Alluvium Drill Cuttings Logging Form Comments - Nye County Nuclear Waste Repository Project Office

Borehole ID: **NC-EWDP- 4PC** (Phase 6)

Date Logged	Sample Number	Depth Interval (feet bgs) From	Depth Interval (feet bgs) To	Comments
6/9/2008	4PC-0-5	0.00	5.00	No return 0-5 ft (no sample).Having trouble establishing Reverse Circulation. FR=Full return. Not field logged-sent to lab for drying and full sieve & Hydrometer. Sample recovery includes water.
6/9/2008	4PC-5-10	5.00	10.00	No moisture content because we're drilling wet. Reverse circulation established at ~10ft.
6/9/2008	4PC-10-15	10.00	15.00	Poor returns from 0.00 to 50.0 ft. Sample split ratio 1/2:1/2, no pies.
6/9/2008	4PC-15-18.3	15.00	18.30	Gravels approx. 10% basalt, 90% tuff fragments.
6/10/2008	4PC-18.3-20	18.30	20.00	No return established during initial advance.
6/10/2008	4PC-20-25	20.00	25.00	No return established during initial advance.
6/10/2008	4PC-25-30	25.00	30.00	Poor return.
6/10/2008	4PC-30-31	30.00	31.00	Poor return.
6/10/2008	4PC-31-35	31.00	35.00	Gravel: Minor basalt fragments, predominantly tuff.
6/10/2008	4PC-35-40	35.00	40.00	Injection rate measured at 40 ft, estimated from 0-40 ft.
6/10/2008	4PC-40-45	40.00	45.00	
6/10/2008	4PC-45-50	45.00	50.00	Full return at 50 ft.
6/10/2008	4PC-50-52.8	50.00	52.80	Presence of clay, sticky. Full return sample biased by sampling.
6/10/2008	4PC-52.8-55	52.80	55.00	
6/10/2008	4PC-55-60	55.00	60.00	Gravel fragments predominantly tuff with trace basalt.
6/10/2008	4PC-60-65	60.00	65.00	No sample in the over-ream interval 60-65 ft.

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6/12/2008	4PC-65-70	65.00	70.00	Drilling boulder and cobble size clasts. Also thin layers of medium coarse cemented sand.
6/12/2008	4PC-70-75	70.00	75.00	Heavy CaCO3 coatings on grains.
6/12/2008	4PC-75-78.6	75.00	78.60	Full return sample to Lab not logged.
6/12/2008	4PC-78.6-80	78.60	80.00	Sand component is distinctly poorly graded and subrounded.
6/12/2008	4PC-80-85	80.00	85.00	Logging subsample is least representative of all samples because of only partical scoops.
6/12/2008	4PC-85-90	85.00	90.00	Reduction in gravel may be due to subsample bias.
6/12/2008	4PC-90-93.6	90.00	93.60	FR=Full Return Sample.
6/12/2008	4PC-93.6-95	93.60	95.00	
6/12/2008	4PC-95-100	95.00	100.00	Condition hole with EZ-Mud. Hole has been hogging-out.
6/13/2008	4PC-100-105	100.00	105.00	Sample contaminated by borehole conditioning. Cement occurs in thin layer (s).
6/13/2008	4PC-105-110	105.00	110.00	All fragements are angular. Probably drilling cobble and boulders. Clasts size up to 30mm.
6/13/2008	4PC-112.1-115	112.10	115.00	All fragements are angular. Probably drilling cobble and boulders. Clasts size up to 30mm; FR sample 110-112.1 ft; Full recovery samples will not be shown on log.
6/13/2008	4PC-115-120	115.00	120.00	Small sample because sampler miscommunication.
6/13/2008	4PC-120-125	120.00	125.00	
6/13/2008	4PC-125-130	125.00	130.00	
6/13/2008	4PC-133.4-135	133.40	135.00	FR sample 130-133.4 ft.

