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APPLICABILITY OF THE LINEAR SORPTION ISOTHERM MODEL TO REPRESENT CONTAMINANT TRANSPORT PROCESSES IN SITE-WIDE PERFORMANCE ASSESSMENTS

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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Richland, Washington

Contractor for the U.S. Department of Energy
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GV Last, PNNL

June 2003

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Applicability of the Linear Sorption Isotherm Model to Represent Contaminant Transport Processes in Site-Wide Performance Assessments

A White Paper

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September 18, 2002

Prepared for
Fluor Hanford, Inc
Richland, Washington

1.0 Introduction and Technical Need

The estimation of flux of contaminants through the vadose zone to the groundwater under varying geologic, hydrologic, and chemical conditions is key to making technically credible and sound decisions regarding soil site characterization and remediation, single-shell tank retrieval, and waste site closures (DOE 2000). One of the principal needs identified in the science and technology roadmap (DOE 2000) is the need to improve the conceptual and numerical models that describe the location of contaminants today, and to provide the basis for forecasting future movement of contaminants on both site-specific and site-wide scales.

The State of Knowledge (DOE 1999) and Preliminary Concepts[1] documents describe the importance of geochemical processes on the transport of contaminants through the Vadose Zone. These processes have been identified in the international list of Features, Events, and Processes (FEPs) (NEA 2000) and included in the list of FEPS currently being developed for Hanford Site asseessments (Soler et al. 2001). The current vision for Hanford site-wide cumulative risk assessments as performed using the System Assessment Capability (SAC) (Kincaid et. al., 2000) is to represent contaminant adsorption using the linear isotherm (empirical distribution coefficient, K_d) sorption model.

Integration Project Expert Panel (IPEP) comments indicate that work is required to adequately justify the applicability of the linear sorption model, and to identify and defend the range of K_d values that are adopted for assessments. The work plans developed for the Science and Technology (S&T) efforts, SAC, and the Core Projects must answer directly the question of "Is there a scientific basis for the application of the linear sorption isotherm model to the complex wastes of the Hanford Site?" This paper is intended to address these issues.

The reason that well documented justification is required for using the linear sorption (K_d) model is that this approach is strictly empirical and is often applicable only under a limited range of physical-chemical conditions. As a result, K_d values can be applied with confidence only to conditions under which the linear adsorption isotherm has been demonstrated to be applicable. If the sediment/soil mineralogy or physical properties, solution chemistry, or contaminant loading/concentration of the system to be modeled is significantly different from that for which the K_d values were determined, significant error could potentially occur in the estimated transport rates. This is because many factors can affect the degree to which a particular contaminant adsorbs to a particular sediment or soil. These factors include: sediment mineralogy and surface area, major ion concentration (complexation and competitive adsorption), pH of the solution, and concentration of the adsorbate in solution and on the adsorbent. Another important variable that can affect adsorption is kinetics. If the contact time between the contaminant in solution and the sediment is limited by hydrologic factors, equilibrium may not be attained. In this case, modeling with equilibrium K_d values will overestimate the degree of adsorption. In some cases careful application of currently available geochemical knowledge can often significantly reduce the number of variables that must be considered for evaluating K_d values for each particular contaminant (see EPA 1999a, b for identification of key controlling parameters for several radionuclides).

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[1] Groundwater/Vadose Zone Integration Project, *Preliminary System Assessment Capability Concepts for Architecture, Platform and Data Management*, September 30, 1999, http://www.bhi-erc.com/vadose/Workgrps/SAC/Report/9-30rep.pdf

2.0 Background: Adsorption Mechanisms

Adsorption, accumulation at the solid-water interface, is one of the primary processes controlling the transport of dissolved contaminants in the vadose zone and groundwater. Adsorption occurs as atoms, molecules, and ions exert forces on each other at this solid-water interface. Adsorption reactions are discussed primarily in terms of intermolecular interactions between solute and solid phases (Stumm and Morgan 1996). These interactions include:

1.) *Surface complexation reactions* (surface hydrolysis and the formation of coordinative bonds at the surface with metals and with ligands).

2.) *Electrostatic interactions* at the surfaces, extending over longer distances than chemical forces.

3.) *Hydrophobic expulsion* of hydrophobic substances (this includes nonpolar organic solutes), which are usually only sparingly soluble in water and tend to reduce their contact with water and seek relatively nonpolar environments, thus accumulating on solid surfaces and becoming adsorbed on organic sorbents.

4.) *Adsorption of surfactants* (molecules that contain a hydrophobic moiety). Interfacial tension and adsorption are intimately related through the Gibbs adsorption law. Expressed simply this law indicates that substances that reduce surface tension will tend to adsorb at interfaces.

5.) *Adsorption of polymers* and of polyelectrolytes (humic substances and proteins in particular), is a rather general phenomenon in natural waters and soil systems that has far-reaching consequences for the interaction of particles with each other and on the attachments of colloids (and bacteria) to surfaces.

The process in which chemicals become associated with solid phases is often referred to as *sorption*, especially when one is not sure whether one is dealing with *ad*sorption (onto a two-dimensional surface) or *ab*sorption into a three-dimensional matrix.

The chemical properties of the solution in contact with the solid phase will have a substantial affect on its adsorption characteristics. For example, pH will have a major influence on the degree of surface hydrolysis, which in turn affects the nature and extent of surface charge. Ionic strength will affect the electrostatic nature of the surface and therefore the electrostatic interactions that can occur. In addition to these affects, the adsorption process itself will change the nature of the surfaces of the solid phase and will influence further adsorption.

The chemical properties of the solution in contact with the solid phase will also affect adsorption as a result of interactions between dissolved species. For example, many metal ions form complexes with major anions in solution. The formation of these complex species can have a major influence on the charge and geometry of the original ion and as a result, significantly alter the sorptive properties of the ion of interest. A special case of complex formation is hydrolysis. Hydrolysis is the formation of complexes with hydroxide ion and is a strong function of pH. Ionic strength can be an important factor that affects the activity of all dissolved ions and as a result the extent of complex formation. Eh can also have a large influent on adsorption by altering the oxidation state of the contaminant and the adsorbent.

3.0 Numerical Simulation of Sorption Processes

Although most of the mechanisms that affect surface sorption described above are fairly well understood, data are not readily available for all the contaminants, sorbents and conditions required for Hanford conditions. Significant problems become apparent when attempting to apply mechanistic modeling approaches to the adsorption of contaminants in some of the complex systems that occur at the Hanford Site. Some of the most significant problems include the large number of contaminants of concern, the large number of potential adsorbents within Hanford sediment, interaction between adsorbent materials that could potentially affect there individual adsorption properties and the wide range of conditions that exist within the various waste sites at Hanford. Mechanistic data simply are not available for all the contaminants, adsorbents and conditions that would be required to model all the potentially important wastes sites at Hanford. In addition the resources required to develop these data would be very large in terms of both cost and time. Additional problems with the application of a mechanistic approach is that a variety of irreversible and rate controlled processes are known to impact adsorption at some sites and many of these kinetic processes are poorly quantified. For example, it is known that desorption K_d values for many contaminants are known to be significantly higher than their adsorption K_d values. This indicates that some irreversible adsorption processes may be taking place. Another important process is the irreversible alteration of mineral components of sediments beneath the high-level radioactive waste storage tanks that have been in contact with high pH tank waste. These alterations are poorly understood and are the subject of ongoing investigations.

Although it is expected that mechanistic investigations of contaminant adsorption will provide invaluable data to improve our understanding of contaminant transport at the Hanford site, this approach alone is not likely to provide all the necessary data required to conduct timely transport modeling for all contaminants and conditions as required for ongoing Hanford site risk assessments.

4.0 The Linear Sorption Model Approach and its Application at Hanford

In the linear adsorption model, adsorption is described with a distribution coefficient or K_d:

$$K_d = S/C_{aq}$$

where S is the concentration of the contaminant on the solid and C_{aq} is the concentration of the contaminant in the aqueous phase. As indicated previously the primary drawback of this approach is that the model is purely empirical and should be applied only to conditions under which the K_d was measured. This restriction can be relaxed if a particular variable is known to have no or minimal influence on the adsorption of the contaminant of interest. The advantages of this approach is that it is simple and it can be applied to complex matrices (such as soils and sediments) and solutions for which it would be difficult or impossible to obtain all the required mechanistic surface adsorption data.

An important benefit of the linear adsorption approach at Hanford, is that a relatively extensive database of K_d values applicable to Hanford sediments is available for the contaminants of most concern over a fairly broad range of conditions (Cantrell et al. 2002). These data have been critically reviewed and cataloged and placed in an accessible database that will be periodically updated as new data become available. This K_d database (Cantrell et al. 2002) includes available data on the solution chemistry, sediment mineralogy, physical

properties of the sediment and other experimental parameters used in the determination of the K_d values.

For most circumstances, the linear adsorption model (K_d model) approach will be adequate for modeling transport through the Hanford system, especially for the far field and low impact sites where geochemical conditions remain fairly constant and contaminant loading of the adsorption sites is low. However, in some situations such as where large changes in chemical conditions occur within a small spatial zone (underneath a leaking high-level waste tank for example), the linear adsorption model may not be appropriate. In these circumstances, rapidly changing chemical conditions can result in large changes in reactivity of the contaminants with surface sites and in large changes in K_d values within a small spacial domain. K_d values are frequently dependent upon many chemical parameters such as pH, sodium ion concentration, contaminant concentration, etc. High contaminant concentrations can present problems for the linear adsorption model approach. An inherent assumption of the K_d adsorption model approach is that adsorption is linear. At high surface loadings adsorption typically becomes nonlinear, resulting in error when using the linear adsorption approach. These limitations of the linear adsorption model approach have been dramatically illustrated by the recent work conducted on Cs^+ adsorption on Hanford sediments under conditions expected underneath a leaking high-level waste tank (Zachara et al., 2002). Under these types of circumstances (e.g., large variation in pH, sodium ion concentration, complexing agents, and contaminant loading) a more sophisticated approach to surface adsorption modeling is warranted.

In addition to the direct influence of chemical variables on K_d values it should be noted that nearly all K_d value measurements are adsorption K_d values. In most modeling approaches the K_d value is assumed to be at equilibrium and reversible. This is not always true. For example, desorption K_d values are frequently higher than adsorption K_d values. This can result from a number of phenomenon. For example, aging of the sediment after adsorption of a contaminant could potentially result in chemical alterations that could slow the release of adsorbed contaminants or encapsulate the contaminant. Phase changes on or within the sediment or subsequent precipitation of mineral phases onto the surfaces of the sediment are examples of chemical alterations that could lead to these affects. In addition to chemical affects, physical processes can influence adsorption. For example, over time contaminants can diffuse through micropores within sediments to reach adsorption sites that were not initially accessible. This can result in a slow increase in K_d values over time and also result in apparently higher desorption K_d values.

It is envisioned that improvements will be periodically made to site-wide assessment tools (such as SAC) by focusing on the sites, contaminants, and conditions that have a combination of high potential risk and high uncertainty associated with the adsorption data. Through this approach, limited resources can be better allocated to the sites and conditions that are found to have the highest potential risk and the highest potential for risk uncertainty reduction by collecting more accurate adsorption data.

Obtaining more accurate adsorption data may involve determination of K_d values under conditions that more closely resemble that of the site being modeled or it could involve a more detailed mechanistic study to get a better understanding of the important transport processes and mechanisms involved. The actual approach to be taken will be situation dependent.

5.0 K_d Values as a Function of Waste Stream Designations and Impact Zones

Currently 6 waste stream descriptions are being used in version 0 of SAC for purposes of assigning K_d values. Along with the waste stream designation each waste site is broken down into impact zones: high impact, intermediate impact and groundwater (background or insignificant impact). In order to better justify the selection of the K_d values for each waste stream designation and impact zone, it has been determined that quantitative values (chemical concentrations), for each waste stream category should be assigned. This will provide for a systematic approach for the assignment of K_d values that is less ambiguous and more technically defensible. Based on review of the six waste stream designations it was also determined that the six designations should be reduced to three. The current six waste stream designations are:

1. High Organic/Very Acidic
2. High Organic/Near Neutral
3. High Salt/Very Basic
4. Chelates/ High Salt
5. Low Organic/Low Salt/Acidic
6. Low Organic/Low Salt/Near Neutral

These can be simplified to the following three:

1. High Salt
2. Very Acidic
3. Low Salt/Near Neutral

The reasons for these simplifications are as follows. The high organic designation can be eliminated because waste streams that were termed "high organic" generally refer to TBP, hexone, NPH (kerosene), lard oil, carbon tetrachloride. Based on our geochemical experience, tabulations of metal-organic complex stability constants such as Martell (1971), Martell and Smith (1977), Smith and Martell (1982), and the fact that most of these organics are non-polar and relatively hydrophobic molecules, excepting TPB these organics cannot complex metals and radionuclides and will not be important in their transport. Based on these references and our geochemical experience we are confident that TBP is a weak complexant and after any dilution will not be capable of mobilizing metals and radionuclides. Such non polar and/or hydrophobic organic compounds if disposed in large quantities and high concentration could potentially affect radionuclide and metal migration by creating a reducing zone, however, field evidence suggests that this did not occur to any significant extent at the Hanford Site (see Serne and Wood 1990 and references therein). There is also no evidence of such organic compound impacts at other nuclear waste sites across North America (Serne et al. 1990 and 1995).

The acidic waste stream is combined with the near neutral waste stream because waste streams that are not strongly acidic will be neutralized immediately (for all practical purposes). The Chelates/High Salt category is simplified to just High Salt because the effect of high salt is generally greater than that of the chelating agents and chelating agents were released at a relatively small number of sites. Only at very high concentrations of chelates are they capable of significantly mobilizing radionuclides and metals. In addition the chelates themselves can

adsorb. These arguments are supported by K_d measurements made in the presence of EDTA and other chelating agents (Cantrell et al. 2002; Serne et al. 2002).

Unfortunately assignment of K_d values for the very acidic waste is problematic. At Hanford it is believed that the only very acidic waste streams to be disposed were at U-Plant. The waste sites that are believed to have received very acidic waste are trenches 216-U-1, 216-U-2, U-8, U-12 and possibly 216-U-17. Due to relatively wide range in pH values of the acidic wastes that were disposed and a lack of information on the relative amounts of wastes for a particular pH value it is almost impossible to estimate an appropriate K_d value for this waste category. At the current time it is suggested that K_d values appropriate for low salt/near neutral be used for very acidic sites until better characterization data for the waste stream or acidic impacted waste sites become available.

6.0 Conclusions and Recommendations

The linear adsorption model or K_d approach is a useful and practical approach for modeling contaminant adsorption in transport performance assessments. This empirical approach has the advantages of being simple and the availability of a considerable database of Hanford specific K_d values measured under a variety of conditions.

An inherent drawback of this approach is its empirical nature. Because the variation in a K_d value cannot be confidently estimated beyond the range of chemical conditions under which it was measured, the utility of any K_d measurement is good only for that specific set of conditions. This limitation is not a significant problem as long as the site-specific conditions being modeled do not deviate significantly from that for which K_d measurements are available. However, for situations in which the concentrations of chemical parameters change rapidly within a small spatial zone (e.g., under a leaking high level waste tank), K_d values are not generally available for all the important contaminants as a function of all the important parameters in sufficient detail to provide transport modeling results that are sufficiently accurate.

In this situation several approaches could be taken. Each of the possible approaches will require a more detailed knowledge of the geochemical parameters and mechanisms that control adsorption of a particular contaminant under site-specific conditions. The more scientifically rigorous approach would be to conduct detailed mechanistic adsorption studies to determine the influence of all the important geochemical parameters over a broad range of concentrations that could potentially influence adsorption for each contaminant of interest. This approach is likely to be costly and time consuming.

A faster and more economical alternative to the more scientifically rigorous approach is to apply available mechanistic information to design an adsorption study in which K_d values are determined over a range of geochemical parameters that have the greatest influence on adsorption. These studies would be limited to contaminants that pose the greatest potential risk. It is likely that this approach would only be required for the limited number of waste sites where high concentration wastes were discharged or at leaking high level waste tank sites. Although this approach is not as ideal as a completely mechanistic approach, it would provide a method to obtain more reliable modeling results in a more economical and timely fashion.

As a means of increasing the scientific defensibility of using the K_d approach for estimating adsorption in performance assessment modeling it is recommended that a detailed comparison be made with a transport model in which a more rigorous mechanistic approach to adsorption is used. For example, a comprehensive mechanistic Sr adsorption/desorption study for Hanford sedimentary materials is currently being conducted at PNNL (Zachara et al. 2002 Draft Document). This data could be used as the basis for a modeling approach comparison. In this comparison, a site that has previously been well characterized would be selected to aid in the comparison. The modeling approach used in a typical SAC transport scenario would be run and these results would be compared with a modeling run for the same site which utilized the available mechanistic data to the greatest extent practical. This type of comparison would be very useful for establishing the magnitude of error that could be expected when using the more simplistic but more broadly applicable K_d approach for adsorption modeling in a transport code. Further comparisons with other example contaminants of concern such as uranium could be conducted as data became available.

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DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION	COMMENTS
5			Sand & dirt	
10			Sand - gravel	7' to 9' concrete
11			Sand - pea gravel	Special
12			Sand - pea gravel	Special
13			Pea gravel	Special
14			Pea gravel	Special
15			Pea gravel	
16			Pea gravel	Special
17			Pea gravel	Special
18			Sand - gravel	Special
19			Sand - gravel	Special
20			Sand - gravel - cobblestone	
21			Sand - gravel	
22			Sand - gravel	
23			Sand - gravel	
24			Sand - gravel	
25			Sand - gravel	
26			Sand - gravel	
27			Sand - gravel	
28			Sand - gravel	
29			Sand - gravel	
30			Sand - gravel	
31			Sand - gravel - cobblestone	Special
32			Same as above	
33			Same as above	
34			Same as above	
35			Same as above	
36			Same as above	
37			Same as above	
38			Sand	Special
39			Sand	
41			Sand	
42			Sand	
43			Sand & silt	Special
44			Sand & silt	
45			Sand & silt	
46			Sand & silt	
47			Sand & silt	
48			Sand & silt	
49			Sand & silt	
50			Sand & silt	
51			Sand & silt	
52			Sand & silt	
53			Sand & silt	
54			Sand & silt	
55			Sand & silt	
56			Sand & silt	
57			Sand & silt	
58			Sand & silt	
59			Sand & silt	
60			Sand & silt	
61			Sand & silt	
62			Sand & silt	
63			Sand & silt	
64			Sand & silt	
65			Sand & silt	

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION	COMMENTS
66			Sand & silt	
67			Sand & silt	
68			Sand & silt	
69			Sand & silt	
70			Sand & silt	
71			Sand & silt	
72			Sand & silt	
73			Sand & silt	
74			Sand & silt	
75			Sand & silt	
76			Sand & silt	
77			Sand & silt	
78			Sand & silt	
79			Sand & silt	
80			Sandy silt	
81			Sandy silt	
82			Sandy silt	
83			Sandy silt	
84			Sandy silt	
85			Sandy silt	
86			Sandy silt	
88			Sandy silt	
90			Sandy silt	
92			Sand & silt	
93			Sand & silt	
94			Sand & silt	
95			Sand & silt	
96			Sand & silt	
97			Sand & silt	
98			Sand & silt	
99			Sand & silt	

299-W15-95.XLS

WELL_INFO

FIELD	VALUE/LINK	SOURCE/QUALIFICATION
WELL_NAME	299-W15-95	
NS_COORD	135631.354	HWIS
EW_COORD	566752.751	HWIS
GRND_SURF_EL	202.693	From HWIS Survey Data Report of August 2001 (http://ERC015.erc.rl.gov/CyberDocs/Libraries/Default_Library/Common/frameviewdsp.asp?doc=428901&lib=ERCDOCS&rendition=native&mimetype=application%2Fpdf)
ASBUILT_PDF	http://172.17.20.14/eis/hwisapp	HWIS
DRILL_LOG_PDF	Not Available	
GEO_LOG_PDF	http://172.17.20.14/eis/hwisapp	HWIS
GEOPHYS_LOG_LINK	http://pnl45.pnl.gov/boreholelogs/200WEST/W15095/	
DRILL_LOG_SUM	DRILL_LOG_SUM	Secondary Data sumarized from Hard copy drill logs stored in Sigma V/rm 2110
GEO_LOG_SUM	GEO_LOG_SUM	Secondary Data sumarized from borehole log retrieved from HWIS
GEOPHYS_LOG_SUM	GEOPHYS_LOG_SUM	Download from (http://pnl45.pnl.gov/boreholelogs/200WEST/W15095/)
PARTICLE_SIZE	ROCSAN_VL	Virtual Library
CALCIUM_CARBONATE	ROCSAN_VL	Virtual Library
FOLK/WENT_CLASS	ROCSAN_VL	Virtual Library
MOISTURE	Not Available	
BULK_DENSITY	Not Available	
MINERALOGY	Not Available	
BULK_ROCK_CHEM	Not Available	
SAMPLE_ARCHIVE	1-100'	From AGGPublic/COS Geo Database/Sediment.library.archive.xls

