides two types of measurements; i.e., horizontal coplanar (HCP) and vertical coplanar (VCP) arrays. Apparent conductivity can be calculated from both modes but HCP configuration is a little more sensitive to the buried targets than VCP configuration (Frischknecht et al., 1991). Note that the minimum or maximum peaks at the right position of the buried objects.

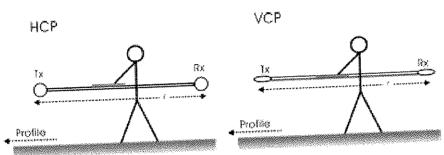


Figure 4. Schematic diagram for typical HLEM survey. The survey can be either the horizontal coplanar (HCP) or the vertical co-planar (VCP) configuration.

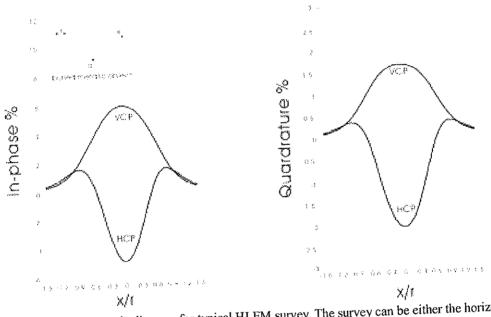


Figure 5. Schematic diagram for typical HLEM survey. The survey can be either the horizontal coplanar (HCP) or the vertical coplanar (VCP) configuration.

Apparent resistivity (ρ_a) can be calculated from both configurations by

) can be calculated from both configurations by

$$\frac{1}{\rho_a} \approx \frac{4}{\mu_0 \omega r^2} \times (Quardrature \ reading) \tag{1}$$

where, ω is angular frequency, μ_0 is magnetic permeability in free space, and r is the distance between the transmitter and the receiver.

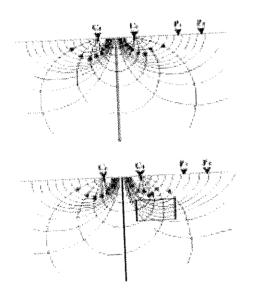
2.2 DC resistivity (dipole-dipole) survey

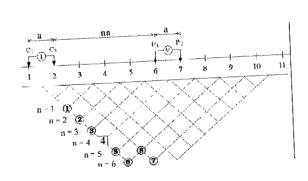
Dipole-dipole survey needs two current electrodes and two potential electrodes. The potential induced by transmitted current is disturbed by underground inhomogeneities (Figure 6). Dipole-dipole survey measures the potential distribution on the surface with fixed current/potential electrode spacing. The bigger the separation between the current electrodes and the potential electrodes is, the deeper information the data carries. With moving the potential electrodes with fixed separation, normalized potential with applied current ($\Delta V/I$) is measured (Figure 7). The measured data is converted to apparent resistivity by multiplying the geometric factor (G):

$$\rho_a = G \frac{\Lambda V}{I}$$

$$G = -2\pi (n-1)n(n+1)a$$
(2)

The geometric factor is dependant on the electrode spacing (a) and the spread number (n) illustrated in Figure 7. Two-dimensional resistivity image can be gathered by inversion process using the apparent resistivity. A commercial software Dipro4Win was used for inversion of the data.





Stacking will improve signal to noise (S/N) ratio. Maximizing transmitting power (current) is another good way of improving S/N ratio. ABEM Terrameter (model SAS300C) provides 2mA to 500mA transmitting currents selectable depending on the resistivity of the earth. In most of cases, 20mA of currents were transmitted in this survey.

3. Geophysical survey design

Twelve HLEM survey lines were set up to from two-dimensional grid on the surface as shown in Figure 8. The main purpose of the HLEM survey is to detect any metallic objects (drums) beneath the earth. When plotting 2-dimensional contours of the resistivity measured, closed contours will be concentrated on the right place where a metallic objects is buried.

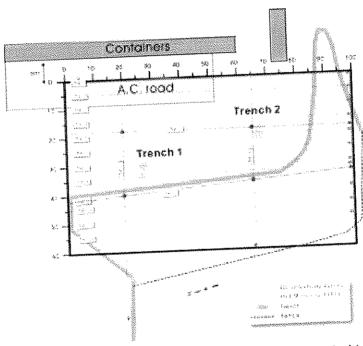


Figure 8. Survey lines for HLEM (blue) and DC resistivity method (red)

At every survey line, the HLEM data have been collected at every 2m for both vertical co-planer (VCP) and horizontal co-planer (HCP) configuration of the source and receiver coils. Though, in-line configuration of the coils (the TX coil and RX coils are in-line with the survey lines) was used to minimize the interferences by the containers and by the fences around the survey area, they will inevitably affect the data near to them.

Four DC resistivity survey lines are set up to find out the depth to the residual soils and/or bedrock; two of them are in N-S directions and the other two are perpendicular to them (red lines in Figure 8). The dipole spacing for Line-1 and Line-2 are set to 5m, and for Line-3 and Line 4 to 3m, of which maximum penetration depth is 25m and 15m, respectively.

4. Results and Interpretations

4.1 DC resistivity (dipole-dipole) survey

Figure 9 shows the inversion results of the four DC resistivity surveys. Generally speaking, the resistivity sections show the characteristics of the two-layered earth. The top layer shows high resistivity and the bottom shows relatively low resistivity for all the four sections. The top layer with high resistivity (ranged from 100 ~500 ohm-m) can be the landfill material over the groundwater level, while the bottom layer with lower resistivity (below 100 ohm-m) can be the residual soil below the groundwater level. They say that the area used to be an agricultural field before the landfill. The residual soil in agricultural fields shows the characteristics of tine-grained, low permeability, high water contents, and thus low resistivity. Estimated boundary between the landfill materials and the residual soils are overlain in each resistivity sections. The boundary shows almost flat except for Line-3 and the thickness of the landfill ranges 3 to 7 m.

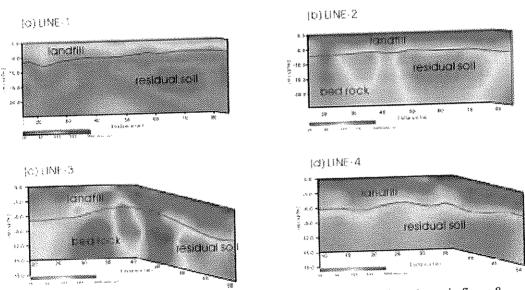


Figure 9. Resistivity sections from DC resistivity survey for the four lines shown in figure 8.

High resistivity below 10m (a few hundred ohm-m) can be the bedrock underneath the residual soils. Note that it appears only at the left side in Line-2 and at the center of Line-3. One cannot find such layer from Line-1 and Line-4. The bedrock can lie deeper than 20 m in Line-1 and Line-4.

The resistivity of groundwater normally shows from about 50 ohm-m to a few hundreds ohm-m depending on its mineral contents. The more the groundwater contains the metallic mineral, the smaller the resistivity of the groundwater. From the extra-ordinarily low resistivity of the second layer (especially at around 70m in Line-1), which shows 30 ~80 ohm-m, we have a doubt that the groundwater may contains various kind of metallic mineral or be contaminated.

Figure 10 shows a 3-D view of the DC resistivity results. Note that high resistivity zone of 3rd layer is concentrated to the NW part of the site. We assumed that this high resistivity zone indicates the bedrock. The bedrock is seated deeper than 20 m in SE part, while at around 10m in NW part of the survey area (marked A in the figure).

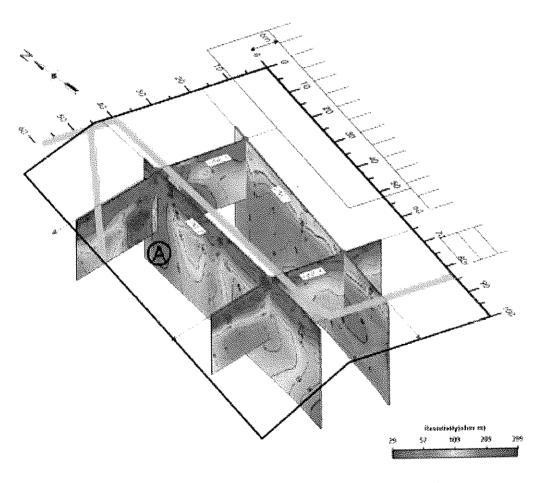


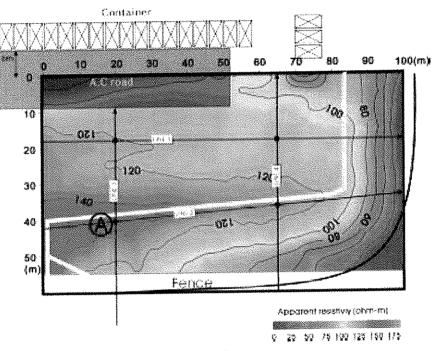
Figure 10. 3-D view of electrical resistivity distribution from DC resistivity survey

4.2 HLEM survey

Figure 11 shows the apparent resistivity contours from the HLEM survey. Apparent resistivity contours from VCP and HCP shows very similar results, except for the resistivity values. VCP shows slightly high apparent resistivity values than HCP.

The HLEM methods are very sensitive to the nearby metallic objects. Note that the fences and the containers affect the HLEM data and appear as low resistivity anomalies (below 100 ohm-m) surrounding the survey area. Excluding them, any conductive anomaly couldn't be found within the region. This, in turn, implies us that no more metallic drums are exists within the survey area. Overall apparent resistivity of the ground lies at around 100 ohm-m.

Note the high resistivity anomaly at the marking point (A). This high resistivity anomaly is consistent with the high resistivity zone in DC resistivity survey above. As mentioned in DC resistivity section, the bedrock seems to lie in shallow depth (about 10 m) at the marking point A. Shallow bedrock will affect the HLEM data and appears as high resistivity anomaly.



(a) HCP

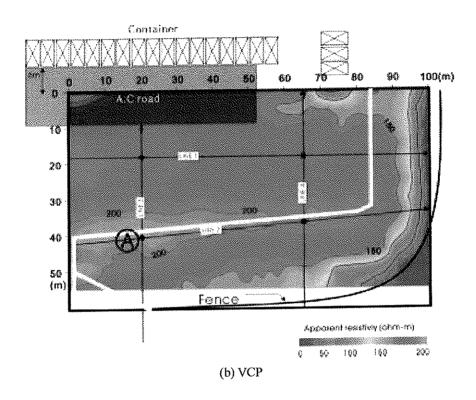


Figure 11. Apparent resistivity contours from HLEM survey

4.3 Integrated interpretations

Backhoe excavation has been carried out on two spots indicated in Figure 2. Figure 12 shows the resistivity sections from two different geophysical methods, HLEM and DC resistivity, with the pictures after the excavation. As expected in Trench 1, the residual soil came out at the depth of about 4~ 4.5 m from the surface, which is right depth where it shows low resistivity anomaly in resistivity section of Line-3 as indicated in the figure. The upper part of the residual soil (the landfill) showed almost homogeneous sand layer, which forms the high resistivity top layers in resistivity sections. Residual soils, however, has not been found in Trench 2 through about 5m from the surface. As can be seen from the resistivity section from Line-4, the boundary to the residual soil layer lies in around 6m in depth, which is somewhat deeper than at Trench 1.

Any drums or metallic objects could not been found, which, in turn, shows us why any conductive anomaly did not appear in HLEM data.

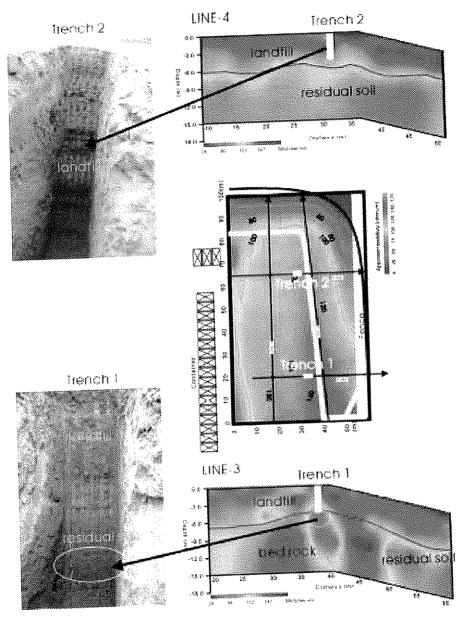


Figure 12. Integrated interpretation of geophysical methods (HLEM and DC resistivity) with backhoe excavation.

5. Conclusions and remarks

Horizontal loop electromagnetic method (HLEM) and DC resistivity survey has been carried out to characterize the landfill and potential buried drums or metallic objects. Both of the geophysical data showed very consistent results with each other. The resistivity of the landfill ranges from $100 \sim 250$ ohm-m, while that of residual soils is a few tens of ohm-m. The bedrock in this area seems to reach deeper than 20m in most parts of the area. An exception is NW part, where the bedrock depth seems to be within 10m.

Two-dimensional resistivity section clearly showed the boundary between the landfill and the residual soils. The boundary lies between 3 to 6 m in depth. Backhoe excavation also confirmed it. No conductive anomaly by any buried metallic objects was found in 2-dimensional apparent resistivity contour map from HLEM survey. Ground resistivity showed homogeneous feature all through the area.

Though we couldn't find any proof that metallic drums are still remains within the landfill, careful attention should be paid to the extra-ordinal low resistivity anomaly (below 50 ohm-m) in the resistivity section from DC resistivity survey, see 70m from left in Line-2 section in Figure 9. This can be either some kind of conductive objects including metallic drums or the groundwater contaminated by various ionic solutions as well as heavy metallic ions. The latter is more consistent with *a-priori* information of the site as well as geophysical interpretation in following two reasons;

- The anomaly doesn't appear within the landfill layer, but in depth over 15m below the residual soils. There is no reason that metallic drums are buried within the residual soil layer.
- The anomaly only appears in DC resistivity. The HLEM method, which is more sensitive to the concentrated metallic objects than DC resistivity, couldn't show the anomaly. In HLEM data, the resistivity in that part shows slightly lower than other parts instead. This suggests us that the anomaly is not any concentrated body but spread widely.

