COLUMBIA SAND AND GRAVEL

LOCATION

The site is a ten acre gravel pit located in Multnomah County on 122nd and San Rafael. Its specific location is SW¼ Section 26 Township IN, Range 2E, WM. (Figures 1 and 2)

ZONING

The site is zoned R-7, single family residential district. Multnomah's comprehensive plan also designates the site R-7.

CURRENT SITE USE

The site is a sand and gravel pit.

ADJACENT LAND USE

The nearest house to the site is 100 feet away. Fifty homes exist within 500 feet of the site.

GEOLOGY

The Columbia Sand and Gravel Pit is located on the Portland Terrace which is underlain by sands and gravels of the Quaternary Fluvio-lacustrine deposits. These Fluviolacustrine sands and gravels have been mined from the pit to a total estimated depth of 150 feet.

As exposed in the pit walls the Fluviolacustrine deposits consist mainly of massive, crudely bedded, laterally discontinuous layers of gravelly-sand. The sand matrix is generally coarse grained and angular and varies in degree of induration from loose to moderately clay cemented. The percent of clay and silt in the sand matrix varies from a trace to an estimated 20 percent by weight. In some locations these gravelly sands form gently dipping large scale fore-set cross beds with apparent dips in varying directions, depending upon pit wall orientation.

Secondary in volume to the gravelly-sands are discontinuous lenses of sandy-gravel and openwork gravels encountered at varying levels along the pit walls. The sandy-gravels are often found in moderately to steeply dipping cross beds thinner than the gravelly sand beds described previously. In some cases the gravel and cobble layers have no matrix and are termed openwork gravels. Generally these openwork gravels are less than one foot thick and laterally discontinuous.

The sandy-gravels and gravelly-sands contain occasional large cobbles and boulders. There are also several channel shaped deposits of cross bedded sands along the pit walls. Of some interest is the discontinuous layer of cemented gravel along the east wall of the pit. This layer forms a secondary ledge below the rim of the pit and the cemented zone is up to two feet in thickness. The cementing agent is not known but the resulting conglomerate is very hard.

As part of the gravel washing operation the silt and clay wash fines were drained into settling ponds as the pit was mined out. Today these deposits of silt and clay are found in three locations in the pit. The largest volume of silt and clay has accumulated in the northeast corner of the pit and in an abandoned settling pond now exposed in the southwest wall of the pit. The total volume of the wash fines is estimated at 100,000 cubic yards.

This semi-confining layer reportedly conveys significant quantities of vertical upward leakage from the Troutdale Gravels to the Columbia River sands (Willis, 1978).

The local groundwater flow system is recharged by direct infiltration of precipitation and by underflow from the bordering hills. The direction of flow is downgradient toward the Columbia and approximately perpendicular to the surface slope. On the terrace some recharge to the upper Troutdale occurs through the overlying Fluviolacustrine deposits. The pit appears to be excavated entirely in the Fluviolacustrine deposits to a maximum estimated depth of 140 feet at elevation 150 feet msl. The peizometric and watertable surface is approximately 105 feet below the deepest point of the pit at watertable elevation 45 feet msl as measured in the on-site well, however, less than 10 percent of the pit floor area is exavated to this depth. The Fluviolacustrine deposits exposed in the pit walls and beneath the pit bottom are unsaturated and reportedly there is not flow of perched groundwater into the pit even during the wet season. There is a partially saturated sand lense along the upper wall of the northwest corner of the pit parallel to 122nd Avenue. This sand lense is partially saturated even during the summer and probably is recharged by storm runoff from dry wells along 122nd Avenue.

The Troutdale Gravel Aquifer underlies the Fluviolacustrine deposits on the East Portland terrace and underlies a thick surface layer of floodplain silts and clays adjacent to the Columbia River. This unit is the most widely utilized aquifer in the East Portland area and the majority of the producing wells in the vicinity of the pit are pumping from this aquifer.