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	WELL SITE GEOLOGIST'S DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, etc.)	COLOR (Munsell Code - Wet/Dry)	HCl REACTION
100			99-103': **SAND.** 90% sand, 10% silt. At 99' is clean, pred. med., light grey - then rust read scale from old casing, and black staining.		
101	DB				
102					
103					
104	SS	Sl. moist	103-105': **Slightly Silty SAND.** 85-90% sand, 10-15% silt. Sand predom. med-fn, mod. sorted, SA; 20-30% basalt, 70-80% qtz, feld., tr. mica	10YR5/2 (grey brown)	Strong
105					
106	SS	Sl. Moist	105-108': **Silty SAND.** 70% sand, 30% silt. Sand 90% v. fn, 10% fn., well sorted, SA (subangular); 80% qtz/feld, 20% mafic	2.5Y5/3 (lt. olive brown)	Very Strong
107					
108	SS				
109		Moist	108-112.5': **Sandy SILT.** As above but fine. 25% Sand (v. fn), 75% silt. Tr. Clay.		Strong
110	SS				
111					
112	SS		112': Tr cse peb, caliché fragments.		
113					
114	SS	Sl. Moist	112.5-116': **Caliche w/gravel.** Gravel increase at 115'	10YR7/4 (v. pale brown)	Violent
115					
116	SS				
117		Dry	116-121': **Silty Sandy GRAVEL.** 50% Gravel, 30% sand, 20% silt. Poorly sorted, gravel SR (subround), occ. Caliche coatings on gravel.	10YR5/1 (gray)	Weak
118	SS				
119	DB				
120	SS				
121			*121': Sandy Gravel, no rxn to HCl - possible top of Ringold.*		
122	SS	Sl. Moist to Dry	121-128.5': **Sandy GRAVEL.** 60% Gravel, 35-40% Sand, tc-5% silt. Gravel 20% v cse peb, 40% cse, 30% med, 10% fn-v. fn. Sand 20% v. cse-cse, 60% med, 20% fn -v. fn. Poorly sorted, gravel R-Sr (round to subrounded), 40% basalt, 60% granitic, qtzite/other; sand 70% qtz/feld, 30% basalt.	10YR5/2 (graysih brown)	None.
123					
124	SS				
125					
126	DB				
127					
128					
129					
130		Dry	128.5-30': **Gravelly SAND.** 70% f-med. Sand, 25% gravel, tr fines		
131	SS	Dry	130-139': **SAND.** 95% f-med. Snd, 5% basalic frags to 2" max; sand 75% f-med. 25% cse; 80% qtz, 20% basalt & other lithic frags, trace mica; subang-subround;		
132					
133	DB				
134					
135					
136					
137					
138					
139			*fining* ▼		
140		Dry	139-142.5': **Silty SAND.** 60% f-med. Sand; 35% fines, 5% gravel. Sand is 80% qtz, 20% basalt, trace mica, subangular to subrounded. Finesare dry, nonplastic. Gravel mostly basalt w/occa. Quatzite. Rounded.		
141					
142					
143			142.5-143.5': **Gravelly SAND.** 70% med-cse sand, 25% grav to 3 inch max, 5% fines. Sand is 80% qtz, subrounded-subang. 20% ang basalt frags; grav is mostly basalt w/occas. qtzite.		
144					
145		Dry			
			143.5-147': **Silty SAND w/gravel.** 60% f-med. Sand, 25% silt (fines), 15% gravel to 4 inch max. Sand is 75% qtz, 25% basalt, particles are subrounded to subangular, Gravel is subang-subrounded basalt w/ocassional qtzite		
146	SS				
147			*Gravel content increase. Boulder noted at 148 ft in graphic log.*		
148	DB	Dry	147-156': **Sitly Sandy GRAVEL.** [147-148': lg. Cob to sm boulder]. 50% gravel, 30% sand, 20 % silt. Gravel sm cob to fn peb; sand 20% v, cse, 40% cse, 20% med. 20 % fn-v. fn; poorly sorted; gravel subround, sand SA-SR; gravel 60% basalt, 40% granite & qrzite. Sand 70% qtz/feld, 30% basalt/other.	10YR 6/2 (lt. brnish gray)	None
149					
150					
151					
152					
153			*Drilling indicates occ. thin layers of sand (<0.2').*		

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	WELL SITE GEOLOGIST'S DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, etc.)	COLOR (Munsell Code - Wet/Dry)	HCl REACTION
154					
155					
156	SS				
157 158 159 160 161	DB	Dry - Sl. Moist	156-170.5': **Sandy GRAVEL.** 40% Gravel, 50% Sand, 10% Silt. (~156.5-157' 90% Sand). Gravel similar to above. Sand 10% v. cse-med, 70% fn, 20% v. fn. Sand mod-well sorted, 85% qtz/feld, 15% basalt. Sand SA, tr mica. *Drill rate slows.* 159': Gravel content increase ~60%; 35% Sand, 5% silt.	10YR5/2 (gray brown)	None
162					
163 164			163-163.5: fn sand, then back to Sandy Gravel.		
165 166 167 168		Sl. Moist	**Sandy GRAVEL.** 50% Gravel, 45% Sand 5% silt. Gravel 30% sm cob-v. cse pebble, 30% cse peb. 40% med-fn; Sand 20% v. cse-med. 40% fn, 40% v. fn. Poorly sorted. Gravel 40% basalt, 60% granite/qtzite; Sand 85% qtz/feld, 15% baslat, tr mica' max size >10 cm. Gravel R-SR.	10YR5/2 (gray brown)	None
169 170 171			168.5-169': Sand content increase ~75%. 169': back to Sandy Gravel		
172 173 174	SS	Sl. Moist	170.5' - 174': **SAND.** 100% Sand, tr. Silt. 10% med. Sand, 50% fn, 40% v. fn., well sorted, subangular; 85-90% qtz/feld, 10-15% baslat, tr mica. 173.5' gravel starting again.	10YR5/2 (grayish brown)	None
175 176 177 178 179	DB	Sl. Moist	174'-186': **Sandy GRAVEL.** 45-50% gravel, 45-50% sand, tr-5% silt. Gravel 10% sm cob, 25% v.cse peb, 25% cse peb, 40% med0fn peb; Sand 20% cse-med, 40% fn, 40% v. fn. Poorly sorted; gravel R-SR, Sand SA; Sand 85% qtz/feld, 15% basalt/other lith. Frags; Gravel 30-40% basalt, 60-70% granite/qtzite/other; well indurated *Driller notes "tight drilling"*	10YR5/2 (gry brn)	None
180					
181					
182					
183					
184					
185					
186 187 188	SS DB	Sl. Moist	186-187': **SAND.** 5% Gravel, 95% Sand, tr silt. Sand 40% fn, 60% v. fn. Well sorted, SA,;80-85% qtz/feld, 15-20% basalt/other, tr mica. 187-187.5': Sandy GRAVEL. Similar to above.	10YR5/2	None

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
3.26	0.64	167	13.2	0.35	0.52
3.76	1.14	170	12	0.45	0.47
4.26	1.64	168	11.2	0.54	0.94
4.76	2.14	167	13.7	0.45	0.85
5.26	2.64	168	16	0.85	0.94
5.76	3.14	167	13.8	0.15	0.75
6.26	3.64	173	14.2	0.04	0.68
6.76	4.14	177	12.9	0.66	0.49
7.26	4.64	172	14	0.51	0.81
7.76	5.14	166	12.4	0.37	0.77
8.26	5.64	165	13.2	0.57	0.74
8.76	6.14	164	11	0.59	0.53
9.26	6.64	163	13.5	0.34	0.72
9.76	7.14	173	11.7	0.3	0.72
10.26	7.64	175	13.2	0.82	0.65
10.76	8.14	181	14	0.64	0.99
11.26	8.64	183	13.2	0.96	0.62
11.76	9.14	175	15.6	0.25	0.52
12.26	9.64	172	10.5	0.63	0.73
12.76	10.14	169	14.3	0.35	0.69
13.26	10.64	170	15	0.61	0.78
13.76	11.14	172	10.8	0.63	0.51
14.26	11.64	180	13.6	0.63	0.63
14.76	12.14	178	15.9	0.5	0.56
15.26	12.64	176	14.1	0.58	0.85
15.76	13.14	181	16.4	0.43	0.46
16.26	13.64	180	14.2	0.31	0.73
16.76	14.14	176	14.8	0.51	0.66
17.26	14.64	171	13.4	0.17	0.55
17.76	15.14	165	12.4	0.22	0.7
18.26	15.64	150	12.6		0.31
18.76	16.14	140	11.1	0.4	0.59
19.26	16.64	140	11.3	0.23	0.7
19.76	17.14	136	11.6	0.34	0.53
20.26	17.64	134	10.1	0.5	0.56
20.76	18.14	137	10.9	0.34	0.48
21.26	18.64	135	9.23	0.66	0.58
21.76	19.14	139	10.6	0.19	0.5
22.26	19.64	136	9.77	0.45	0.53
22.76	20.14	138	9.77	0.39	0.43
23.26	20.64	136	9.49	0.13	0.69
23.76	21.14	136	9.8	0.41	0.3
24.26	21.64	136	11.2	0.56	0.47
24.76	22.14	138	11.1	0.52	0.48
25.26	22.64	138	10.4	0.47	0.45
25.76	23.14	135	10.5	0.64	0.31
26.26	23.64	132	10.5	0.4	0.6
26.76	24.14	139	9.02	0.39	0.35
27.26	24.64	139	11.1	0.57	0.32

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
27.76	25.14	138	11.8	0.58	0.61
28.26	25.64	138	12.5	0.64	0.5
28.76	26.14	137	11.7	0.17	0.66
29.26	26.64	138	10.1	0.75	0.69
29.76	27.14	139	11.7	0.76	0.67
30.26	27.64	138	12.5	0.46	0.43
30.76	28.14	137	12.6	0.45	0.57
31.26	28.64	137	9.12	0.31	0.76
31.76	29.14	135	9.92	0.49	0.33
32.26	29.64	137	9.25	0.41	0.66
32.76	30.14	132	10.2		0.52
33.26	30.64	131	11.1	0.79	0.49
33.76	31.14	133	10.1	0.33	0.43
34.26	31.64	133	10.3	0.66	0.56
34.76	32.14	135	10.5	0.5	0.5
35.26	32.64	136	9.98	0.19	0.16
35.76	33.14	131	9.76	0.34	0.41
36.26	33.64	137	9.77	0.16	0.4
36.76	34.14	134	11.1	0.35	0.39
37.26	34.64	133	12	0.48	0.45
37.76	35.14	133	10.9		0.46
38.26	35.64	132	9.66	0.39	0.57
38.76	36.14	134	9.42	0.21	0.41
39.26	36.64	144	10.2	0.58	0.63
39.76	37.14	164	13.6	0.59	0.62
40.26	37.64	184	13.7	0.17	0.56
40.76	38.14	194	16.1	0.52	0.6
41.26	38.64	200	16.2	0.41	0.74
41.76	39.14	203	16.2	0.26	0.88
42.26	39.64	203	15.5	0.51	1.04
42.76	40.14	202	13.9	0.33	0.74
43.26	40.64	202	16.1	0.44	0.91
43.76	41.14	194	13.5	0.39	0.82
44.26	41.64	185	13.3	0.37	0.88
44.76	42.14	186	13.9	0.43	0.59
45.26	42.64	179	15	0.46	0.78
45.76	43.14	180	14.6	0.53	0.65
46.26	43.64	179	13.6	0.29	0.76
46.76	44.14	176	12.1		1.04
47.26	44.64	175	14.7	0.86	0.58
47.76	45.14	180	13.2	0.39	0.15
48.26	45.64	183	14.7	0.6	0.61
48.76	46.14	185	15.3	0.55	0.73
49.26	46.64	183	12.9	0.33	0.71
49.76	47.14	189	12.7	0.58	0.46
50.26	47.64	192	16.1	0.38	0.92
50.76	48.14	194	16.2	1.04	0.73
51.26	48.64	196	15.4	0.41	0.8
51.76	49.14	196	15.7	0.59	0.78

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
52.26	49.64	191	16.7	0.85	0.5
52.76	50.14	189	15.4	0.67	0.65
53.26	50.64	200	17	0.75	1
53.76	51.14	214	18.4	0.62	1.11
54.26	51.64	222	17.8	0.56	0.83
54.76	52.14	229	15.9	0.6	0.96
55.26	52.64	230	17.2	0.56	0.67
55.76	53.14	228	17.3	0.8	0.88
56.26	53.64	226	13.7	0.59	1.01
56.76	54.14	225	14.4	0.72	0.88
57.26	54.64	215	13.2	0.27	0.53
57.76	55.14	214	17.2	0.26	0.46
58.26	55.64	208	16.3	0.57	0.99
58.76	56.14	203	16.5	0.53	0.63
59.26	56.64	196	12.9	0.92	0.65
59.76	57.14	198	16.7	0.78	0.79
60.26	57.64	198	14.6	0.48	0.49
60.76	58.14	193	13.2	0.71	0.86
61.26	58.64	201	16.4	0.43	0.87
61.76	59.14	212	14	0.72	0.78
62.26	59.64	220	15.1	0.32	0.97
62.76	60.14	225	17.6	0.83	1.07
63.26	60.64	221	19.2	1.07	1.2
63.76	61.14	233	18	0.61	0.68
64.26	61.64	226	17.9	0.67	0.84
64.76	62.14	211	17.2	0.63	0.57
65.26	62.64	203	14.1	0.48	0.71
65.76	63.14	202	15.7	0.64	0.58
66.26	63.64	196	12.9	0.51	0.72
66.76	64.14	196	14.7	0.74	0.9
67.26	64.64	191	13.4	0.64	0.76
67.76	65.14	198	13.5	0.84	1.04
68.26	65.64	197	15.3	0.99	0.73
68.76	66.14	196	14.4	0.49	0.87
69.26	66.64	188	14.3	0.67	0.73
69.76	67.14	187	14	0.43	0.73
70.26	67.64	196	16.2	0.79	0.93
70.76	68.14	201	16.8	0.24	0.71
71.26	68.64	206	16.2	0.72	0.85
71.76	69.14	209	17.4	0.23	1.06
72.26	69.64	212	17.8	0.49	0.69
72.76	70.14	210	18.5	0.68	0.75
73.26	70.64	214	17.4	0.73	1
73.76	71.14	226	17.5	0.73	0.66
74.26	71.64	223	18.7	0.93	0.94
74.76	72.14	227	19	0.59	1.01
75.26	72.64	225	20.2	0.78	0.85
75.76	73.14	222	17	0.58	1.26
76.26	73.64	222	21.2	0.53	0.73

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
76.76	74.14	226	17.8	0.67	0.63
77.26	74.64	222	16.2	0.62	0.74
77.76	75.14	224	15.5	0.49	0.63
78.26	75.64	218	16.5	0.77	0.75
78.76	76.14	224	16.1	0.41	1.02
79.26	76.64	226	15.7	0.5	1.03
79.76	77.14	223	19.7	0.65	0.65
80.26	77.64	218	18	0.28	0.83
80.76	78.14	218	17	0.54	0.71
81.26	78.64	215	21.5	0.64	1.05
81.76	79.14	212	16	0.53	1.1
82.26	79.64	212	16.7	0.25	0.81
82.76	80.14	214	14.2	0.5	0.24
83.26	80.64	213	13.5	0.49	0.97
83.76	81.14	217	16.1	0.55	0.52
84.26	81.64	212	15.6	0.88	0.8
84.76	82.14	211	18.9	0.66	0.53
85.26	82.64	206	15	0.3	0.93
85.76	83.14	205	17.7	0.32	0.83
86.26	83.64	216	15.4	0.72	0.79
86.76	84.14	208	15.8	0.54	1.26
87.26	84.64	212	15.7	1.05	1.01
87.76	85.14	214	16	0.76	0.83
88.26	85.64	213	17.6	0.64	0.52
88.76	86.14	211	15.2	0.61	0.63
89.26	86.64	205	18.1	0.54	0.6
89.76	87.14	198	14.7	0.74	0.66
90.26	87.64	204	13.8	0.79	0.81
90.76	88.14	206	15.3	0.61	1.13
91.26	88.64	205	16.2	0.26	0.78
91.76	89.14	205	17	0.18	0.74
92.26	89.64	212	17.5	0.74	0.69
92.76	90.14	211	14	0.38	0.79
93.26	90.64	212	17.4	0.48	0.73
93.76	91.14	210	15.2	0.76	0.66
94.26	91.64	214	17.6	1.09	0.95
94.76	92.14	213	19.4	0.4	0.43
95.26	92.64	214	16.8	0.55	0.95
95.76	93.14	207	18.6	0.18	0.52
96.26	93.64	209	17.6	0.66	0.94
96.76	94.14	205	17.8	0.84	0.73
97.26	94.64	207	17.3	0.44	0.89
97.76	95.14	213	15.3	0.91	0.9
98.26	95.64	209	17	0.87	0.76
98.51	95.89	204	14.1	0.82	0.78
	#VALUE!				
99.75	97.13	195	16.2	0.26	0.71
99.25	96.63	193	15.3	0.13	0.46
99	96.38	201	14.4	0.63	0.83

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
	#VALUE!				
64.5	61.88	222	17.3	0.82	0.83
64.25	61.63	228	17.8	0.81	1.06
63.75	61.13	234	15.1	0.56	0.76
63.25	60.63	227	14.3	0.63	1.07
62.75	60.13	226	16.9	0.82	0.9
62.25	59.63	224	13.9	0.76	1.07
61.75	59.13	215	14.9	0.46	0.86
61.25	58.63	196	13.8	0.62	0.83
60.75	58.13	192	14.4	0.52	0.63
60.25	57.63	191	15	0.45	0.9
59.75	57.13	199	14.2	0.77	0.46
59.25	56.63	201	15.8	0.97	0.66
58.75	56.13	202	14.5	0.79	0.52
58.25	55.63	209	16.3	0.93	0.6
57.75	55.13	216	13.5	0.72	0.6
57.25	54.63	223	15.4	1.08	0.88
56.75	54.13	223	16.2	0.76	0.98
56.25	53.63	223	15.9	0.88	0.66
55.75	53.13	227	14.9	0.54	0.66
55.25	52.63	234	17	0.84	0.72
55	52.38	237	15.7	0.64	0.44
40	37.38	179	12.7	0.85	0.79
40.5	37.88	196	15.5	0.71	0.81
41	38.38	200	13.8	0.94	0.83
41.5	38.88	207	14.7	0.85	0.81
42	39.38	209	16.3	0.65	0.81
42.5	39.88	209	16.2	0.82	0.72
43	40.38	206	15.9	0.81	0.8
43.5	40.88	200	16.5	0.55	0.71
44	41.38	197	15.3	0.76	0.56
44.5	41.88	193	14.8	0.82	0.77
45	42.38	184	14	0.62	0.79
45.5	42.88	181	12.5	0.76	0.47
46	43.38	181	14.2	0.68	0.66
46.5	43.88	182	14.6	0.87	0.76
47	44.38	184	12.7	0.66	0.77
41	38.38	202	15	0.8	0.81
40.5	37.88	198	14.1	1.01	0.8
40	37.38	180	13.4	0.87	0.69
39.5	36.88	159	11.2	0.76	0.67

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	1	0.6	159.7	5.59	85.87	8.54	(g)S	3.64	1.95	2.83	7.04	17.02	30.84	28.14	6.09	2.45
299-W15-95	10	0.5	155.3	11.86	85.04	3.09	gS	11.03	0.84	0.64	16.76	52.48	11.86	3.29	1.42	1.68
299-W15-95	11	0.4	152	62.52	32.74	4.74	msG	36.76	25.76	18.38	4.68	4.28	3.49	1.91	1.71	3.03
299-W15-95	12	1	170.9	70.14	27.99	1.87	sG	34.37	35.77	13.88	5.39	4.63	2.87	1.23	0.64	1.23
299-W15-95	13	0.6	147.8	61.72	35.79	2.50	sG	41.46	20.26	14.99	7.70	7.22	4.32	1.55	0.95	1.55
299-W15-95	14	1	141.9	68.19	28.91	2.89	sG	36.32	31.88	15.37	5.64	4.44	2.19	1.27	0.99	1.90
299-W15-95	15	0.7	169.8	58.57	37.85	3.58	sG	30.93	27.64	21.73	7.46	4.90	1.91	1.85	1.37	2.21
299-W15-95	16	0.8	179.4	58.55	36.98	4.47	msG	29.61	28.94	17.60	7.32	6.42	3.63	2.01	1.68	2.79
299-W15-95	17	0.7	167.8	59.80	36.20	4.00	sG	35.54	24.25	19.12	6.87	4.84	3.29	2.09	1.61	2.39
299-W15-95	18	0.5	174.8	44.09	50.23	5.68	msG	19.69	24.40	23.42	12.86	7.00	4.13	2.81	2.47	3.21
299-W15-95	19	0.6	155.5	42.76	53.44	3.80	sG	16.48	26.27	27.43	14.68	6.18	3.03	2.12	1.55	2.25
299-W15-95	20	0.6	156.6	49.17	47.64	3.19	sG	21.07	28.10	25.93	10.92	4.73	4.09	1.98	1.40	1.79
299-W15-95	21	0.5	158.1	41.10	52.12	6.78	msG	14.50	26.60	23.62	13.11	7.35	4.62	3.42	2.79	3.99
299-W15-95	22	0.6	151.5	31.10	62.93	5.97	sG	16.98	14.12	25.53	21.09	8.69	4.51	3.12	2.39	3.58
299-W15-95	23	0.7	152.2	31.36	59.22	9.42	msG	20.69	10.67	18.38	19.96	10.87	6.26	3.75	3.75	5.67
299-W15-95	24	0.6	137.8	31.15	61.43	7.42	msG	17.32	13.83	20.38	21.25	10.12	5.75	3.93	2.98	4.44
299-W15-95	26	0.9	156.5	25.59	69.11	5.30	gS	15.83	9.76	24.82	26.93	9.76	4.59	3.00	2.17	3.13
299-W15-95	27	0.6	162.1	25.76	66.54	7.70	(m)gS	10.06	15.70	23.53	22.59	10.61	5.83	3.97	3.17	4.53
299-W15-95	28	0.6	154.6	46.95	50.32	2.73	sG	30.78	16.17	20.45	18.90	6.69	2.73	1.56	1.10	1.62
299-W15-95	29	0.7	139.5	44.25	50.89	4.85	sG	24.77	19.49	23.34	15.35	6.42	3.43	2.36	2.14	2.71
299-W15-95	30	0.6	152.5	37.24	58.70	4.06	sG	16.82	20.42	25.00	20.88	7.98	2.95	1.90	1.57	2.49
299-W15-95	31	0.6	165.8	41.91	54.54	3.55	sG	17.92	23.99	27.00	17.32	5.71	2.77	1.74	1.32	2.22
299-W15-95	32	0.7	145.4	48.70	46.99	4.31	sG	32.42	16.28	20.59	14.91	6.43	3.15	1.92	1.57	2.74
299-W15-95	33	0.7	148.7	40.25	48.31	11.43	msG	25.71	14.54	13.95	15.20	8.92	5.82	4.43	3.90	7.53
299-W15-95	34	1	157.2	62.71	32.08	5.21	msG	46.44	16.26	12.33	9.15	5.27	3.18	2.16	1.84	3.37
299-W15-95	35	0.5	142.6	35.30	60.84	3.86	sG	17.96	17.33	24.49	22.11	8.00	3.93	2.32	1.54	2.32
299-W15-95	37	1.6	160.3	8.94	74.92	16.14	(gm)S	7.25	1.69	4.82	11.57	25.70	21.58	11.26	6.88	9.26
299-W15-95	38	1.6	178.1	0.11	81.08	18.81	(m)S	0.00	0.11	1.35	12.16	30.57	19.93	17.06	10.14	8.67
299-W15-95	39	1.4	157.1	2.82	79.59	17.59	(m)S	2.24	0.58	3.65	13.05	25.85	21.18	15.87	9.66	7.93