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Appendix B

Field Logbook and Notes

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(88)	4/14/03 CAMP GARRA DRUR D& 41 P21		07% CHOTTE TRUST O STAN JULY RUCCHES	LOWER # 58 FLOW THE BUTTY OF THE	Mus to per America Cocentral 30 m	NOTH OF #57, THIS CHAMLE	12 Due TO SUSPICION CONTRAMBATION	IN LOCATION # 37. I NOTED THE	SAN YOUR THAT THE CHAMER WILL	LEWIS TO BOSHING ON INTO BY AT	ELEV. BELLIN HREEDYD HIMMINER	THE CANGERTH TO IS I'M COURT IS	ETICANNIETED IN #57, THIS CONT / PAGE	MAY Extend OUTSIDE OF AACH D.	DR Les general made this Decion	TO ICCLORATE # 38,	7 500 MATE - 501-150 70 , 4505 7	ORDO MARUE MATERAL ENLUMNTERES &	Followigin Belginks inchestinely	Doews with DEPTH, FUD SWITCH TO	6" AC(ESS).
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Appendix C

Boring Logs, Well Completion Diagrams, Well Development Logs, and Groundwater Sampling Logs

Soil Sampling PID Checking AREA D

				5	on Sam	ipling PID Checki	ng AKEA	19				
	STATISTICS OF STATES	Time(1st)	tominima)	\$3508-X500465				Time(2ad	sampling)		PID	
Point NOJ				Depth	rid	REMARK	Date	Callected	Measured	Depth	2	REMARK
Soil NO.	Date	Collected		Dellin	(ppm)		A CONTRACTOR	Time	Time		(ppm)	
		Time	Time	000000000000000000000000000000000000000			2003,5,27	11:05		lm	_	
CC001 SS01	2003.04.01	11:03		l m		ascon at 9ft	2003,3.27	12:15		6.6m	-	
BS01	•••	8:25	8:45	20~220	57.6			12:13		0,011		
	2003.04.09	8;35	8:50	25~270	465		2003.5.27					
	200,7,04,02	8:55	9;20	35~370	16.1							
		9:20	9;45	40-420	N.D		2003.6.2	10:31	10:50	~2.2m	0	
CC003 \$301	2003.04.01	14:40	14:58	2m	N.D		2003.5.27	13:55	10.50	lm	-,	
CC004 SS01	2003,04.01	10:53	<u> </u>	Jm			2003.3.27	15:10		23m		
CC006 SS01		14:29		1-2.5m			2003,5.28	15:28		3.5~4.5m	•	
BS01	2003.04.01	15:00		4~5.5m	- :		2003.3.20	15:52		5-6m		
BS02		15:15		5.5~7m	-		2003.6.2	10:59	11:15	1~2.2m	5.1	
CC007 SS01	2003.04.01	11:15	11:27	200	0.1	7.C=00	2003.5.28	14:12	14:35	2~3m	0	
CC008 \$501	2003,04,01	11:30	11:45	2m	03	BG=0 mg/l	2003.5.28	14:40	14.32	2~3m		
CC009 SS01	2003.04.01	11:45	12:00	2.1m	0.2		2303,3.26	14:20	-	1~2n:		
CC010 SS01		10:28	11:02	im	0.2		2003.5.27	15:30		4.7~5.8m		
BS0J	2003.04.01	11:40	·····	4.7~5.8m	-		2003.3.21	15:56		7,3~8.6m		
BS02		12:20		7.3~8.6m		grab		13.30				
CC012		9:35	10:00	0~20	N.D			1	1		Į.	
		9:45	10:00	2~4ft	N.D						•	ļ
		9:50	10:10	4~6∩	2.6						1	
		10:00	10:20	6~7.5fl	2.3				L			
1		10:05	10:40	8~10U	40.6						1	
1		10:10	10:46	10-120	7.4	l			1			
	2003.04.13	10:15	10:45	12~14Ω	453			1	1			
		10,20	10:45	15 J7ft	40.7			1	1			
1		10:25	10:50	2022ft	236			1	1			
		10:50	11:20	25~27fl	8.1			1	1			
1		11:05	11:25	30~32N	284			1	ł			ř
1		11:25	12:15	35~37fl	5.5			1	ł			
		11:45	12:15	40-421)	6.6		2000 5 33	14:48		2~3m	-	
CC013 SS01	2003.04.01	12:00	12:13	2111	0.5		2003,5.27		11:35	1~2.2m	0	
CC014 SS01	2003.04.02	14:00	<u> </u>	1.9m	<u> </u>		2003.6.2	11:22 12:25	12:40	2~3m	0	
CC015 SS01	2003.04.01	14:20	14:55	2m	N.D	T.P: 68.1, lots of ascon	2003.5.28		13:30	1~2.2m	2.5	
CC017 SS01		8:43	9:13	1~2.5	N.D			13:05 15:16	15:40	4~5.2m	2.6	
BS01	2003,04.02	B:55	9:15	2,5-4m	0.1		2003.6.2		16:40	5.5-6.7m	1.2	
D302	2005,04.02	9:35	10:40	5,5~7m	0.8			36:15 36:15	16:50	7,0~8.2m	2.7	
DS00		9:55	10:47	7~8.5m	0.7			16:58	17:20	1~2.2m	2.9	
CC018 SS01		11:10		1~1,25m			2003.6.2	10:38	17:20	4.5~5.7m	3,4	1
3501	2003.04.02	13:20	13:40	4.3~6.0m	1.3	CH4 ConC: 89.3mg/kg	7607,617	17:46	18:10	7.5~8.7m	5.1	1
BS02		14:00	14:18	7.5~9m	0.2	CH4 ConC: 152.2mg/kg	2002 6 22	17:46	18:10	1.2~2.2m		
CC019 8801	2003,01.01	15:15	15.79	1 2m	0.1		2003.5.27	17:57	16:15	5 2.5m	3,3	
CC020 8801	2003,04.01	16:20	1634	2 ₈₁	N.D			15:36	15:50	1.5~2.5m	4.1	
CC021 SS01	2003,04.01	16:58	17:35	1.9m	N.D		2003.5.29	9:10	9:40	1.0~2.2m	3.4	
SS01	2003.04.02	14:30		1~2.5m	-		2003.6.3	10:20	10:36	6.5~7.7m	0.7	1.
CC022 BS01	2005.04.02	15:45	16:05	6.5~8m	0.1	<u></u>	2007 5 22	17:02	10:30	2~3m	9.7	
CC023 SS01	2003,04,01	17:15	17:23	2m	N.D		2003.5.27		18:40	5.5~6.7m	1 2	
CC024 BS01		9:50	10:05	20~2211	83.8		5002 4 5	18:20	19:30	8.5~9.7m	3.5	
BS02	2003.04.08	10:30	10:52	30~320	1605		2003.6.2	18:40	19:50	9.7~10.8m	0	
BS03	1	10:40	11:10	35~370	325	BG : 2.1	ł	19:20	1 19:50	7.7~10.8B	· ·	.1

Point NO.	25-072-030-00901		me	Kerningh C	PID		05 49 EE	Ti			PID	REMARK
Soil NO.	Date	Collected Time	Measured Time	Depth	(ppm)	REMARK	Date		Measured Time	Depth	(ppm)	KEMAKK
CC039		14:05	14:25	8~10ft	N.D		l					
		14:10	14:30	16~12N	N.D							
		14:15	14:40	15~17A	N.D							
	2003.04.12	14:27	15:00	20~220	N.D							
		14:45	15:10	25~270	N.D							
		15:25	16:00	30~32A 35~37A	N.D N.D							
70040		15;35 10:30	16:00 10:55	9-7ft	42				 			
CC040		10:35	10:55	2-46	22		l					
1	1	10:15	11:05	4~6ft	14.7		1	11:48	12:10	1.2~2.2m	4.8	
SS01		11:05	11:35	6~7.5ft	3.2							
	1	11:15	11:35	8~10ft	8.8							
	2003.04.15	11:20	11:35	10~12ft	106		2003.5.29					
		11:25	11:40	12~14ft	190		1					
		11:30	11:40	15-170	72.1		ł	13:22	13:33	6~6.7m	4.3	
BS01		13:15	13:30	20-220	94.7 26.5		ł	13.22	13.33	U-0.7III	7,5	
		13:20 13:40	13:35 13:50	25~27€ 30~32€	5.4		1					
C080 BS01	2003,04,09	10:40	13:30	4,5m			2003.6.3	11:45	12:00	4.5~5.7m.	1.4	

or more and the	0000000		Time(1st	mmpling)	1078245300	PID		ig. Circum	Time(2nd			PID	REMARK
Point ? Sail N		Date	Collected Time		Depth	(ppm)	REMARK	Date	Collected Time	Measured Time	Depth	(nem)	REMARK
CC066	8801	anii mara	8,30	8:53	(3~2∩	113			10:05	10:20	0.5~1.7m	6	
00000	2001		8:30	9:05	2-4ft	53.6		İ				-	
			8:40	9:10	67.5ft	44.6							
1			8:45	9:20	8-10ft	15.2							
İ			8:50	9:20	10~12€	2			10:35	10:48	34.2m	4.1	
- 1	BSOL	2003.4.11	9:05	9:30	12~14ft	1.8		2003.6.4					
			9:45	10:15	15~17û	9.5							
			10:05	10:40	20~21 SO	253							
			10:30	10:50	25~27R	30.2							
- 1	12000		11:05	11:30	30-320	- 6]						
	BS02		11:35	12:05	35~35'4"	5.9			11:25	11:50	9-10.0m	0.5	
CC067	SS01	2003.04.04	13:05	13:35	0.1-0.8m	0.8		2003.6.4	12:15	12:40	0.5~1.7m	1.4	
CC069	SSØ1	2003.04.04	14:00	14:35	0.1~0.8m	0.2	T.P: 23.3 CO2: 1831					ļ	
CC070		2003.04.04	14:16	14:38	0.1~0.8m	0.1	T.P:70.2 CO2:5300.2						

												1 _	BOREHOL	E/WELL LOCAT	ION SKETCH MAP
											PAGE 1 OF 2	N			
			LOG	0	FΝ	/ELI	_ A	RE/	41	#53					
			OO ICOT NA									-			
PROJECTING	Э.	l la	ROJECT NA	ME		Camp	Carr	oll Are	a D ar	id Area 41 RI		J₹			
LOCATION	~		٣							DATE & TIME STARTED 4/14/03					
LOGGEDBY	Car	np Carro	oli, Taegi	REV	EWEDE	Y OF K	viea			DATE & TIME FINISHED	****	1			
DRILLING CO	William Mark	an sail tea	<i>عا</i> و							4/15/03 (DRILLING METHOD	09:00	COORD	NATES		
DRILLING CC	MINACIO	*) [28/2LL.1/	FED /			<u>060</u>				Hollow-Ster	m Auger	-	IDE 4 OF E1	D ATION	DATUM
SAMPLING M	ETHOD lit-Spoot	ı Sampl	er	G/VIVI	rce PAN Hi	MER TY drauli		nmer		SIZE / TYPE OF BIT 6"		50	JRFACE EL		nean sea level
WELL INSTA	LLED?	C	ASING MAT		/DIAME	TER			CREEN			C d -	_	Diameter 7	Slot Size:
YES DE	OF NC	WELL CC		Sch	40 P\	FWELL C		Ti		Slotted Material: F TTOM OF SCREEN	PRODUCT SURFAC	ngth: 6.1 r Æ		Diameter, 2" DWATER SURFA	CE DATE
(msl)		т		·····		т		T		m / m				MELL CONS	4/15/2003 TRUCTION DETAILS
_ (§ g		~ \ <u>}</u>	ш		шį	ر اردور		2	SURF	ACE CONDITION:			DEPTH reters bgs)	A ACTITION A	
DEPTH leters bg PID	SLOWS DRIVE	S VE	LAB SAMPLE ID	EXTENT	SAMPLE	EPT	uscs	GRAPHIC LOG		ŁITHOLOGIĆ DE	ECCEIDTSON		EPT		
DEPTH (meters bgs) P1D	ã _m e	DRIVE / RECOVERY (meters / %)	_ 22	ŭ	\$ ⊢	DEPTH (meters bgs)	ر ا	5		LITTOLOGIC DE	FORM BOM		(i		
-	-	-	 	 			sc	XXX	CLAY	'EY GAND (GC): reddish yel	low(7.5YR 6/6), - 70%	b		┐ <mark>┆╒┩</mark> ╶╄	PVC Top Cap
† †	4/4/6/7	0.6098 / 83	4			-			medi	rm to coarse sand, ~30% fi	ries, moist; medium c	rsise.			
						[
	5/9/10/12	0,6098 / 88				1	SM		รเเกิ	, CLAYEY SAND (SM): rex	ddish yellow(7.5YR 6/	6) 30%	1-1-1		
-		-		_					grade dense	s to light brown (7.5YR 6/3)	i, ~70% sand, ~30% f	ines,	+ 1		
-	2/12/16/2	2.6098 / 100	d										h 1		1/2" Dia. Bentonite Pellets
+ +						<u> </u>							1,1		
2	18/23/25	0.6098 / 67	-			_2_									
						[
	9/26/37/5	0.6098 / 52				ļ -							} -		
3						3							3-		
├ - ┤	15/40/41/5	00.6098 / 87	,												
				ļ			a.		SUT	, CLAYEY SAND (CL): ligh	nt vellowish hrown (10	YR 6/4)	[]		
E0/6/92	6/40/45/5	00.6098791				_4_			~20%	very fine to fine sand, ~80 SAND (SM); reddish yello	% fines, moist.		4		
						ļ .	SM		roddia ~30%	th yellow(7.5YR 6/8), ~70%	medium to coarse s	and,	-		
1835.60	31/50	0,0098 / 100				- -			(80%	sand, 20% fines).			h -		
	0.,,00												1.1		
-5						5									
<u>a</u>						[<u> </u>									
¥[]														科	
A - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 -						6							-6-		
Ž -													h 1		
<u>\$</u>						-							1		
															Filter Pack
CAMP CARROLL AREA D AND AREA 41.69J		1												注到	,
<u>ا</u> ا													 		Slotted PVC Casing
- Q	50	2,1524 / 100	4		1		-	翻					+ +		
S 8						-8-							-8		
하 네					1	† -		134					[]		
LOG METRIC UNITS								图验							
8 1					<u></u>			LEE			,				haring (well and at the
	part of the man	eport prepa rface condit	red for the ni ions may dif	amed ter at	l project a other loc	and shou ations an	kd be re id may (ad rogeth change at	er with th this loca	at report for complete infor tion with the passage of tir	mation. This summ ne. The data preser	ary applie nted is a si	s only at the implification	e location of this of actual conditi	ouring / woii and at the ons encountered.
On This log is time of drill															

			BOREHOLE / WELL LOCATION SKETCH MAP
L	OG OF WELL AREA	PAGE 2 OF 2 A 41 #53	N 4
PROJECT NO. PRO	OJECT NAME	ea D and Area 41 RI	
LOCATION I		DATE & TIME STARTED	• •
OGGED BY	I, Taegu, Republic of Korea	4/14/03 15:22 DATE & TIME FINISHED	-
	,6	4/15/03 09:00	WELL CONSTRUCTION DETAILS
DEPTH (meters bgs) PID (ppmv) BLOWS / DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID EXTENT SAMPLE TYPE DEPTH (meters bgs) USCS GRAPHIC LOG	SURFACE CONDITION: LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAILS
E		End of Borehote at 12.2 m.	11-12-17 Threaded PVC El Cap 13-13-15-15-15-18-17-18-18-18-18-18-18-18-18-18-18-18-18-18-
This log is part of the report prepared time of drilling. Subsurface conditions	d for the named project and should be read togeth as may differ at other locations and may change at	er with that report for complete Information. This summar this location with the passage of time. The data present	ry applices only at the location of this boring / well and at the led is a simplification of actual conditions encountered.

