



MEMORANDUM

To: S. Otto, AICP Date: July 2, 2014
From: M. Reiter, EIT   Project: 9059.07.03
RE: Leichner Landfill Site Conditions Summary

LEICHNER LANDFILL—SITE CONDITIONS SUMMARY

This memorandum has been prepared to summarize existing site conditions at the Leichner Master Plan Area. Information was compiled from a variety of sources to assess the availability and level of service of existing infrastructure that will serve future development on the project site.

Infrastructure

Sanitary Sewer

Clark County Regional Wastewater District (CRWWD) is the sanitary sewer purveyor for the area. Sewer infrastructure is available adjacent to the site in all directions, including a main “trunk” line in NE 94th Avenue to the west and smaller conveyance lines in the residential subdivisions to the north, east, and south of the project site. The project site is within CRWWD’s Glenwood Creek Sub-basin 29. Sewer flows in the entire area generally drain via an 18-inch-diameter, polyvinyl chloride (PVC) sewer trunk in NE 94th Avenue. Flows combine from the north and south at the intersection of NE 94th Avenue and NE 90th Street and head west to CRWWD’s Glenwood Pump Station at 9115 NE 90th Street. Flows are conveyed through an 18-inch-diameter forcemain to the west and eventually to the Salmon Creek Wastewater Treatment Plant.

Both the Glenwood Pump Station and the 18-inch-diameter PVC pipe in NE 94th Avenue have been identified by CRWWD as requiring upgrades to address forecasted demand growth in the area (MacKay & Sposito, 2006). Upgrades will bring an increased level of service to the project site and benefit future development. Although upgrades are planned, the existing system has capacity to accommodate a fully developed basin (MacKay & Sposito, 2006). Based on the existing system’s capacity and the presence of a trunk line immediately adjacent to the project site, this analysis finds that sanitary sewer service is readily available for development on the project site. Industrial or commercial facilities that discharge excessive quantities of water to the sanitary sewer will need to coordinate closely with CRWWD with specific details on expected discharges. See Sheet C1.0 (attached) for additional details of existing sanitary sewer conditions.

Potable Water

The City of Vancouver (City) is the potable water purveyor for the area. Water infrastructure is available adjacent to the site in all directions, including a 12-inch-diameter ductile iron (DI) main line in NE 94th Avenue to the west and smaller supply lines in the residential subdivisions to the north, east, and south of the project site. A 6-inch-diameter lateral supplies two fire hydrants on the Waste Connections (WC) property. The project site lies within the city's Heights High pressure zone, which is generally well-served with regard to flow and pressure. Heights High contains two water stations that pump and treat local groundwater, but, to serve the relatively high demand, the pressure zone imports water from nearly all of the City's water stations. The project site can be served by the 12-inch-diameter DI water main in NE 94th Avenue. Hydraulic modeling efforts calculated peak-hour demand pressures in this main to be 60 to 100 pounds per square inch (psi) (HDR, 2007). A modeled fire flow analysis calculated sufficient fire flow demand at this main, and in surrounding areas, while forecasting growth in demand through the year 2026 (HDR, 2007).

Based on these favorable pressure and flow conditions, this analysis finds that potable water and fire suppression water are readily available for development on the project site. Industrial or commercial facilities that consume excessive amounts of potable water will need to coordinate closely with the City with specific details on expected consumption. See the attached Sheet C1.0 for additional details of existing potable water infrastructure.

Power

Clark Public Utilities (CPU) provides power service to the area. Overhead power is available adjacent to the site in all directions, including NE 94th Avenue to the west, NE 107th Avenue to the east, NE 86th Street to the south, and NE 99th Street to the northeast and northwest. High-voltage (115 kilovolt) overhead power lines cross the north end of the property, connecting NE 99th Street on the east and west sides. Medium-voltage overhead power lines (three-phase and one-phase) run along 94th Avenue NE and extend east into the interior of the site immediately to the north and south of the WC property.

Based on the availability of both high- and medium-voltage lines adjacent to and within the project site, this analysis finds that power is readily available for development on the project site. Industrial or commercial facilities that consume excessive amounts of power will need to coordinate closely with CPU to determine which overhead lines will offer the most reliable supply. See the attached Sheet C2.0 for additional details of existing power infrastructure.

Natural Gas

Northwest Natural Gas Co. (NWN) provides natural gas service to the area. Natural gas infrastructure is available adjacent to the site in all directions, including 4-inch- and 6-inch-diameter polyethylene lines in NE 94th Avenue to the west and smaller, 2-inch-diameter, polyethylene and wrapped steel lines in the residential subdivisions to the north, south, and east of the project site. A 2-inch-diameter, wrapped steel line currently terminates at the end of NE 99th Street to the northeast of the project site, and service does not continue in NE 99th Street to the northwest of

the project site. Two service laterals currently serve the WC site from the line in NE 94th Avenue. The project site likely is best served by the line in NE 94th Avenue, which is a low-pressure (60 psi maximum), 4-inch-diameter, Class B supply to the north of NE 95th Street and to the south of NE 90th Street. This line changes to 6-inch-diameter between NE 90th Street and NE 95th Street.