299-W15-95.XLS

ROCSAN_VL

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	40	1.5	167.7	0.12	84.90	14.98	(m)S	0.00	0.12	0.96	10.35	36.34	22.86	14.38	7.82	7.16
299-W15-95	41	1.6	155.6	2.98	76.91	20.12	sM	1.68	1.29	3.23	13.65	27.43	19.40	13.20	8.99	11.13
299-W15-95	42	1.5	166.2	0.48	84.23	15.29	(m)S	0.00	0.48	2.54	11.66	32.27	25.56	12.21	6.83	8.46
299-W15-95	43	1.6	147.8	1.29	90.09	8.62	S	0.41	0.88	5.50	21.66	36.93	18.19	7.81	4.41	4.21
299-W15-95	45	1.3	144.8	8.26	87.29	4.44	(g)S	4.86	3.40	13.19	35.21	27.78	7.71	3.40	1.88	2.57
299-W15-95	46	1.4	176.5	11.33	84.12	4.55	gS	5.75	5.58	20.60	35.97	18.21	6.26	3.07	1.94	2.62
299-W15-95	47	1.4	156.6	9.72	75.88	14.40	(gm)S	4.86	4.86	13.12	26.10	19.39	10.30	6.97	4.99	9.40
299-W15-95	48	1.4	144.3	3.68	85.20	11.12	(m)S	0.63	3.06	10.42	28.56	29.05	11.05	6.12	4.31	6.81
299-W15-95	49	1.5	154.1	1.04	83.82	15.14	(m)S	0.00	1.04	2.86	17.74	33.01	20.21	10.01	5.98	9.16
299-W15-95	50	1.6	143.9	2.32	66.53	31.15	sM	0.27	2.05	2.39	2.19	6.35	14.34	41.26	20.49	10.66
299-W15-95	51	1.6	157.1	0.06	89.97	9.97	S	0.00	0.06	1.46	11.17	38.86	28.25	10.22	5.08	4.89
299-W15-95	52	2.1	145.1	0.00	89.34	10.66	(m)S	0.00	0.00	0.14	3.51	32.32	39.96	13.41	5.23	5.43
299-W15-95	53	1.9	163	0.00	92.35	7.65	S	0.00	0.00	0.12	6.37	42.07	34.78	9.00	3.74	3.92
299-W15-95	54	1.6	164.3	0.06	73.03	26.91	sM	0.00	0.06	0.18	0.85	20.11	21.63	30.26	17.13	9.78
299-W15-95	55	1.4	171.9	0.41	90.80	8.79	S	0.00	0.41	5.24	21.54	37.37	16.88	9.78	4.48	4.31
299-W15-95	56	1.3	153	5.28	88.85	5.87	(g)S	0.52	4.76	15.26	27.59	30.53	10.83	4.63	2.61	3.26
299-W15-95	57	1.4	151.7	0.79	90.21	8.99	S	0.00	0.79	9.46	32.41	31.75	11.24	5.36	3.97	5.03
299-W15-95	58	2.3	143.2	39.79	54.88	5.33	sG	33.19	6.60	14.46	19.23	12.35	6.04	2.81	2.25	3.09
299-W15-95	59	1.5	157.4	2.41	88.13	9.46	S	0.89	1.52	4.06	12.13	34.60	27.75	9.59	4.63	4.83
299-W15-95	61	1.8	142.4	0.35	88.58	11.06	(m)S	0.00	0.35	1.69	10.71	34.18	29.25	12.76	6.20	4.86
299-W15-95	62	1.7	157.2	0.83	91.26	7.91	S	0.06	0.77	7.91	29.85	34.89	13.07	5.55	3.51	4.40
299-W15-95	63	1.7	143.2	2.02	82.81	15.17	(m)S	0.21	1.81	8.63	23.87	29.16	13.50	7.65	5.85	9.32
299-W15-95	64	1.5	151.4	6.34	86.58	7.08	(g)S	1.67	4.67	11.42	29.57	31.44	10.61	3.54	3.60	3.47
299-W15-95	65	1.5	142.7	3.51	88.84	7.65	S	0.14	3.37	13.96	30.53	29.12	10.39	4.84	3.23	4.42
299-W15-95	66	1.6	145.6	5.09	86.50	8.41	(g)S	1.56	3.53	10.45	31.34	30.66	10.31	3.73	4.07	4.34
299-W15-95	67	1.6	155.9	18.74	72.21	9.05	(m)gS	9.37	9.37	15.79	26.96	18.49	7.51	3.47	3.98	5.07
299-W15-95	68	1.5	154.4	9.44	79.31	11.25	(gm)S	6.40	3.04	9.89	29.86	23.27	10.15	6.14	4.59	6.66
299-W15-95	69	1.5	154.6	3.11	90.55	6.34	S	1.42	1.68	11.20	34.63	31.39	10.68	2.65	3.50	2.85
299-W15-95	70	1.6	167.3	1.43	93.21	5.36	S	0.24	1.19	8.76	29.84	37.34	13.22	4.05	2.50	2.86

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	71	1.6	167.5	0.24	34.02	65.74	sM	0.00	0.24	0.96	3.43	8.61	8.07	12.94	32.27	33.47
299-W15-95	72	1.4	141.2	0.43	89.94	9.64	S	0.14	0.28	1.77	19.70	43.87	19.35	5.24	5.03	4.61
299-W15-95	73	1.3	145.7	0.90	93.04	6.06	S	0.00	0.90	4.55	23.16	47.21	13.65	4.48	2.76	3.31
299-W15-95	74	1.3	170.2	1.75	89.08	9.17	S	0.18	1.58	6.72	23.31	37.79	15.19	6.07	4.38	4.79
299-W15-95	75	1.4	144.8	0.83	84.92	14.26	(m)S	0.00	0.83	4.20	13.15	27.07	26.79	13.71	8.88	5.37
299-W15-95	76	1.4	150.9	0.00	59.74	40.26	sM	0.00	0.00	0.07	0.20	2.58	14.11	42.78	28.61	11.66
299-W15-95	77	1.4	163.5	0.37	75.29	24.34	sM	0.00	0.37	3.01	8.85	17.58	17.70	28.15	14.01	10.33
299-W15-95	78	1.3	145.4	0.62	90.95	8.44	S	0.00	0.62	6.72	23.53	35.25	18.31	7.13	4.12	4.32
299-W15-95	79	1.1	148.8	1.34	87.69	10.96	(m)S	0.27	1.08	5.04	16.41	32.21	23.00	11.03	5.92	5.04
299-W15-95	80	1.4	153	0.00	72.43	27.57	sM	0.00	0.00	0.07	0.79	3.80	25.67	42.11	19.52	8.06
299-W15-95	81	1.3	160.1	0.00	73.13	26.87	sM	0.00	0.00	0.06	0.44	2.39	23.79	46.45	17.70	9.17
299-W15-95	82	1.3	156.2	0.26	87.03	12.72	(m)S	0.00	0.26	3.47	20.81	30.31	18.18	14.26	6.36	6.36
299-W15-95	83	1.3	145.4	0.41	88.89	10.70	(m)S	0.14	0.28	2.76	18.91	41.06	17.81	8.35	4.62	6.07
299-W15-95	84	1.1	151.2	2.00	91.15	6.86	S	0.20	1.80	6.72	20.51	39.01	19.51	5.39	3.40	3.46
299-W15-95	85	1.2	153	0.00	63.81	36.19	sM	0.00	0.00	0.07	1.18	4.52	20.75	37.30	26.24	9.95
299-W15-95	86	1.3	152.6	1.84	78.33	19.83	sM	0.13	1.71	11.23	18.32	16.22	17.14	15.43	12.08	7.75
299-W15-95	87	1.2	153	0.59	79.02	20.39	sM	0.00	0.59	4.84	17.71	22.68	17.97	15.82	11.96	8.43
299-W15-95	88	1.2	140.2	1.94	85.45	12.62	(m)S	0.36	1.58	4.80	9.82	21.22	35.63	13.98	6.09	6.52
299-W15-95	89	1.3	158.7	0.00	61.63	38.37	sM	0.00	0.00	0.13	0.38	2.39	11.78	46.94	26.28	12.10
299-W15-95	90	1.2	151.7	0.00	44.58	55.42	sM	0.00	0.00	0.13	0.26	3.43	9.45	31.31	39.30	16.12
299-W15-95	91	1.5	147.6	0.41	76.99	22.60	sM	0.07	0.34	1.77	10.14	30.29	24.17	10.62	15.04	7.56
299-W15-95	92	1.3	148.7	0.27	81.97	17.76	(m)S	0.00	0.27	3.92	17.29	31.20	21.27	8.31	12.96	4.79
299-W15-95	93	1.3	140.4	0.00	84.42	15.58	(m)S	0.00	0.00	0.21	4.57	28.81	37.60	13.22	8.08	7.51
299-W15-95	94	1.3	150.8	0.07	81.31	18.62	(m)S	0.00	0.07	0.07	0.73	5.17	43.67	31.68	11.00	7.62
299-W15-95	95	1.3	149.2	0.07	77.64	22.30	sM	0.00	0.07	0.13	1.21	13.23	43.18	19.88	13.10	9.20
299-W15-95	96	1.1	140.3	3.80	83.94	12.26	(m)S	0.43	3.37	7.38	24.37	27.24	17.28	7.67	5.66	6.59
299-W15-95	97	1.2	144.1	0.14	93.81	6.05	S	0.00	0.14	0.83	8.55	52.29	26.36	5.77	2.85	3.20
299-W15-95	98	1.8	146.9	7.57	82.69	9.75	(gm)S	1.30	6.27	12.75	17.66	28.29	17.11	6.88	4.29	5.45
299-W15-95	99	1.4	139.2	0.93	91.16	7.91	S	0.00	0.93	3.74	13.23	33.29	29.62	11.29	4.24	3.67

299-W15-95.XLS

ROCSAN_VL

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	100	1.5	147.2	0.27	90.37	9.36	S	0.14	0.14	0.61	6.24	36.91	33.58	13.03	4.95	4.41

Analysis and Interpretation Worksheets

WELL_NAME	EVAL_TYPE	SAMP_INTERVAL_BOTTOM	SAMP_INTERVAL_UNITS	SOIL_SAMP_NUM	LITHO_CLASS	TOTAL_GRAVEL_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	FINE_PEBBLE_PCNT -2.00	VERY_FINE_PEBBLE_PCNT -1.00	VERY_COARSE_SAND_PCNT 0.00	COARSE_SAND_PCNT 1.00	MEDIUM_SAND_PCNT 2.00	FINE_SAND_PCNT 3.00	VERY_FINE_SAND_PCNT 4.00	SILT_PCNT 4.75	PAN_PCNT 6.00	Average Size Fraction	CALCIUM_CARBONATE_PCNT
299-W15-95	L	1	Feet	B03VP2	(G)S	5.59	10.05503513	(g)S	85.87	8.54	3.64	1.95	2.83	7.04	17.02	30.84	28.14	6.09	2.45	2.805575	0.6
299-W15-95	L	10	Feet	B03VP3	GS	11.87	27.51779935	gS	85.03	3.09	11.03	0.84	0.64	16.78	52.48	11.86	3.29	1.42	1.68	1.64385	0.5
299-W15-95	L	11	Feet	B03VP4	MSG	62.52	6.907172996	msG	32.74	4.74	36.76	25.76	18.38	4.68	4.28	3.49	1.91	1.71	3.03	-0.416275	0.4
299-W15-95	L	12	Feet	B03VP5	SG	70.14	14.97326203	sG	28	1.87	34.37	35.77	13.88	5.39	4.63	2.87	1.23	0.84	1.23	-0.6591	1
299-W15-95	L	13	Feet	B03VP6	SG	61.72	14.312	sG	35.78	2.5	41.46	20.26	14.99	7.7	7.22	4.32	1.55	0.95	1.55	-0.480675	0.6
299-W15-95	L	14	Feet	B03VP7	SG	68.2	10.00346021	sG	28.91	2.89	36.32	31.88	15.37	5.64	4.44	2.19	1.27	0.99	1.9	-0.622475	1
299-W15-95	L	15	Feet	B03VP8	SG	58.57	10.5726257	sG	37.85	3.58	30.93	27.64	21.73	7.46	4.9	1.91	1.85	1.37	2.21	-0.393425	0.7
299-W15-95	L	16	Feet	B03VP9	MSG	58.55	8.272930649	msG	36.98	4.47	29.61	28.94	17.6	7.32	6.42	3.63	2.01	1.68	2.79	-0.2435	0.8
299-W15-95	L	17	Feet	B03VQ0	SG	59.79	9.0525	sG	36.21	4	35.54	24.25	19.12	6.87	4.84	3.29	2.09	1.61	2.39	-0.385625	0.7
299-W15-95	L	18	Feet	B03VQ1	MSG	44.09	8.841549296	msG	50.22	5.68	19.69	24.4	23.42	12.86	7	4.13	2.81	2.47	3.21	0.177025	0.5
299-W15-95	L	19	Feet	B03VQ2	SG	42.75	14.06315789	sG	53.44	3.8	16.48	26.27	27.43	14.68	6.18	3.03	2.12	1.55	2.25	0.062425	0.6
299-W15-95	L	20	Feet	B03VQ3	SG	49.17	14.93730408	sG	47.65	3.19	21.07	28.1	25.93	10.92	4.73	4.09	1.98	1.4	1.79	-0.1228	0.6
299-W15-95	L	21	Feet	B03VQ4	MSG	41.1	7.687315634	msG	52.12	6.78	14.5	26.6	23.62	13.11	7.35	4.62	3.42	2.79	3.99	0.369425	0.5
299-W15-95	L	22	Feet	B03VQ5	SG	31.1	10.54271357	sG	62.94	5.97	16.98	14.12	25.53	21.09	8.69	4.51	3.12	2.39	3.58	0.492325	0.6
299-W15-95	L	23	Feet	B03VQ6	MSG	31.36	6.286624204	msG	59.22	9.42	20.69	10.67	18.38	19.96	10.87	6.26	3.75	3.75	5.67	0.752625	0.7
299-W15-95	L	24	Feet	B03VQ7	MSG	31.15	8.278975741	msG	61.43	7.42	17.32	13.83	20.38	21.25	10.12	5.75	3.93	2.98	4.44	0.66785	0.6
299-W15-95	L	26	Feet	B03VQ8	GS	25.59	13.03773585	gS	69.1	5.3	15.83	9.76	24.82	26.93	9.76	4.59	3	2.17	3.13	0.598875	0.9
299-W15-95	L	27	Feet	B03VQ9	(M)GS	25.76	8.64025974	(m)gS	66.53	7.7	10.06	15.7	23.53	22.59	10.61	5.83	3.97	3.17	4.53	0.835975	0.6
299-W15-95	L	28	Feet	B03VR0	SG	46.95	18.43589744	sG	50.33	2.73	30.78	16.17	20.45	18.9	6.69	2.73	1.56	1.1	1.62	-0.16075	0.6
299-W15-95	L	29	Feet	B03VR1	SG	44.26	10.49484536	sG	50.9	4.85	24.77	19.49	23.34	15.35	6.42	3.43	2.36	2.14	2.71	0.05315	0.7
299-W15-95	L	30	Feet	B03VR2	SG	37.24	14.46059113	sG	58.71	4.06	16.82	20.42	25	20.88	7.98	2.95	1.9	1.57	2.49	0.216275	0.6
299-W15-95	L	31	Feet	B03VR3	SG	41.91	15.36338028	sG	54.54	3.55	17.92	23.99	27	17.32	5.71	2.77	1.74	1.32	2.22	0.0377	0.6
299-W15-95	L	32	Feet	B03VR4	SG	48.7	10.90487239	sG	47	4.31	32.42	16.28	20.59	14.91	6.43	3.15	1.82	1.57	2.74	-0.123225	0.7
299-W15-95	L	33	Feet	B03VR5	MSG	40.25	4.227471566	msG	48.32	11.43	25.71	14.54	13.95	15.2	8.92	5.82	4.43	3.9	7.53	0.65985	0.7
299-W15-95	L	34	Feet	B03VR6	MSG	62.7	6.159309021	msG	32.09	5.21	46.44	16.26	12.33	9.15	5.27	3.18	2.16	1.84	3.37	-0.4231	1
299-W15-95	L	35	Feet	B03VR7	SG	35.29	15.7842487	sG	60.85	3.86	17.96	17.33	24.49	22.11	8	3.93	2.32	1.54	2.32	0.27165	0.5
299-W15-95	L	37	Feet	B03VR8	(GM)S	8.94	4.642503098	(gm)S	74.93	16.14	7.25	1.69	4.82	11.57	25.7	21.58	11.26	6.88	9.26	2.448	1.6
299-W15-95	L	38	Feet	B03VR9	(M)S	0.11	4.30994152	(m)S	81.07	18.81	0	0.11	1.35	12.16	30.57	19.93	17.06	10.14	8.67	3.01405	1.6
299-W15-95	L	39	Feet	B03VS0	(M)S	2.82	4.525298465	(m)S	79.6	17.59	2.24	0.58	3.65	13.05	25.85	21.18	15.87	9.65	7.93	2.80175	1.4
299-W15-95	L	40	Feet	B03VS1	(M)S	0.12	5.666889186	(m)S	84.89	14.98	0	0.12	0.96	10.35	36.34	22.86	14.38	7.82	7.16	2.89115	1.5
299-W15-95	L	41	Feet	B03VS2	MS	2.97	3.822564612	mS	78.91	20.12	1.68	1.29	3.23	13.65	27.43	19.4	13.2	8.99	11.13	2.843425	1.6
299-W15-95	L	42	Feet	B03VS3	(M)S	0.48	5.509483322	(m)S	84.24	15.29	0	0.48	2.54	11.66	32.27	25.56	12.21	6.83	8.46	2.844425	1.5
299-W15-95	L	43	Feet	B03VS4	S	1.29	10.4512761	S	90.09	8.62	0.41	0.88	5.5	21.66	36.93	18.19	7.81	4.41	4.21	2.259375	1.6
299-W15-95	L	45	Feet	B03VS5	(G)S	8.26	19.65990991	(g)S	87.29	4.44	4.86	3.4	13.19	35.21	27.78	7.71	3.4	1.88	2.57	1.3873	1.3
299-W15-95	L	46	Feet	B03VS6	GS	11.33	18.48571429	gS	84.11	4.55	5.75	5.58	20.6	35.97	18.21	6.26	3.07	1.94	2.62	1.11305	1.4
299-W15-95	L	47	Feet	B03VS7	(GM)S	9.72	5.269444444	(gm)S	75.68	14.4	4.86	4.86	13.12	26.1	19.39	10.3	6.97	4.99	9.4	1.891825	1.4
299-W15-95	L	48	Feet	B03VS8	(M)S	3.69	7.661870504	(m)S	85.2	11.12	0.63	3.06	10.42	28.56	29.05	11.05	6.12	4.31	6.81	2.013025	1.4
299-W15-95	L	49	Feet	B03VS9	(M)S	1.04	5.536988111	(m)S	83.83	15.14	0	1.04	2.86	17.74	33.01	20.21	10.01	5.98	9.16	2.66755	1.5
299-W15-95	L	50	Feet	B03VT0	MS	2.32	2.135794543	mS	66.53	31.15	0.27	2.05	2.39	2.19	6.35	14.34	41.26	20.49	10.66	3.816475	1.6
299-W15-95	L	51	Feet	B03VT1	S	0.06	9.023069208	S	89.96	9.97	0	0.06	1.46	11.17	38.86	28.25	10.22	5.08	4.89	2.6793	1.6
299-W15-95	L	52	Feet	B03VT2	(M)S	0	8.380863039	(m)S	89.34	10.66	0	0	0.14	3.51	32.32	39.96	13.41	5.23	5.43	2.990925	2.1
299-W15-95	L	53	Feet	B03VT3	S	0	12.07058824	S	92.34	7.65	0	0	0.12	6.37	42.07	34.78	9	3.74	3.92	2.72135	1.9
299-W15-95	L	54	Feet	B03VT4	MS	0.06	2.713861018	mS	73.03	26.91	0	0.06	0.18	0.85	20.11	21.63	30.26	17.13	9.78	3.669875	1.6
299-W15-95	L	55	Feet	B03VT5	S	0.41	10.33105802	S	90.81	8.79	0	0.41	5.24	21.54	37.37	16.88	9.78	4.48	4.31	2.3277	1.4
299-W15-95	L	56	Feet	B03VT6	(G)S	5.28	15.13458262	(g)S	88.84	5.87	0.52	4.76	15.26	27.59	30.53	10.83	4.63	2.61	3.26	1.658175	1.3
299-W15-95	L	57	Feet	B03VT7	S	0.79	10.03559511	S	90.22	8.99	0	0.79	9.46	32.41	31.75	11.24	5.36	3.97	5.03	1.993175	1.4
299-W15-95	L	58	Feet	B03VT8	SG	39.79	10.29831144	sG	54.89	5.33	33.19	6.6	14.46	19.23	12.35	6.04	2.81	2.25	3.09	0.295375	2.3
299-W15-95	L	59	Feet	B03VT9	S	2.41	9.316067653	S	88.13	9.46	0.89	1.52	4.06	12.13	34.6	27.75	9.59	4.63	4.83	2.506125	1.5
299-W15-95	L	61	Feet	B03VV0	(M)S	0.35	8.00994575	(m)S	88.59	11.06	0	0.35	1.69	10.71	34.18	29.25	12.76	6.2	4.86	2.7612	1.8
299-W15-95	L	62	Feet	B03VV1	S	0.83	11.53855879	S	91.27	7.91	0.06	0.77	7.91	29.85	34.89	13.07	5.55	3.51	4.4	2.032225	1.7
299-W15-95	L	63	Feet	B03VV2	(M)S	2.02	5.458600264	(m)S	82.81	15.17	0.21	1.81	8.63	23.87	29.16	13.5	7.65	5.85	9.32	2.347675	1.7
299-W15-95	L	64	Feet	B03VV3	(G)S	6.34	12.22881356	(g)S	86.58	7.08	1.67	4.67	11.42	29.57	31.44	10.61	3.54	3.6	3.47	1.6835	1.5
299-W15-95	L	65	Feet	B03VV4	S	3.51	11.6130719	S	88.84	7.65	0.14	3.37	13.96	30.53	29.12	10.39	4.84	3.23	4.42	1.775125	1.5
299-W15-95	L	66	Feet	B03VV5	(G)S	5.09	10.28418549	(g)S	86.49	8.41	1.56	3.53	10.45	31.34	30.66	10.31	3.73	4.07	4.34	1.772325	1.6
299-W15-95	L	67	Feet	B03VV6	(M)GS	18.74	7.980110497	(m)gS	72.22	9.05	9.37	9.37	15.79	26.96	18.49	7.51	3.47	3.98	5.07	1.21565	1.6
299-W15-95	L	68	Feet	B03VV7	(GM)S	9.44	7.049777778	(gm)S	79.31	11.25	6.4	3.04	9.89	29.86	23.27	10.15	6.14	4.59	6.66	1.773325	1.5
299-W15-95	L	69	Feet	B03VV8	S	3.1	14.28233438	S	90.55	6.34	1.42	1.68	11.2	34.63	31.39	10.68	2.65	3.5	2.85	1.59255	1.5
299-W15-95	L	70	Feet	B03VV9	S	1.43	17.38992537	S	93.21	5.36	0.24	1.19	8.76	29.84	37.34	13.22	4.05	2.5	2.86	1.87745	1.6
299-W15-95	L	71	Feet	B03VW0	M	0.24	0.51734104	sM	34.01	65.74	0	0.24	0.96	3.43	8.61	8.07	12.94	32.27	33.47	4.504625	1.6
299-W15-95	L	72	Feet	B03VW1	S	0.42	9.328838174	S	89.93	9.64	0.14	0.28	1.77	19.7	43.87	19.35	5.24	5.03	4.61	2.374425	1.4
299-W15-95	L	73	Feet	B03VW2	S	0.9	15.35476546	S	93.05	6.06	0	0.9	4.55	23.16	47.21	13.65	4.48	2.76	3.31	2.0852	1.3
299-W15-95	L	74	Feet	B03VW3	S	1.76	9.714285714	S	89.08	9.17	0.18	1.58	6.72	23.31	37.79	15.19	6.07	4.38	4.79	2.16345	1.3
299-W15-95	L	75	Feet	B03VW4	(M)S	0.83	5.955119215	(m)S	84.92	14.26	0	0.83	4.2	13.15	27.07	26.79	13.71	8.88	5.37	2.7607	1.4
299-W15-95	L	76	Feet	B03VW5	MS	0	1.483854943	mS	59.74	40.26	0	0	0.07	0.2	2.58	14.11	42.78	28.61	11.66	4.246675	1.4
299-W15-95	L	77	Feet	B03VW6	MS	0.37	3.09326212	mS	75.29	24.34	0	0.37	3.01	8.85	17.58	17.7	28.15	14.01	10.33	3.378675	1.4
299-W15-95	L	78	Feet	B03VW7	S	0.62	10.77488152	S	90.94	8.44	0	0.62	6.72	23.53	35.25	18.31	7.13	4.12	4.32	2.2235	1.3
299-W15-95	L	79	Feet	B03VW8	(M)S	1.35	8.000912409	(m)S	87.69	10.96	0.27	1.08	5.04	16.41	32.21	23	11.03	5.92	5.04	2.5069	1.1
299-W15-95	L	80	Feet	B03VW9	MS	0	2.627493653	mS	72.44	27.57	0	0	0.07	0.79	3.8	25.67	42.11	19.52	8.06	3.9492	1.4
299-W15-95	L	81	Feet	B03VX0	MS	0	2.721622627	mS	73.13	26.87	0	0	0.06	0.44	2.39	23.79	46.45	17.7	9.17	4.01485	1.3
299-W15-95	L	82	Feet	B03VX1	(M)S	0.26	6.841981132	(m)S	87.03	12.72	0	0.26	3.47	20.81	30.31	18.18	14.26	6.36	6.36	2.6112	1.3
299-W15-95	L	83	Feet	B03VX2	(M)S	0.42	8.307476636	(m)S	88.89	10.7	0.14	0.28	2.76	18.91	41.06	17.81	8.35	4.62	6.07	2.45665	1.3
299-W15-95	L	84	Feet	B03VX3	S	2	13.28571429	S	91.14	6.86	0.2	1.8	6.72	20.51	39.01	19.51	5.39	3.4	3.46	2.1333	1.1
299-W15-95	L	85	Feet	B03VX4	MS	0	1.763470572	mS	63.82	36.19	0	0	0.07	1.18	4.52	20.75	37.3	26.24	9.95	4.0601	1.2
299-W15-95	L	86	Feet	B03VX5	MS	1.84	3.950579929	mS	78.34	19.83	0.13	1.71	11.23	18.32	16.22	17.14	15.43	12.08	7.75	2.6581	1.3