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6/13/2008	4PC-135-140	135.00	140.00	Reduced grain size (10mm). Minor grain coating, medium-coarse sand.
6/13/2008	4PC-140-145	140.00	145.00	Grain size up to 15mm. Minor grain coating. Fine-medium-coarse sand.
6/13/2008	4PC-145-150	145.00	150.00	No grain coating.
6/13/2008	4PC-152.2-155	152.20	155.00	Trace coating. Small grains (10mm); FR sample 150 - 152.2 ft.
6/13/2008	4PC-155-160	155.00	160.00	Fine-medium-coarse sand.
6/13/2008	4PC-160-165	160.00	165.00	Contamination from conditioning. Gravels are fine.
6/13/2008	4PC-165-170	165.00	170.00	Fine gravels. No coatings. Fine-Medium-coarse sand.
6/13/2008	4PC-173.6-175	173.60	175.00	FR sample 170 - 173.6 ft.
6/13/2008	4PC-175-180	175.00	180.00	
6/13/2008	4PC-180-185	180.00	185.00	Small sample. Contamination from conditioning. Lots of polymer.
6/13/2008	4PC-185-190	185.00	190.00	White rhyolite clast. Clasts up to 15mm. Heavy grain coatings.
6/13/2008	4PC-192-195	192.00	195.00	Large clasts up to 30mm. No grain coatings. Drillings cobbles/boulders. Trace basalt, FR Sample 190 - 192 ft.
6/13/2008	4PC-195-200	195.00	200.00	Small grains (20mm) no coatings.
6/13/2008	4PC-200-205	200.00	205.00	Heavy grain coatings (1mm). Clasts up to 20mm.
6/14/2008	4PC-205-210	205.00	210.00	Sample contaminated with polymer and slough from being stuck in hole and conditioning.
6/14/2008	4PC-210-215	210.00	215.00	Sample contaminated with polymer and slough from being stuck in hole and conditioning. FR sample 210 - 215 ft; interval logged from SMF sample.

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6/14/2008	4PC-215-220	215.00	220.00	Basalt clasts present. Sand component is fine-medium and poorly graded.
6/14/2020	4PC-220-225	220.00	225.00	Heavy grain coatings (2mm) indicated cementation. No uphole sloughing. Good sample.
6/14/2008	4PC-225-230	225.00	230.00	Heavy grain coating (2mm).
6/14/2008	4PC-232.6-235	232.60	235.00	Thin grain coatings (1mm). Minor basalt clasts (1-2%). FR sample 230 -232.6 ft.
6/14/2008	4PC-235-240	235.00	240.00	Possible contamination from uphole.
6/14/2008	4PC-240-245	240.00	245.00	Large clasts (25mm). Thin grain coatings (1mm).
6/14/2008	4PC-245-250	245.00	250.00	Highly multi-lithic clast composition. Sand is coarse grained.
6/14/2008	4PC-251.9-255	251.90	255.00	Fine to medium grained sand. Almost poorly graded. FR sample 250 -251.9 ft.
6/14/2008	4PC-255-260	255.00	260.00	Coarse grained sand.
6/15/2008	4PC-260-265	260.00	265.00	Probably mostly fill.
6/15/2008	4PC-265-270	265.00	270.00	No grain coatings.
6/15/2008	4PC-272.2-275	272.20	275.00	No grain coatings, FR sample 270 - 272.2 ft.
6/15/2008	4PC-275-280	275.00	280.00	Fine to medium grained sand, minor coarse grained (~1%), lots of fines.
6/15/2008	4PC-280-285	280.00	285.00	Thin grain coatings (1mm).
6/15/2008	4PC-285-290	285.00	290.00	Almost poorly graded. Sand is fine to medium. Gravels are all fine.
6/15/2008	4PC-293-295	293.00	295.00	Minor basalt clasts (2-3%); FR sample 290 - 293.0 ft.