												BOREHOL	E / WELL LOCAT	ION SKETCH MAP
										PAGE 1 OF 2	N			
											N			
			LOG	0	F W	/ELI	LΑ	RE/	4 41	#54	11			
ROJECT NO.		P	ROJECT NA	ME							-			
OCATION			····			Camp	Carr	oll Are	a D an	d Area 41 RI DATE & TIME STARTED	- 7			
	Can	np Carro	oll, Taeg		epubli NEWED 8		orea			4/9/03 13:40 DATE & TIME FINISHED	-			
OGGED BY			b6	KEV	ievved e	S¥				4/10/03 14:05				
RILLING CON	TRACTOR	RYDRILLER	FED/		b	6				DRILLING METHOD Hollow-Stem Auger	Ĺ.	RDINATES		
AMPLING ME		ı Sample	er	SAM		MERTY drauli		nmer		SIZE / TYPE OF BIT 8"		SURFACE E		DATUM nean sea leve
VELL INSTALI		C	ASING MAT		/ DIAME				CREEN	Slotted Material: PVC Le	ength: 6.	1 m	Diameter: 2"	Slot Size:
LEVATION OF		WELT CO	*****	JUII		F WELL C		T	OP & BO	TTOM OF SCREEN PRODUCT SURFAC			OWATER SURFAC	
		\		Г	<u> </u>	6		1	CUOE	m / m ACE CONDITION:		(S	WELL CONST	TRUCTION DETAILS
DEPTH neters bgs) PID (ppmv)	WS /	VE / VER' 's / %	9 E C	EXTENT	SAMPLE	TH rs bg	nscs	H S				PTH rs bg		
DEPTH (meters by PJD (ppmv)	3_OWS	CRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	Ä	SA E	DEPTH (neters bgs)	Su	3RAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)		
=				 	SS	ت ا	SC	XXX	SANE	Y LEAN CLAY (SC), greenish gray (GLEY1 5/50	3Y),			PVC Top Cap
	1/3/5/4	0.6098 / 70	C-054SB-0	ţΧ		<u> </u>			~10%	gravel, ~30% sand, ~60% fines, loose.				
]				\vdash	1	[]	<u> </u>			DADAND (DON HILLS IN THE STATE OF THE STATE		\		
-1	2/3/6/10	0.6098 / 80				<u> </u> -1	sc		reddis	EY SAND (SC): strong brown (7.5YR 4/6) 50% g h yellow(7.5YR 6/6), ~50% medium to coarse s fines, loose.	pades to and	' 1		
				-		 			3070	in had, to cook.		~ -		
	7 <i>1</i> 9/11/15	0,6098/90				[]							
2	8/11/14	0.4573					sc		CLAY	EY SAND (SC): strong brown (7.5YR 5/8), ~60%	6 coarse	, —2—		
-	41017	0.7.070				├ ~			sand,	~40% fines, loose.		-		
]	OMERE	0.6098 / 70												
_3	10/15/15/1	D.0090770				_3_						3		
-						-	SC		CLAY	EY SAND (SC): light reddish brown(5YR 6/4) 40 s to brown (7.5YR 5/4), ~60% coarse to medium	% a sand			
	4/12/15/20	1.2195/80							~40%	fines, moist; medium dense.	i oco ici,			
4						4						4	V. V.	
				_								+ 1		
							SM			EAND (EM): pink (7.6YR 7/3), -70% coarce to	mecăuri	_]		
	472472073	0,0098770							sand,	~30% fines, dense.		6		1/2" Dia, Uentoni
				\vdash								+ 1		Pellets
-						_						[]		
6						6						— —		
-							SM		reddis	SAND (SM): reddish brown(5YR 5/3) 50% graden brown(5YR 5/4), ~70% coarse to medium san	nd, ~30%	。 ├ ┤	23 23	
-	18/20/49/5	0.6098 / 100				-			finoc,	dry; vory donce; increased day content at 7.6 m 0% sand, 40% fines).	eters	_	国国	
						7						[]		
<i>`</i>						<u> </u>								
-												<u> </u>		
	25/50	0.3049 / 100	ı									-8-		
						-								
						· -								
	- 4 - £ 41- a -	nori prenar	ed for the n	amed	project a	and shou	ld be rea	ad togeth	erwith the	at report for complete information. This summ	ary app	ties only at the	e kocatkon of Ilis L	wing/weilandalil#
This log is pa	ar ormere a. Subsur	face condition	ons mav dif	fer at o	other loca	ations an	d may c	thange at	this locat	ion with the passage of time. The data preser	nted is a	i Simpaikation	Of accual consuler	ATIS ECHOOLUPILEX ECU.

										BOREHO	LE / WELL LOCATION SKETCH MAP
					FΝ	/EL	LA	REA	PAGE 2 OF 2		
PROJECT NO.		P	ROJECT NA	ME		Camp	Carr	oll Are	a D and Area 41 Rí		
OCATION	Car	np Carro	il, Taeg	u, R	epubli	c of K	orea		DATE & TIME STARTED 4/9/03 13:40		
OGGED BY			مان	REV	EWED E	3Y			DATE & TIME FINISHED 4/10/03 14:05		
pgs)	70111	,% %)	щ	E	ш	- (sbq		일	SURFACE CONDITION:	E (S)	WELL CONSTRUCTION DETAIL
DEPTH (meters bgs) PID (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTE	SAMPLE	DEPTH (meters bgs)	nscs	GRAPHIC LOG	ŁITHOLOGIC DESCRIPTION	DEPTH (meters bgs)	
-	16/43/50	0.4573 / 100	XC-054SB-0	X	SS		SM		SILTY SAND (SM): reddish brown(5YR 5/3), ~60% coarse medium sand, ~40% fines, very dense.	to	
-10						10-				10	Filter Pack Skutted PVC Ca
-11	40/50	0.304970				 			Greentha No. 2000 CC	11-	
-									Preprobe No recovery		
-12						12				12	
-13						13				13	
	50	0.1524/100					SM	31/12	SILTY, CLAYEY SAND (SM): yellowish brown (10YR 54), ~60% coarse to medium sand, ~40% fines, no odor; wet, ve dense.		Threaded PVC E
14—						14 			End of Borehole at 13.7 m.	14-	
15						15				- - -15	
4											
16-						-16				16	
17—						 					
1											
18—						 18 				18	
10						 - 10					
		.						,			

											_	BOREHO	LE/WE	LL LOCATIO	ON SKETCH MAP
										PAGE 1 OF 2	N				
			LOG		FΝ	/EL	LA	REA	41	#66					
ROJECT NO.		۴	ROJECT NA	WE		Camr	n Carr	oli Are	a D an	d Area 41 RI					
CATION										DATE & TIME STARTED	1				
XGGED BY	Can	np Carro	oll, Taeg		opubli ÆWED E		orea		-	4/11/03 08:15 DATE & TIME FINISHED	-				
ASSED BY	ŧ.	1	66							4/11/03 16:30					
RILLING CON	TRACTOF	R/DRILLER	FED/			66				DRILLING METHOD Hoflow-Stem Auger	COOR	DINATES			
WPLING MET				المعجول	PCE: HAN		PE			SIZE / TYPE OF BIT	s	URFACE E	LEVATIO		DATUM
Split ELL INSTALL		1 Sampl	er ASING MAT	ESIAI		<u>/drauli</u>	ic Han		CREEN	6"	<u> </u>			n	ean sea lev
YES ES	WC FD1				40 P		•		Type: S		ngth: 6.1		Diamel		Slot Size:
EVATION OF		WELL CO	OVER		TOPO	F WELL (CASING	Υ		TOM OF SCREEN PRODUCT SURFAC m / m	Œ	GROUN	DWATE	R SURFACI	E DATE 4/11/200
<u> </u>		T		Π	T	T]			CE CONDITION:		- m	WEL	L CONST	RUCTION DETAIL
PiD PiD (ppmv)	Š.Ε.	DRIVE / RECOVERY (neters / %)	LAB SAMPLE ID	F	当山	DEPTH (meters bgs)	Si	GRAPHIC LOG				DEPTH (meters bgs)			
neters by PID (ppmv)	BLOWS	F S S	₹ E	EXTENT	SAMPLE TYPE	EP.	nscs	RAP LOC		LITHOLOGIC DESCRIPTION		Zers			
, ë	<u>ლ</u> _		l o	ш	S,	الله الله		Ō				J E	T		
	~		L	17	SS		sc	88	SAND	Y LEAN CLAY (SC): strong brown (7.5YR 46) 2t to reddish yellow(7.5YR 66) and 50% grades to (7.5YR 5/6), ~40% medium to coarse sand, ~60	0% o stroca			₽ √F	—PVC Top Cap
	2/4/4/4	0.6098 / 80	CC-066SS-0	1X]		brown	; to recash yellow(7.5YR 6/6) and 50% grades ((7.5YR 5/6), ~40% medium to coarse sand, ~60 um odor, odor noted at 0.9 meters bas.	o suorig 0% fines,			\bowtie	
]				\vdash	1	[Peroe	armonor, outer motern at 0.2 meters ugs.				M	
	1/3/3/3	0.6098 / 50							1			_1_	K		
_				ļ	1	L .								Ø	
4	2141415	0.6098 / 80				ļ. <u> </u>						+ +			
	e-trat∪	5.5557 00]	<u> </u>						ᅪᅧ		\bowtie	
2	2/4/7	0.4573				<u> </u>	CL		CLAY!	EY SILT (CL): light yellowish brown (2.5Y 6/4) 60 to light olive brown (2.5Y 5/4), ~100% fines, pet iff to very stiff, odor noted at 1.8 meters bgs.	0% troleum	2	M	Ø	
4	- "			\vdash	-	 			odor, s	iff to very stiff, odor noted at 1.8 meters bgs.		+ +	K	\bowtie	
-				П]	-			1					M	
_ 	4/6/11/15	0,6098 / 100	1									1 1		X	
3	מאמאני	0.3049/0		 		-3-							X	N/	
]	2000 IA	3.004070		7	SS								M	M	
			CC-066SB-0	₽V		L _							X		
4_	47/11/17	0.9146		I۸.		4						<u> </u>	Ø		
_				\square		<u> </u>						+ 4		M	
4												+ +	K	\bowtie	
4 [,,,,,,,,,	0.6098/90										_			
5 6	10122121	0.0036790					SC		USEISE	SY SAND (SC): dark reddish brown(5YR 3/2), ~70 to mediam sand, ~30% lines, no odor, moist; m	r% Xedium	<u>5</u>			
1						"			dense.			[1	77	774	1/2" Dia. Bentor
1												[]		Ţ.,	Pellets
								88							
`]						L ´]	sc			Y SAND (SC): reddish yellow(5YR 7/8), ~60% (
] [26/31/50).4573 / 100]			Ļ ↓			to med	ium sand, ~40% fines, no odor; moist; very dens	xe				
1												+ +			
7						7						7	[:]	[:]	
4												+ +		- [3]	
									C: 41.	V CAND (CC) (apht how and EVID CUI. 3004	namo to	† †		ぼ	
	nnnor	n enne				┞. ┪	sc		mediur	:Y SAND (SC); light brown(7,5YR 6/4), ~70% oo n sand, ~30% fines, moist.	Jean See 10	+ _ 1		<u>*</u> }]	
8 ⁵	<i>1</i> 20/38/50	0.6098				8						-8-		<i>€</i>	
]							· '								
7]	F	#3	
'						1		レンバスス	3			ı 1	L 1	1.4.1	

											BOREHO	LE / WELL LOCATION SKETCH MAP
					FW	/EL	LA	REA	PAGE 2 OF 2	N		
ROJECT NO	l.	P	PROJECT NA	ME		Camp	Carr	oli Are	a D and Area 41 RI	A		
OCATION OGGED BY	Can	np Carro	oll, Taeg	u, R	epubli IEWED I	c of K	orea		DATE & TIME STARTED 4/11/03 08:15 DATE & TIME FINISHED			
···			66	-	1				4/11/03 16:30			WELL CONSTRUCTION DETAIL
Meters bgs) PID (ppmv)	BLOWS / DRIVE	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bgs)	nscs	GRAPHIC LOG	SURFACE CONDITION: LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	WELL CONSTRUCTION DE PAL
-10	36/44/29/4 /		C-0665B-0		SS		a.		SANDY LEAN CLAY (CL): light brown(7,5YR 6/4), ~40° coarse to medium sand, ~60% fines.	%	- 10-	Filter Pack
11—	50	0.1524	T T T T T T T T T T T T T T T T T T T	X	\$ \$	11	SM		SILTY SAND (SM); brown (7.5YR 5/4), -70% coarse to medium sand, -30% fines, very dense.	o		Solited PVC Car
-12						 - 13			Preprobe. No recovery.			
14	50	0.1524				— 14— — 14— — —	SM	SPER	SII TY SAND/SMI) brown (7 5VR 5/3) ~70%, marsa Ir		14 	Threaded PVC E
16—	100	0.1524 / 100				 - 16- 	551		SILTY SAND (SM): brown (7.5YR 5/3), ~70% coarse to modum cand, ~3U% finor, no odor. End of Borelide at 15.2 m.			
18—		PAPER LAND AND AND AND AND AND AND AND AND AND				18					- 18-	
19						19 					19-	

											_	BOREHO	DLE / WELL LOCATION SKETCH MAP
										D10# 1 0# -			
										PAGE 1 OF 1	N		
		LC	OG O	F	BOF	RIN	G A	RE	4 41	B-051			
PROJECT NO.		P	PROJECT N	WE		Came	n Carr	oli Are	a Dar	nd Area 41 Ri			
OCATION	Car		oli, Taeg		anubli			•••••		DATE & TIME STARTED 4/4/03 10:10			
OGGED BY	Car	np Carre	k . /		republi 1EWED 8		orea			DATE & TIME FINISHED			
RILLING CON				1						4/4/03 10:27 DRILLING METHOD	COOR	ONATES	
AMPLING MET		Beautif	ul Enviro		ental (IPLE HAA		'PE			Direct-Push SIZE / TYPE OF BIT	SI	JRFACE E	LEVATION DATUM
Geo VELL INSTALL		Sample	e r ASING MAT	ERIA	L/DIAME	TER		ls	CREEN		<u></u>	······	mean sea leve
YES LEVATION OF	NC	WELL CC				F WELL (CANIDAC		Туј	oe: <u>Material:</u> TTOM OF SCREEN PRODUCT SURFAC	Length:	GROUIN	Diameter: Stot Size:
nsi)		WELLO	T	1	10-0	T VVCLL (74314G	,	UF & BU	HOWOF SCALEN PRODUCT SUNFAC	·-		
bgs)	νω	% % %	Щ		Щ	H bgs)	,,	일 문	SURF	ACE CONDITION:		H bgs)	WELL CONSTRUCTION DETAIL
(meters bgs) PID (ppmv)	BLOWS /	DRIVE / RECOVERY (rreters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO WELL INSTALLED
				-			sc	***	CLAY	EY SAND (SC): strong brown (7.5YR 56), ~5% g . fine to coarse sand, ~40% fines, moist; dense;	ravel,	-	••••
-		0.9780	SS051SS0	<u></u>	SS	-	GL.			CLAY (CL.): dark grayish brown (10YR 4/3), ~100			
		0.4	55051550	X			\ \frac{1}{2}		mediu	m to high, moist; stiff.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	11	
-							SC		- CI AV	EY SAND (SC); yellowish brown (10YR 5/6), ~55	94 6no		
1		1.3 / 80					SC		to me	dium sand, ~45% fines, moist, dense.	76 IIIRE		
2		1.0100				2						_2_	
-										End of Borehole at 2.3 m.			
-3—						3						_3_	
-													
]						_							
4						4						-4-	
]													
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This loo is perf	of the rep	ont prepare	ed for the ne	amed er at o	project or	nd should	d be rea	d logethe	r with tha	t report for complete information. This cummar on with the passage of time. The data present	ry applioc ed is a sin	only at the	o location of this boring / woll and at the

										_	BOREHO	LE / WELL LOCATION SKETCH MAP
	L	og o	F	30F	RING	G A	RE	۹ 41	PAGE 1 OF 1	N 1		
		PROJECT NA	ME									
					Camp	Carr	oll Are	a D an	d Area 41 RI	^		
Ċa	mo Car	roll. Taca	u. R	ilduas	c of K	orea			4/3/03 13:30			
		* \ (~~~~		1		
		صاط 🕯							4/3/03 14:05			
TRACTO				ontal (°orn					LOOK	JINAIES	
THOD	Deaut	IFRI ESTAIL				PE				S	URFACE E	LEVATION DATUM
										<u></u>		mean sea leve
		CASING MAT	ERIAL	. / DIAME	TER		S		ner Material: I	enoth:		Diameter: Slot Size:
	-	XOVER		TOPO	F WELL (CASING	T				GROUN	DWATER SURFACE DATE
	_						·	-				WELL CONSTRUCTION DETAIL
1	1.78	§ m	_	ш	s _g		ပ	SURF	ACE CONDITION:		[—] _ روّن (قور	FACET COMO LLOO HOM DESIGN
Š⊠	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	5 음년 0	I Z	APL.	H E	SS	F. S				F 2	NO WELL INSTALLED
0.2		\$ [] \$ =	X	8}}	E E	🖺	¥, \		LITHOLOGIC DESCRIPTION		H	
***	T 52. 8	=		L	ڦ						5	4
				00		SU		CLAY	EY SAND (SC): (7.5YR 4.56), ~60% fine to coar ~40% fines, moist; dense	rse	L _	
			1	33	Ľ]	12	, car (ci,			L _	
	1/70		 \/		[**					
	1.3	CC052SS0	1 X		Γ, -	1						
		ŀ	\prod			sc		CLAY	EY SAND (SC): strong brown (7.5YR 5/6), -60%	fine to		
			/		Γ "	1		COGIS	s seatu, -4070 Intos, most, more maios.			
					_	1	**					
	1.5/70	·									[,]	
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			l				<i>3</i>					
	0.5/90	' 										
					3		ممحمد	Ketus			7	
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	THOD probe	Camp Car Beaut THOD Diprobe Samp ED? NO 83 VELLO 1/700 1.3	Camp Carroll, Taeg TRACTOR/DRILLER Beautiful Environ Deprobe Sampler LEP? NO SE WELL COVER AND SHAPE WELL COVER 1/70 1/70 1/70 1/70 1/70 1/70 1/70 1/70	Camp Carroll, Taegu, REV TRACTOR/DRILLER Beautiful Environm THOD SAM DPROBE Sampler ED? NO 88 VELL COVER 1/70 1.3 1.5/70	Camp Carroll, Taegu, Republi REVIEWED B Beautiful Environmental C DPODE Sampler LED? NO SS VELL COVER TOP O 1.30 1.5770 1.5770 PROJECT NAME REVIEWED B REVIEWED	Camp Carroll, Tacgu, Republic of K REVIEWED BY ITRACTOR/DRILLER Beautiful Environmental Corp SAMPLE HAMMER TY DPOPODE Sampler LED? NO SE CASING MATERIAL / DIAMETER VELL COVER TOP OF WELL COVER 1/70 1.3 1.5/70 CC052SS0 TAGE Camp Carroll, Tacgu, Republic of K REVIEWED BY REVIEWED BY SAMPLE HAMMER TY SAMPLE HAMMER TY AND SE 1/70 1.3 1.5/70	Camp Carroll, Taegu, Republic of Korea REVIEWED BY ITRACTOR/DRILLER Beautiful Environmental Corp BOD SAMPLE HAMMER TYPE CASING MATERIAL / DIAMETER TOP OF WELL CASING	Camp Carroll, Taegu, Republic of Korea REVIEWED BY ITRACTOR/DRILLER Beautiful Environmental Corp SAMPLE HAMMER TYPE DED? NO SS CASING MATERIAL / DIAMETER VELL COVER TOP OF WELL CASING TOP OF WELL C	Camp Carroll Area D an Camp Carroll, Taegu, Republic of Korea REVIEWED BY ITRACTOR/DRILLER Beautiful Environmental Corp TOD SAMPLE HAMMER TYPE DIVIDIO SAMPLE HAMMER TYPE WELL COVER TOP OF WELL CASING TOP & BO SURFA SURFA 1/70 1.3 1.5/70 0.5/90 TOP & STAND SS SURFA SURFA CLAY COORSES	LOG OF BORING AREA 41 B-052 PROJECT NAME Camp Carroll Area D and Area 41 RI	LOG OF BORING AREA 41 B-052 PROJECT NAME Camp Carroll Area D and Area 41 RI	LOG OF BORING AREA 41 B-052 PROJECT NAME Camp Carroll Area D and Area 41 RI