299-W15-95.XLS

ROCSAN_ANAL

WELL_NAME	EVAL_TYPE	SAMP_INTERVAL_BOTTOM	SAMP_INTERVAL_UNITS	SOIL_SAMP_NUM	LITHO_CLASS	TOTAL_GRAVEL_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	FINE_PEBBLE_PCNT	VERY_FINE_PEBBLE_PCNT	VERY_COARSE_SAND_PCNT	COARSE_SAND_PCNT	MEDIUM_SAND_PCNT	FINE_SAND_PCNT	VERY_FINE_SAND_PCNT	SILT_PCNT	PAN_PCNT	Average Size Fraction	CALCIUM_CARBONATE_PCNT
											-2.00	-1.00	0.00	1.00	2.00	3.00	4.00	4.75	6.00		
299-W15-95	L	87 Feet	B03VX6	MS	0.59	3.875429132	mS	79.02	20.39	0	0.59	4.84	17.71	22.68	17.97	15.82	11.96	6.43	2.8706	1.2
299-W15-95	L	88 Feet	B03VX7	(M)S	1.94	6.770998415	(m)S	85.45	12.62	0.36	1.58	4.8	9.82	21.22	35.63	13.98	6.09	6.52	2.808175	1.2
299-W15-95	L	89 Feet	B03VX8	MS	0	1.605942142	mS	61.62	38.37	0	0	0.13	0.38	2.39	11.78	46.94	26.28	12.1	4.2569	1.3
299-W15-95	L	90 Feet	B03VX9	M	0	0.804402743	sM	44.58	55.42	0	0	0.13	0.26	3.43	9.45	31.31	39.3	16.12	4.44105	1.2
299-W15-95	L	91 Feet	B03VY0	MS	0.41	3.406637168	mS	76.99	22.6	0.07	0.34	1.77	10.14	30.29	24.17	10.62	15.04	7.56	3.0203	1.5
299-W15-95	L	92 Feet	B03VY1	(M)S	0.27	4.616554054	(m)S	81.99	17.76	0	0.27	3.92	17.29	31.2	21.27	8.31	12.96	4.79	2.6677	1.3
299-W15-95	L	93 Feet	B03VY2	(M)S	0	5.417843389	(m)S	84.41	15.58	0	0	0.21	4.57	28.81	37.6	13.22	8.08	7.51	3.1131	1.3
299-W15-95	L	94 Feet	B03VY3	(M)S	0.07	4.367346939	(m)S	81.32	18.62	0	0.07	0.07	0.73	5.17	43.67	31.68	11	7.62	3.667	1.3
299-W15-95	L	95 Feet	B03VY4	MS	0.07	3.481165919	mS	77.63	22.3	0	0.07	0.13	1.21	13.23	43.18	19.88	13.1	9.2	3.54085	1.3
299-W15-95	L	96 Feet	B03VY5	(M)S	3.8	6.846655791	(m)S	83.94	12.26	0.43	3.37	7.38	24.37	27.24	17.28	7.67	5.66	6.59	2.23565	1.1
299-W15-95	L	97 Feet	B03VY6	S	0.14	15.50413223	S	93.8	6.05	0	0.14	0.83	8.55	52.29	26.36	5.77	2.85	3.2	2.478875	1.2
299-W15-95	L	98 Feet	B03VY7	(GM)S	7.57	8.481025641	(gm)S	82.69	8.75	1.3	6.27	12.75	17.66	28.29	17.11	6.88	4.29	5.45	1.972975	1.8
299-W15-95	L	99 Feet	B03VY8	S	0.93	11.52591856	S	91.17	7.91	0	0.93	3.74	13.23	33.29	29.62	11.29	4.24	3.67	2.5506	1.4
299-W15-95	L	100 Feet	B03VY9	S	0.28	9.65491453	S	90.37	9.36	0.14	0.14	0.61	6.24	36.91	33.58	13.03	4.95	4.41	2.824725	1.5

Pacific Northwest National Laboratory

BOREHOLE SUMMARY

Boring/Well No 299-W15-95 | Depth 0-187.5 ft | Date 6/6/02 | Sheet 1 of 1

Location 216-Z-9 Crib, 200 West Area | Project CTET Geology

Prepared by G. V. Last June 6, 2002

Well Site Geology by L. D. Walker (100-187.5 ft) | Date June 4, 2001

Lithologic Class. Scheme Folk/Wentworth | Procedure | Rev

Steel Tape/E-Tape NA / NA | Field Indicator Equip. 1) NA 2) NA

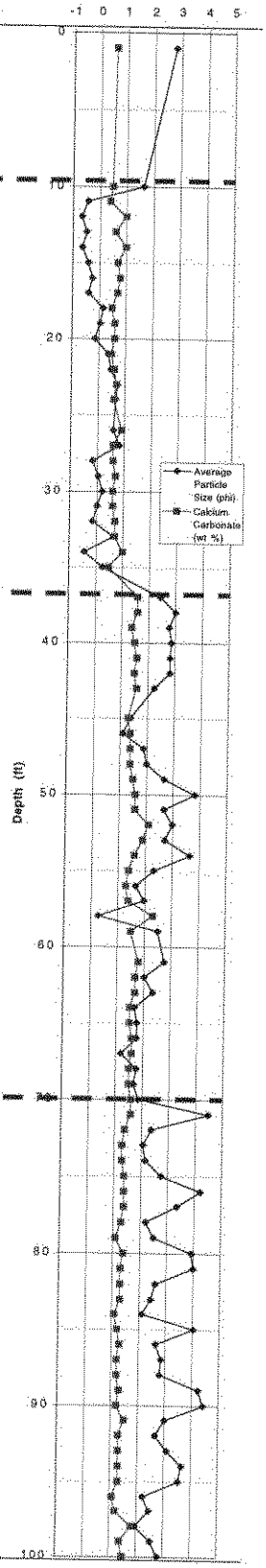
Drilling Contractor

Driller H. E. Osborn (0-100 ft)

Rig/Method 22W-1 (0-100 ft)

Depth Control Point Ground Surface

DEPTH (ft)	DATE/ TIME	SAMPLES TYPE	SAMPLES RECOVERY	MOISTURE	GRAPHIC LOG C	Z	S	G	LITHOLOGIC DESCRIPTION (particle size dist/Beilen, sorting, mineralogy, roundness, color, reaction to HCl, etc.)	COLOR MUNSELL CODE	COLOR NAME	HCl REACTION	CASING LOG 12"	8"	8"	12"	DRILLING AND COMPLETION COMMENTS (drilling rate, down time, blow counts, water level, drill fluid, casing, seals, etc.)
0																	
1																	
2																	
3																	
4																	
5	1/19/59 10:25								Sand & dirt								
6																	
7																	
8									7' to 9' concrete								
9									7' to 9' concrete								
10	1/19/59 10:55								Sand - gravel								
11	1/19/59 11:00	Special							Sand - pea gravel								
12	1/19/59 11:15	Special							Sand - pea gravel								
13	1/19/59 11:20	Special							Pea gravel								
14	1/19/59 11:25	Special							Pea gravel								
15	1/19/59 11:30								Pea gravel								
16	1/19/59 12:30	Special							Pea gravel								
17	1/19/59 13:00	Special							Pea gravel								
18	1/19/59 13:10	Special							Sand - gravel								
19	1/19/59 13:15	Special							Sand - gravel								
20	1/19/59 13:40								Sand - gravel - cobblestone								
21	1/19/59 13:50								Sand - gravel								
22	1/19/59 14:00								Sand - gravel								
23	1/19/59 14:10								Sand - gravel								
24	1/19/59 14:25								Sand - gravel								
25	1/19/59 14:30								Sand - gravel								
26	1/19/59 14:35								Sand - gravel								
27	1/19/59 15:30								Sand - gravel								
28	1/19/59 15:35								Sand - gravel								
29	1/19/59 15:40								Sand - gravel								
30	1/19/59 15:45								Sand - gravel								10' of 12" casing
31	1/20/59 8:40	Special							Sand - gravel - cobblestone								34'1" of 8" casing
32	1/20/59 8:45								Same as above								
33	1/20/59 8:50								Same as above								
34	1/20/59 8:55								Same as above								
35	1/20/59 9:20								Same as above								
36	1/20/59 10:00								Same as above								
37	1/20/59 10:20								Same as above								
38	1/20/59 10:25	Special							Sand								
39	1/20/59 10:30								Sand								
40																	
41	1/20/59 11:00								Sand								
42	1/20/59 11:05								Sand								
43	1/20/59 11:10	Special							Sand & silt								
44	1/20/59 11:13								Sand & silt								
45	1/20/59 11:15								Sand & silt								
46	1/20/59 12:05								Sand & silt								
47	1/20/59 13:05								Sand & silt								
48	1/20/59 13:13								Sand & silt								
49	1/20/59 13:20								Sand & silt								
50	1/20/59 13:30								Sand & silt								
51	1/20/59 13:40								Sand & silt								
52	1/20/59 13:45								Sand & silt								
53	1/20/59 13:48								Sand & silt								
54	1/20/59 13:50								Sand & silt								
55	1/20/59 13:52								Sand & silt								
56	1/20/59 13:53								Sand & silt								
57	1/20/59 14:00								Sand & silt								
58	1/20/59 14:05								Sand & silt								
59	1/20/59 15:15								Sand & silt								
60	1/20/59 15:25								Sand & silt								
61	1/20/59 15:35								Sand & silt								
62	1/20/59 15:38								Sand & silt								
63	1/20/59 15:40								Sand & silt								
64	1/20/59 15:42								Sand & silt								
65	1/20/59 15:43								Sand & silt								
66	1/20/59 15:50								Sand & silt								
67	1/20/59 16:53								Sand & silt								
68	1/21/59 8:45								Sand & silt								
69	1/21/59 8:50								Sand & silt								
70	1/21/59 9:00								Sand & silt								
71	1/21/59 9:02								Sand & silt								
72	1/21/59 9:04								Sand & silt								
73	1/21/59 9:05								Sand & silt								
74	1/21/59 9:08								Sand & silt								
75	1/21/59 9:10								Sand & silt								
76	1/21/59 9:13								Sand & silt								
77	1/21/59 9:15								Sand & silt								
78	1/21/59 9:20								Sand & silt								
79	1/21/59 9:23								Sand & silt								
80	1/21/59 9:25								Sandy silt								
81	1/21/59 10:40								Sandy silt								
82	1/21/59 10:43								Sandy silt								
83	1/21/59 10:45								Sandy silt								
84	1/21/59 10:50								Sandy silt								
85	1/21/59 10:53								Sandy silt								
86	1/21/59 10:55								Sandy silt								
87	1/21/59 11:00																
88	1/21/59 11:03								Sandy silt								
89	1/21/59 11:05																
90	1/21/59 11:10								Sandy silt								
91	1/21/59 12:30																
92	1/21/59 12:32								Sand & silt								
93	1/21/59 12:35								Sand & silt								
94	1/21/59 12:40								Sand & silt								
95	1/21/59 12:45								Sand & silt								
96	1/21/59 12:50								Sand & silt								
97	1/21/59 14:10								Sand & silt								
98	1/21/59 14:12								Sand & silt								
99	1/21/59 14:15								Sand & silt								
100	1/21/59 14:18								Sand & silt								103' 0" of 8" casing in hole.



Pacific Northwest National Laboratory	BOREHOLE SUMMARY	Boring/Well No 299-W15-95	Depth 0-187.5 ft	Date 6/6/02	Sheet 1 of 1
		Location 216-Z-9 Crib, 200 West Area	Project CTET Geology		

Prepared by G. V. Last June 6, 2002

Well Site Geology by L. D. Walker (100-187.5 ft) Date June 4, 2001

Lithologic Class. Scheme Folk/Wentworth Procedure Rev

Steel Tape/E-Tape NA / NA Field Indicator Equip. 1) NA 2) NA

Drilling Contractor

Driller H. E. Osborn (0-100 ft)

Rig/Method 22W-1 (0-100 ft)

Depth Control Point Ground Surface

DEPTH (ft)	DATE/ TIME	SAMPLES TYPE	SAMPLES RECOVERY	MOISTURE	GRAPHIC LOG C	Z	S	G	LITHOLOGIC DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, color, reaction to HCl, etc.)	COLOR MUNSELL CODE	COLOR NAME	HCl REACTION	CASING LOG 12"	8"	6"	4"	12"	DRILLING AND COMPLETION COMMENTS (drilling rate, down time, blow counts, water level, drill fluid, casing, seals, etc.)
101																		
102																		
103																		
104																		
105																		
106																		
107																		
108																		
109																		
110																		
111																		
112																		
113																		
114																		
115																		
116																		
117																		
118																		
119																		
120																		

W = Wet, M = Moist, D = Dry

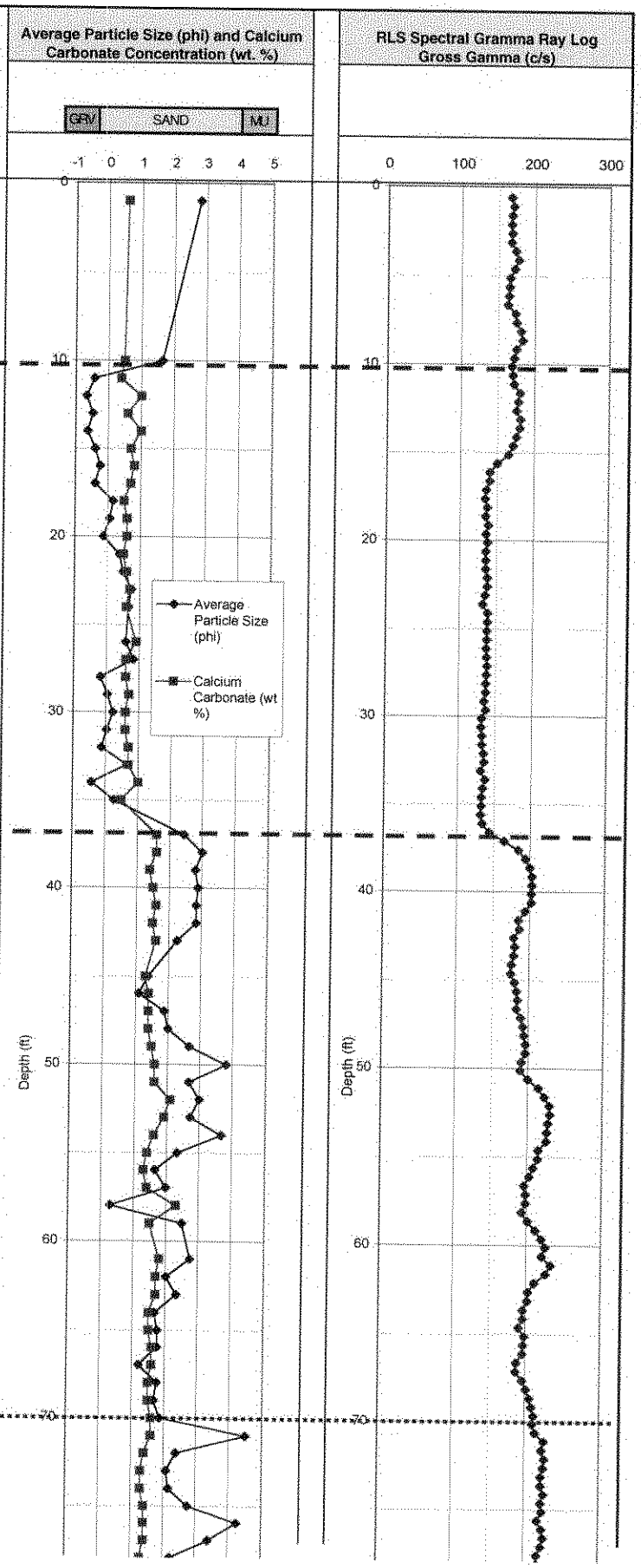
2000/99/LGW-YZ 08/2001

-1 0 1 2 3 4 5

Depth (ft)

