

| HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717 | | | | SOIL BORING NUMBER B-57 | | | | | | | |
|--|-------------------|-------|--------------------|---|---------------|----------------------|-------------------|-------------|------------------|--|--------------------------------------|
| PROJECT: NW Natural Gasco Facility Portland, Oregon | | | | HAI LOGGER: Rob Ede | | DRILL START | DRILL FINISH | | | | |
| PROJECT #: 2708 | | | | SAMPLING METHOD: Macro Core | | Time: 10:45 | Time: 16:00 | | | | |
| | | | | DRILLING METHOD: Push Probe / Direct Push | | Date: 06/08/04 | Date: 06/08/04 | | | | |
| | | | | EQUIPMENT TYPE: Geo-Probe 6600 | | | | | | | |
| | | | | DRILLER: Neil Kranz | | | | | | | |
| | | | | DRILLING CONTRACTOR: Geo-Tech Explorations, Inc. | | | | | | | |
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | BORING DIAMETER: | 2-inch |
| | | | | | | | | | | CASING DIAMETER: | 3.25" steel temporary set at 45' bgs |
| | | | | | | | | | | SURFACE ELEVATION: | 31.46 |
| | | | | | | | | | | TOP OF CASING ELEVATION: | Not Applicable |
| SOIL DESCRIPTION | | | | | | | | | | | |
| | | | | | | | 1 | | | Grass surface | |
| | | | | | | | 2 | | | Silty SAND with Gravel - brown, dry, gravels up to 20 mm, rounded, angular, tarry at 2' bgs, sandy gravel in a tar matrix, tar is solid, but discontinuous with large rock fragments and concrete (0-3' bgs) | |
| | BAG | 11:00 | 63.5 | | | | 3 | | SP | | |
| | | | | | | | 4 | | | | |
| | | | | | | | 5 | | | | |
| Bentonite Chips | | | | | | | 6 | | | Silty SAND with Gravel - patchy tar, black tar in brown sand matrix (5-7.5' bgs) | |
| | | | | | | | 7 | | | | |
| | | | | | | | 8 | | | | |
| | BAG | 11:05 | 756 | | | | 9 | | | Gravelly SILT with TAR - very moist, black to brown, ductile, plastic, tar becomes somewhat liquid (black & viscous) at base of core (7.5-9.5' bgs) | |
| | | | | | | | 10 | | | | |
| | | | | | | | 11 | | | Gravelly SILT with TAR - moist, black to dark gray with minor brown zones, tar is observed to have zones which are more oily when broken open, thick black oil-blebs (~1 to 2 mm diameter), ductile, moderate creosote odor, some gravels have green/gray color (10-14' bgs) | |
| | | | | | | | 12 | | ML | | |
| | | | | | | | 13 | | | | |
| | BAG | 11:07 | 249 | | | | 14 | | | | |
| | | | | | | | 15 | | | | |
| Bentonite Grout | | | | | | | 16 | | | | |
| | | | | | | | 17 | | GM | Silty GRAVEL - tarry, slightly moist, dark brown to black, tar is less than 30%, non-ductile, slightly plastic, gravel/concrete zone at 17' bgs (3" thick), becoming more tarry and oily below 18' bgs, strong creosote odor (15-18.5' bgs) | |
| | | | | | | | 18 | | | | |
| | BAG | 11:15 | 117 | | | | 19 | | | | |
| | | | | | | | 20 | | | | |