														BOREHO	LE/WELL LOCATIO	IN SKETCH MAP
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			LC	og o	FI	BOF	RING	G A	RE	4 41	B-055		 			
PROJE	CT NO.	***********	F	PROJECT N	AME		······································						T			
LOCAT							Camp	o Car	roli Are	a D ar	d Area 41 RI DATE & TIME STARTED	······································	*			
LOGGE	***************************************	Car	np Carr	oli, Taeg	u, R	epubli MEWED (ic of K	orea			4/4/03 10:00 DATE & TIME FINISHED	l				
		TOWN TO	R/DRILLER	66	Ľ			***************************************			4/4/03 10:09 DRILLING METHOD		- COOPI	DINATES		
	NG ME			ul Envir			Corp	/PC			Direct-Push SIZE / TYPE OF BIT				ELEVATION	DATUM
	Geo	probe	Sample		<u></u>			PE		Apres	SIZE / TIPE OF BR		: 3	UKFAUE E		ean sea level
YE		NC) tsa	CASING MAT	IERIA					CREEN Ty			ength:		Diameter:	Slot Size:
ELEVA msl)	TION OF		WEIT CC	OVER		TOPO	F WELL (CASING	ĭ	OP & BO	TTOM OF SCREEN PROD	OUCT SURFACE		GROUN	DWATER SURFACE	
عوم bgs)	_	, m	/% (%)	щ	L	m	- Pgs)		2	SURF	ACE CONDITION:			P d	WELL CONSTR	SUCTION DETAILS
DEPTH (meters bgs)	P1D (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRI	РПОМ		DEPTH (meters bgs)	NO WEL	LINSTALLED
		andrease & Laborator a a se						a		SAND	Y LEAN CLAY (CL): red (2.5YR 4	6), ~30% fine to	>			A-4000
-			0.7/80							medit	m sand, ~70% fines, low, moist;	arm; till soil.		-		
· -								sc		CLAY	EY SAND (SC): yellowish brown (1 fium sand, ~45% fines, moist, der	10YR 5/6), ~55%	6 fine			
-										101112	acest dealth, 4070 is too, tricking dur			-		
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ROJECT	T NO.			ROJECT NA			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					4			
OCATIO	NA I						Cam) Carr	oll Are	ea Dar	d Area 41 RI DATE & TIME STARTED	-			
		Can	np Carro	oll, Taeg	u, R	epubli	c of K	orea			4/4/03 09:45				
OGGED	BY		Carried States	66	REV	NEWED B	3Y				DATE & TIME FINISHED 4/4/03 09:57				
RILLING	CON		70RILLER		.d						DRILLING METHOD	COORE	NATES		
AMPLINO		HOD		ul Enviro		PLE HAN		PE			Direct-Push SIZE / TYPE OF BIT	SU	JRFACE E	LEVATION	DATUM
ÆLL INS			Sample	ASING MAT	FRIA	/ DIAME	TER		Is	CREEN				me	ean sea leve
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<u>(§</u>			≿હ				(\$1			SURF	ACE CONDITION:		38)	WELL CONSTR	UCTION DETAIL
eters be	ppmv)	BLOWS A	VE /	APLE D	EXTENT	SAMPLE	표원	nscs	¥g				PTH is by	NO WELL	L INSTALLED
meters bgs)	고,멾	ELC PR	DRIVE / FECOVERY (meters / %)	LAB SAMPLE ID	🖫	SAN T	DEPTH (maters bgs)	Ĭ	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)		
						SS			V. V.						
+				CC056SS0	\bigvee	1	-	sc		CLAY to me	EY SAND (SC); yellowish brown (10YR 5/6), ~6 Jium sand, ~45% fines, moist; dense.	5% fine			
1			0.7/80		$ \Lambda$		<u> </u>								
-1	f							sc		CLAY	EY SAND (SC): strong brown(7.5YR 4.5/6), ~55 m sand, ~45% fines, moist; dense.	% fine to	[1]		
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OCATION		Com	n Carr	oli, Taeg	D	onubli					DATE & TIME STARTI	ED 1 10:30	1		
XGGED BY		VIII	o Carre	h 6		EWED 8		orca			DATE & TIME FINISHE	D	1		
RILLING C	ONTRA		/DRILLER		<u> </u>		_				DRILLING METHOD	10:40	COORE	NATES	
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G ELL INST			Sample	F ASING MAT	EDIA	/ MAMP	TER			CREEN	<u> </u>				mean sea l
YE\$		NO	62							Ту	pe: Mate		Length:		Diameter. Slot Size:
EVATION ISI)	IOF		METT CO	VER		TOPO	F WELL (ASING	Т	OP & BC	TTOM OF SCREEN	PRODUCT SURFAC	E	GROUN	DWATER SURFACE DAT
gs)	Τ,		_ <u>}</u> ;	ş11	ļ	I	(§		U	SURF	ACE CONDITION:			gs)	WELL CONSTRUCTION DE
neters bgs)	(Vima SWS	DRIVE	DRIVE / RECOVERY (neters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (neters bgs)	USCS	GRAPHIC LOG					DEPTH (meters bgs)	NO WELL INSTALLED
a let		ä	REC.	SAI	Ä	S.	nette E	5	98. 7.		LITHOLOGIC	DESCRIPTION		(mete	
\dashv	-	_				SS		SU	27/22	() ()	SEV STANKLY SV strong b	mum (/ 6VU 6K3 - 6bW	tino to		
			0.7/80		N/		<u> </u>	SC.		medi	'EY SAND (SC): strong b am sand, ~45% fines, mo	pist; dense.	iline to		
			1.2	CC057SS0 ⁻	LY.										
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		LC	og o	FI	30F	RINO	3 A	RE/	۷ 41	PAGE 1 OF 1	N			
PROJECT NO).		PROJECT N								-			
OCATION		L				Camp	Carr	oll Are	a D an	Id Area 41 RI	"			
CONTINUE	Car	np Carr	oll, Taeg	u, R	epubli	c of K	orea			4/4/03 09:25			•	
OCCED BY			66	REV	IEWED I	3Y				DATE & TIME FINISHED 4/4/03 09:40				
ORILLING CO	NTRACTO	RYDRILLER	3	<u> </u>				••••••		DRILLING METHOD	COOR	DINATES	***************************************	
	· ·	Beautif	ul Envir			Orp MER TY				Direct-Push SIZE / TYPE OF BIT	-	SURFACE E	CVATION	DATUM
SAMPLING MI Ge	eoprobe	Sample	er	SAM	MLE HAN	ANAEK IYI	rc			SIZE / FTPC OF BIT	Ì	DOIN NOL L	CLYMION	mean sea leve
VELL INSTAI	LLED?	C	CASING MAT	ERIA	/ DIAME	TER		so	REEN				P'	Clad Cine.
YES LEVATION (METT CC	OVER		TOPO	FWELLO	ASING	1	Tyr OP & BO	oe: Material: TTOM OF SCREEN PRODUCT SURFA	Length: CE	GROUN	Diameter. DWATER SURF	Slot Size: FACE DATE
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(meters bgs)	BLOWS	DRIVE / RECOVERY Imeters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO	WELL INSTALLED
		0.7/80					С		SANE media	DY LEAN CLAY (CL); red (2.5YR 4/5), -30% fin um sand, ~70% fines, low, moist; firm; fill soil.	e to			
4				ļ	SS	┡ -						-		
-1		0.6	CC058SS0	łΥ		<u> -</u> 1-			OLAV.	EY SAND (SC): yellowish brown (10YR 5/6), ~	560/ 5no	_├-¹		
-				\triangle	SS	├ ~	sc		to me	dium sand, ~45% fines, moist; dense.	270 IIIR			
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Tras tog is p time of dinlar	oan of the re ng. Subsur	eport prepa tace condit	rea for the n fons may dif	amed fer at d	other loca project a	ing snout itlons and	uberea ∫mayd	iange al	a wan ma Hils kwali	at report for complete information. This sumn ion with the passage of lime. The data prese	nted is a s	simplification	n of actual cond	litions encountered.

												BOREHO	LE /WELL LOCATI	ON SKETCH MAP
										PAGE 1 OF 1	N			
		LC	G O	F	3OF	RIN	G A	RE	41	I B-059	I			
PROJECT NO.		P	ROJECT NA	ME						··············	14			
LOCATION						Camp	Carr	oll Are	a D ar	1d Area 41 Ri	"			
	Can	np Carro	oll, Taeg				orea			4/4/03 10:50				
LOGGED BY			66	REV	1EWED E	37				DATE & TIME FINISHED 4/4/03 11:05				
DRILLING CON			ul Enviro	nm	ontal (DRILLING METHOD Direct-Push	COORD	NATES		
SAMPLING ME	THOO					MER TY	PE			SIZE / TYPE OF BIT	SL	RFACE E	LEVATION	DATUM
Ge: WELL INSTAL	oprobe LED?	Sample C	e r ASING MAT	ERIA!	. / DIAME	TER		s	CREEN		<u> </u>		n	nean sea level
YES ELEVATION O		WELL CO	WED.		TOPO	F WELL C	PASING			pe: Material: L TTOM OF SCREEN PRODUCT SURFACE	_ength:	GROUN	Diameter. DWATER SURFAC	Slot Size: E DATE
(msl)		WELL CO	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		101-0	· vville c	<i></i>	·		THOMAS SOREET THOSOSTOSIANOS	_	, ,		
(\$6)	,	~¥.(%	ω	 -	шi	d (sgs)		٥	SURF	ACE CONDITION:		DEPTH (meters bgs)	WELL CONST	RUCTION DETAILS
DEPTH eters bg P3D (ppmv)	BLOWS / DRIVE	SIVE OVE	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	EPTF ers t	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		EPT!	NO WE	LL INSTALLED
DEPTH (meters bgs) P1D (ppmv)	뛰	DRIVE / RECOVERY (meters / %)	85	û	Sy.	DEPTH (meters bgs)		R _		LITROLOGIC DESCRIPTION		G e		
					SS		sc		CLAY	'EY SAND (SC): strong brown (7.5YR 5/6), ~60% e sand, ~40% fines, moist; dense; fill soil.	fine to			••
		0.7780		$\backslash /$	ĺ	_				and the second s		<u> </u>		
			CC059SS0	$\downarrow \downarrow$			SC		C) A)	/EY SAND (SC): strong brown (7.5YR 5/6), ~55%		} -		
1		1.5				11	3c		medit	um sand, ~45% fines, moist; dense.	III IO IO	- 1-		
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		1,6/80												
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This log is pa time of drilling	rt of the rep j. Subsuda	oort prepare Sürkürün sürk	ed for the na ans may diffe	imed alalu	projecta Julien kood	nd shouk Liurus aru	d be rea Imay d	id togethe iai ige al	er with the Unis locat	at report for complete information. This summar ion with the passage of time. The data presente	y applies ed is a sin	only at the oplification	e location of this bo of actual condition	ning / well and at the io cnoountered,

BORING LOG METRIC UNITS CAMP CARROLL AREA D AND AREA 41.GPU ACE_1336.GDT 16'9/03

											BOREHO	DLE / WELL LOCATION SKETCH MAP
	LO	G O	FE	ЗОБ	RING	G A	RE	4 41	PAGE 1 OF B-060	1 N		
PROJECT NO.	Pf	ROJECT NA	ME		Camr	Carr	oil Arc	a Dar	d Area 41 RI			
LOCATION					Carni	Cari	UII AIE	a D ai	DATE & TIME STARTED			•
Cam .ogged.by	p Carro	il, Taeg		epubli EWED I		orea			4/3/03 15:30 DATE & TIME FINISHED			
LOGGED BY		bu	PICEVI	EVVEOL) I				4/3/03 21:05			
ORILLING CONTRACTOR		ıl Enviro		omtal (~~~				DRILLING METHOD Direct-Push	COOR	DINATES	
SAMPLING METHOD	<u>seauuu</u>				MER TY	PE.			SIZE / TYPE OF BIT	5	SURFACE E	LEVATION DATUM
Geoprobe S VELL INSTALLED?		r ASING MAT	ERIAL	/ DIAME	TEQ.		9	CREEN				mean sea level
YES NO		TOWN COVICE	LINDL					Ту	oe: Material:	Length.		Diameter: Slot Size:
ELEVATION OF msl)	MEIT CO.	VER		TOPO	FWELL (ASING	T	OP & BO	TOM OF SCREEN PRODUCT SUR	ACE	GROUN	DWATER SURFACE DATE
					6			SURF	ACE CONDITION:		(\$	WELL CONSTRUCTION DETAILS
DEPTH (maters bgs) PID (ppmv) ELOWS / DRIVE	DRIVE / PECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (Teters bgs)	NO WELL INSTALLED
-	0.7780		abla	SS		sc		CLAY ~55%	EY SAND (SC): strong brown (7.5YR 5/6), ~5 fine to coarse sand, ~40% fines, moist, de	% gravel, nse; fill soil.		•
]	1.1	CC080SS01	l X I									
			M		1	a.		LEAN	CLAY with Sand (CL); red (2.5YR 4/6), ~20%	fine to	1	
`-	0.7/80			SS		M.		medic	m sand, -80% fines, moist; stiff; fill soil. ML): brownish yellow (10YR 6/6), ~100% fine		╬ -	
-			М					media	m dense; native soil.			
-	1 0.7/90	CC060BS01	IXI								-	
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time of drilling. Subsurfac	oe conditio	nsmaydiffi	eratot	her loca	tions and	Imay d	ange at	his locati	on with the passage of time. The data pres	ented is a s	implification	n of actual conditions encountered.