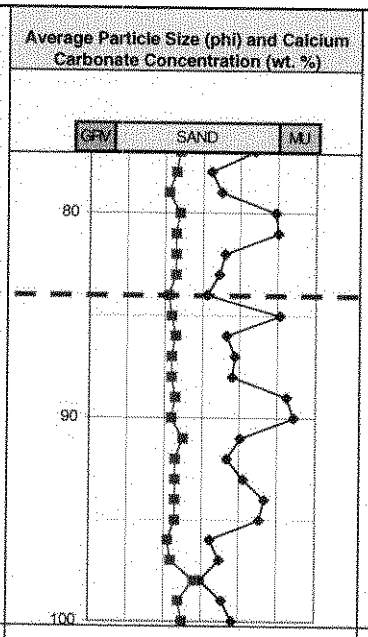
299-W15-95

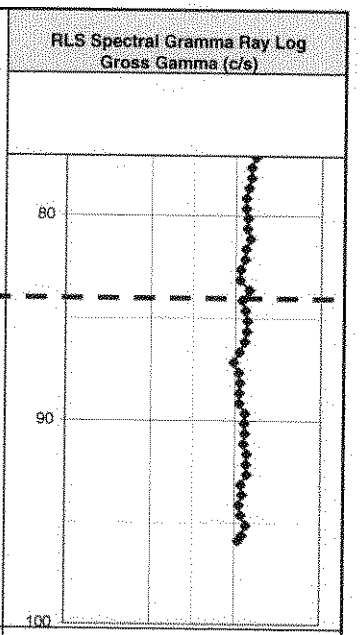
DEPTH (Ft)	Qualitative Data: DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM_CARBONATE_PCNT
0									
1				5.59	85.87	8.54	10.06	(g)S	0.6
2									
3									
4									
5									
6	BACKFILL		Sand & dirt						
7									
8			7' to 9' concrete						
9			7' to 9' concrete						
10			Sand - gravel	11.87	85.03	3.09	27.52	gS	0.5
11	Special		Sand - pea gravel	62.52	32.74	4.74	6.91	msG	0.4
12	Special		Sand - pea gravel	70.14	28	1.87	14.97	sG	1
13	Special		Pea gravel	61.72	35.78	2.5	14.31	sG	0.6
14	Special		Pea gravel	68.2	28.91	2.89	10.00	sG	1
15			Pea gravel	58.57	37.85	3.58	10.57	sG	0.7
16	Special		Pea gravel	58.55	36.98	4.47	8.27	msG	0.8
17	Special		Pea gravel	59.79	36.21	4	9.05	sG	0.7
18	Special		Sand - gravel	44.09	50.22	5.68	8.84	msG	0.5
19	Special		Sand - gravel	42.76	53.44	3.8	14.06	sG	0.6
20			Sand - gravel - cobblestone	49.17	47.65	3.19	14.94	sG	0.6
21			Sand - gravel	41.1	52.12	6.78	7.69	msG	0.5
22			Sand - gravel	31.1	62.94	5.97	10.54	sG	0.6
23	HANFORD		Sand - gravel	31.36	59.22	9.42	6.29	msG	0.7
24	GD		Sand - gravel	31.15	61.43	7.42	8.28	msG	0.6
25			Sand - gravel						
26			Sand - gravel	25.59	69.1	5.3	13.04	gS	0.9
27			Sand - gravel	25.76	66.53	7.7	8.64	(m)gS	0.6
28			Sand - gravel	46.95	50.33	2.73	18.44	sG	0.6
29			Sand - gravel	44.26	50.9	4.85	10.49	sG	0.7
30			Sand - gravel	37.24	58.71	4.06	14.46	sG	0.6
31	Special		Sand - gravel - cobblestone	41.91	54.54	3.55	15.36	sG	0.6
32			Same as above	48.7	47	4.31	10.90	sG	0.7
33			Same as above	40.25	48.32	11.43	4.23	msG	0.7
34			Same as above	62.7	32.09	5.21	6.16	msG	1
35			Same as above	35.29	60.85	3.86	15.76	sG	0.5
36			Same as above						
37			Same as above	8.94	74.93	16.14	4.64	(gm)S	1.6
38	Special		Sand	0.11	81.07	18.81	4.31	(m)S	1.6
39			Sand	2.82	79.6	17.59	4.53	(m)S	1.4
40				0.12	84.89	14.98	5.67	(m)S	1.5
41			Sand	2.97	76.91	20.12	3.82	mS	1.6
42			Sand	0.48	84.24	15.29	5.51	(m)S	1.5
43	Special		Sand & silt	1.29	90.09	8.62	10.45	S	1.6
44			Sand & silt						
45			Sand & silt	8.26	87.29	4.44	19.66	(g)S	1.3
46			Sand & silt	11.33	84.11	4.55	18.49	gS	1.4
47			Sand & silt	9.72	75.88	14.4	5.27	(gm)S	1.4
48			Sand & silt	3.69	85.2	11.12	7.66	(m)S	1.4
49			Sand & silt	1.04	83.83	15.14	5.54	(m)S	1.5
50			Sand & silt	2.32	66.53	31.15	2.14	mS	1.6
51			Sand & silt	0.06	89.96	9.97	9.02	S	1.6
52	HANFORD		Sand & silt	0	89.34	10.66	8.38	(m)S	2.1
53	SD (H2)		Sand & silt	0	92.34	7.65	12.07	S	1.9
54			Sand & silt	0.06	73.03	26.91	2.71	mS	1.6
55			Sand & silt	0.41	90.81	8.79	10.33	S	1.4
56			Sand & silt	5.28	88.84	5.87	15.13	(g)S	1.3
57			Sand & silt	0.79	90.22	8.99	10.04	S	1.4
58			Sand & silt	39.78	54.89	5.33	10.30	sG	2.3
59			Sand & silt	2.41	88.13	9.46	9.32	S	1.5
60			Sand & silt						
61			Sand & silt	0.35	88.59	11.06	8.01	(m)S	1.8
62			Sand & silt	0.83	91.27	7.91	11.54	S	1.7
63			Sand & silt	2.02	82.81	15.17	5.46	(m)S	1.7
64			Sand & silt	6.34	86.58	7.08	12.23	(g)S	1.5
65			Sand & silt	3.51	88.84	7.65	11.61	S	1.5
66			Sand & silt	5.09	86.49	8.41	10.28	(g)S	1.6
67			Sand & silt	18.74	72.22	9.05	7.98	(m)gS	1.6
68			Sand & silt	9.44	79.31	11.25	7.05	(gm)S	1.5
69			Sand & silt	3.1	90.55	6.34	14.28	S	1.5
70			Sand & silt	1.43	93.21	5.36	17.39	S	1.6
71			Sand & silt	0.24	34.01	65.74	0.52	sM	1.6
72			Sand & silt	0.42	89.93	9.64	9.33	S	1.4
73			Sand & silt	0.9	93.05	6.06	15.35	S	1.3
74			Sand & silt	1.76	89.08	9.17	9.71	S	1.3
75			Sand & silt	0.83	84.92	14.26	5.96	(m)S	1.4
76			Sand & silt	0	59.74	40.26	1.48	mS	1.4
77			Sand & silt	0.37	75.29	24.34	3.09	mS	1.4



299-W15-95

DEPTH (FT)	Qualitative Data: DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM CARBONATE_PCNT
78			Sand & silt	0.62	90.94	8.44	10.77	S	1.3
79			Sand & silt	1.35	87.69	10.96	8.00	(m)S	1.1
80			Sandy silt	0	72.44	27.57	2.63	mS	1.4
81			Sandy silt	0	73.13	26.87	2.72	mS	1.3
82			Sandy silt	0.26	87.03	12.72	6.84	(m)S	1.3
83			Sandy silt	0.42	88.89	10.7	8.31	(m)S	1.3
84			Sandy silt	2	91.14	6.86	13.28	S	1.1
85			Sandy silt	0	63.82	36.19	1.76	mS	1.2
86			Sandy silt	1.84	78.34	19.83	3.95	mS	1.3
87				0.59	79.02	20.39	3.88	mS	1.2
88			Sandy silt	1.94	85.45	12.62	6.77	(m)S	1.2
89				0	61.62	38.37	1.61	mS	1.3
90			Sandy silt	0	44.58	55.42	0.80	sM	1.2
91	HANFORD SD (H4)			0.41	76.99	22.6	3.41	mS	1.5
92			Sand & silt	0.27	81.99	17.76	4.62	(m)S	1.3
93			Sand & silt	0	84.41	15.58	5.42	(m)S	1.3
94			Sand & silt	0.07	81.32	18.62	4.37	(m)S	1.3
95			Sand & silt	0.07	77.63	22.3	3.48	mS	1.3
96			Sand & silt	3.8	83.94	12.26	6.85	(m)S	1.1
97			Sand & silt	0.14	93.8	6.05	15.50	S	1.2
98			Sand & silt	7.57	82.69	9.75	8.48	(gm)S	1.8
99			Sand & silt	0.93	91.17	7.91	11.53	S	1.4
100			Sand & silt	0.28	90.37	9.36	9.65	S	1.5
101	DB								
102									
103									
104	SS	Sl. moist							
105									
106	SS	Sl. Moist							
107									
108	SS								
109		Moist							
110	SS								
111									
112	SS								
113									
114	SS	Sl. Moist							
115									
116	SS								
117		Dry							
118	SS								
119	DB								
120	SS								
121									
122	SS	Sl. Moist to Dry							
123									
124	SS								
125									
126	DB								
127									
128									
129									
130		Dry							
131	SS	Dry							
132									
133	DB								
134									
135									
136									
137									
138									
139									
140		Dry							
141									
142									
143									
144									
145		Dry							
146	SS								
147									
148	DB	Dry							
149									





299-W15-95

DEPTH (FT)	Qualitative Data: DRILL/ SAMPLE METHOD	Qualitative Data: MOISTURE	Qualitative Data: DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	Particle Size Data (from ROCSAN): TOTAL_SAND_PCNT	Particle Size Data (from ROCSAN): TOTAL_MUD_PCNT	Particle Size Data (from ROCSAN): Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM_CARBONATE_PCNT	Average Particle Size (phi) and Calcium Carbonate Concentration (wt. %): GRV / SAND / MU	RLS Spectral Gamma Ray Log Gross Gamma (c/s)
150											
151											
152											
153											
154											
155											
156	SS										
157		Dry -									
158	DB	Sl. Moist									
159											
160											
161											
162											
163											
164											
165		Sl. Moist									
166											
167											
168											
169											
170											
171											
172		Sl. Moist									
173	SS										
174											
175	DB	Sl. Moist									
176											
177											
178											
179											
180											
181											
182											
183											
184											
185											
186	SS										
187		Sl. Moist									
188	DB										

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION	COMMENTS
66			Sand & silt	
67			Sand & silt	
68			Sand & silt	
69			Sand & silt	
70			Sand & silt	
71			Sand & silt	
72			Sand & silt	
73			Sand & silt	
74			Sand & silt	
75			Sand & silt	
76			Sand & silt	
77			Sand & silt	
78			Sand & silt	
79			Sand & silt	
80			Sandy silt	
81			Sandy silt	
82			Sandy silt	
83			Sandy silt	
84			Sandy silt	
85			Sandy silt	
86			Sandy silt	
88			Sandy silt	
90			Sandy silt	
92			Sand & silt	
93			Sand & silt	
94			Sand & silt	
95			Sand & silt	
96			Sand & silt	
97			Sand & silt	
98			Sand & silt	
99			Sand & silt	

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	WELL SITE GEOLOGIST'S DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, etc.)	COLOR (Munsell Code - Wet/Dry)	HCl REACTION
100			99-103': **SAND.** 90% sand, 10% silt. At 99' is clean, pred. med., light grey - then rust read scale from old casing, and black staining.		
101	DB				
102					
103					
104	SS	Sl. moist	103-105': **Slightly Silty SAND.** 85-90% sand, 10-15% silt. Sand predom. med-fn, mod. sorted, SA; 20-30% basalt, 70-80% qtz, feld., tr. mica	10YR5/2 (grey brown)	Strong
105					
106	SS	Sl. Moist	105-108': **Silty SAND.** 70% sand, 30% silt. Sand 90% v. fn, 10% fn., well sorted, SA (subangular); 80% qtz/feld, 20% mafic	2.5Y5/3 (lt. olive brown)	Very Strong
107					
108	SS				
109		Moist	108-112.5': **Sandy SILT.** As above but fine. 25% Sand (v. fn), 75% silt. Tr. Clay.		Strong
110	SS				
111					
112	SS		112': Tr cse peb, caliché fragments.		
113					
114	SS	Sl. Moist	112.5-116': **Caliche w/gravel.** Gravel increase at 115'	10YR7/4 (v. pale brown)	Violent
115					
116	SS				
117		Dry	116-121': **Silty Sandy GRAVEL.** 50% Gravel, 30% sand, 20% silt. Poorly sorted, gravel SR (subround), occ. Caliche coatings on gravel.	10YR5/1 (gray)	Weak
118	SS				
119	DB				
120	SS				
121			*121': Sandy Gravel, no rxn to HCl - possible top of Ringold.*		
122	SS	Sl. Moist to Dry	121-128.5': **Sandy GRAVEL.** 60% Gravel, 35-40% Sand, tc-5% silt. Gravel 20% v cse peb, 40% cse, 30% med, 10% fn-v. fn. Sand 20% v. cse-cse, 60% med, 20% fn -v. fn. Poorly sorted, gravel R-Sr (round to subrounded), 40% basalt, 60% granitic, qtzite/other; sand 70% qtz/feld, 30% basalt.	10YR5/2 (graysih brown)	None.
123					
124	SS				
125					
126	DB				
127					
128					
129					
130		Dry	128.5-30': **Gravelly SAND.** 70% f-med. Sand, 25% gravel, tr fines		
131	SS	Dry	130-139': **SAND.** 95% f-med. Snd, 5% basalic frags to 2" max; sand 75% f-med. 25% cse; 80% qtz, 20% basalt & other lithic frags, trace mica; subang-subround;		
132					
133	DB				
134					
135					
136					
137					
138					
139			*fining* ▼		
140		Dry	139-142.5': **Silty SAND.** 60% f-med. Sand; 35% fines, 5% gravel. Sand is 80% qtz, 20% basalt, trace mica, subangular to subrounded. Finesare dry, nonplastic. Gravel mostly basalt w/occa. Quatzite. Rounded.		
141					
142					
143			142.5-143.5': **Gravelly SAND.** 70% med-cse sand, 25% grav to 3 inch max, 5% fines. Sand is 80% qtz, subrounded-subang. 20% ang basalt frags; grav is mostly basalt w/occas. qtzite.		
144					
145		Dry			
			143.5-147': **Silty SAND w/gravel.** 60% f-med. Sand, 25% silt (fines), 15% gravel to 4 inch max. Sand is 75% qtz, 25% basalt, particles are subrounded to subangular, Gravel is subang-subrounded basalt w/ocassional qtzite		
146	SS				
147			*Gravel content increase. Boulder noted at 148 ft in graphic log.*		
148	DB	Dry	147-156': **Sitly Sandy GRAVEL.** [147-148': lg. Cob to sm boulder]. 50% gravel, 30% sand, 20 % silt. Gravel sm cob to fn peb; sand 20% v, cse, 40% cse, 20% med. 20 % fn-v. fn; poorly sorted; gravel subround, sand SA-SR; gravel 60% basalt, 40% granite & qrzite. Sand 70% qtz/feld, 30% basalt/other.	10YR 6/2 (lt. brnish gray)	None
149					
150					
151					
152					
153			*Drilling indicates occ. thin layers of sand (<0.2').*		

DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	WELL SITE GEOLOGIST'S DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, etc.)	COLOR (Munsell Code - Wet/Dry)	HCl REACTION
154					
155					
156	SS				
157 158 159 160 161	DB	Dry - Sl. Moist	156-170.5': **Sandy GRAVEL.** 40% Gravel, 50% Sand, 10% Silt. (~156.5-157' 90% Sand). Gravel similar to above. Sand 10% v. cse-med, 70% fn, 20% v. fn. Sand mod-well sorted, 85% qtz/feld, 15% basalt. Sand SA, tr mica. *Drill rate slows.* 159': Gravel content increase ~60%; 35% Sand, 5% silt.	10YR5/2 (gray brown)	None
162					
163 164			163-163.5: fn sand, then back to Sandy Gravel.		
165 166 167 168		Sl. Moist	**Sandy GRAVEL.** 50% Gravel, 45% Sand 5% silt. Gravel 30% sm cob-v. cse pebble, 30% cse peb. 40% med-fn; Sand 20% v. cse-med. 40% fn, 40% v. fn. Poorly sorted. Gravel 40% basalt, 60% granite/qtzite; Sand 85% qtz/feld, 15% baslat, tr mica' max size >10 cm. Gravel R-SR.	10YR5/2 (gray brown)	None
169 170 171			168.5-169': Sand content increase ~75%. 169': back to Sandy Gravel		
172 173 174	SS	Sl. Moist	170.5' - 174': **SAND.** 100% Sand, tr. Silt. 10% med. Sand, 50% fn, 40% v. fn., well sorted, subangular; 85-90% qtz/feld, 10-15% baslat, tr mica. 173.5' gravel starting again.	10YR5/2 (grayish brown)	None
175 176 177 178 179	DB	Sl. Moist	174'-186': **Sandy GRAVEL.** 45-50% gravel, 45-50% sand, tr-5% silt. Gravel 10% sm cob, 25% v.cse peb, 25% cse peb, 40% med0fn peb; Sand 20% cse-med, 40% fn, 40% v. fn. Poorly sorted; gravel R-SR, Sand SA; Sand 85% qtz/feld, 15% basalt/other lith. Frags; Gravel 30-40% basalt, 60-70% granite/qtzite/other; well indurated *Driller notes "tight drilling"*	10YR5/2 (gry brn)	None
180					
181					
182					
183					
184					
185					
186 187 188	SS DB	Sl. Moist	186-187': **SAND.** 5% Gravel, 95% Sand, tr silt. Sand 40% fn, 60% v. fn. Well sorted, SA,;80-85% qtz/feld, 15-20% basalt/other, tr mica. 187-187.5': Sandy GRAVEL. Similar to above.	10YR5/2	None

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
3.26	0.64	167	13.2	0.35	0.52
3.76	1.14	170	12	0.45	0.47
4.26	1.64	168	11.2	0.54	0.94
4.76	2.14	167	13.7	0.45	0.85
5.26	2.64	168	16	0.85	0.94
5.76	3.14	167	13.8	0.15	0.75
6.26	3.64	173	14.2	0.04	0.68
6.76	4.14	177	12.9	0.66	0.49
7.26	4.64	172	14	0.51	0.81
7.76	5.14	166	12.4	0.37	0.77
8.26	5.64	165	13.2	0.57	0.74
8.76	6.14	164	11	0.59	0.53
9.26	6.64	163	13.5	0.34	0.72
9.76	7.14	173	11.7	0.3	0.72
10.26	7.64	175	13.2	0.82	0.65
10.76	8.14	181	14	0.64	0.99
11.26	8.64	183	13.2	0.96	0.62
11.76	9.14	175	15.6	0.25	0.52
12.26	9.64	172	10.5	0.63	0.73
12.76	10.14	169	14.3	0.35	0.69
13.26	10.64	170	15	0.61	0.78
13.76	11.14	172	10.8	0.63	0.51
14.26	11.64	180	13.6	0.63	0.63
14.76	12.14	178	15.9	0.5	0.56
15.26	12.64	176	14.1	0.58	0.85
15.76	13.14	181	16.4	0.43	0.46
16.26	13.64	180	14.2	0.31	0.73
16.76	14.14	176	14.8	0.51	0.66
17.26	14.64	171	13.4	0.17	0.55
17.76	15.14	165	12.4	0.22	0.7
18.26	15.64	150	12.6		0.31
18.76	16.14	140	11.1	0.4	0.59
19.26	16.64	140	11.3	0.23	0.7
19.76	17.14	136	11.6	0.34	0.53
20.26	17.64	134	10.1	0.5	0.56
20.76	18.14	137	10.9	0.34	0.48
21.26	18.64	135	9.23	0.66	0.58
21.76	19.14	139	10.6	0.19	0.5
22.26	19.64	136	9.77	0.45	0.53
22.76	20.14	138	9.77	0.39	0.43
23.26	20.64	136	9.49	0.13	0.69
23.76	21.14	136	9.8	0.41	0.3
24.26	21.64	136	11.2	0.56	0.47
24.76	22.14	138	11.1	0.52	0.48
25.26	22.64	138	10.4	0.47	0.45
25.76	23.14	135	10.5	0.64	0.31
26.26	23.64	132	10.5	0.4	0.6
26.76	24.14	139	9.02	0.39	0.35
27.26	24.64	139	11.1	0.57	0.32

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
27.76	25.14	138	11.8	0.58	0.61
28.26	25.64	138	12.5	0.64	0.5
28.76	26.14	137	11.7	0.17	0.66
29.26	26.64	138	10.1	0.75	0.69
29.76	27.14	139	11.7	0.76	0.67
30.26	27.64	138	12.5	0.46	0.43
30.76	28.14	137	12.6	0.45	0.57
31.26	28.64	137	9.12	0.31	0.76
31.76	29.14	135	9.92	0.49	0.33
32.26	29.64	137	9.25	0.41	0.66
32.76	30.14	132	10.2		0.52
33.26	30.64	131	11.1	0.79	0.49
33.76	31.14	133	10.1	0.33	0.43
34.26	31.64	133	10.3	0.66	0.56
34.76	32.14	135	10.5	0.5	0.5
35.26	32.64	136	9.98	0.19	0.16
35.76	33.14	131	9.76	0.34	0.41
36.26	33.64	137	9.77	0.16	0.4
36.76	34.14	134	11.1	0.35	0.39
37.26	34.64	133	12	0.48	0.45
37.76	35.14	133	10.9		0.46
38.26	35.64	132	9.66	0.39	0.57
38.76	36.14	134	9.42	0.21	0.41
39.26	36.64	144	10.2	0.58	0.63
39.76	37.14	164	13.6	0.59	0.62
40.26	37.64	184	13.7	0.17	0.56
40.76	38.14	194	16.1	0.52	0.6
41.26	38.64	200	16.2	0.41	0.74
41.76	39.14	203	16.2	0.26	0.88
42.26	39.64	203	15.5	0.51	1.04
42.76	40.14	202	13.9	0.33	0.74
43.26	40.64	202	16.1	0.44	0.91
43.76	41.14	194	13.5	0.39	0.82
44.26	41.64	185	13.3	0.37	0.88
44.76	42.14	186	13.9	0.43	0.59
45.26	42.64	179	15	0.46	0.78
45.76	43.14	180	14.6	0.53	0.65
46.26	43.64	179	13.6	0.29	0.76
46.76	44.14	176	12.1		1.04
47.26	44.64	175	14.7	0.86	0.58
47.76	45.14	180	13.2	0.39	0.15
48.26	45.64	183	14.7	0.6	0.61
48.76	46.14	185	15.3	0.55	0.73
49.26	46.64	183	12.9	0.33	0.71
49.76	47.14	189	12.7	0.58	0.46
50.26	47.64	192	16.1	0.38	0.92
50.76	48.14	194	16.2	1.04	0.73
51.26	48.64	196	15.4	0.41	0.8
51.76	49.14	196	15.7	0.59	0.78

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
52.26	49.64	191	16.7	0.85	0.5
52.76	50.14	189	15.4	0.67	0.65
53.26	50.64	200	17	0.75	1
53.76	51.14	214	18.4	0.62	1.11
54.26	51.64	222	17.8	0.56	0.83
54.76	52.14	229	15.9	0.6	0.96
55.26	52.64	230	17.2	0.56	0.67
55.76	53.14	228	17.3	0.8	0.88
56.26	53.64	226	13.7	0.59	1.01
56.76	54.14	225	14.4	0.72	0.88
57.26	54.64	215	13.2	0.27	0.53
57.76	55.14	214	17.2	0.26	0.46
58.26	55.64	208	16.3	0.57	0.99
58.76	56.14	203	16.5	0.53	0.63
59.26	56.64	196	12.9	0.92	0.65
59.76	57.14	198	16.7	0.78	0.79
60.26	57.64	198	14.6	0.48	0.49
60.76	58.14	193	13.2	0.71	0.86
61.26	58.64	201	16.4	0.43	0.87
61.76	59.14	212	14	0.72	0.78
62.26	59.64	220	15.1	0.32	0.97
62.76	60.14	225	17.6	0.83	1.07
63.26	60.64	221	19.2	1.07	1.2
63.76	61.14	233	18	0.61	0.68
64.26	61.64	226	17.9	0.67	0.84
64.76	62.14	211	17.2	0.63	0.57
65.26	62.64	203	14.1	0.48	0.71
65.76	63.14	202	15.7	0.64	0.58
66.26	63.64	196	12.9	0.51	0.72
66.76	64.14	196	14.7	0.74	0.9
67.26	64.64	191	13.4	0.64	0.76
67.76	65.14	198	13.5	0.84	1.04
68.26	65.64	197	15.3	0.99	0.73
68.76	66.14	196	14.4	0.49	0.87
69.26	66.64	188	14.3	0.67	0.73
69.76	67.14	187	14	0.43	0.73
70.26	67.64	196	16.2	0.79	0.93
70.76	68.14	201	16.8	0.24	0.71
71.26	68.64	206	16.2	0.72	0.85
71.76	69.14	209	17.4	0.23	1.06
72.26	69.64	212	17.8	0.49	0.69
72.76	70.14	210	18.5	0.68	0.75
73.26	70.64	214	17.4	0.73	1
73.76	71.14	226	17.5	0.73	0.66
74.26	71.64	223	18.7	0.93	0.94
74.76	72.14	227	19	0.59	1.01
75.26	72.64	225	20.2	0.78	0.85
75.76	73.14	222	17	0.58	1.26
76.26	73.64	222	21.2	0.53	0.73