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6/15/2008	4PC-295-300	295.00	300.00	Bad hole-Poorly graded sand and gravel. Sand is medium-coarse. Gravels are fine.
6/15/2008	4PC-300-305	300.00	305.00	Hole caving. Well graded with fine-coarse gravel. Trace grain coatings.
6/15/2008	4PC-305-310	305.00	310.00	Only fine gravels. Trace grain coatings.
6/15/2008	4PC-311-315	311.00	315.00	Only final gravels. Trace grain coatings; FR sample 310 - 311.0 ft.
6/15/2008	4PC-315-320	315.00	320.00	Big sample recovery. Hole is caving. Poorly graded. Fight to get unstuck after conditioning.
6/28/2008	4PC-320-325	320.00	325.00	Sample is split ration 3/8 NWRPO: 5/8 SMF. 320 - 325 ft contaminated w/polymer.
6/28/2008	4PC-325-330	325.00	330.00	325 - 330 ft contaminated with bentonite and polymer.
6/28/2008	4PC-333.1-335	333.10	335.00	Sand is fine to medium and poorly graded like beach sand; FR sample 330 - 331.1 ft.
6/28/2008	4PC-335-340	335.00	340.00	Hole starts making water at 340 ft.
6/28/2008	4PC-340-345	340.00	345.00	Very consistent from 320 to 360 ft. Clean granular sand with gravel.
6/28/2008	4PC-345-350	345.00	350.00	Very consistent from 320 to 360 ft. Clean granular sand with gravel.
6/28/2008	4PC-353.1-355	353.10	355.00	Very consistent from 320 to 360ft. Clean granular sand with gravel. FR sample 350 - 353.1 ft.
6/28/2008	4PC-355-360	355.00	360.00	Very consistent from 320 to 360ft. Clean granular sand with gravel.
6/28/2008	4PC-360-365	360.00	365.00	Increasing fines but still granular with coarse sand and fine gravel.
6/28/2008	4PC-365-370	365.00	370.00	Increasing fines but stil granular with coarse sand and fine gravel.
6/28/2008	4PC-373-375	373.00	375.00	Increasing fines but still granular with coarse sand and fine gravel; FR sample 370 - 373.0 ft.

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6/28/2008	4PC-375-380	375.00	380.00	
6/28/2008	4PC-380-385	380.00	385.00	Drilling slows down. Bit is plugging.
6/28/2008	4PC-385-390	385.00	390.00	Poorly graded. Looks like beach sand.
6/28/2008	4PC-393.6-395	393.60	395.00	Poorly graded. Looks like beach sand; FR sample 390 - 393.6 ft.
6/28/2008	4PC-395-400	395.00	400.00	Tuff; preserved in alluvial sediments.
6/28/2008	4PC-400-405	400.00	405.00	Tuff; clay and sand in sample is from bit pulverizing tuff.
6/28/2008	4PC-405-410	405.00	410.00	Tuff, clay and sand in sample is from bit pulverizing tuff.
6/28/2008	4PC-410.2-415	410.20	415.00	Clayey; FR sample 410 - 410.2 ft.
6/28/2008	4PC-415-420	415.00	420.00	Decreasing clay.
6/28/2008	4PC-420-425	420.00	425.00	
6/28/2008	4PC-425-430	425.00	430.00	Poorly graded SP sands with no binder cause drilling problems on 6/29/08.
6/28/2008	4PC-430.2-435	430.20	435.00	Clay in sample is probably a result of thin clay seams.
6/28/2008	4PC-435-440	435.00	440.00	
6/28/2008	4PC-440-445	440.00	445.00	Sandy-silty-clay. Clay is fat and stiff.
6/28/2008	4PC-445-450	445.00	450.00	Gravels are possibly contamination from uphole.
6/28/2008	4PC-453.2-455	453.20	455.00	Clay is fat and stiff; FR sample 450 - 453.2 ft.

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Date Logged	Sample Number	Depth Interval (feet bgs) From	Depth Interval (feet bgs) To	Comments
6/30/2008	4PC-455-460	455.00	460.00	Begin using flooded mud drilling method. Bentonitic contamination in sample.