											_	BOREHO	DLE / WELL LOCATION SKETCH MAP
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			\	,- ,	205	71817	~ A	DE /	N 41	I D 064			
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PROJECT NO	I.	P	ROJECT NA	ME		Camp	Carr	ali Ara		nd Aran 44 Pl			
LOCATION								Oli Are	a D ar	nd Area 41 RI DATE & TIME STARTED			
LOGGED BY	Can	np Carro	oll, Taegi		epubli NEWED E		orea			4/3/03 14:10 DATE & TIME FINISHED			
DRILLING CO			66						····	4/3/03 15:00 DRILLING METHOD	COORD	NATES	
			ul Enviro	<u>>nme</u>	ental (Corp				Direct-Push			
SAMPLING ME Ge		Sample	:r	SAM	PLE HAN	MMER TYP	Æ			SIZE / TYPE OF BIT	St	JRFACE E	ELEVATION DATUM mean sea level
WELL INSTAL YES	LED?) 8 2	ASING MAT	ERIAL	./DIAME	TER	***************************************	so	CREEN	no: Majorial:	Length:		Diameter: Stot Size:
ELEVATION C		MET CO	NER		TOP Of	F WELL C	ASING	TO	Tyj OP&BO	pe: <u>Material:</u> TTOM OF SCREEN PRODUCT SURF.		GROUN	DWATER SURFACE DATE
(msl)	1	· .	1					T 1	SURE	ACE CONDITION:		- F	WELL CONSTRUCTION DETAILS
DEPTH (meters bgs) PID (ppmv)	VS./	DRIVE / RECOVERY (meters / %)	<u> </u>	F	PE 프	DEPTH (meters bgs)	က္လ	GRAPHIC LOG	00	NOL CONDING.		DEPTH (meters bgs)	NOVACU MICTARICO
DEPTH leters by PID (opmy)	BLOWS	DRIV CO)	LAB SAMPLE ID	EXTENT	SAMPLE	DEP.	USCS	LO		LITHOLOGIC DESCRIPTION		DEP	NO WELL INSTALLED
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		,					CL.		yellow fines	DY LEAN CLAY (CL): red (2.5YR 4/6) 50% mot vish red (5YR 4/6), ~50% fine to coarse sand, moist; medium stiff; dense; fill soil.	~50%	-	
		1/60				 	SC		CLAY	'EY SAND (SC): strong brown(7.5YR 4.5/6), ~6	50% fine to	† †	
									at 1.0	e sand, ~40% fines, moist; dense; becomes r meter bgs.	nore mable		
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BORING LOG METR CUNITS CAMP CARROLL AREA D'AND AREA 41.GP. ACE_1838.GDT 1619/03

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ROJECT NO.	IР	ROJECT NA	ME							$- \mathbf{I} $		
CATION	<u></u>				Camp	Carr	oll Are	ea D ar	Id Area 41 RI	_		
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RILLING CONTRACT		ul Enviro	onm	ental (Corp				DRILLING METHOD Direct-Push	COORL	NATES	
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ELL INSTALLEO?		ASING MAT	ERIA	L/DIAME	TER		S	CREEN Ty	pe; Material:	Length:		Diameter. Slot Size:
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(pp (BLO	DRIVE / RECOVERY (meters / %)	SAL	X	SAN	DEPTH (meters bgs)	ľ	GR/2		LETHOLOGIC DESCRIPTION		DEPTH (meters bgs)	
	+ -	<u></u>	1	SS		CL 3C		SAND	DY LEAN CLAY (CL): red (2.5YR 4/5), ~50% fin	e to	┨──	
	1/90	CC062SS0	łγ		[-	34		CLAY with y	e aend, 50% finos, fill sell EY SAND (SC): very pale brown (10YR 8/4) 509 ellowish brown (10YR 5/4), ~60% fine to coars	% mottled e sand,	-	
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PROJECT	NO.		Į F	PROJECT N	ME		Cami	Carr	oli Are	a D an	d Area 41 RI			
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OGGEDI	BY	Car	np Carr	oll, Taeg	REV	epubli 1EWED I	<u>IC OT K</u> 3Y	orea			4/4/03 09:10 DATE & TIME FINISHED	-		
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DEPTH (meters bgs)	(ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO WELL INSTALLED
			0.7/80	CC063SS0	\bigvee	SS		sc		CLAYI ~55%	EY SAND (SC): strong brown (7.5YR 5/6), ~5% fine to coarse sand, ~40% fines, moist; dens	gravel, e; fili soil.		
]			0.7780		\mathbb{N}			GC		CLAY	Y GRAVEL with Sand (GC): strong brown (7.5	YR 5/6)		
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-							<u> </u>			gravel,	Y SAND (SC): strong brown(7.5YR 4.5/6), ~5% ~75% fine to coarse sand, ~20% fines, moist,	o nne ; dense.		
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CONTION							Camp	Car	oil Are	ea D ar	nd Area 41 RI			
LOCATION		Car	np Carr	oil, Taeg	u, R	epubl	ic of K	orea			DATE & TIME STARTED 4/4/03 10:45			
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DRILLING (CONT	RACIO	R7DRILLER	i da	Ь	^************					4/4/03 10:48 DRILLING METHOD	COORD	INATES	
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(Geo	probe	Sample					, r			SIZE / TIPE OF BIT	SL	KFACE E	mean sea leve
WELL INST YES	TALLE) sa	CASING MAT	ERIA	L / DIAME	TER		s	CREEN Tyj	oe: Material:	Length:		Diameter: Slot Size:
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DEPTH meters bgs)	(ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO WELL INSTALLED
			0.7/80	Not sampled				sc		CLAY mediu to 0.4	EY SAND (SC): strong brown (7.5YR 56), ~56% m sand, ~45% fines, moist; dense; quartz veinir meters bgs.	finoto ng at 0.1		• • • • • • • • • • • • • • • • • • • •
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DRILLING CONTRACTOR	PROJECT None of the project of the p	Cam u, Republic of K	p Carroll a		PAGE 1 OF 1 B-065 INCLUDE A TIME STARTED 4/3/03 15:10 DATE & TIME FINISHED 4/3/03 15:25 DRILLING METHOD Direct-Push SIZE / TYPE OF BIT	COORI	DINATES URFACE E	LEVATION	DATUM an sea level
Geoprobe WELL INSTALLED?		TERIAL / DIAMETER		SCREEN					
YES NC ELEVATION OF	WELL COVER	TOP OF WELL	CASING		pe: Material: TTOM OF SCREEN PRODUCT SURFA	Length: CE	GROUN	Diameter: DWATER SURFACE	Siot Size: DATE
DEPTH (THETERS DGS) PID (Ppmv) BLOWS / DRIVE	DRIVE / RECOVERY (Teters / %) LAB SAMPLE ID	EXTENT SAMPLE TYPE DEPTH (meters bgs)		907	ACE CONDITION: LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	WELL CONSTRU	CTION DETAILS
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PROJECT NO).	P	ROJECT NA	ME						. 1 4 44			
LOCATION				~		Camp	Carr	oli Are	a D ar	nd Area 41 RI DATE & TIME STARTED			
LOGGED BY	Can	np Carro	oll, Taegi	u, Ro	<mark>epubli</mark> IEWED I	ic of K	огеа			4/4/03 13:00 DATE & TIME HINISHED			
		115	- be	I.C.V	IL VILLO I	<i></i>				4/4/03 13:30			
DRILLING CO			: ul Enviro	nm [.]	ental (Corp				DRILLING METHOD Direct-Push	COORD	INATES	
SAMPLING ME				SAM	PLE HAN	MER TY	PE			SIZE/TYPE OF BIT	SU	RFACE E	LEVATION DATUM mean sea level
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DEPTH (meters bgs) PID (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EX	SAMPLE	DEPTH (meters bgs)	Š	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	WWEENOMED
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		07/00	CC067SS01	M		├ -	CL.		SANO fine to	DY LEAN CLAY (CL), strong brown (7,5YR 4/8), ~4/ o coarse sand, ~60% fines, moist; stiff.	0%	1	
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				$\vdash\vdash$			SC		CLAY mediu	'EY SAND (SC): strong brown (7.5YR 5/6), ~55% um sand, ~45% fines, moist; dense; highly wealthe	fine to red.	-	
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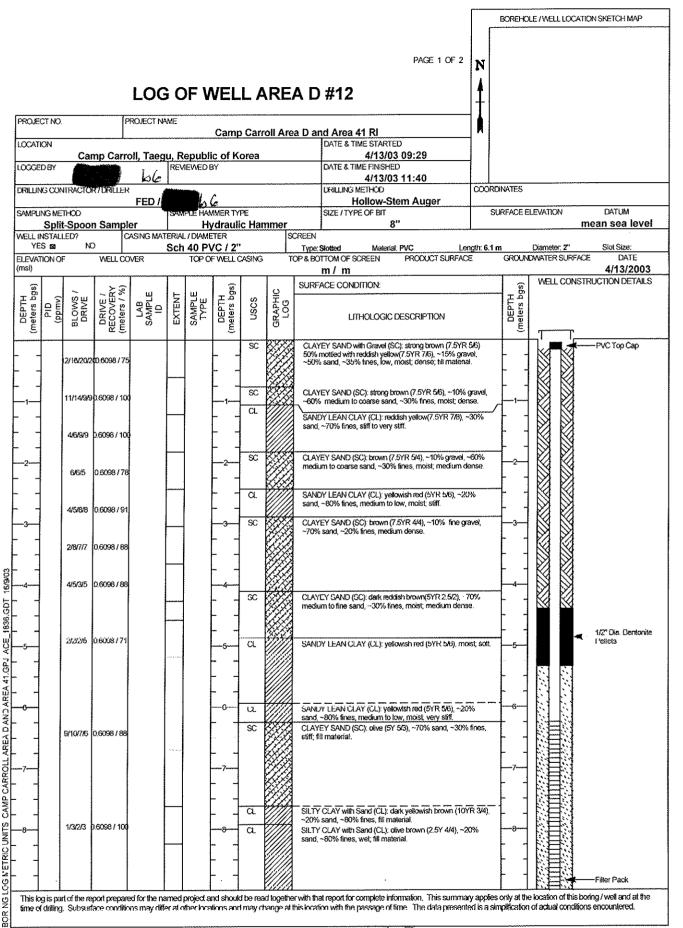
BORING LOG METRICUNITS CAMP CARROLL AREA D AND AREA 41.GPJ ACE_1836.GDT 15/£/03

LOG OF BORING AREA 41 B-068 ROJECT NO. PROJECT NAME Camp Carroll Area D and Area 41 RI CCATION Camp Carroll, Taegu, Republic of Korea Camp Carroll, Taegu, Republic of Korea DATE & TIME STARTED 4/4/03 13:40 DATE & TIME HINSHELD 4/4/03 13:50 RILLING CONTRACTOR / DRILLER Beautiful Environmental Corp AMPLING METHOD Geoprobe Sampler DIRECT NAME SURFACE SURFACE DIRECT NAME DATE & TIME HINSHELD 4/4/03 13:50 COORDINATE DIRECT-Push SURFACE SURFACE SURFACE SURFACE SURFACE DIRECT NAME SURFACE DIRECT NAME SURFACE SURFACE SURFACE DIRECT NAME SURFACE SURFACE DIRECT NAME SURFACE SURFACE DIRECT NAME SURFACE SURFACE SURFACE SURFACE SURFACE SURFACE SURFACE SURFACE DIRECT NAME SURFACE	
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Camp Carroll Area D and Area 41 RI CCATION Camp Carroll, Taegu, Republic of Korea Camp Carroll, Taegu, Republic of Korea Camp Carroll, Taegu, Republic of Korea Camp Carroll, Taegu, Republic of Korea Camp Carroll, Taegu, Republic of Korea 4/4/03 13:40 CCORDINATE Beautiful Environmental Corp Direct-Push AMPUNG METHOD SAMPLE HAMMER TYPE SIZE / TYPE OF BIT SURFACE CAMP Carroll Area D and Area 41 RI DATE & TIME STARTED AMPLING METHOD COORDINATE SURFACE SURFACE SURFACE SURFACE SURFACE CAMP Carroll Area D and Area 41 RI DATE & TIME STARTED AMPLING METHOD SAMPLE HAMMER TYPE SIZE / TYPE OF BIT SURFACE SUR	
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Geoprobe Sampler	E ELEVATION DATUM
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(meters bgs) BLOWS / BRIOWS /	NO WELL INSTALLED
CL ///// SANDY LEAN CLAY (CL): strong brown (7.5YR 4/6), ~40%	
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medium sand, ~45% fines, moist; dense; highly weathered. ~	1
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End of Borehole at 2.2 m.	_
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This log is part of the report prepared for the named project and should be read together with that report for complete information. This summary applies only a ime of drilling. Eubcurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplific	it the location of this boring / well and at th tion of actual conditions encountered

ELL INST. YES EVATION (SI)	CONTI CONTI GEO! TALLE	RACTOR HOD probe	7DRILLER Beautifi Sample	ul Environ r ASING MATE	nme SAME	ental C PLE HAM	Corp MMER TY	PE		D S CREEN Type: OP & BOTT	ATE & TIME STARTED 4/4/03 14:00 VATE & TIME FINISHED 4/4/03 14:10 RILLING METHOD Direct-Push IZE / TYPE OF BIT Material OM OF SCREEN PRODUCT SURF/ DE CONDITION:	St Length:			DATUM mean sea leve Slot Size: FACE DATE INSTRUCTION DETAIL WELL INSTALLED
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YES EVATION (sl)	N OF	NO	DRIVE / DRIVE / SECOVERY (%) 02/1/20	SAMPLE 1D		SAMPLE G	F WELL C	nscs		Type: OP & BOTT	OM OF SCREEN PRODUCT SURFACE CONDITION:		·	OWATER SURF	FACE DATE INSTRUCTION DETAIL
ısl)	T	BLOWS / DRIVE	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE		nscs	I	OP & BOTT	OM OF SCREEN PRODUCT SURFACE CONDITION:	ACE	·	WELL CON	NSTRUCTION DETAIL
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			NOJECT 144	.vic		Camp	Carr	oll Are	a D ar	nd Area 41 RI	▋	
LOCATION	Camp	Carro	oll, Taegi				orea			4/4/03 14:16		
LOGGED BY			66	REV	EWEUE	ЗY				DATE & TIME FINISHED 4/4/03 14:30		
DRILLING CONT			al Enviro	nm	entai (Corp				DRILLING METHOD Direct-Push	COOR	DINATES
SAMPLING MET Geo	ноо probe Sa	ample	r	SAM	PLE HAN	MER TY	PΕ			SIZE / TYPE OF BIT	S	SURFACE ELEVATION DATUM mean sea level
WELL INSTALLI YES	ED? NO s		ASING MATI	ERIAL	/DIAME	TER		S	CREEN Typ	pe: Material:	Length:	Diameter: Slot Size:
ELEVATION OF (msl)	ν	VELL CO	VER		TOPO	F WELL C	ASING	T		TTOM OF SCREEN PRODUCT SURFAC		GROUNDWATER SURFACE DATE
(Sg)	_ [≿§	uı.		***	38)		U	SURF	ACE CONDITION:		WELL CONSTRUCTION DETAILS
DEPTH (meters bgs) PID (ppmv)	BLOWS DRIVE	RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC LOG		LITHOLOGIC DESCRIPTION		WELL CONSTRUCTION DETAILS HE S S S S S S S S S S S S S S S S S S S
							SC	XXXX	CLAY	EY SAND (SC), dark greenish gray(5GY 4/1), -60	0% Nre	
- 4	C).7/80					SC		\	arse sand, ~40% fines, moist; dense; fill soil. EY SAND (SC): strong brown (7.5YR 5/6), ~60%	fine to	/ } -}
-					SS				coars	e sand, -40% fines, moist; dense; fill soil.		
- 1				\setminus / \mid		_ ' _						
	1	.4780	CC070SS01	X			SC		CLAY	EY SAND (SC): strong brown (7.5YR 5/6), ~55%	fine to	
2				$/ \setminus$		2			mediu	rm sand, ~45% fines, moist; dense; highly weath	ered.	2
-								82.62		End of Borehole at 2.2 m.		+ +
_												
3						_3_						3
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-4-	İ					-4-						4-
-]					Ì	-]						
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. * -					-	-						
• -												-
_7						_7_						7—
. 4					ŀ	- 1	-					
]	l					
-8					-	_8_						8-
[]												<u> </u>
					F	.						.
												s only at the location of this boring/well and at the
ume of drilling.	Subsurface	condition	s may differ	at ot	ner locat	ions and	may ch	ange at ti	ns kocatio	on with the passage of time. The data present	ed is a si	mpincation of actual conditions encountered.
										1004		