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
76.76	74.14	226	17.8	0.67	0.63
77.26	74.64	222	16.2	0.62	0.74
77.76	75.14	224	15.5	0.49	0.63
78.26	75.64	218	16.5	0.77	0.75
78.76	76.14	224	16.1	0.41	1.02
79.26	76.64	226	15.7	0.5	1.03
79.76	77.14	223	19.7	0.65	0.65
80.26	77.64	218	18	0.28	0.83
80.76	78.14	218	17	0.54	0.71
81.26	78.64	215	21.5	0.64	1.05
81.76	79.14	212	16	0.53	1.1
82.26	79.64	212	16.7	0.25	0.81
82.76	80.14	214	14.2	0.5	0.24
83.26	80.64	213	13.5	0.49	0.97
83.76	81.14	217	16.1	0.55	0.52
84.26	81.64	212	15.6	0.88	0.8
84.76	82.14	211	18.9	0.66	0.53
85.26	82.64	206	15	0.3	0.93
85.76	83.14	205	17.7	0.32	0.83
86.26	83.64	216	15.4	0.72	0.79
86.76	84.14	208	15.8	0.54	1.26
87.26	84.64	212	15.7	1.05	1.01
87.76	85.14	214	16	0.76	0.83
88.26	85.64	213	17.6	0.64	0.52
88.76	86.14	211	15.2	0.61	0.63
89.26	86.64	205	18.1	0.54	0.6
89.76	87.14	198	14.7	0.74	0.66
90.26	87.64	204	13.8	0.79	0.81
90.76	88.14	206	15.3	0.61	1.13
91.26	88.64	205	16.2	0.26	0.78
91.76	89.14	205	17	0.18	0.74
92.26	89.64	212	17.5	0.74	0.69
92.76	90.14	211	14	0.38	0.79
93.26	90.64	212	17.4	0.48	0.73
93.76	91.14	210	15.2	0.76	0.66
94.26	91.64	214	17.6	1.09	0.95
94.76	92.14	213	19.4	0.4	0.43
95.26	92.64	214	16.8	0.55	0.95
95.76	93.14	207	18.6	0.18	0.52
96.26	93.64	209	17.6	0.66	0.94
96.76	94.14	205	17.8	0.84	0.73
97.26	94.64	207	17.3	0.44	0.89
97.76	95.14	213	15.3	0.91	0.9
98.26	95.64	209	17	0.87	0.76
98.51	95.89	204	14.1	0.82	0.78
	#VALUE!				
99.75	97.13	195	16.2	0.26	0.71
99.25	96.63	193	15.3	0.13	0.46
99	96.38	201	14.4	0.63	0.83

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Depth (ft BTOC)	Depth (ft BGS)	GROSS	K40	URANIUM	THORIUM
	#VALUE!				
64.5	61.88	222	17.3	0.82	0.83
64.25	61.63	228	17.8	0.81	1.06
63.75	61.13	234	15.1	0.56	0.76
63.25	60.63	227	14.3	0.63	1.07
62.75	60.13	226	16.9	0.82	0.9
62.25	59.63	224	13.9	0.76	1.07
61.75	59.13	215	14.9	0.46	0.86
61.25	58.63	196	13.8	0.62	0.83
60.75	58.13	192	14.4	0.52	0.63
60.25	57.63	191	15	0.45	0.9
59.75	57.13	199	14.2	0.77	0.46
59.25	56.63	201	15.8	0.97	0.66
58.75	56.13	202	14.5	0.79	0.52
58.25	55.63	209	16.3	0.93	0.6
57.75	55.13	216	13.5	0.72	0.6
57.25	54.63	223	15.4	1.08	0.88
56.75	54.13	223	16.2	0.76	0.98
56.25	53.63	223	15.9	0.88	0.66
55.75	53.13	227	14.9	0.54	0.66
55.25	52.63	234	17	0.84	0.72
55	52.38	237	15.7	0.64	0.44
40	37.38	179	12.7	0.85	0.79
40.5	37.88	196	15.5	0.71	0.81
41	38.38	200	13.8	0.94	0.83
41.5	38.88	207	14.7	0.85	0.81
42	39.38	209	16.3	0.65	0.81
42.5	39.88	209	16.2	0.82	0.72
43	40.38	206	15.9	0.81	0.8
43.5	40.88	200	16.5	0.55	0.71
44	41.38	197	15.3	0.76	0.56
44.5	41.88	193	14.8	0.82	0.77
45	42.38	184	14	0.62	0.79
45.5	42.88	181	12.5	0.76	0.47
46	43.38	181	14.2	0.68	0.66
46.5	43.88	182	14.6	0.87	0.76
47	44.38	184	12.7	0.66	0.77
41	38.38	202	15	0.8	0.81
40.5	37.88	198	14.1	1.01	0.8
40	37.38	180	13.4	0.87	0.69
39.5	36.88	159	11.2	0.76	0.67

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DEPTH (Ft)	DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION	COMMENTS
5			Sand & dirt	
10			Sand - gravel	7' to 9' concrete
11			Sand - pea gravel	Special
12			Sand - pea gravel	Special
13			Pea gravel	Special
14			Pea gravel	Special
15			Pea gravel	
16			Pea gravel	Special
17			Pea gravel	Special
18			Sand - gravel	Special
19			Sand - gravel	Special
20			Sand - gravel - cobblestone	
21			Sand - gravel	
22			Sand - gravel	
23			Sand - gravel	
24			Sand - gravel	
25			Sand - gravel	
26			Sand - gravel	
27			Sand - gravel	
28			Sand - gravel	
29			Sand - gravel	
30			Sand - gravel	
31			Sand - gravel - cobblestone	Special
32			Same as above	
33			Same as above	
34			Same as above	
35			Same as above	
36			Same as above	
37			Same as above	
38			Sand	Special
39			Sand	
41			Sand	
42			Sand	
43			Sand & silt	Special
44			Sand & silt	
45			Sand & silt	
46			Sand & silt	
47			Sand & silt	
48			Sand & silt	
49			Sand & silt	
50			Sand & silt	
51			Sand & silt	
52			Sand & silt	
53			Sand & silt	
54			Sand & silt	
55			Sand & silt	
56			Sand & silt	
57			Sand & silt	
58			Sand & silt	
59			Sand & silt	
60			Sand & silt	
61			Sand & silt	
62			Sand & silt	
63			Sand & silt	
64			Sand & silt	
65			Sand & silt	

299-W15-95.XLS

WELL_INFO

FIELD	VALUE/LINK	SOURCE/QUALIFICATION
WELL_NAME	299-W15-95	
NS_COORD	135631.354	HWIS
EW_COORD	566752.751	HWIS
GRND_SURF_EL	202.693	From HWIS Survey Data Report of August 2001 (http://ERC015.erc.rl.gov/CyberDocs/Libraries/Default_Library/Common/frameviewdsp.asp?doc=428901&lib=ERCDOCS&rendition=native&mimetype=application%2Fpdf)
ASBUILT_PDF	http://172.17.20.14/eis/hwisapp	HWIS
DRILL_LOG_PDF	Not Available	
GEO_LOG_PDF	http://172.17.20.14/eis/hwisapp	HWIS
GEOPHYS_LOG_LINK	http://pnl45.pnl.gov/boreholelogs/200WEST/W15095/	
DRILL_LOG_SUM	DRILL_LOG_SUM	Secondary Data sumarized from Hard copy drill logs stored in Sigma V/rm 2110
GEO_LOG_SUM	GEO_LOG_SUM	Secondary Data sumarized from borehole log retrieved from HWIS
GEOPHYS_LOG_SUM	GEOPHYS_LOG_SUM	Download from (http://pnl45.pnl.gov/boreholelogs/200WEST/W15095/)
PARTICLE_SIZE	ROCSAN_VL	Virtual Library
CALCIUM_CARBONATE	ROCSAN_VL	Virtual Library
FOLK/WENT_CLASS	ROCSAN_VL	Virtual Library
MOISTURE	Not Available	
BULK_DENSITY	Not Available	
MINERALOGY	Not Available	
BULK_ROCK_CHEM	Not Available	
SAMPLE_ARCHIVE	1-100'	From AGGPublic/COS Geo Database/Sediment.library.archive.xls

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ROCSAN_VL

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	1	0.6	159.7	5.59	85.87	8.54	(g)S	3.64	1.95	2.83	7.04	17.02	30.84	28.14	6.09	2.45
299-W15-95	10	0.5	155.3	11.86	85.04	3.09	gS	11.03	0.84	0.64	16.76	52.48	11.86	3.29	1.42	1.68
299-W15-95	11	0.4	152	62.52	32.74	4.74	msG	36.76	25.76	18.38	4.68	4.28	3.49	1.91	1.71	3.03
299-W15-95	12	1	170.9	70.14	27.99	1.87	sG	34.37	35.77	13.88	5.39	4.63	2.87	1.23	0.64	1.23
299-W15-95	13	0.6	147.8	61.72	35.79	2.50	sG	41.46	20.26	14.99	7.70	7.22	4.32	1.55	0.95	1.55
299-W15-95	14	1	141.9	68.19	28.91	2.89	sG	36.32	31.88	15.37	5.64	4.44	2.19	1.27	0.99	1.90
299-W15-95	15	0.7	169.8	58.57	37.85	3.58	sG	30.93	27.64	21.73	7.46	4.90	1.91	1.85	1.37	2.21
299-W15-95	16	0.8	179.4	58.55	36.98	4.47	msG	29.61	28.94	17.60	7.32	6.42	3.63	2.01	1.68	2.79
299-W15-95	17	0.7	167.8	59.80	36.20	4.00	sG	35.54	24.25	19.12	6.87	4.84	3.29	2.09	1.61	2.39
299-W15-95	18	0.5	174.8	44.09	50.23	5.68	msG	19.69	24.40	23.42	12.86	7.00	4.13	2.81	2.47	3.21
299-W15-95	19	0.6	155.5	42.76	53.44	3.80	sG	16.48	26.27	27.43	14.68	6.18	3.03	2.12	1.55	2.25
299-W15-95	20	0.6	156.6	49.17	47.64	3.19	sG	21.07	28.10	25.93	10.92	4.73	4.09	1.98	1.40	1.79
299-W15-95	21	0.5	158.1	41.10	52.12	6.78	msG	14.50	26.60	23.62	13.11	7.35	4.62	3.42	2.79	3.99
299-W15-95	22	0.6	151.5	31.10	62.93	5.97	sG	16.98	14.12	25.53	21.09	8.69	4.51	3.12	2.39	3.58
299-W15-95	23	0.7	152.2	31.36	59.22	9.42	msG	20.69	10.67	18.38	19.96	10.87	6.26	3.75	3.75	5.67
299-W15-95	24	0.6	137.8	31.15	61.43	7.42	msG	17.32	13.83	20.38	21.25	10.12	5.75	3.93	2.98	4.44
299-W15-95	26	0.9	156.5	25.59	69.11	5.30	gS	15.83	9.76	24.82	26.93	9.76	4.59	3.00	2.17	3.13
299-W15-95	27	0.6	162.1	25.76	66.54	7.70	(m)gS	10.06	15.70	23.53	22.59	10.61	5.83	3.97	3.17	4.53
299-W15-95	28	0.6	154.6	46.95	50.32	2.73	sG	30.78	16.17	20.45	18.90	6.69	2.73	1.56	1.10	1.62
299-W15-95	29	0.7	139.5	44.25	50.89	4.85	sG	24.77	19.49	23.34	15.35	6.42	3.43	2.36	2.14	2.71
299-W15-95	30	0.6	152.5	37.24	58.70	4.06	sG	16.82	20.42	25.00	20.88	7.98	2.95	1.90	1.57	2.49
299-W15-95	31	0.6	165.8	41.91	54.54	3.55	sG	17.92	23.99	27.00	17.32	5.71	2.77	1.74	1.32	2.22
299-W15-95	32	0.7	145.4	48.70	46.99	4.31	sG	32.42	16.28	20.59	14.91	6.43	3.15	1.92	1.57	2.74
299-W15-95	33	0.7	148.7	40.25	48.31	11.43	msG	25.71	14.54	13.95	15.20	8.92	5.82	4.43	3.90	7.53
299-W15-95	34	1	157.2	62.71	32.08	5.21	msG	46.44	16.26	12.33	9.15	5.27	3.18	2.16	1.84	3.37
299-W15-95	35	0.5	142.6	35.30	60.84	3.86	sG	17.96	17.33	24.49	22.11	8.00	3.93	2.32	1.54	2.32
299-W15-95	37	1.6	160.3	8.94	74.92	16.14	(gm)S	7.25	1.69	4.82	11.57	25.70	21.58	11.26	6.88	9.26
299-W15-95	38	1.6	178.1	0.11	81.08	18.81	(m)S	0.00	0.11	1.35	12.16	30.57	19.93	17.06	10.14	8.67
299-W15-95	39	1.4	157.1	2.82	79.59	17.59	(m)S	2.24	0.58	3.65	13.05	25.85	21.18	15.87	9.66	7.93

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	40	1.5	167.7	0.12	84.90	14.98	(m)S	0.00	0.12	0.96	10.35	36.34	22.86	14.38	7.82	7.16
299-W15-95	41	1.6	155.6	2.98	76.91	20.12	sM	1.68	1.29	3.23	13.65	27.43	19.40	13.20	8.99	11.13
299-W15-95	42	1.5	166.2	0.48	84.23	15.29	(m)S	0.00	0.48	2.54	11.66	32.27	25.56	12.21	6.83	8.46
299-W15-95	43	1.6	147.8	1.29	90.09	8.62	S	0.41	0.88	5.50	21.66	36.93	18.19	7.81	4.41	4.21
299-W15-95	45	1.3	144.8	8.26	87.29	4.44	(g)S	4.86	3.40	13.19	35.21	27.78	7.71	3.40	1.88	2.57
299-W15-95	46	1.4	176.5	11.33	84.12	4.55	gS	5.75	5.58	20.60	35.97	18.21	6.26	3.07	1.94	2.62
299-W15-95	47	1.4	156.6	9.72	75.88	14.40	(gm)S	4.86	4.86	13.12	26.10	19.39	10.30	6.97	4.99	9.40
299-W15-95	48	1.4	144.3	3.68	85.20	11.12	(m)S	0.63	3.06	10.42	28.56	29.05	11.05	6.12	4.31	6.81
299-W15-95	49	1.5	154.1	1.04	83.82	15.14	(m)S	0.00	1.04	2.86	17.74	33.01	20.21	10.01	5.98	9.16
299-W15-95	50	1.6	143.9	2.32	66.53	31.15	sM	0.27	2.05	2.39	2.19	6.35	14.34	41.26	20.49	10.66
299-W15-95	51	1.6	157.1	0.06	89.97	9.97	S	0.00	0.06	1.46	11.17	38.86	28.25	10.22	5.08	4.89
299-W15-95	52	2.1	145.1	0.00	89.34	10.66	(m)S	0.00	0.00	0.14	3.51	32.32	39.96	13.41	5.23	5.43
299-W15-95	53	1.9	163	0.00	92.35	7.65	S	0.00	0.00	0.12	6.37	42.07	34.78	9.00	3.74	3.92
299-W15-95	54	1.6	164.3	0.06	73.03	26.91	sM	0.00	0.06	0.18	0.85	20.11	21.63	30.26	17.13	9.78
299-W15-95	55	1.4	171.9	0.41	90.80	8.79	S	0.00	0.41	5.24	21.54	37.37	16.88	9.78	4.48	4.31
299-W15-95	56	1.3	153	5.28	88.85	5.87	(g)S	0.52	4.76	15.26	27.59	30.53	10.83	4.63	2.61	3.26
299-W15-95	57	1.4	151.7	0.79	90.21	8.99	S	0.00	0.79	9.46	32.41	31.75	11.24	5.36	3.97	5.03
299-W15-95	58	2.3	143.2	39.79	54.88	5.33	sG	33.19	6.60	14.46	19.23	12.35	6.04	2.81	2.25	3.09
299-W15-95	59	1.5	157.4	2.41	88.13	9.46	S	0.89	1.52	4.06	12.13	34.60	27.75	9.59	4.63	4.83
299-W15-95	61	1.8	142.4	0.35	88.58	11.06	(m)S	0.00	0.35	1.69	10.71	34.18	29.25	12.76	6.20	4.86
299-W15-95	62	1.7	157.2	0.83	91.26	7.91	S	0.06	0.77	7.91	29.85	34.89	13.07	5.55	3.51	4.40
299-W15-95	63	1.7	143.2	2.02	82.81	15.17	(m)S	0.21	1.81	8.63	23.87	29.16	13.50	7.65	5.85	9.32
299-W15-95	64	1.5	151.4	6.34	86.58	7.08	(g)S	1.67	4.67	11.42	29.57	31.44	10.61	3.54	3.60	3.47
299-W15-95	65	1.5	142.7	3.51	88.84	7.65	S	0.14	3.37	13.96	30.53	29.12	10.39	4.84	3.23	4.42
299-W15-95	66	1.6	145.6	5.09	86.50	8.41	(g)S	1.56	3.53	10.45	31.34	30.66	10.31	3.73	4.07	4.34
299-W15-95	67	1.6	155.9	18.74	72.21	9.05	(m)gS	9.37	9.37	15.79	26.96	18.49	7.51	3.47	3.98	5.07
299-W15-95	68	1.5	154.4	9.44	79.31	11.25	(gm)S	6.40	3.04	9.89	29.86	23.27	10.15	6.14	4.59	6.66
299-W15-95	69	1.5	154.6	3.11	90.55	6.34	S	1.42	1.68	11.20	34.63	31.39	10.68	2.65	3.50	2.85
299-W15-95	70	1.6	167.3	1.43	93.21	5.36	S	0.24	1.19	8.76	29.84	37.34	13.22	4.05	2.50	2.86

WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	71	1.6	167.5	0.24	34.02	65.74	sM	0.00	0.24	0.96	3.43	8.61	8.07	12.94	32.27	33.47
299-W15-95	72	1.4	141.2	0.43	89.94	9.64	S	0.14	0.28	1.77	19.70	43.87	19.35	5.24	5.03	4.61
299-W15-95	73	1.3	145.7	0.90	93.04	6.06	S	0.00	0.90	4.55	23.16	47.21	13.65	4.48	2.76	3.31
299-W15-95	74	1.3	170.2	1.75	89.08	9.17	S	0.18	1.58	6.72	23.31	37.79	15.19	6.07	4.38	4.79
299-W15-95	75	1.4	144.8	0.83	84.92	14.26	(m)S	0.00	0.83	4.20	13.15	27.07	26.79	13.71	8.88	5.37
299-W15-95	76	1.4	150.9	0.00	59.74	40.26	sM	0.00	0.00	0.07	0.20	2.58	14.11	42.78	28.61	11.66
299-W15-95	77	1.4	163.5	0.37	75.29	24.34	sM	0.00	0.37	3.01	8.85	17.58	17.70	28.15	14.01	10.33
299-W15-95	78	1.3	145.4	0.62	90.95	8.44	S	0.00	0.62	6.72	23.53	35.25	18.31	7.13	4.12	4.32
299-W15-95	79	1.1	148.8	1.34	87.69	10.96	(m)S	0.27	1.08	5.04	16.41	32.21	23.00	11.03	5.92	5.04
299-W15-95	80	1.4	153	0.00	72.43	27.57	sM	0.00	0.00	0.07	0.79	3.80	25.67	42.11	19.52	8.06
299-W15-95	81	1.3	160.1	0.00	73.13	26.87	sM	0.00	0.00	0.06	0.44	2.39	23.79	46.45	17.70	9.17
299-W15-95	82	1.3	156.2	0.26	87.03	12.72	(m)S	0.00	0.26	3.47	20.81	30.31	18.18	14.26	6.36	6.36
299-W15-95	83	1.3	145.4	0.41	88.89	10.70	(m)S	0.14	0.28	2.76	18.91	41.06	17.81	8.35	4.62	6.07
299-W15-95	84	1.1	151.2	2.00	91.15	6.86	S	0.20	1.80	6.72	20.51	39.01	19.51	5.39	3.40	3.46
299-W15-95	85	1.2	153	0.00	63.81	36.19	sM	0.00	0.00	0.07	1.18	4.52	20.75	37.30	26.24	9.95
299-W15-95	86	1.3	152.6	1.84	78.33	19.83	sM	0.13	1.71	11.23	18.32	16.22	17.14	15.43	12.08	7.75
299-W15-95	87	1.2	153	0.59	79.02	20.39	sM	0.00	0.59	4.84	17.71	22.68	17.97	15.82	11.96	8.43
299-W15-95	88	1.2	140.2	1.94	85.45	12.62	(m)S	0.36	1.58	4.80	9.82	21.22	35.63	13.98	6.09	6.52
299-W15-95	89	1.3	158.7	0.00	61.63	38.37	sM	0.00	0.00	0.13	0.38	2.39	11.78	46.94	26.28	12.10
299-W15-95	90	1.2	151.7	0.00	44.58	55.42	sM	0.00	0.00	0.13	0.26	3.43	9.45	31.31	39.30	16.12
299-W15-95	91	1.5	147.6	0.41	76.99	22.60	sM	0.07	0.34	1.77	10.14	30.29	24.17	10.62	15.04	7.56
299-W15-95	92	1.3	148.7	0.27	81.97	17.76	(m)S	0.00	0.27	3.92	17.29	31.20	21.27	8.31	12.96	4.79
299-W15-95	93	1.3	140.4	0.00	84.42	15.58	(m)S	0.00	0.00	0.21	4.57	28.81	37.60	13.22	8.08	7.51
299-W15-95	94	1.3	150.8	0.07	81.31	18.62	(m)S	0.00	0.07	0.07	0.73	5.17	43.67	31.68	11.00	7.62
299-W15-95	95	1.3	149.2	0.07	77.64	22.30	sM	0.00	0.07	0.13	1.21	13.23	43.18	19.88	13.10	9.20
299-W15-95	96	1.1	140.3	3.80	83.94	12.26	(m)S	0.43	3.37	7.38	24.37	27.24	17.28	7.67	5.66	6.59
299-W15-95	97	1.2	144.1	0.14	93.81	6.05	S	0.00	0.14	0.83	8.55	52.29	26.36	5.77	2.85	3.20
299-W15-95	98	1.8	146.9	7.57	82.69	9.75	(gm)S	1.30	6.27	12.75	17.66	28.29	17.11	6.88	4.29	5.45
299-W15-95	99	1.4	139.2	0.93	91.16	7.91	S	0.00	0.93	3.74	13.23	33.29	29.62	11.29	4.24	3.67