As part of this investigation all of the wells on file with the Oregon Water Resources Department in the vicinity of the pit were field located and water table measurement made if possible. Many of the wells in the area are community owned such as the Parkrose School and Water District, Richland Water District and Hazelwood Water District wells. The Parkrose Heights High School irrigation supply is approximately 600 feet northeast of the pit and is the closest well of record to the pit. A number of other wells are located northwest of the pit across I-80 expressway and along the base of the terrace.

The aquifer coefficients of the Troutdale Gravel Aquifer apparently vary considerably depending upon the well location. In aquifer tests conducted in wells along the Columbia River floodplain and lower terrace area the Troutdale gravel aquifer showed T values from 127,000 to 644,000 gpd/foot. The specific capacities of wells in these areas range from 98 to 900 and commonly average 125 gpm/foot of drawdown (Willis, 1978).

In the upper terrace area where the pit is located the performance of wells in the Troutdale Gravel Aquifer is generally poorer than those along the lower terrace and floodplain. The only aquifer test data available in the vicinity of the pit was the Hazelwood Water District well No. 3 (34 abd). In this test the T value was 20,000 gpd/foot and the well had a specific capacity of 9.5 gpm/foot of drawdown. Specific capacity data calculated from drillers logs of other wells on the upper terrace range from about four gpm/foot for the Richland Water District wells to about 80 gpm/foot for the Glendover Golf Course wells. The specific capacity of the pit well (26 cbc) is about 10 gpm/foot of drawdown and the specific capacity of the Hazelwood Water District well (34abd) southwest of the pit is approximately 9.5 gpm/foot of drawdown. Comparison of specific capacity data between wells is of limited value because of varying well efficiencies, length of screened interval, extent of initial development, etc. It appears that these variations in well specific capacity are paritally due to lateral variations in lithology and degree of cementation of the gravel and sand matrix. According to (Willis, 1977) "the permeability of the Troutdale gravels can be severely affected by the degree of cementation and/or the weathering of the basaltic gravel... In locations such as near the Richland Water District wells, the degree of cementation may severely limit the volume of water which can be removed by these wells."

In order to estimate the volume of underflow beneath the pit the T value of 20,000 gpd/foot is used from the nearby Hazelwood Water District well (34 abd). A hydraulic gradient of 0.001 ft/ft has been calculated from static water level elevations in the vicinity of the pit. Given a pit width of 600 feet, the groundwater underflow beneath the pit is about 12,000 gal./day. If only the upper 10 feet of the saturated zone is considered, the underflow is about 600 gal./day.

SOIL

On site soild has been removed, however, the pit is in a zone with association with 50 percent or more Class III Soils or 50 percent or more Classes II and III combined.

SURFACE WATER

The closest surface water channel is the Columbia River which is two miles away.

COVER MATERIAL

Most cover material would have to be imported to the site.

CAPACITY

The site has a 710,000 ton capacity and an estimated 1,200,000 ton capacity after gravel and clayey fines removel.

ACCESS

Bordered by NE 122nd Street, a four lane, two-way street, and NE San Rafael, a two lane, two-way street, the site under consideration is also in a highly accessible area. One of the boundary streets for the site, 122nd Street, is a major thoroughfare in east Portland. The proposed site is located only a short distance from Highway 80N, a major highway in the area. Highway 205, located near the site, will, when completed, provide another easy access route. The pit is approximately 16 miles from Rossman's Landfill in Oregon City.

CLIMATE

Mean annual precipitation at the Portland International Airport is 37.61 inches. Over 70 percent of the precipitation generally occurs during the period October through March.