BORING LOG METRIC UNITS CAMP CARROLL AREA D'AND AREA 41.GPJ 40E_1336.GDT 16/8/03



										1 1		
									PAGE 2 OF 2	N		
					FV	VEL	LA	RE.	A D #12	4		
PROJECT NO.		P	ROJECT NA	ME		Came	Carr	oil Are	a D and Area 41 RI			
OCATION	Con	np Carro	U Toos	D					DATE & TIME STARTED	1		
OGGED BY	Can	iip Carit		REV	epubli EWED 8	BY	orea		4/13/03 09:29 DATE & TIME FINISHED	1 [
			<u>වර </u>		 	Γ	F	1	4/13/03 11:40			WELL CONSTRUCTION DETAILS
DEPTH (meters bgs) PID (ppmv)	BLOWS / DRIVE	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC LOG	SURFACE CONDITION: LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	WELL SOLOTHOLOUPE MED
-10	2/3/6/5	0.6098 / 96					а		SANDY SILTY CLAY (CL): strong brown (7.5YR 5/8), ~ sand, ~80% fines, wel; native soil.	20%		Slotted PVC Casing
-							SC		CLAYEY SAND (SC): brownish yellow (10YR 6/6), ~60' to medium sand, ~40% fines, wet.	% fine		
11	<i>V41</i> 8/10	0.6098 / 75				—11— 			Villagarias A, 1874 ilias, NC			
12	2/3/5/9	0.6098 / 0				12			End of Borehole at 12.5 m.		12	Threaded PVC End Cap
13						13					13	
4-					} -	~ -14 					14-	
5						 15					15	
6—						16		77044			16	
7—					-	17					17	
8—						-18-					- 18-	
9						 					19—	
his log is part of	the repo	ort prepared	i for the name	ned p	roject an	d should	be read	together	with that report for complete information. This summan, stocation with the passage of time, The data presente	/ applies	s only at the s	ocation of this boring / well and at the

												1.	BOREH	OLE / WE	LL LOCAT	ION SKETCH MAP
											PAGE 1 OF	2 N				
			LOC	3 C)FV	VEL	L A	RE	A D a	#24		 				
ROJECT NO.		F	PROJECT N	AME		Camr) Carı	roll Are	a D and	Area 41 Ri						
CATION	0	0	-U T	5				0117110		ATE & TIME STARTED	0.00	7				
OGGED BY	Vā.	ub carr	oll, Taeg	REV	(epubi	IC OT N 3Y	orea		D	4/8/03 0 ATE & TIME FINISHED	9:00					
RILLING CON	VIRACTO	R/DRILLER	<u>ble </u>						a	4/8/03 1	1:00	COOR	DINATES		·····	
AMPLING ME	ת איני		FED/	busa Y		MER TY				Hollow-Sten	n Auger			CL CL (A TI	ON	DATUM
Split	t-Spooi	n Sampi		L	Hy	/drauli				ZE / TYPE OF BIT 8"			SURFACE (ECEVAII		nean sea leve
ELL INSTALI YES ⊠	LED? NO		ASING MAT			TER /C / 2"		SC	CREEN Type: Sl o	tted Material: P*	VC :	Length: 6.1	m	Diame	ter: 2"	Slot Size:
EVATION O	F	WELL CO	·····			F WELL (TO	OP & BOTT	OM OF SCREEN	PRODUCT SURFA				R SURFAC	Æ DATE
.	Γ		T			<u>@</u>				E CONDITION:			Î	WEI	L CONST	4/10/2003 RUCTION DETAILS
neters bgs) PID (ppmv)	WS /	VE / VERY 's / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	USCS	GRAPHIC LOG					DEPTH (meters bgs)			
(meters PID (ppm)	BLOWS	DRIVE / RECOVER (meters / 1	SAM	EXT	SAN	DEF	S	A S		LITHOLOGIC DE	SCRIPTION		DEF			
ا ا		<u> </u>			ļ	===	sc	2222	QII TV A	LAYEY SAND (SC): stro	na haran (7 6VO 4	IAS) FOOR		LT.		DV/C Ton Con
	7/5/6/11	0.6098 / 75	,				, w		mottled v	vith strong brown (7.5YR s sand, ~30% fines, mois	5/6), ~5% gravel, ~ t; medium dense:	65% fine fill	-	M	M	PVC Top Cap
1				_		-	sc		material.							
	12/15/12/9	0.6098 / 75	,				,		mottled v	LAYEY SAND (SC): yelk vith yellowish brown (10YI 5% fines, medium dense	R 5/6), ~5% gravel ; fill material.	l, ~60%] 🕅	N/	
`						- ' -	sc			LAYEY SAND (SC): dark			ļ		M	
	7/6/5/5	0.6098 / 70					~		~20% fir	ne to coarse, subangular (idium dense; fill material.	ravel, ~50% sand	, ~30%	} -			
-				<u> </u>			sc			LAYEY SAND (SC): dark			h -			
	4/6/5/10	0.6098 / 80				_2_	00		~35% fr	e to coarse, subangular o dium dense; fill material.	ravel, ~40% sand	, ~25%	2-			
]						[]	SC		SILTY	LAYEY SAND (SC): dark	vollauish haum (10VR 46\	[]		Ø	
4	6/6/7/13	0.6098 / 65							~10% fir	e to coarse, subangular g dium dense.	ravei, ~60% sand	, ~30%	-	K K		
						-3	SC		SHTY C	I AYFY SAND (SC): stro	g brown (7.5YR 5	<i>l</i> 6) 50%	3—		M	
]	5/11/8/5	0.6098/0							mottled w subangul	nith strong brown (7.5YR 5 ar gravel, ~60% sand, ~3	0/8), ~10% fine to 0% fines, medium	coarse, stiff.			M	
]						_]	a.		SILTY CI	AY with Sand (CL): stron	g brown (7.5YR 5/	8), ~25%	-[]			
$\dashv \mid$	1/4/0/6	0.6098 / 50				-4-			sand, ~7	5% fines, stiff	. ,		4		K	
+				$\vdash \vdash$			SU		SILIY, O	LAYEY SAND (SC): yelio	wish red (5YK 4/6	50%	- †			
]						_				ith yellowish red (5YR 5/6				W	\searrow	
]	2/8/9/11	0.6098 / 100											5		4	1/2" Dia. Bentonite Pelleta
4			-	\dashv									+ +			1 Section 1
+													-			
1				1	Ì	-							 			
]				\equiv	ss		sc			.AYEY SAND (SC): yello	wish red (5YR 5/6)), ~60%			 	
4	4141314	0.6098 / 80 1.4878 / 100	XC-024BS-01	Χl					sand, ~40	r% fines.] :[
-	ſ		ľ	$\stackrel{\smile}{\longrightarrow}$		- +	SC			AYEY SAND (SC): brown	n (7,5YR 5/4), ~60	% sand,			慧	
] [—7 —			~40% 1116	s, loose to dense.			7-		∄.1	
]			İ		Ī								[]		1/1	
4			ŀ	\dashv		- 4							-		₹. }	
-	2/4/8/8	0.6098 / 70			}	-8-							-8-		13	
1	Ì		ļ	\dashv											1	
					f	- 1										
				- 1	L-			メソメス								
	1.65		16. "							port for complete informa				LLE		

										_	BOREHOLE	/WELL LOCATION SKETCH MAP
									PAGE 2 OF 2	N		
PROJECT NO.		P	LOG)F V	VEL	.L A	RE	A D #24			
.OCATION						Cam	Carr	oli Are	a D and Area 41 Ri	M		
.0GGE0.8Y	Car	np Carro	oll, Taeg H <i>©</i>	u, R	epubli EWED B	c of K	orea		4/8/03 09:00 DATE & TIME FINISHED			
ŝ		≿ङ				<u>©</u>		0	4/8/03 11:00 SURFACE CONDITION:		1 2	WELL CONSTRUCTION DETAIL
DEPTH (meters bgs) PID (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bgs)	nscs	GRAPHIC	LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	
-				7	SS	ļ .	SC		SILTY, CLAYEY SAND (SC): olive brown (2.5Y 4/4).		-	Slotted PVC Ca
-10	1/3/4/5	D.6098 / 100)C-024BS-0	X			а		SiLTY CLAY with Sand (CL): dark yellowish brown (10) ~15% fine to medium sand, ~85% fines, medium, soft medium stiff.		L	Filter Pack
-10						- "-	SC		SILTY, CLAYEY SAND (SC): yellowish brown (10YR 5 mottled with yellowish brown (10YR 5/6), -60% sand, -fines, medium dense.	/4) 50% -40%	- [-	
11	3/10/15/12	0.6098 / 70										
12-						—12— 	CL.		SILTY CLAY with Sand (CL): yellow (10YR 7/5), ~20% to fine sand, ~80% fines, medium stiff, native soil.	coarse	12-1	Threaded PVC I
-	3/6/9/12	0.6098 / 60							to tine sand, ~80% fines, medium strit, native soil.			
7.7												
14—						 —14—			End of Borehole at 13.7 m.		14	
16						15					15	
						_]						
16											16	
						—16— -						
.]						-]						
]						- '/-					17-	
] [ŀ							
-						-18-	1				- 18	
						- 1						
19-									,		10	
This log is par ime of drilling	i of the rej Subsurf	ו oort prepare ace condition	d for the na ns may diffe	י medip ratet	ו xrojectar herkv>ا	i ad shouk Sons and	tbe read may ch	together ange at ti	with that report for complete information. This summary is location with the passage of time. The data presente	y applies ed is a si	s only at the k	ocation of this boring / well and at the actual conditions encountered

												BOREHO	LE/WEL	L LOCATIO	N SKETCH MAP
										PAGE 1 OF 2	N				
			LOG	٠.	\r" \/	\/I''' I	: A	DE	۸ ID	#27	4				
			LOG	, (7	v C L	.L <i>F</i>		ΑD	#31	+				
PROJECT NO).	F	PROJECT NA	WE		Came	Carr	nii Ara	a Dar	nd Area 41 RI					
LOCATION								OH MIE	a D ai	DATE & TIME STARTED	┪"┃				
LOGGEDBY	Cai	np Carr	oll, Taeg		epubli IEWED E		orea			4/12/03 08:12 DATE & TIME FINISHED					
DRILLING CO	Mikaterre	enderi LEG	ble .						,	4/12/03 10:45 DRILLING METHOD	COOR	NATES			
SAMPLING ME			FED /	tro.		OG MERTY	DE.			Hollow-Stem Auger SIZE / TYPE OF BIT		JRFACE E	1 271 JATTIC	NI.	DATUM
Spl	it-Spoo	n Sampi			Hy	/drauli				SIZE/TTPE OF BIT		UNFACEE	LEVAN		ean sea level
WELLINSTAL YES 🖪	JLED? N		ASING MAT			eter /C / 2"	,	S	CREEN Type:	Slotted Material: PVC I	ength: 6.1	m	Diamete	ec. 2 "	Slot Size:
ELEVATION ((msl)	Æ	WEIL CO	OVER	••••	TOPO	FWELLO	ASING	T		TTOM OF SCREEN PRODUCT SURFA	CE	GROUN	DWATER	SURFACE	DATE 4/12/2003
<u>(§)</u>	T	ি হু ু	T			[S		0	T	ACE CONDITION:		(sg	WELL	LCONSTR	UCTION DETAILS
DEPTH eters bg PID	BLOWS DRIVE	NE/	LAB SAMPLE ID	EXTENT	SAMPLE	PTH srs b	USCS	GRAPHIC LOG				TH Siz			
DEPTH (meters bgs) PID	9.9	DRIVE / RECOVERY (meters / %)	SAI	Ä	SA.	DEPTH (neters bgs)	Š	GR.		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	·		
		 					SC	<i>XX</i>		, CLAYEY SAND with Gravel (SC): yellowish to			┐¦╭ ,		PVC Top Cap
	10/13/11/	0.6098760				[sc		fines. SILTY	< 5/4), ~20% fine to coarse gravel, ~50% sand, < CLAYEY SAND (SC): strong brown (7.5YR 5/	3), ~10%				
					1		SC	<i>XX</i>	dense			+ -			
1	8/10/15/14	0.6098 / 100	3			-1-				', CLAYEY SAND (SC): dark brown (7.5YR 3/3)), ~60% sand, ~30% fines, medium dense; fill r		1-1-		M	
	9771077	D.6098 / 100					SC		-20%	', CLAYEY SAND with Gravel (SC): brown (7.5' fine gravel, ~50% sand, ~30% fines, medium	(R 4/4), dense; fill				
	ornor	p.60367 10			SS				mater	nal.		+ +			
—2—	9/11/7	0.6098 / 50	CC-037SB-0	M	33	-2	SM	TT.	SILTY	CLAYEY SAND with Gravel (SM); greenish		2-			
				$\langle \cdot \rangle$	SS				gray (c	GLEY1 5/5GY), ~20% gravet, ~80% medium to ~20% fines, medium dense; fill material.	warse	[]			
- 4	4/6/6/9	p.6098 / 100	C-037SB-0	ľΧľ			a		SH TY	CLAY (CL): yellowish red (5YR 5/6), ~100% f	nes stiff	╀┤			
 3				\square		_3_	SM			CLAYEY SAND (SM): greenish gray (GLEY1		3			
	7/9/6/10	0.6098 / 90							~70% materi	medium to coarse sand, ~30% fines, moist;	siff, fill				
4	5/6/7/7	0.6098 / 80				4	CF		SILTY mediu	CLAY (CL): gevenish gray (GLEY1 5/5GY), ~70 im to coarse sand, ~30% fines, moist; stiff; fill:	% naterial	-4-			
												[]			
												 			
-5-	2/4/4/5	0.6098 / 10				-h						5-	$\langle \rangle$	\Diamond	
															_1/2" Dia. Bentonite
						- 4									Pellets
Ö						-	~		Cli XX	CLAY (CL): olive brown (2.5Y 4/3), ~10% sand	. 000/	0-	8.	8	
			XXXXXSB-0	Ņ	SS		a. a.			chemical odor, soil staining noted at 20 feet b					
		0.3964 / 100		\triangle		_	٠.		olive b	CLAY (CL): reddish yellow(5YR 6/8) 50% groo cown (2.5Y 4/3), ~10% sand, ~90% fines, stiff,	es to fill				
7					ł	7			materi	al.		- 7-			
						_						[]			
				\dashv		-]	CL.			CLAY (CL): reddish yellow(5YR 6/8), ~100% fi m, chemical odor; moist; medium stiff.	nes,				
-8-	1/3/2/3	0.6098 / 60				-8-					D G(A)	-8-		鸖	
				\neg		- 1	CL.			Y LEAN CLAY (CL): light yellowish brown (10Y sand, -70% fines, medium, molst	n 0/4),	[]			
						_									
This ha is m	ert of the m	nort menan	ed for the re	amed i	omiect e	nd shoul	i be æa	M////	er with the	at report for complete information. This summ	arv annie	only at the	location	T:	ng/well and at the
time of drilling	g. Subsurf	ace condition	ons may diffe	erato	ther loca	tions and	may d	nange at	this locati	on with the passage of time. The data prese	nted is a si	mplification	of actua	conditions	encountered.