299-W15-95.XLS

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WELL_NAME	SAMP_Interval_Bottom	CALCIUM_CARBONATE_PCNT	split_wt	TOTAL_GRAVEL_PCNT	TOTAL_sand_PCNT	TOTAL_Mud_PCNT	Litho_class	fine_pebble_pcnt	very_fine_pebble_pcnt	very_coarse_sand_pcnt	coarse_sand_pcnt	medium_sand_pcnt	fine_sand_pcnt	very_fine_sand_pcnt	silt_pcnt	Pan_pcnt
299-W15-95	100	1.5	147.2	0.27	90.37	9.36	S	0.14	0.14	0.61	6.24	36.91	33.58	13.03	4.95	4.41

Analysis and Interpretation Worksheets

WELL_NAME	EVAL_TYPE	SAMP_INTERVAL_BOTTOM	SAMP_INTERVAL_UNITS	SOIL_SAMP_NUM	LITHO_CLASS	TOTAL_GRAVEL_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	FINE_PEBBLE_PCNT	VERY_FINE_PEBBLE_PCNT	VERY_COARSE_SAND_PCNT	COARSE_SAND_PCNT	MEDIUM_SAND_PCNT	FINE_SAND_PCNT	VERY_FINE_SAND_PCNT	SILT_PCNT	PAN_PCNT	Average Size Fraction	CALCIUM_CARBONATE_PCNT
											-2.00	-1.00	0.00	1.00	2.00	3.00	4.00	4.75	6.00		
299-W15-95	L	1 Feet		B03VP2	(G)S	5.59	10.05503513	(g)S	85.87	8.54	3.64	1.95	2.83	7.04	17.02	30.84	28.14	6.09	2.45	2.505575	0.8
299-W15-95	L	10 Feet		B03VP3	GS	11.87	27.51779935	gS	85.03	3.09	11.03	0.84	0.64	16.76	52.48	11.86	3.29	1.42	1.68	1.64385	0.5
299-W15-95	L	11 Feet		B03VP4	MSG	62.52	6.907172996	msG	32.74	4.74	36.76	25.76	18.38	4.68	4.28	3.49	1.91	1.71	3.03	-0.416275	0.4
299-W15-95	L	12 Feet		B03VP5	SG	70.14	14.97326203	sG	28	1.87	34.37	35.77	13.88	5.39	4.63	2.87	1.23	0.64	1.23	-0.6591	1
299-W15-95	L	13 Feet		B03VP6	SG	61.72	14.312	sG	35.78	2.5	41.46	20.26	14.99	7.7	7.22	4.32	1.55	0.95	1.55	-0.480675	0.6
299-W15-95	L	14 Feet		B03VP7	SG	68.2	10.00346021	sG	28.91	2.89	36.32	31.88	15.37	5.64	4.44	2.19	1.27	0.99	1.9	-0.622475	1
299-W15-95	L	15 Feet		B03VP8	SG	58.57	10.5726257	sG	37.85	3.58	30.93	27.64	21.73	7.46	4.9	1.91	1.85	1.37	2.21	-0.393425	0.7
299-W15-95	L	16 Feet		B03VP9	MSG	58.55	8.272930649	msG	36.98	4.47	29.61	28.94	17.6	7.32	6.42	3.63	2.01	1.68	2.79	-0.2435	0.8
299-W15-95	L	17 Feet		B03VQ0	SG	59.79	9.0525	sG	36.21	4	35.54	24.25	19.12	6.87	4.64	3.29	2.09	1.61	2.39	-0.385625	0.7
299-W15-95	L	18 Feet		B03VQ1	MSG	44.09	8.841549296	msG	50.22	5.68	19.69	24.4	23.42	12.86	7	4.13	2.81	2.47	3.21	0.177025	0.5
299-W15-95	L	19 Feet		B03VQ2	SG	42.75	14.08315789	sG	53.44	3.8	16.48	26.27	27.43	14.88	6.18	3.03	2.12	1.55	2.25	0.062425	0.6
299-W15-95	L	20 Feet		B03VQ3	SG	49.17	14.93730408	sG	47.65	3.19	21.07	28.1	25.93	10.92	4.73	4.09	1.98	1.4	1.79	-0.1228	0.6
299-W15-95	L	21 Feet		B03VQ4	MSG	41.1	7.687315634	msG	52.12	6.78	14.5	26.6	23.62	13.11	7.35	4.62	3.42	2.79	3.99	0.369425	0.5
299-W15-95	L	22 Feet		B03VQ5	SG	31.1	10.54271357	sG	62.94	5.97	16.98	14.12	25.53	21.09	8.69	4.51	3.12	2.39	3.58	0.492325	0.6
299-W15-95	L	23 Feet		B03VQ6	MSG	31.36	6.286824204	msG	59.22	9.42	20.69	10.67	18.38	19.98	10.87	6.26	3.75	3.75	5.67	0.752625	0.7
299-W15-95	L	24 Feet		B03VQ7	MSG	31.15	8.278975741	msG	61.43	7.42	17.32	13.83	20.38	21.25	10.12	5.75	3.93	2.98	4.44	0.68785	0.6
299-W15-95	L	26 Feet		B03VQ8	GS	25.59	13.03773585	gS	69.1	5.3	15.83	9.76	24.82	26.93	9.76	4.59	3	2.17	3.13	0.598875	0.9
299-W15-95	L	27 Feet		B03VQ9	(M)GS	25.76	8.64025974	(m)gS	66.53	7.7	10.06	15.7	23.53	22.59	10.61	5.83	3.97	3.17	4.53	0.835975	0.6
299-W15-95	L	28 Feet		B03VR0	SG	46.95	18.43589744	sG	50.33	2.73	30.78	16.17	20.45	18.9	8.69	2.73	1.56	1.1	1.62	-0.16075	0.6
299-W15-95	L	29 Feet		B03VR1	SG	44.26	10.49484536	sG	50.9	4.85	24.77	19.49	23.34	15.35	6.42	3.43	2.36	2.14	2.71	0.05315	0.7
299-W15-95	L	30 Feet		B03VR2	SG	37.24	14.46059113	sG	58.71	4.06	16.82	20.42	25	20.88	7.98	2.95	1.9	1.57	2.49	0.216275	0.6
299-W15-95	L	31 Feet		B03VR3	SG	41.91	15.36338028	sG	54.54	3.55	17.92	23.99	27	17.32	5.71	2.77	1.74	1.32	2.22	0.0377	0.6
299-W15-95	L	32 Feet		B03VR4	SG	46.7	10.90487239	sG	47	4.31	32.42	16.28	20.59	14.91	6.43	3.15	1.92	1.57	2.74	-0.123225	0.7
299-W15-95	L	33 Feet		B03VR5	MSG	40.25	4.227471566	msG	48.32	11.43	25.71	14.54	13.95	15.2	8.92	5.82	4.43	3.9	7.53	0.65965	0.7
299-W15-95	L	34 Feet		B03VR6	MSG	62.7	6.159309021	msG	32.09	5.21	46.44	16.26	12.33	9.15	5.27	3.18	2.16	1.84	3.37	-0.4231	1
299-W15-95	L	35 Feet		B03VR7	SG	35.29	15.7642487	sG	60.85	3.86	17.96	17.33	24.49	22.11	8	3.93	2.32	1.54	2.32	0.27165	0.5
299-W15-95	L	37 Feet		B03VR8	(GM)S	8.94	4.642503098	(gm)S	74.93	16.14	7.25	1.69	4.82	11.57	25.7	21.58	11.26	6.88	9.26	2.448	1.6
299-W15-95	L	38 Feet		B03VR9	(M)S	0.11	4.30994152	(m)S	81.07	18.81	0	0.11	1.35	12.16	30.57	19.93	17.06	10.14	8.67	3.01405	1.6
299-W15-95	L	39 Feet		B03VS0	(M)S	2.62	4.525298465	(m)S	79.6	17.59	2.24	0.56	3.85	13.05	25.85	21.18	15.87	9.66	7.93	2.89175	1.4
299-W15-95	L	40 Feet		B03VS1	(M)S	0.12	5.666889186	(m)S	84.89	14.98	0	0.12	0.96	10.35	36.34	22.86	14.38	7.82	7.16	2.89115	1.5
299-W15-95	L	41 Feet		B03VS2	MS	2.97	3.822564612	mS	76.91	20.12	1.68	1.29	3.23	13.65	27.43	19.4	13.2	8.99	11.13	2.843425	1.6
299-W15-95	L	42 Feet		B03VS3	(M)S	0.48	5.509483322	(m)S	84.24	15.29	0	0.48	2.54	11.86	32.27	25.56	12.21	6.83	8.46	2.844425	1.5
299-W15-95	L	43 Feet		B03VS4	S	1.29	10.4512781	S	90.09	8.62	0.41	0.88	5.5	21.66	36.93	18.19	7.81	4.41	4.21	2.258375	1.6
299-W15-95	L	45 Feet		B03VS5	(G)S	6.26	19.65990991	(g)S	87.29	4.44	4.86	3.4	13.19	35.21	27.76	7.71	3.4	1.88	2.57	1.3873	1.3
299-W15-95	L	46 Feet		B03VS6	GS	11.33	18.48571429	gS	84.11	4.55	5.75	5.58	20.6	35.97	18.21	6.26	3.07	1.94	2.82	1.11305	1.4
299-W15-95	L	47 Feet		B03VS7	(GM)S	9.72	5.269444444	(gm)S	75.88	14.4	4.86	4.86	13.12	26.1	19.39	10.3	6.97	4.99	9.4	1.891625	1.4
299-W15-95	L	48 Feet		B03VS8	(M)S	3.69	7.661870504	(m)S	85.2	11.12	0.63	3.06	10.42	28.56	29.05	11.05	6.12	4.31	6.81	2.013025	1.4
299-W15-95	L	49 Feet		B03VS9	(M)S	1.04	5.536988111	(m)S	83.83	15.14	0	1.04	2.86	17.74	33.01	20.21	10.01	5.98	9.16	2.66755	1.5
299-W15-95	L	50 Feet		B03VT0	MS	2.32	2.135794543	mS	66.53	31.15	0.27	2.05	2.39	2.19	6.35	14.34	41.26	20.49	10.66	3.816475	1.6
299-W15-95	L	51 Feet		B03VT1	S	0.06	9.023069208	S	89.96	9.97	0	0.06	1.46	11.17	38.86	28.25	10.22	5.08	4.89	2.8793	1.6
299-W15-95	L	52 Feet		B03VT2	(M)S	0	8.380863039	(m)S	89.34	10.66	0	0	0.14	3.51	32.32	39.96	13.41	5.23	5.43	2.990925	2.1
299-W15-95	L	53 Feet		B03VT3	S	0	12.07058824	S	92.34	7.65	0	0	0.12	6.37	42.07	34.78	9	3.74	3.92	2.72135	1.9
299-W15-95	L	54 Feet		B03VT4	MS	0.06	2.713861018	mS	73.03	26.91	0	0.06	0.18	0.85	20.11	21.63	30.26	17.13	9.78	3.669875	1.6
299-W15-95	L	55 Feet		B03VT5	S	0.41	10.33105802	S	90.81	8.79	0	0.41	5.24	21.54	37.37	16.88	9.78	4.48	4.31	2.3277	1.4
299-W15-95	L	56 Feet		B03VT6	(G)S	5.28	15.13458262	(g)S	88.84	5.87	0.52	4.76	15.26	27.59	30.53	10.83	4.63	2.61	3.26	1.658175	1.3
299-W15-95	L	57 Feet		B03VT7	S	0.79	10.03559511	S	90.22	8.99	0	0.79	9.46	32.41	31.75	11.24	5.36	3.97	5.03	1.993175	1.4
299-W15-95	L	58 Feet		B03VT8	SG	39.79	10.29831144	sG	54.88	5.33	33.19	6.6	14.46	19.23	12.35	6.04	2.81	2.25	3.09	0.295375	2.3
299-W15-95	L	59 Feet		B03VT9	S	2.41	9.318067653	S	88.13	9.46	0.89	1.52	4.06	12.13	34.6	27.75	9.59	4.83	4.83	2.506125	1.5
299-W15-95	L	61 Feet		B03VV0	(M)S	0.35	8.00994575	(m)S	88.59	11.06	0	0.35	1.69	10.71	34.18	29.25	12.76	6.2	4.86	2.7612	1.8
299-W15-95	L	62 Feet		B03VV1	S	0.83	11.53855879	S	91.27	7.91	0.06	0.77	7.91	29.85	34.89	13.07	5.55	3.51	4.4	2.032225	1.7
299-W15-95	L	63 Feet		B03VV2	(M)S	2.02	5.458800204	(m)S	82.81	15.17	0.21	1.81	8.63	23.87	29.16	13.5	7.65	5.85	9.32	2.347675	1.7
299-W15-95	L	64 Feet		B03VV3	(G)S	6.34	12.22881356	(g)S	86.58	7.08	1.67	4.67	11.42	29.57	31.44	10.61	3.54	3.6	3.47	1.6835	1.5
299-W15-95	L	65 Feet		B03VV4	S	3.51	11.6130719	S	88.84	7.65	0.14	3.37	13.96	30.53	29.12	10.39	4.84	3.23	4.42	1.775125	1.5
299-W15-95	L	66 Feet		B03VV5	(G)S	5.09	10.28418549	(g)S	86.49	8.41	1.56	3.53	10.45	31.34	30.86	10.31	3.73	4.07	4.34	1.772325	1.6
299-W15-95	L	67 Feet		B03VV6	(M)GS	18.74	7.980110497	(m)gS	72.22	9.05	9.37	9.37	15.79	26.96	16.49	7.51	3.47	3.98	5.07	1.21565	1.6
299-W15-95	L	68 Feet		B03VV7	(GM)S	9.44	1.049777778	(gm)S	79.31	11.25	8.4	3.04	9.89	29.86	23.27	10.15	6.14	4.59	6.66	1.773325	1.5
299-W15-95	L	69 Feet		B03VV8	S	3.1	14.28233438	S	90.55	6.34	1.42	1.68	11.2	34.63	31.39	10.68	2.65	3.5	2.85	1.69255	1.5
299-W15-95	L	70 Feet		B03VV9	S	1.43	17.38992537	S	93.21	5.36	0.24	1.19	8.76	29.84	37.34	13.22	4.05	2.5	2.86	1.87745	1.6
299-W15-95	L	71 Feet		B03VW0	M	0.24	0.51734104	sM	34.01	65.74	0	0.24	0.96	3.43	8.61	8.07	12.94	32.27	33.47	4.504825	1.6
299-W15-95	L	72 Feet		B03VW1	S	0.42	9.328838174	S	89.93	9.64	0.14	0.28	1.77	19.7	43.87	19.35	5.24	5.03	4.61	2.374425	1.4
299-W15-95	L	73 Feet		B03VW2	S	0.9	15.35478548	S	93.05	6.08	0	0.9	4.55	23.16	47.21	13.65	4.48	2.76	3.31	2.0652	1.3
299-W15-95	L	74 Feet		B03VW3	S	1.76	9.714285714	S	89.08	9.17	0.18	1.58	6.72	23.31	37.79	15.19	6.07	4.38	4.79	2.16345	1.3
299-W15-95	L	75 Feet		B03VW4	(M)S	0.83	5.955119215	(m)S	84.92	14.26	0	0.83	4.2	13.15	27.07	26.79	13.71	8.88	5.37	2.7607	1.4
299-W15-95	L	76 Feet		B03VW5	MS	0	1.483854943	mS	59.74	40.26	0	0	0.07	0.2	2.58	14.11	42.78	28.61	11.66	4.246675	1.4
299-W15-95	L	77 Feet		B03VW6	MS	0.37	3.09326212	mS	75.29	24.34	0	0.37	3.01	8.85	17.58	17.7	28.15	14.01	10.33	3.378675	1.4
299-W15-95	L	78 Feet		B03VW7	S	0.62	10.77468152	S	90.94	8.44	0	0.62	6.72	23.53	35.25	18.31	7.13	4.12	4.32	2.2235	1.3
299-W15-95	L	79 Feet		B03VW8	(M)S	1.35	8.000912409	(m)S	87.69	10.96	0.27	1.08	5.04	16.41	32.21	23	11.03	5.92	5.04	2.5089	1.1
299-W15-95	L	80 Feet		B03VW9	MS	0	2.627493653	mS	72.44	27.57	0	0	0.07	0.79	3.8	25.87	42.11	19.52	8.06	3.9492	1.4
299-W15-95	L	81 Feet		B03VX0	MS	0	2.721622627	mS	73.13	26.87	0	0	0.06	0.44	2.39	23.79	46.45	17.7	9.17	4.01485	1.3
299-W15-95	L	82 Feet		B03VX1	(M)S	0.26	6.841981132	(m)S	87.03	12.72	0	0.26	3.47	20.81	30.31	16.18	14.26	6.36	6.36	2.8112	1.3
299-W15-95	L	83 Feet		B03VX2	(M)S	0.42	8.307476636	(m)S	88.89	10.7	0.14	0.28	2.76	18.91	41.06	17.81	8.35	4.62	6.07	2.45665	1.3
299-W15-95	L	84 Feet		B03VX3	S	2	13.28571429	S	91.14	6.86	0.2	1.8	6.72	20.51	39.01	19.51	5.39	3.4	3.46	2.1333	1.1
299-W15-95	L	85 Feet		B03VX4	MS	0	1.763470572	mS	63.82	36.19	0	0	0.07	1.18	4.52	20.75	37.3	26.24	9.95	4.0601	1.2
299-W15-95	L	86 Feet		B03VX5	MS	1.84	3.950579929	mS	78.34	19.83	0.13	1.71	11.23	18.32	18.22	17.14	15.43	12.08	7.75	2.6581	1.3

WELL_NAME	EVAL_TYPE	SAMP_INTERVAL_BOTTOM	SAMP_INTERVAL_UNITS	SOIL_SAMP_NUM	LITHO_CLASS	TOTAL_GRAVEL_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal)	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	FINE_PEBBLE_PCNT	VERY_FINE_PEBBLE_PCNT	VERY_COARSE_SAND_PCNT	COARSE_SAND_PCNT	MEDIUM_SAND_PCNT	FINE_SAND_PCNT	VERY_FINE_SAND_PCNT	SILT_PCNT	PAN_PCNT	Average Size Fraction	CALCIUM_CARBONATE_PCNT
											-2.00	-1.00	0.00	1.00	2.00	3.00	4.00	4.75	8.00		
299-W15-95	L	87 Feet	B03VX6	MS	0.59	3.875429132	mS	79.02	20.39	0	0.59	4.84	17.71	22.68	17.97	15.62	11.96	8.43	2.8706	1.2
299-W15-95	L	88 Feet	B03VX7	(M)S	1.94	6.770998415	(m)S	85.45	12.62	0.36	1.58	4.6	9.82	21.22	35.63	13.98	8.09	6.52	2.808175	1.2
299-W15-95	L	89 Feet	B03VX8	MS	0	1.605942142	mS	61.62	38.37	0	0	0.13	0.38	2.39	11.78	46.94	26.28	12.1	4.2569	1.3
299-W15-95	L	90 Feet	B03VX9	M	0	0.804402743	sM	44.58	55.42	0	0	0.13	0.26	3.43	9.45	31.31	39.3	16.12	4.44105	1.2
299-W15-95	L	91 Feet	B03VY0	MS	0.41	3.406637166	mS	76.99	22.6	0.07	0.34	1.77	10.14	30.29	24.17	10.62	15.04	7.56	3.0203	1.5
299-W15-95	L	92 Feet	B03VY1	(M)S	0.27	4.616554054	(m)S	81.99	17.76	0	0.27	3.92	17.29	31.2	21.27	8.31	12.96	4.79	2.6677	1.3
299-W15-95	L	93 Feet	B03VY2	(M)S	0	5.417843369	(m)S	84.41	15.58	0	0	0.21	4.57	28.81	37.6	13.22	8.08	7.51	3.1131	1.3
299-W15-95	L	94 Feet	B03VY3	(M)S	0.07	4.367346939	(m)S	81.32	18.62	0	0.07	0.07	0.73	5.17	43.67	31.88	11	7.62	3.667	1.3
299-W15-95	L	95 Feet	B03VY4	MS	0.07	3.481165919	mS	77.63	22.3	0	0.07	0.13	1.21	13.23	43.18	19.88	13.1	9.2	3.54085	1.3
299-W15-95	L	96 Feet	B03VY5	(M)S	3.8	6.846655791	(m)S	83.94	12.26	0.43	3.37	7.38	24.37	27.24	17.28	7.87	5.66	6.59	2.23565	1.1
299-W15-95	L	97 Feet	B03VY6	S	0.14	15.50413223	S	93.8	6.05	0	0.14	0.83	8.55	52.29	26.36	5.77	2.85	3.2	2.478875	1.2
299-W15-95	L	98 Feet	B03VY7	(GM)S	7.57	8.481025641	(gm)S	82.69	9.75	1.3	6.27	12.75	17.66	28.29	17.11	6.88	4.29	5.45	1.972975	1.8
299-W15-95	L	99 Feet	B03VY8	S	0.93	11.52591656	S	91.17	7.91	0	0.93	3.74	13.23	33.29	29.62	11.29	4.24	3.67	2.5506	1.4
299-W15-95	L	100 Feet	B03VY9	S	0.28	9.65491453	S	90.37	9.36	0.14	0.14	0.61	8.24	36.91	33.58	13.03	4.95	4.41	2.824725	1.5

Pacific Northwest National Laboratory

BOREHOLE SUMMARY

Boring/Well No 299-W15-95 | Depth 0-187.5 ft | Date 6/6/02 | Sheet 1 of 1

Location 216-Z-9 Crib, 200 West Area | Project CTET Geology

Prepared by G. V. Last (Print) June 6, 2002 (Date) (Sign) (Rev)

Well Site Geology by L. D. Walker (100-187.5 ft) | Date June 4, 2001

Lithologic Class. Scheme Folk/Wentworth | Procedure | Rev

Steel Tape/E-Tape NA / NA | Field Indicator Equip. 1) NA 2) NA

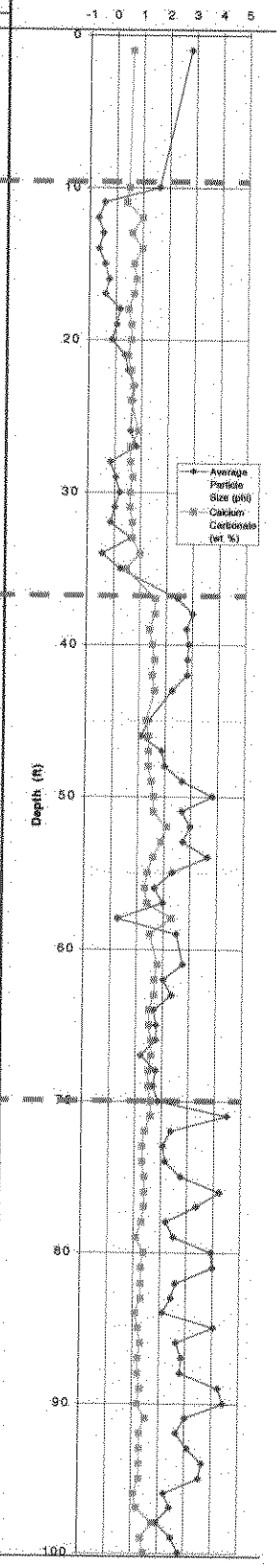
Drilling Contractor

Driller H. E. Osborn (0-100 ft)