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Prepared by Metro Staff

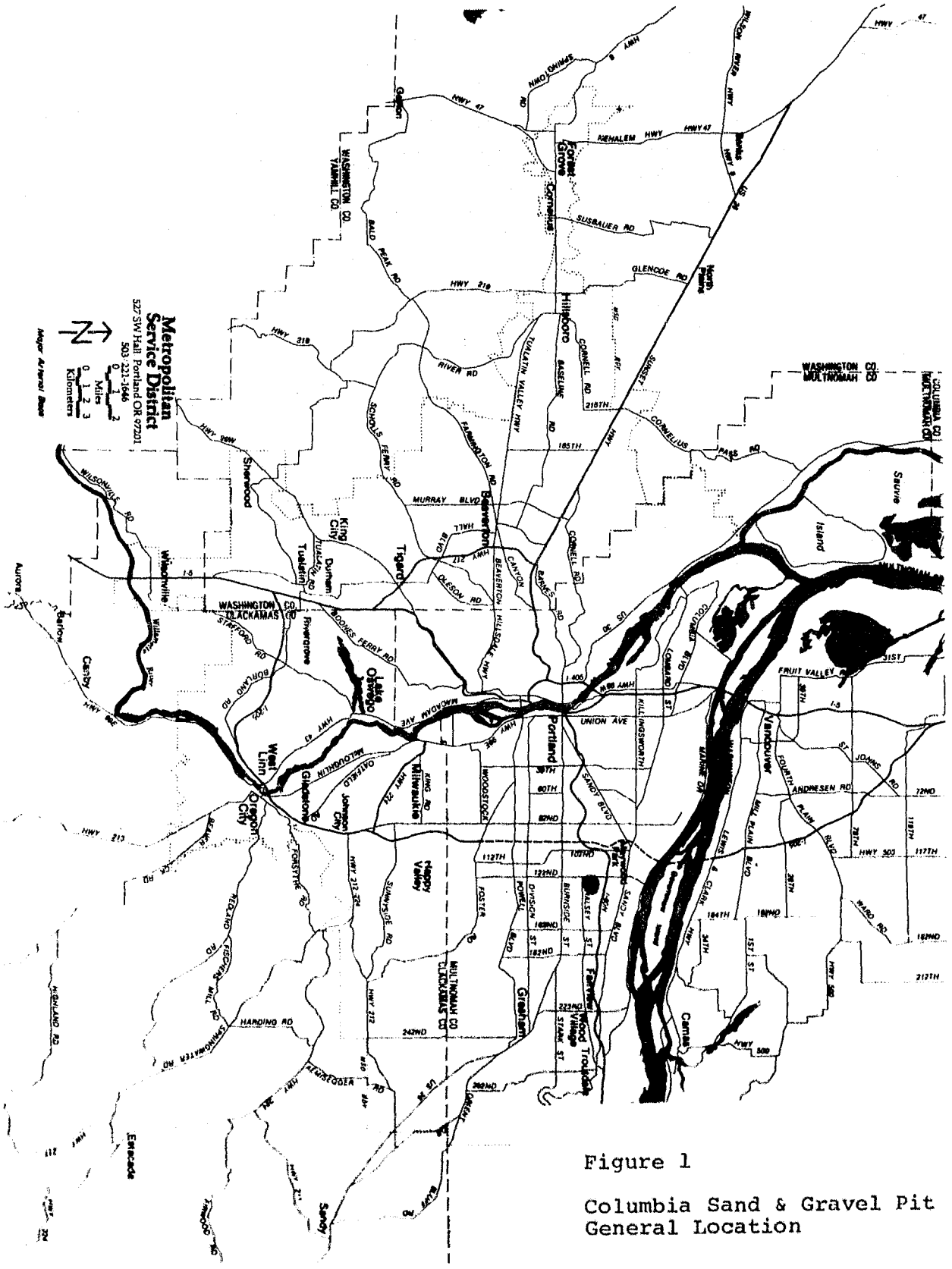
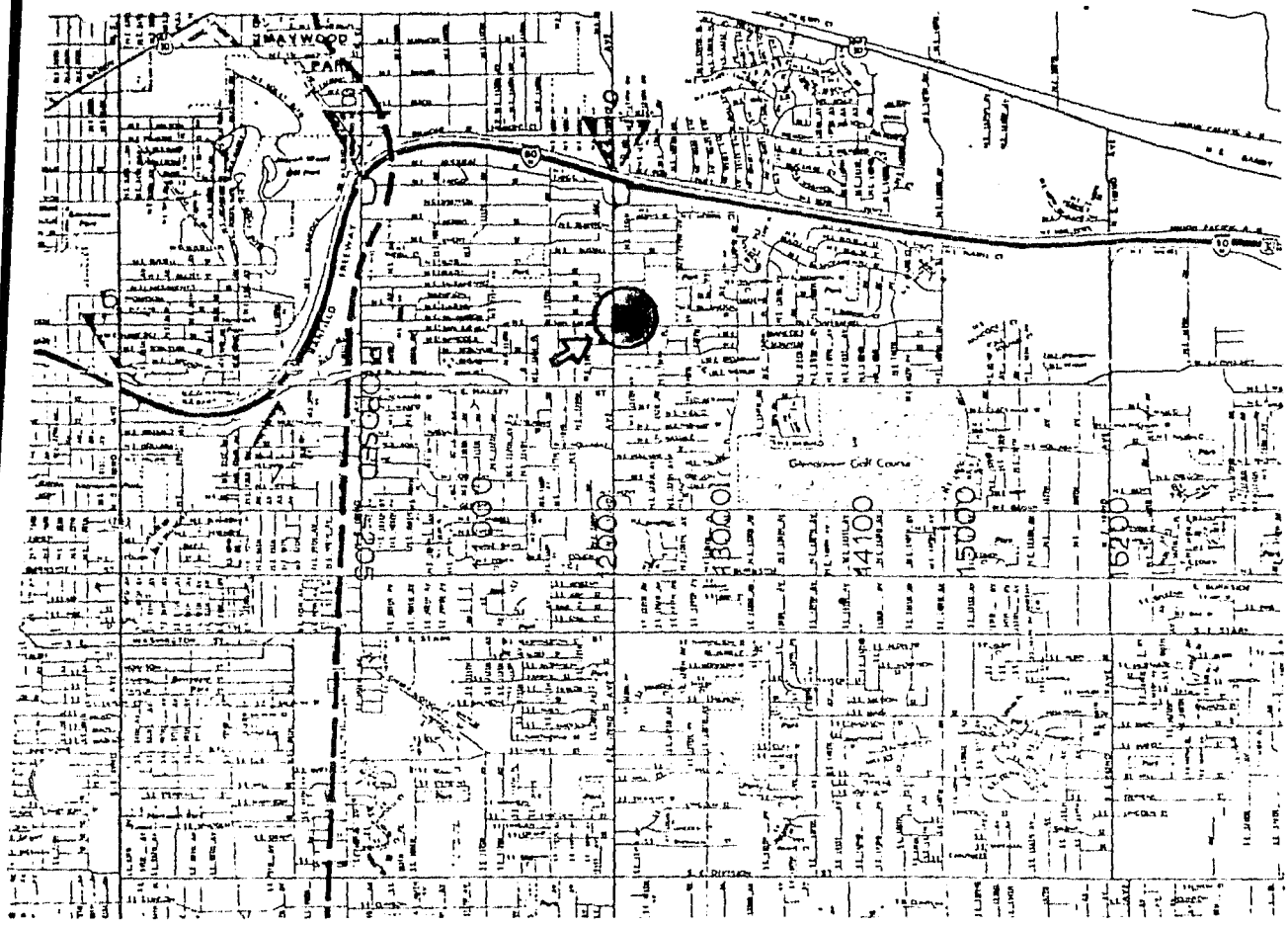


Figure 1

Columbia Sand & Gravel Pit
General Location



PROPOSED LANDFILL SITE

COLUMBIA SAND & GRAVEL PIT

N.E. 122nd & N.E. San Rafael

Figure 2

Columbia Sand & Gravel Pit
Specific Location