BORING LOG METRIC UNITS CAMP CARROLL AREA D AND AREA 41.GPJ 4.0E _ 336.GDT 16/8/03

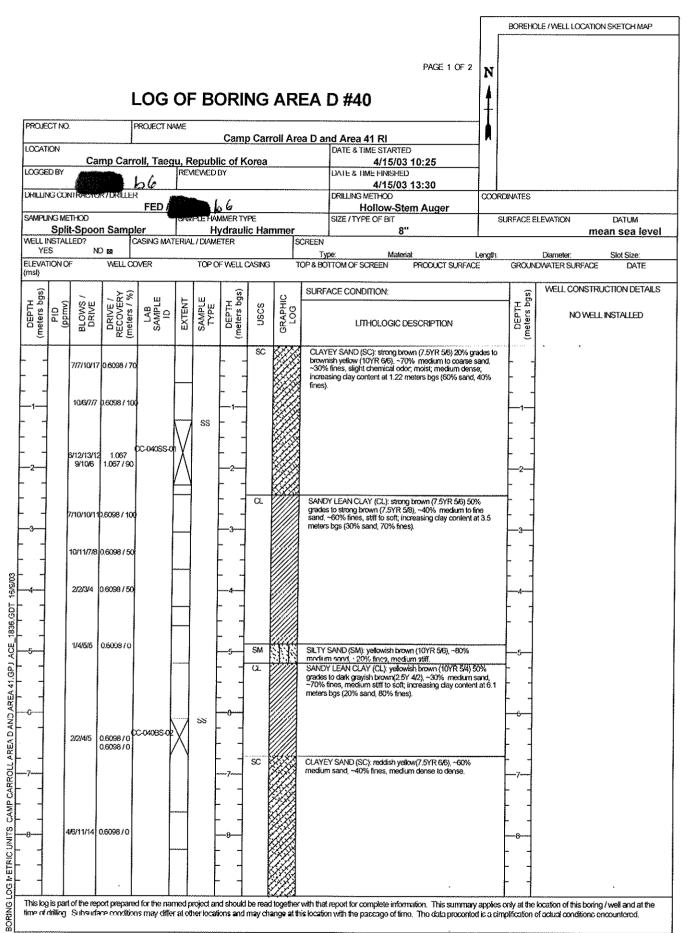
BOREHOLE / WELL LOCATION SKETCH MAP PAGE 2 OF 2 N **LOG OF WELL AREA D #37** PROJECT NO. PROJECT NAME Camp Carroll Area D and Area 41 Ri LOCATION DATE & TIME STARTED Camp Carroll, Taegu, Republic of Korea 4/12/03 08:12 LOGGEOBY DATE & TIME FINISHED 4/12/03 10:45 LAB SAMPLE ID WELL CONSTRUCTION DETAILS DEPTH (meters bgs) PID (ppmv) SURFACE CONDITION: DEPTH (meters bgs) DEPTH (meters bgs) GRAPHIC LOG EXTENT SAMPLE TYPE BLOWS / nscs LITHOLOGIC DESCRIPTION CLAYEY SAND (SC): greenish gray (GLEY1 5/5GY), ~60% sand, ~40% fines, low, moist, medium dense. SC 0/15/18/210,6098 / 55 Slotted PVC Casing CLAYEY SAND (SC): yellowish brown (10YR 5/4), ~60% sand, ~40% fines, wel; medium dense. S 0/18/27/250.6098 / 50 CLAYEY SAND (SC): yellowish brown (10YR 5/4), ~70% fine to medium sand, ~30% fines, wel; dense. 5/20/28/350.6098 / 60 Threaded PVC End End of Borehole at 13.1 m. BORING LOG METRIC UNITS CAMP CARROLL AREA D AND AREA 41.GPJ 4.0E_1338.GDT 16.9/03 This log is part of the report prepared for the named project and should be read together with that report for complete information. This summary applies only at the location of this boring / well and at the time of drilling. Subsurface conditions may driter at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

													_	BOREHO	LE / WEL	L LOCATIO	N SKETCH MAP
											PACE	1 OF 2					
							_				race	. : 0 - 2	N				
			LOG	C	FV	VEL	LA	RE.	A D	#38			1				
ROJECT NO.		F	ROJECT NA	WE		Cami	Carr	oll Are	a Dar	d Area 41 R	I		À				
CATION								VII AIC	a D ai	DATE & TIME S	TARTED						
DGGED BY	Can	np Carro	oli, Taeg		EWED 8		orea			DATE & TIME FI							
RILLING CON	TRACTOR	R/DRILLER	blo	(Marie		1 7				4/1 DRILLING METH	14/03 14:00 DD		COORE	NATES			
WPUNG ME			FED /	ICAN.	PLE HAN	MER TY	oc:			Hollo SIZE / TYPE OF	w-Stem Auge	er	St	JRFACE E	LEVATIO	ON .	DATUM
Spli	t-Spoor	1 Sampl	er		Hy	/drauli			CREEN		8"						ean sea lev
ELL INSTALI YES 62	NC)			40 P\	/C / 2"			Type:		Material: PVC		gth: 6.1 r		Diamete		Slot Size:
EVATION O	F	WELL CO	OVER		TOPO	F WELL (CASING	Т		TOM OF SCREE m / m	N PRODUC	CT SURFACI	<u> </u>	GROUN		SURFACE	4/14/200
gs)	1	- ≿%		Ţ	111	H pgs)		ပ္	SURF	ACE CONDITION	N:			(sb)	WELL	CONSTR	RUCTION DETAIL
Peters bgs) PID (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bg	SOSI	GRAPHIC LOG		LET IO	OGIC DESCRIPTI	ION!		DEPTH (meters bgs)			
(neters PID (ppm)	92	REG Table	X	ŭ	SA T	(Tiet D] _	R.		LEHMOL	ショウ ひだりしだけ	ON		ine.	η		
			-		†		sc		CLAY	EY SAND (SC): d	ark grayish brown(10 o coarse sand, ~30	0YR 4/2), ~1	0% ist.			W.	—PVC Top Cap
_	8/11/9/6	0.6098 / 54	1				L										
-	ENE'E	0 6000 177]			-	a.		GANE grave	Y LEAN CLAY (C , ~30% medium :	L): strong brown (7. sand, ~70% fines, r ers bgs (40%sand,	5YR 5/8), -(noist: increa	1% sing	-		\aleph	
1	D/9/6/5	0.6098 / 75	1			_1			sand	content at 0.9 met	ers ogs (40%sand,	ou% lines).		1			
]	2/5/10/11	0.6098 / 62	,			ļ <u>.</u>			L					ļ -			
-	20,10,11	0.00007 02		L	şs		SC		reciclis	h velow(7.5YR 6A	eddish yellow(7,5YR 6), ~0% gravel, ~60° s, moist; very dense	% medium:	ades to				
2	7/12/15	0.6098 / 78	DC-038BS-0	łV		2				, , , , , , , , , , , , , , , , , , , ,	-, ,,			2-			
				$\langle - \rangle$	ss											M	
-	9/14/15/20	0.6098 / 83	C-038BS-0	ľΧ		┡ -								-			
3—				<u> </u>	1	3								3			
]	7/18/23/26	0.6098 / 83												-			
-														 			
4─	2312812712	0.6098792				4								4			
4	4/31/14/3	0.6098												-			
-	4/3 1/ 14/3	0.0090												-			
5 -]	15/56	0.3040 / 45				 								-5-			
-																\otimes	
-						├ <u>-</u>								+ -			1/2" Dia. Bentor
																	Polloto
4 1	4/30/35/5	0.6098 / 82												-	; ;	::	
-														<u> </u>			
/ <u> </u>						_7_ 								Γ'			
-							SM		SILTY ~0% (, CLAYEY SAND ravel, ~60% med	(SM): reddish yellov furn to coarse sand	v(7.5YR 6/8) I, ~40% fine:	0%, moist	-			
<u> </u>						<u> </u>								<u></u>			
<u>"</u>]																	
4 1						- ~								-			
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Die boie na	rt of the re	port prepar	ed for the na	amed	project a	nd shoul	d be rea	d togeth	er with th	at report for comp	tete information. T	his summa	y applies	only at th	e location	n of this bor	ing/well and at th sencountered.

Camp Carroll, Tasqu. Republic of Korea ONE STATE SPREED AND STATE SPREED ONE STAT												ļ	BOREHOL	E / WELL LOC/	ATION SKETCH MAP
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SECTIFIC Camp. Carroll, Tassus, Republic of Kones Camp. Carroll Tassus, Republic of Kones Control Tassus, Republic of K				LOC		e v	VEI	1 A	DE	N ID #20		A			
Camp Carroll, Tasqu. Republic of Korea ONE STATE SPREED AND STATE SPREED ONE STAT				LUG	, C	7F V	V C.L	LA		A D #30]+			
Camp Carroll, Taseux, Republic of Korea A14/403 88.95 A14/403 14:90 SEPARAGE CONDITION UTHACLOGIC DISCORPTION UTHACLOGIC	PROJECT NO.		P	ROJECT NA	WE		Camp	Carr	oll Are	a D and Area 41 Ri					
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SUPPLICATION DETAIL SUPPLICAT	OGGED DY		OCCUPATION OF THE PARTY OF THE		REV	CWEDI	3Y			DATE & TIME FINISHE	ED				
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End of Morende at 13.7 m. 18— 19— 19— 19— 19— 19— 19— 19—	11_												11		
End of Borenole at 1st / m. Threaded PVC E T	¨-						├								
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re of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	1								,		1		<u> </u>		·
	This log is part ime of drilling.	t of the re Subsurf	port prepare ace conditio	ed for the na ons may diff	amedi, erat o	project a ther toca	nd shouk Nons and	d be rea d may ct	d togethe nange at	with that report for complete in his location with the passage of	formation. This summa time. The data present	ry applie ed Is a si	s only at the Implification	location of this of actual condi	i boring / well and at the tions encountered.
\$ 47% 6273 ASS											1079				

												BOREH	OLE/W	ELL LOCA	ATION SKETCH MAP
			LOG	S C	OF V	VEL	L A	\RE	A D	PAGE 1 OF 2	N 1				
ROJECT NO).	F	ROJECT N	AME	******					·····	┨				
OCATION						Cam	p Carr	oll Are	a D ar	nd Area 41 RI Date & Time Started	🏲				
	Ca	mp Carr	oll, Taeg				orea			4/12/03 13;21					
CXCGED BY			h6	REV	NEWED F	RY				DATE & TIME FINISHED 4/12/03 16:05					
RILLING CO	NIRACIO	RYDRILLER	· ·				***************************************			DRILLING METHOD	 	RONATES		••••••	***************************************
AMPLING MI	=THOD		FED /	TSAM	IPLE HAN	MER T	/PF			Hollow-Stem Auger SIZE / TYPE OF BIT	\vdash	SURFACE	ELEVAT	ION	DATUM
Spl	it-Spoo	n Sampl		<u> </u>	Hy	ydraul				8"		00/11/102			mean sea lev
ÆLLINSTAI YES ⊠	.LED? N		ASING MAT		L/ <i>D</i> IAME 1 40 P \			S	CREEN Type:	Slotted Material: PVC Le	ength: 6.º	1 m	Diam	eter. 2"	Slot Size:
LEVATION ()F	WELL CO		001		F WELL		T	OP & BO	TTOM OF SCREEN PRODUCT SURFAC				ER SURF	ACE DATE
<u> </u>	Т		1	1	1		1		1	m / m ACE CONDITION:			. I we	LL CONS	4/13/200 STRUCTION DETA
(meters bgs)	ω in	DRIVE / RECOVERY (meters / %)	_ 😃	15	шш	DEPTH (meters bgs)	l w	을 ,	SURF	ACE CONDITION.		DEPTH (meters bas)			
eters by	BLOWS	ESS and a series	LAB SAMPLE ID	EXTENT	SAMPLE	EP-1	USCS	GRAPHIC		LITHOLOGIC DESCRIPTION		SEPT			
֓֞֞֞֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	1 85		S	"	တိ	(me		Õ				ق ا	·		
J				T			sc		CLAY	EY SAND (SC): yellow (10YR 7/6), ~10% gravel, im to coarse sand, ~30% fines, low, moist; den	-60%		$\prod_{i=1}^{k}$	■	PVC Top Cap
]	1/20/20/1	5 0,6098/90				[]			mater	iai.	ew ₁ till				
				\vdash	1					EV CAN IS (DO) (Second Second	w ·				
-1	7/9/7/8	0.6098 / 100				<u> </u> -1	SC			EY SAND (SC): brownish yellow (10YR 6/6), ~50 fines, moist; medium dense; fill material.	r% sand,	· 1_	1 🛭		
-							1					-	- 🖏		
	6/12/13/12	0.6098 / 70					sc		CLAY	EY SAND with Gravel (SC): brownish yellow (10)	/R 6/6),	-	1 🔯		
. 1					-				~20%	gravel, ~50% sand, ~50% fines, moist; fill mater	iai.	-			
-2	10/10/11	0.6098				_2_	sc			EY SAND (SC): strong brown (7.5YR 5/6), ~10% medium to coarse sand, ~30% fines, moist; me		_2-] 👸		
]				ļ					dense	; fill material.	-colours				
4	3/9/8/5	0.6098 / 60					-		011 70 4			4 .	↓ 🔯		
.3						_3_	CL.		~80%	CLAY (CL): strong brown (7.5YR 5/6), ~20% sai fines, medium, moist; stiff, fill material.	70,	_3_	1 🔯		
-	AF7 KQ15.5	0.6098 / 100										_} .	1 🛭		
-		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					sc.		mediu	EY SAND (SC); yellowish brown (10YR 5/4), ~60° m to coarse sand, ~40% fines, medium dense;		.	1 🔯		
, 1	10/50	0.6098 / 70					SC		materi CLAYI	EY SAND (SC); reddish yellow(5YR 6/6) 50% ara	des to		1 🔯		
1	4/6/5/7	0.6098770				A			dry; fill	(10YR 7/6), ~50% sand, ~50% fines, low to med material	aum,	4			
													N.	X	
4							SC		CLAYE	EY SAND (SC): strong brown (7.5YR 5/6), ~60% n to coarse band, ~40% fines, low, medium der	ise fill	ļ.			1/2" Dis. Bentor
5—	4/5/5/4	0.5098740				_5_		11/2	maten	al,	.~~, HII	-5-		1 1°	Pellets
-		İ										+ -			
1												-			
] [:]		
~]		1					sc			Y SAND (SC): strong brown (7.5YR 5/6), ~10%					
_	6/7/7/6	0.609870								~60% sand, ~30% fines, no odor; moist; mediur fill material.	n	L .		量::1	
-			ŀ									-		∄ ∛]	
7		ļ			-	—7 —						7—		∄ :]	
-					}							+ -		#∦	
1			-	\dashv		~ †	QL		SANITA	LEAN CLAY (CL): dark greenish gray (GLEY1 4	V5GY\	<i>-</i> ∤ ′		₹3	
	3/3/4/5	0.6098 / 40			ļ		~			medium to fine sand, ~70% fines, moist to wet;				#	
Ĭ .	_		Ĺ	_										∄ :∄	
4															
4					-					Þ				<u> </u>	Filler Pack
1 I	į.			1				1////						<u> → J</u>	1 102H 1 14P

			LOG	C	FV	VEL	LA	RE	A D	#39			🛊			
PROJECT NO.	***************************************	R	ROJECT NA	ME		Camp	Carr	oll Are	a D ar	nd Area 41 F	રા					
LOCATION	Car	np Carro	ii. Taeq	u. R	epubli	c of K				DATE & TIME S		21				
O/GED BY			66	REV	EWEDE	3Y				DATE & TIME F		***************************************] [
(\$6)		. ≿ 😨	***	Ī.		ŝ	[v	SURF	ACE CONDITIC			J.,	(sb	WELL CON	NSTRUCTION DETAILS
DEPTH (meters bgs) PID (ppmv)	BLOWS / DRIVE	DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC		LITHOL	OGIC DESC	RIPTION		DEPTH (meters bgs)		
-	1/2/4/5	0.6098 / 100	1				a.		SiLT' secor sand,	/ CLAY (CL): yelk ndary mineralizatio , ~90% fines, med	owish brown (1 on gray(2.5Y 6/ fium, wet, med	DYR 5/8) 20% with 1), ~10% fine to vitium stiff.	h very fine	-		Slotted PVC Casing
-10						 -10-								—10— — 10—		
-11	8/8/9/11	0.6098 / 70				11	a		EAN(grade sand,	DY LEAN CLAY (i s to yellowish bro ~70% fines, no o	CL): brownish y wn (10YR 5/4), dor, wet; very s	otlow (10YR 6/8): ~30% fine to me stiff.	20% xakum			
-																
-12	2/3/6/7	0.609870				—12— 	CL.		SANE medi	DY LEAN CLAY (C um to coarse sand End	CL): pale yellow d, ~80% fines, of Borehole at	(2.5Y 7/4), ~20% wet; stiff. 12.5 m.		12		Threaded PVC End Cap
-13						 13								- 13-		
-14						 14										
-15				:		—15— 								15		
-16						16								 1 6		
-17						 -1/								 		
-18						—18— 								-18		
-19_														19		