Rig/Method 22W-1 (0-100 ft)

Depth Control Point Ground Surface

DEPTH (ft)	DATE/ TIME	SAMPLES TYPE	SAMPLES RECOVERY	MOISTURE	GRAPHIC LOG c	2	e	o	LITHOLOGIC DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, color, reaction to HCl, etc.)	COLOR MUNSELL CODE	COLOR NAME	HCl REACTION	CASING LOG 13"	8"	0	5"	12"	DRILLING AND COMPLETION COMMENTS (drilling rate, down time, blow counts, water level, drill fluid, casing, seals, etc.)
0																		
1																		
2																		
3																		
4																		
5	1/19/59 10:25								Sand & dirt									
6																		
7																		
8									7' to 9' concrete									
9									7' to 9' concrete									
10	1/19/59 10:55								Sand - gravel									
11	1/19/59 11:00	Special							Sand - poa gravel									
12	1/19/59 11:15	Special							Sand - poa gravel									
13	1/19/59 11:20	Special							Poa gravel									
14	1/19/59 11:25	Special							Poa gravel									
15	1/19/59 11:30								Poa gravel									
16	1/19/59 12:30	Special							Poa gravel									
17	1/19/59 13:00	Special							Poa gravel									
18	1/19/59 13:10	Special							Sand - gravel									
19	1/19/59 13:15	Special							Sand - gravel									
20	1/19/59 13:40								Sand - gravel - cobblestone									
21	1/19/59 13:50								Sand - gravel									
22	1/19/59 14:00								Sand - gravel									
23	1/19/59 14:10								Sand - gravel									
24	1/19/59 14:25								Sand - gravel									
25	1/19/59 14:30								Sand - gravel									
26	1/19/59 14:35								Sand - gravel									
27	1/19/59 15:30								Sand - gravel									
28	1/19/59 15:35								Sand - gravel									
29	1/19/59 15:40								Sand - gravel									
30	1/19/59 15:45								Sand - gravel									10' of 12" casing
31	1/20/59 8:40	Special							Sand - gravel - cobblestone									34'1" of 8" casing
32	1/20/59 8:45								Same as above									
33	1/20/59 8:50								Same as above									
34	1/20/59 8:55								Same as above									
35	1/20/59 9:20								Same as above									
36	1/20/59 10:00								Same as above									
37	1/20/59 10:20								Same as above									
38	1/20/59 10:25	Special							Sand									
39	1/20/59 10:30								Sand									
40																		
41	1/20/59 11:00								Sand									
42	1/20/59 11:05								Sand									
43	1/20/59 11:10	Special							Sand & silt									
44	1/20/59 11:13								Sand & silt									
45	1/20/59 11:15								Sand & silt									
46	1/20/59 12:05								Sand & silt									
47	1/20/59 13:05								Sand & silt									
48	1/20/59 13:15								Sand & silt									
49	1/20/59 13:20								Sand & silt									
50	1/20/59 13:30								Sand & silt									
51	1/20/59 13:40								Sand & silt									
52	1/20/59 13:45								Sand & silt									
53	1/20/59 13:48								Sand & silt									
54	1/20/59 13:50								Sand & silt									
55	1/20/59 13:52								Sand & silt									
56	1/20/59 13:53								Sand & silt									
57	1/20/59 14:00								Sand & silt									
58	1/20/59 14:05								Sand & silt									
59	1/20/59 15:15								Sand & silt									
60	1/20/59 15:25								Sand & silt									
61	1/20/59 15:35								Sand & silt									
62	1/20/59 15:38								Sand & silt									
63	1/20/59 15:40								Sand & silt									
64	1/20/59 15:42								Sand & silt									
65	1/20/59 15:45								Sand & silt									
66	1/20/59 15:50								Sand & silt									
67	1/20/59 16:53								Sand & silt									
68	1/21/59 8:45								Sand & silt									
69	1/21/59 8:50								Sand & silt									
70	1/21/59 9:00								Sand & silt									
71	1/21/59 9:02								Sand & silt									
72	1/21/59 9:04								Sand & silt									
73	1/21/59 9:05								Sand & silt									
74	1/21/59 9:08								Sand & silt									
75	1/21/59 9:10								Sand & silt									
76	1/21/59 9:13								Sand & silt									
77	1/21/59 9:15								Sand & silt									
78	1/21/59 9:20								Sand & silt									
79	1/21/59 9:23								Sand & silt									
80	1/21/59 9:25								Sandy silt									
81	1/21/59 10:40								Sandy silt									
82	1/21/59 10:43								Sandy silt									
83	1/21/59 10:45								Sandy silt									
84	1/21/59 10:50								Sandy silt									
85	1/21/59 10:53								Sandy silt									
86	1/21/59 10:55								Sandy silt									
87	1/21/59 11:00																	
88	1/21/59 11:03								Sandy silt									
89	1/21/59 11:05																	
90	1/21/59 11:10								Sandy silt									
91	1/21/59 12:30																	
92	1/21/59 12:32								Sand & silt									
93	1/21/59 12:35								Sand & silt									
94	1/21/59 12:40								Sand & silt									
95	1/21/59 12:45								Sand & silt									
96	1/21/59 12:50								Sand & silt									
97	1/21/59 14:10								Sand & silt									
98	1/21/59 14:12								Sand & silt									
99	1/21/59 14:15								Sand & silt									
100	1/21/59 14:18								Sand & silt									103' 0" of 8" casing in hole.



299-W15-95.XLS

Driller, Geologist Log

Pacific Northwest National Laboratory	BOREHOLE SUMMARY	Boring/Well No 299-W15-95	Depth 0-187.5 ft	Date 6/6/02	Sheet 1 of 1
		Location 216-Z-9 Crib, 200 West Area	Project CTET Geology		

Prepared by G. V. Last June 6, 2002

Well Site Geology by L. D. Walker (100-187.5 ft) Date June 4, 2001

Lithologic Class. Scheme Folk/Wentworth Procedure Rev

Steel Tape/E-Tape NA / NA Field Indicator Equip. 1) NA 2) NA

Drilling Contractor

Driller H. E. Osborn (0-100 ft)

Rig/Method 22W-1 (0-100 ft)

Depth Control Point Ground Surface

DEPTH (ft)	DATE/TIME	SAMPLES TYPE	SAMPLES RECOVERY	MOISTURE	GRAPHIC LOG C	GRAPHIC LOG Z	GRAPHIC LOG S	GRAPHIC LOG G	LITHOLOGIC DESCRIPTION (particle size distribution, sorting, mineralogy, roundness, color, reaction to HCL etc.)	COLOR MUNSELL CODE	COLOR NAME	HCl REACTION	CASING LOG 12"	CASING LOG 6"	CASING LOG 6"	CASING LOG 8"	CASING LOG 12"	DRILLING AND COMPLETION COMMENTS (drilling rate, down time, blow counts, water level, drill fluid, casing, seals, etc.)
101																		
102																		
103																		
104																		
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107																		
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116																		
117																		
118																		
119																		
120																		

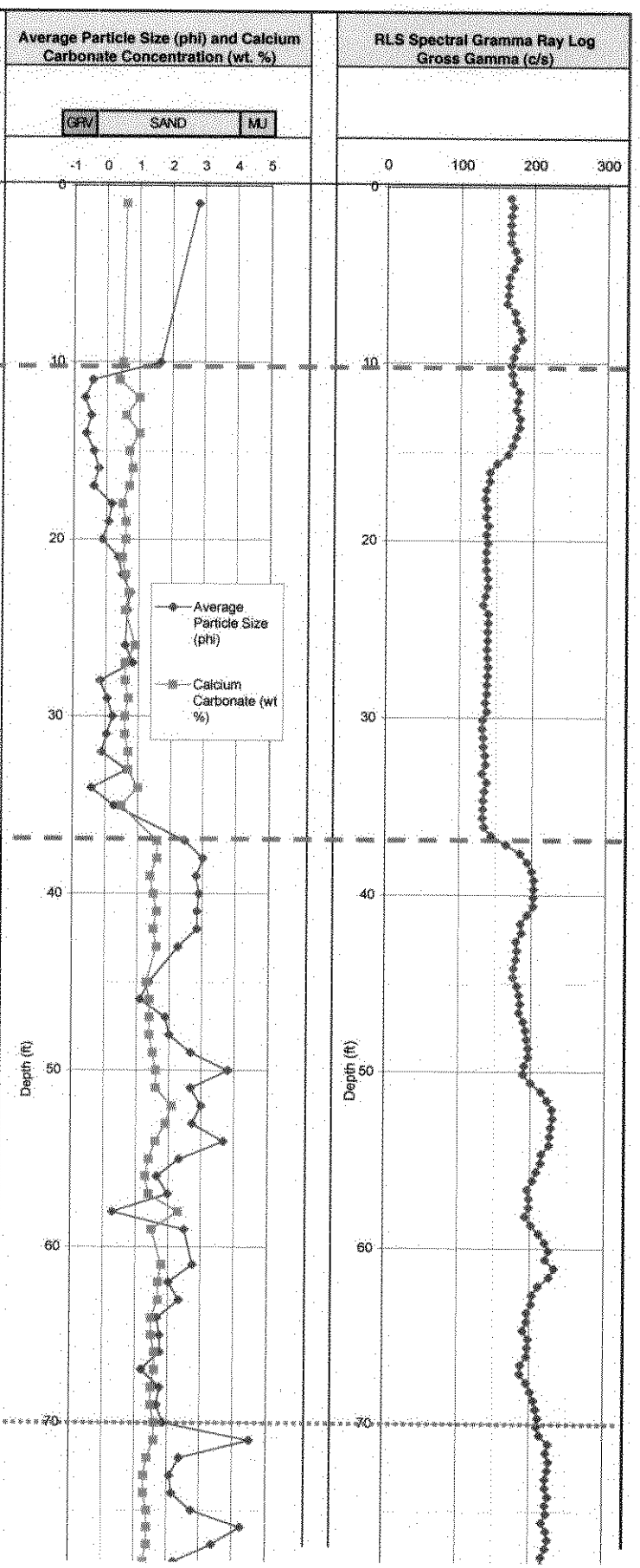
W = Wet, M = Moist, D = Dry

-1 0 1 2 3 4 5

Depth (ft)

299-W15-95

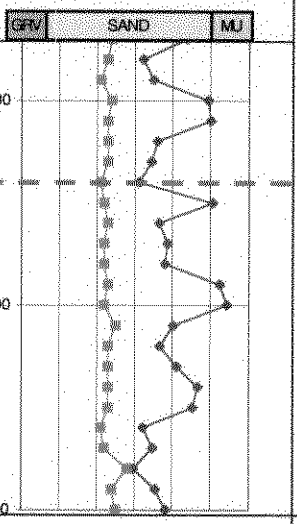
DEPTH (FT)	Qualitative Data: DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM_CARBONATE_PCNT
1				5.59	85.87	8.54	10.06	(g)S	0.6
2									
3									
4									
5	BACKFILL		Sand & dirt						
6									
7									
8			7' to 9' concrete						
9			7' to 9' concrete						
10			Sand - gravel	11.87	85.03	3.09	27.52	gS	0.5
11	Special		Sand - pea gravel	62.52	32.74	4.74	6.91	msG	0.4
12	Special		Sand - pea gravel	70.14	28	1.87	14.97	sG	1
13	Special		Pea gravel	61.72	35.78	2.5	14.31	sG	0.6
14	Special		Pea gravel	68.2	28.91	2.89	10.00	sG	1
15			Pea gravel	58.57	37.85	3.58	10.57	sG	0.7
16	Special		Pea gravel	58.55	36.98	4.47	8.27	msG	0.8
17	Special		Pea gravel	59.79	36.21	4	9.05	sG	0.7
18	Special		Sand - gravel	44.09	50.22	5.68	8.84	msG	0.5
19	Special		Sand - gravel	42.75	53.44	3.8	14.06	sG	0.6
20			Sand - gravel - cobblestone	49.17	47.65	3.19	14.94	sG	0.6
21			Sand - gravel	41.1	52.12	6.78	7.69	msG	0.5
22			Sand - gravel	31.1	62.94	5.97	10.54	sG	0.6
23	HANFORD GD		Sand - gravel	31.36	59.22	9.42	6.29	msG	0.7
24			Sand - gravel	31.15	61.43	7.42	8.28	msG	0.6
25			Sand - gravel						
26			Sand - gravel	25.59	69.1	5.3	13.04	gS	0.9
27			Sand - gravel	25.76	66.53	7.7	8.64	(m)gS	0.6
28			Sand - gravel	46.95	50.33	2.73	18.44	sG	0.6
29			Sand - gravel	44.26	50.9	4.85	10.49	sG	0.7
30			Sand - gravel	37.24	58.71	4.06	14.46	sG	0.6
31	Special		Sand - gravel - cobblestone	41.91	54.54	3.55	15.36	sG	0.6
32			Same as above	48.7	47	4.31	10.90	sG	0.7
33			Same as above	40.25	48.32	11.43	4.23	msG	0.7
34			Same as above	62.7	32.09	5.21	6.16	msG	1
35			Same as above	35.29	60.85	3.86	15.76	sG	0.5
36			Same as above						
37			Same as above	8.94	74.93	16.14	4.64	(gm)S	1.6
38	Special		Sand	0.11	81.07	18.81	4.31	(m)S	1.6
39			Sand	2.82	79.6	17.59	4.53	(m)S	1.4
40				0.12	84.89	14.98	5.67	(m)S	1.5
41			Sand	2.97	76.91	20.12	3.82	mS	1.6
42			Sand	0.48	84.24	15.29	5.51	(m)S	1.5
43	Special		Sand & silt	1.29	90.09	8.62	10.45	S	1.6
44			Sand & silt						
45			Sand & silt	8.26	87.29	4.44	19.66	(g)S	1.3
46			Sand & silt	11.33	84.11	4.55	18.49	gS	1.4
47			Sand & silt	9.72	75.88	14.4	5.27	(gm)S	1.4
48			Sand & silt	3.69	85.2	11.12	7.66	(m)S	1.4
49			Sand & silt	1.04	83.83	15.14	5.54	(m)S	1.5
50			Sand & silt	2.32	66.53	31.15	2.14	mS	1.6
51			Sand & silt	0.06	89.96	9.97	9.02	S	1.6
52	HANFORD SD (H2)		Sand & silt	0	89.34	10.66	8.38	(m)S	2.1
53			Sand & silt	0	92.34	7.66	12.07	S	1.9
54			Sand & silt	0.06	73.03	26.91	2.71	mS	1.6
55			Sand & silt	0.41	90.81	8.79	10.33	S	1.4
56			Sand & silt	5.28	88.84	5.87	15.13	(g)S	1.3
57			Sand & silt	0.79	90.22	8.99	10.04	S	1.4
58			Sand & silt	39.79	54.89	5.33	10.30	sG	2.3
59			Sand & silt	2.41	88.13	9.46	9.32	S	1.5
60			Sand & silt						
61			Sand & silt	0.35	88.59	11.06	8.01	(m)S	1.8
62			Sand & silt	0.83	91.27	7.91	11.54	S	1.7
63			Sand & silt	2.02	82.81	15.17	5.46	(m)S	1.7
64			Sand & silt	6.34	86.58	7.08	12.23	(g)S	1.5
65			Sand & silt	3.51	88.84	7.65	11.61	S	1.5
66			Sand & silt	5.09	86.49	8.41	10.28	(g)S	1.6
67			Sand & silt	18.74	72.22	9.05	7.98	(m)gS	1.6
68			Sand & silt	9.44	79.31	11.25	7.05	(gm)S	1.5
69			Sand & silt	3.1	90.55	6.34	14.28	S	1.5
70			Sand & silt	1.43	93.21	5.36	17.39	S	1.6
71			Sand & silt	0.24	34.01	65.74	0.52	sM	1.6
72			Sand & silt	0.42	89.93	9.64	9.33	S	1.4
73			Sand & silt	0.9	93.05	6.06	15.35	S	1.3
74			Sand & silt	1.76	89.08	9.17	9.71	S	1.3
75			Sand & silt	0.83	84.92	14.26	5.96	(m)S	1.4
76			Sand & silt	0	59.74	40.26	1.48	mS	1.4
77			Sand & silt	0.37	75.29	24.34	3.09	mS	1.4



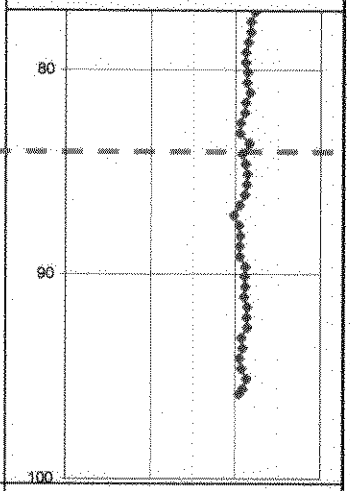
299-W15-95

DEPTH (Ft)	Qualitative Data: DRILL/ SAMPLE METHOD	MOISTURE	DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	TOTAL_SAND_PCNT	TOTAL_MUD_PCNT	Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM_CARBONATE_PCNT
78			Sand & silt	0.62	90.94	8.44	10.77	S	1.3
79			Sand & silt	1.35	87.69	10.96	8.00	(m)S	1.1
80			Sandy silt	0	72.44	27.57	2.63	mS	1.4
81			Sandy silt	0	73.13	26.87	2.72	mS	1.3
82			Sandy silt	0.26	87.03	12.72	6.84	(m)S	1.3
83			Sandy silt	0.42	88.89	10.7	8.31	(m)S	1.3
84			Sandy silt	2	91.14	6.86	13.29	S	1.1
85			Sandy silt	0	63.82	36.19	1.76	mS	1.2
86			Sandy silt	1.84	78.34	19.83	3.95	mS	1.3
87				0.59	79.02	20.39	3.88	mS	1.2
88			Sandy silt	1.94	85.45	12.62	6.77	(m)S	1.2
89				0	61.62	38.37	1.61	mS	1.3
90			Sandy silt	0	44.58	55.42	0.80	sM	1.2
91				0.41	76.99	22.6	3.41	mS	1.5
92	HANFORD SD (H4)		Sand & silt	0.27	81.99	17.76	4.62	(m)S	1.3
93			Sand & silt	0	84.41	15.58	5.42	(m)S	1.3
94			Sand & silt	0.07	81.32	18.62	4.37	(m)S	1.3
95			Sand & silt	0.07	77.63	22.3	3.48	mS	1.3
96			Sand & silt	3.8	83.94	12.26	6.85	(m)S	1.1
97			Sand & silt	0.14	93.8	6.05	15.50	S	1.2
98			Sand & silt	7.57	82.69	9.75	8.48	(gm)S	1.8
99			Sand & silt	0.93	91.17	7.91	11.53	S	1.4
100			Sand & silt	0.28	90.37	9.36	9.65	S	1.5
101	DB								
102									
103									
104	SS	Sl. moist							
105									
106	SS	Sl. Moist							
107									
108	SS								
109		Moist							
110	SS								
111									
112	SS								
113									
114	SS	Sl. Moist							
115									
116	SS								
117		Dry							
118	SS								
119	DB								
120	SS								
121									
122	SS	Sl. Moist to Dry							
123									
124	SS								
125									
126	DB								
127									
128									
129									
130		Dry							
131	SS	Dry							
132									
133	DB								
134									
135									
136									
137									
138									
139									
140		Dry							
141									
142									
143									
144									
145		Dry							
146	SS								
147									
148	DB	Dry							
149									

Average Particle Size (phi) and Calcium Carbonate Concentration (wt. %)



RLS Spectral Gramma Ray Log Gross Gamma (c/s)



299-W15-95

DEPTH (Ft.)	Qualitative Data: DRILL/ SAMPLE METHOD	Qualitative Data: MOISTURE	Qualitative Data: DRILLER'S DESCRIPTION (H. E. Osborn)	Particle Size Data (from ROCSAN): TOTAL_GRAVEL_PCNT	Particle Size Data (from ROCSAN): TOTAL_SAND_PCNT	Particle Size Data (from ROCSAN): TOTAL_MUD_PCNT	Particle Size Data (from ROCSAN): Sand/Silt Ratio	LITHO_CLASS (Recal.)	CALCIUM_CARBONATE_PCNT	Average Particle Size (phi) and Calcium Carbonate Concentration (wt. %) (GRV / SAND / MU)	RLS Spectral Gramma Ray Log Gross Gamma (c/s)
150											
151											
152											
153											
154											
155											
156	SS										
157		Dry - Sl. Moist									
158	DB										
159											
160											
161											
162											
163											
164											
165		Sl. Moist									
166											
167											
168											
169											
170											
171											
172		Sl. Moist									
173	SS										
174											
175	DB	Sl. Moist									
176											
177											
178											
179											
180											
181											
182											
183											
184											
185											
186	SS										
187		Sl. Moist									
188	DB										

DISTRIBUTION SHEET

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R. W. Bryce (PNNL)	H	E6-35	X			
K. J. Cantrell (PNNL)	H	K6-81	X			
W. J. Deutsch (PNNL)	H	K6-81	X			
C. T. Kincaid (PNNL)	H	K9-33	X			
K. M. Krupka (PNNL)	H	K6-81	X			
G. V. Last (PNNL)	H	K6-81	X			
R. J. Serne (PNNL)	H	P7-22	X			
T. W. Fogwell (FH)		E6-35	X			
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V. J. Rohay (FH)		E6-35	X			
M. I. Wood (FH)		H8-44	X			
F. J. Anderson (CHG)		E6-35	X			
F. M. Mann (CHG)		E6-35	X			
W. J. McMahon (CHG)		E6-35	X			
C. W. Miller (CHG)		H9-03	X			
D. A. Myers (CHG)		E6-35	X			
D. C. Weekes (CHG)		H9-03	X			
K. R. Fecht (BHI)		H0-02	X			
R. Khaleel (FFS)		E6-17	X			
L. D. Walker (FH)		E6-35	X			
D. G. Singleton (DPTEC)		B5-18	X			
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