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| PROJECT #: 2708 | | | | SAMPLING METHOD: Macro Core | | | | Time: 10:45 | | Time: 16:00 | |
| DRILLING METHOD: Push Probe / Direct Push | | | | EQUIPMENT TYPE: Geo-Probe 6600 | | | | Date: 06/08/04 | | Date: 06/08/04 | |
| DRILLER: Neil Kranz | | | | DRILLING CONTRACTOR: Geo-Tech Explorations, Inc. | | | | | | | |
| ABANDONMENT DETAILS | SAMPLE NUMBER* | TIME | HEADSPACE (ppm) | LAB RESULTS NW-TPH Dx (ppm) | CORE INTERVAL | RECOVERY INTERVAL | DEPTH (feet) | GROUNDWATER | STRATA (USCS) | SOIL DESCRIPTION | |
| | | | | | ↑ | ↑ | 21 | | | BORING DIAMETER: 2-inch | |
| | | | | | | | 22 | | | CASING DIAMETER: 3.25" steel temporary set at 45' bgs | |
| | BAG | 11:20 | 2.5 | | | ↓ | 23 | | GM | SURFACE ELEVATION: 31.46 | |
| | | | | | | | 24 | | | TOP OF CASING ELEVATION: Not Applicable | |
| | | | | | ↓ | ↑ | 25 | | | SOIL DESCRIPTION | |
| | | | | | | | 26 | | | Silty GRAVEL - moist, gray, gravels (~50% gravel) angular to round, up to 20 mm in size, silt is tan to dark brown, small flecks of carbon pitch?, no evidence of tar or oil, no odor, no sheen (20-21.5' bgs) | |
| | | | | | | | 27 | | | Silty gravelly SAND - moist, black, hard very fine grained sand (carbon pitch?) minor tar, brick fragments, and vegetative matter, strong pitch odor (21.5-22.5' bgs), zone of oily tar (22.5-23.0' bgs) | |
| | BAG | 11:50 | 223 | | | ↓ | 28 | | SP | Tarry gravelly SILT - moist black tar in tan silt (~75% tar), some brick fragments, woody plant debris, strong creosote odor, tan/orange mottled silt layer (~1" thick) at 26.5' bgs (25-26.5' bgs) | |
| | | | | | | | 29 | | | SAND - moist, fine to medium grained, poorly graded, few silt layers, sand has strong sheen, minor black oily zone at base of core (26.5-27.5' bgs) | |
| | | | | | ↓ | ↑ | 30 | ▽ | | SAND - black, wet, medium grained, coated with black, semi-viscous oil (30-30.5' bgs) | |
| | | | | | | | 31 | | ML | SAND - olive-gray to dark-gray, moist, thin brown rootlets (<0.5mm), sheen, petroleum odor (30.5-31.5' bgs) | |
| | | | | | | | 32 | | | SAND - very moist, fine sand grains, some mica, poorly graded, strong sheen and brown product coating sand grains (31.5-33' bgs) | |
| | BAG | 13:05 | 173.0 | | | ↓ | 33 | | SP | | |
| | | | | | | | 34 | | | | |
| | | | | | ↓ | ↑ | 35 | | | | |
| | | | | | | | 36 | | | SAND - gray, wet, fine grained, subangular, coated in brown oil, rainbow sheen on core (35-37'8" bgs) | |
| | | | | | | | 37 | | | | |
| | BAG | | 14.2 | | | | 38 | | ML | SILT - moist, tan to brown mottled, stained orange at upper and lower margin with sands, no sheen, no oil (37'8"-37'10" bgs) | |
| | | | | | | | 39 | | SP | | |
| | BAG | | 18.4 | | | ↓ | 40 | | | SAND - moist, gray to brown, wet, fine grained, some mica, poorly graded, no oil, no tar, no sheen, no petroleum odor (37'10"-40' bgs) | |

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| | | | | | SAMPLING METHOD: | | Macro Core | | START | FINISH | |
| | | | | | DRILLING METHOD: | | Push Probe / Direct Push | | Time: | Time: | |
| | | | | | EQUIPMENT TYPE | | Geo-Probe 6600 | | 10:45 | 16:00 | |
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| | | | | | | | | | | SOIL DESCRIPTION | |
| Bentonite Grout | | | | | ↑ | ↑ | 41 | | SP | <p>SAND - gray, wet, fine-grained, minor white shell fragments interbedded with sandy silt layers from 43-44' bgs, silt is gray, wet, slightly plastic, no petroleum odor, no sheen (40-44' bgs)</p> <p>Note: Set 3.25 inch OD steel protective casing to 45 feet bgs at 15:00, 6/8/04.</p> <p>SAND - gray, wet, fine-grained, minor white shell fragments, silt layer at 49' bgs (~3" thick) silt is gray, slightly plastic, no odor, no sheen (45'-50' bgs)</p> <p>Boring terminated at 50' bgs. Pressure grouted from bottom to approximately 10' bgs, bentonite chips from 0-10' bgs.</p> | |
| | | | | | | | 42 | | | | |
| | | | | | | | 43 | | | | |
| | BAG | 14:55 | 27 | | | ↓ | 44 | | | | |
| | | | | | | ↓ | 45 | | | | |
| | | | | | | ↑ | 46 | | | | |
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| | BAG | 16:00 | 4.9 | | | ↓ | 50 | | | | |
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