	BOREHOLE / WELL LOCATION SKETCH MAP
	MOE 0. OF 0.
	AGE 2 OF 2 N
LOG OF BORING AREA D #40	
Camp Carroll Area D and Area 41 RI	
CATION DATE & TIME STARTED Camp Carroll, Taequ, Republic of Korea 4/15/03 10:2	P.5.
GGEDDY DATE & TIME FINISHED 4/15/03 13:3	
SURFACE CONDITION:	T & NO WELL INSTALLED
(meters bgs) BLOWS /	
1/18/25/32 0.6098 / 0	
10	9.8 m.
	1
	["]
2	-12-
	<u> </u>
	<u> </u>
3-1	13-1
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4	14-
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5—	
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6-	16
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7	J17J
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8	18
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	19
9─1	"
	n. This summary applies only at the location of this boring / well and at t

NOV 107	CT NO.					ВО	RIN	G A	ARE	A D	B-006		\mathbf{I}			
				PROJECT N	-UVIE		Cam	p Carr	oll Are	ea D ar	d Area 41 RI					
.CCATH	ON	Car	nn Care	oll, Taeg	os R	anuhl	ic of K	orea			DATE & TIME STARTED 4/1/03 14:	20				
OGGE	D8Y			b6		EWFD1		OT CO			DATE & TIME FINISHED					
KILLIN	KG COON	no cons	NAPAILLE	₹	J		······				4/1/03 15: DRILLING METHOD		COORD	NATES		***************************************
AMPU	NG ME	THOD	Beautit	ful Envir			Corp MMER TY	PF			Direct-Pus	sh	SH	DEACE E	LEVATION	DATUM
	Geo	probe	Sample						- 1-		OZET THE OF BIT		30	NI AOL L	CCVATION	mean sea lev
YES		N) B 3	CASING MAT	EKIAL	.7 DIAME	:TER		S	CREEN Typ	e: Material:	Le	ngth:		Diameter:	Slot Size:
LEVAT nsl)	ION OF	:	WELL CO	OVER		TOPO	F WELL (CASING	1			ODUCT SURFACE		GROUN	DWATER SURF	
(S)		_	> ௐ		Γ		6		T	SURFA	CE CONDITION:			ြ	WELL CON	STRUCTION DETAIL
Meters bgs)	PID (ppmv)	BLOWS	DRIVE / RECOVERY (meters / %)	LAB SAMPLE FD	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	USCS	GRAPHIC LOG		LMHOLOGIC DESC	RIPTION		DEPTH (meters bgs)	NO	WELL INSTALLED
3	<0.1 <0.1	The state of the s	1.5/80 1.5/90 1.5/80 1.2/100	CC008BS0		SS		SC SC-SM		SiLTY, Some of Silty, -70% dense; angular	CLAYEY SAND (SC): strong by the contains some coars of dense; contains some coars of dense; contains some coars of dense; contains some coars of dense; contains some coars of clayer SAND (SC): strong by strong strong strong strong strong strong strong dense of dense den	nd, ~25% fines, moile sand. brown (7.5YR 5/6), with prown (7.5YR 5/6), with caprolite) with caprolite) with caprolite) with caprolite.	ith ith			
, - , - , - , - , - , -	±0.1		1.5/100	CC006BS02		-	7-1	8		dense. CLAYE	'SAND (SC): yellowish red (5' \$56), ~60% fine to medium s 'SAND (SC): strong brown (7, subrounded to subangular se subrounded to subangular se SAND (SC): dark grayish brown m sand, ~40% fines, moist to	and, ~40% fines, fin 5YR 5/6), ~60% fines, mo	orst, /			
-								a		EANDY Note to m	L'AN CLAY (CL); dark grayish edium sand, -60% fines, med End of Dorelhote at 8	ium wet	35%	-8		

												BOREHO	DLE / WELL LOCATION	ISKETCH MAP
										PAGE 1 OF 1	N			
		L	og c)F	BO	RIN	G A	\RE	A D	B-010	 			
PROJECT NO			PROJECT N								†			
	J. 		-RUECI N	- JANE		Cam	o Carı	oll Are	a D ar	nd Area 41 Ri				
LOCATION	Car	np Carr	oil, Taeg				orea			DATE & TIME STARTED 4/1/03 09:20				
LOX3GED BY			6	RFV	(EWFD)	BY				DATE & TIME FINISHED 4/1/03 12:30				
DRILLING CO			ul Enviro	ากก	ental (Cors				DRILLING METHOD Direct-Push	COORD	INATES		
SAMPLING ME	ETHOD					MMER TY	PE			SIZE / TYPE OF BIT	SL	IRFACE E	ELEVATION	DATUM an see level
WELL INSTAL		- [0	SASING MAT	ERIAL	MAKD\	ETER		S	CREEN				me	an sea level
YES ELEVATION C		MET CO	OVER		TOPO	F WELL	CASING	T-	Ty OP & BO	pe: Material: L TTOM OF SCREEN PRODUCT SURFACE	.ength: E	GROUN	Diameter: DWATER SURFACE	Slot Size: DATE
(msl)	T	1	T	_	1		T	1	ei ipe	ACE CONDITION:		T	WELL CONSTRU	ICTION DETAILS
DEPTH (meters bgs) PID (ppmv)	S N H	DRIVE / RECOVERY (meters / %)	P. F.	F.	J.E	DEPTH (meters bgs)	g	GRAPHIC LOG	SURM	ACE CONDITION.	~~~~~	DEPTH (meters bgs)		
DEPTH neters by P1D (ppmv)	BLOWS	DRIV ECON	LAB SAMPLE ID	EXTENT	SAMPLE TYPE	DEP	nscs	LO		LITHOLOGIC DESCRIPTION		DEP	NO WELL	INSTALLED
5		<u>~</u> 5	ļ	_		<u> </u>			Donner	also ble vece see		٤		
⊲0.1				L		-	SM	1000		obe. No recovery. 'SAND (SM): strong brown (7.5YR 5/6), ~0% graw	al			
 		0.6]		~80%	fine to coarse sand, ~15% fines, moist; medium cobbles at 0.8 to 0.9 meters.	dense,			
					SS	1	SM		SILTY	SAND (SM); strong brown (7.5YR 5/6), ~5% graw	el,			
				$\mathbb{N}/$		┡ -			~80% mang	fine to coarse sand, ~15% fines, moist; dense, anese oxide noted at 2.1 meters.		F =		
- 1		1.1780 17100	CC010SS01	X		-								
2				igspace igspace								_2_		
├						-								
		1.2 / 80					a		SAND	DY LEAN CLAY (CL): strong brown (7.5YR 5/6) 109	<u>.</u>			
						3	<i>ش</i>		mottle	d with white (10YR 8/1), ~5% gravel, ~35% fine to m sand, ~60% fines, low to medium, moist; firm.)	_3_		
							SC-SM		SILTY	, CLAYEY SAND (SC-SM): strong brown (7.5YR 5	itó),	 		
									~65%	fine to medium sand, ~35% fines, moist; dense.		F 1		
		1.3780				- ~								:
-							a.			Y ŁEAN CLAY (CL); strong brown (7.5YR 5/6), ~35 medium sand, ~65% fines, medium, moist; firm.	5%	┡		
												┞ ┤		
					13/3		ъс		Sil TY fine to	,CLAYEY SAND (SC): xtmng brown (7.6YR 50), medium sand, ~35% fines, moist; dense.	-C5%			
_		1.17.23	CC010BS01	V		<u> </u>	sc		SILTY	, CLAYEY SAND (SC): Olive gray(5Y 4/2), -65%	 fine to	ļ ~]		
		1/100		Λ			SC		_ <u>mediur</u> SILTY,	m sand, ~35% fines, moist, dense. CLAYEY SAND (SC): strong brown (7,5YR 5/6), -				
				\dashv			sc		SILTY,	m to coarse sand, ~35% fines, moist; dense. , CLAYEY SAND (SC); yellowish brown (10YR 5/4	1),			
										fine to medium sand, ~35% fines, moist; dense.		_ ` _		
		1.5 / 100					SC			.CLAYEY SAND (SC): red (2.5YR 4/6) 50% and o (2.5Y 4/4), ~65% fine to medium sand, ~35% fine		┝╶┪		
-						- ,	a		SAND	Y LEAN CLAY (CL): dark yellowish brown (10YR 4	(4)			
									micace	<u> </u>				
				_	ss		SC		~50%	Y LEAN CLAY (SC): dark yellowish brown (10YR 4 fine to medium sand, ~50% fines, low to medium		-		
-		40.1400		$\backslash / \! \mid$	SS	-			to wet.			F -		
		1.3 / 100	CC010BS02	XI										
-				\triangle										
										End of Borehote at 8,6 m.		-		
										t report for complete information. This summary on with the passage of time. The data presente				

BORING LOS METRIC UNITS CAMP CARROLL AREA D'AND AREA 41,GPJ ACE_1836.GDT 16/9/03

												,	BOREHO	DLE / WELL LOCATION	SKETCH MAP
											PAGE 1 OF 2	N			
			L	og c	F	во	RIN	iG A	ARE	A D	B-017	‡			
PROJEC	T NO.			PROJECT N	WE										
LOCATIO	N					-	Cam	p Car	roll Are	a D a	nd Area 41 RI Date & time started	•			
		Car	np Carr	oll, Taeg				Corea			4/2/03 08:20				
LOGGED	BY			166	REV	(EWED)	3Y				DATE & TIME (TINISHED 4/2/03 10:30				
DRILLING	CON	TRACTO	R/DRILLE			4_1	~				DRILLING METHOD	COORD	NATES	*****	
SAMPLIN			***********	ful Enviro		entai (IPLE HW		YPE			Direct-Push SIZE / TYPE OF BIT	SU	RFACE E	ELEVATION	DATUM
WELL IN:			Sample	OR MAT	EOIA	LEVARA	TED		- Ic	CREEN		L		mea	an sea level
YES) ga	JAOHIO MATI	LINE					Ту		.ength:		Diameter:	Slot Size:
ELEVATION (msl)	PO NC	-	WELL CO	OVER		TOPO	F WELL	CASING	7	OP&BC	TTOM OF SCREEN PRODUCT SURFACE	=	GROUN	NOWATER SURFACE	DATE
gs)		1	. ≿.%	ш	ļ	ш	gs)		ಲ	SURF	ACE CONDITION:		gs)	WELL CONSTRU	CTION DETAILS
DEPTH (meters bgs) PID (ppmv) BLOWS /			DRIVE / RECOVERY (meters / %)	LAB SAMPLI	EXTENT	SAMPLE TYPE	DEPTH (meters bgs)	nscs	GRAPHIC		LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO WELL I	NSTALLED
))			1		-		_ <u> </u>		 	Precor	obe, No recovery.				
							-	1			,		-		
- 1							-	1					-	1	
								1					<u> </u>		
								SC		SILTY fine to	SILTY, CLAYEY SAND (SC): strong brown (7.5YR 5/6), ~10% fine to coarse, angular gravet, ~70% fine to coarse sand, ~20% fines, moist; dense; fill soil.			<u> </u>	
<0.1				ļ	SS	ļ	-		20% fines, moist; dense; fill soil.						
	1.5/70]\/										
<u>-2</u>	l		1.05 / 100	CC017SS0	ΙX		-2-	1					2		
- 1					$V \setminus$		-	1					-		
_]								sc		SILT\ ~10%	, CLAYEY SAND (SC): yellowish brown (10YR 5/	6) <u>,</u> se]	
3-	l						3	<u> </u>			fine to coarse, angular gravel, ~70% fine to coar ~20% fines, moist, dense; fill soil.		3		
			1.5/80				-	CL		fare to	CLAY with Sand (CL); strong brown (7.5YR 5/8), - coarse, angular gravel, ~70% fine to coarse sain fines, low to medium, moist; firm; fill soil.				
	-							a.		H	CLAY with Sand (CL): yellowish red (5YR 5/8), ~1	10%	┝╶┤		
1							-	1		fine to ~20%	coarse, angular gravel, ~70% fine to coarse san fines, low to medium, moist, firm; fill soil.	d,	╽ . 1		
4							-4-	SC			, CLAYEY SAND (SC): strong brown (7.5YR 5/6),		_4_		
											avel, ~60% fine to coarse, subangular to submun ~35% fines, moist; dense; fill soil.	ided	- 4		
- 4			1.5/80												
5-							-5-				, CLAYEY SAND (SC); strong brown (7,5YR 56),	L C ()	5		
- 1								SC			coarse sand, ~45% fines, moist; firm; fill soil.	~3376	- 1		
	-														
- c							6						6		
			1.5/70										-		
							- ~	L							
- 1								SC SC			'EL with Silt and Sand (GM); dark brown (10YR 3/3) fine to coarse, angular gravel, ~30% sand, ~20%				
_7					\neg		—7— 	sc		SILTY	, CLAYEY SAND (SC): strong brown (7.5YR 5/6),	fill	_/_]		
_]										SILTY fine gr	, CLAYEY SAND (SC): strong brown (7.5YR 5/6), avel, ~60% fine to coarse sand, ~35% fines, moi:	-5% st;			
		ĺ	1.5 / 60							dense					
-8-			, 00				-8-						-8-		
								a		SILTY	CLAY with Sand (Ci.): dark greenish gray(5G 4/1)	, fine			
								aı		to me SANU	tium sand low moist Y LEAN CLAY (CH): yetlowish red (5YR 5/8), ~30	% fine			
1								<u> </u>		1171784	and the set, execution and supply the set				
This log time of a	is par Inling	of the re Subsurf	port prepar ace condibi	ed for the na ons may diffe	imed er at o	project a ther loca	nd shou tìons an	id be rea dimay d	ad togethe hange at	er with tha this locati	at report for complete information. This summar on with the passage of time. The data presente	y applies i ed is a sim	only at the philication	ne nocation of this boring n of actual conditions er	/ well and at the ncountered.

BORING LOG METRIC UNITS CAMP CARROLL AREA D AND AREA 41.GPJ J.CE., 1836.GDT - 6PJC3

									_	BOREHO	LE / WELL LOCATION SKETCH MAP
				BO	RIN	G A	\RE	PAGE 2 OF 2 A D B-017	N 4		
ROJECT NO.	P	ROJECT NA	ME		Camp	Carr	oll Are	ı D and Area 41 RI			
OCATION (DGGED BY	Camp Carro	oll, Taeg	u, R	epubli 1EWED 8	c of K	orea	***************************************	DATE & TIME STARTED 4/2/03 08:20 DATE & TIME FINISHED 4/2/03 10:30			
gs)	/ % (%		ļ-	ш ш	(sg		ಲ	SURFACE CONDITION:		gs)	WELL CONSTRUCTION DETAIL
(meters bgs) P1D (ppmv) BLOWS /	DRIVE / DRIVE / RECOVERY (meters / %)	LAB SAMPLE ID	EXTENT	SAMPLE	DEPTH (meters bgs)	USCS	GRAPHIC LOG	LITHOLOGIC DESCRIPTION		DEPTH (meters bgs)	NO WELL INSTALLED
	1.5/90					ан		SANDY LEAN CLAY (CH): olive brown (2.5Y 4/3), ~30' to medium sand, ~70% fines, high, wet.	% fine		
10-					10	сн		SANDY LEAN CLAY (CH); dark brown (10YR 3/3), ~20 \to medium sand, ~80% fines, high, wel. End of Borehole at 10.0 m.	% fine	10-	
					- II					11 	
2					 12					12-	
3-1										13	
-					 14					14-	
					 					-	
5-1					—15— 					15	
; <u> </u>					 16					16-	
-					- 7						
				İ	17 					-17- 	
					18					18-	
				-	 						
-				}	_19_	;				19	