At the time of this report, WC plans to convert their entire diesel-fueled vehicle fleet to run on compressed natural gas (CNG) by 2018. WC has already installed a temporary CNG fueling station capable of fueling up to 16 vehicles on-site. In the next several years, WC plans to construct a permanent CNG fueling station with the capacity to fuel up to 120 vehicles. The existing line in NE 94th Avenue likely is inadequate to supply such a fueling station. If so, upgrades to the local system would be required. These upgrades would include a larger-diameter, higher-pressure line in the vicinity of the WC site, benefiting future development on the project site.

Based on the current availability of relatively large low-pressure lines adjacent to the project site and the possibility of increased supply being brought to the area in the future, this analysis finds that a reasonable level of natural gas service is available for development on the project site. Industrial or commercial facilities that consume relatively large amounts of natural gas or that require high supply pressures (large boilers, etc.) will need to coordinate closely with NWN to determine whether upgrades to the existing infrastructure are necessary for adequate service. If increased supply is brought to the area in the future to accommodate a CNG fueling station at the WC site, a robust level of service may be available for new development on the project site. See the attached Sheet C2.0 for additional details of existing gas infrastructure.

Communications

CenturyLink, Inc. provides internet, cable, and telephone service to the area. Communications infrastructure is available to the site, at a minimum, via underground cables in NE 94th Avenue.

Based on the availability of communications infrastructure adjacent to the project site, this analysis finds that a reasonable level of communications service (i.e., telephone, cable, and Internet up to 20 megabits per second) is available for development on the project site. Industrial or commercial facilities that require relatively large amounts of data via high-speed Internet connections (data centers, high-tech services, etc.) will need to coordinate closely with CenturyLink, Inc. to determine whether upgrades to the existing infrastructure are necessary for adequate service. See Sheet C2.0 for additional details of existing communications infrastructure.

Stormwater Drainage

Engineered stormwater controls are currently in place for the closed Leichner Landfill property. These were developed as part of the landfill's closure design to minimize stormwater infiltration into the site and leachate creation. The closed landfill has an individual NPDES Permit, and future development at the project site will not be allowed to utilize the landfill's stormwater system. The Fleischer and Koski (Leichner Campus) properties do not contain any engineered stormwater controls. Stormwater on these properties likely infiltrates into the ground on site or is conveyed to

nearby rights-of-way (ROWs) via overland flow. Stormwater infrastructure in the County ROW is owned and maintained by the County. See the attached Sheet C3.0 for additional details of existing stormwater infrastructure.

Existing Site Conditions

Existing stormwater infrastructure and drainage patterns on the project site are being modified by the County and WC. At the time of this report, stormwater runoff from portions of the Leichner Landfill Property (approximately 35 acres) is collected by perimeter ditches and underground perforated pipes and conveyed to a detention basin on the west side of the property. A pump station conveys flows from the west drainage basin to the sedimentation basin at the north end of the property via two 8-inch-diameter high-density polyethylene forcemains. The primary forcemain conveys flow to a ditch for conveyance to the sedimentation basin. The secondary forcemain, utilized only during large storm events, conveys flow to an 18-inch-diameter, plastic pipe that terminates at the sedimentation basin. Runoff from the north half of the landfill (approximately 30 acres) drains by gravity directly into the sedimentation basin via perimeter ditches. Once flows from both basins are combined in the sedimentation basin, a flow-control structure backs up flow and allows for settlement of suspended solids. Flows from the sedimentation basin then enter the north detention basin, immediately to the west, via a short pipe. A second pump station pumps flows from the detention basin through approximately 200 lineal feet (LF) of 20-inch-diameter DI force main to a 24-inch-diameter corrugated metal (CM) gravity line just south of NE 100th Way. This 24-inch-diameter CM pipe travels west down NE 99th Street for approximately 3,500 LF and outfalls to Curtain Creek via 650 LF of grass-lined ditch. The detention basin is designed to retain a 25-year, 24-hour storm and allow a maximum release rate of 8.5 cubic feet per second to Curtain Creek.

The Leichner Landfill stormwater system described above appears to be the only stormwater infrastructure available to convey flows from the project site to discharge at Curtain Creek. All other stormwater infrastructure adjacent to the site in the County ROW consists of catch basins and drywells, which discharge stormwater directly into the ground. NE 94th Avenue has at minimum ten such “stand-alone” systems disposing of stormwater runoff from NE 94th Avenue along the total length of the project site. Future development plans to widen NE 94th Avenue include roadside stormwater facilities to treat and dispose of stormwater runoff from the ROW.

Based on the lack of cohesive stormwater infrastructure adjacent to the project site, this analysis finds that stormwater management will be a key design concern for new development on the project site. Without a wetland or water body in the immediate vicinity or existing conveyance lines to such a discharge location, stormwater runoff will have to be managed on site or pumped off site to the nearest conveyance lines or water body.

Regulatory Requirements for New Development

New developments on the project site will be subject to the ten minimum requirements of the Western Washington Stormwater Management Manual, consistent with Clark County Code. Additional requirements specific to landfill closures will also govern development on the landfill

property specifically. Generally, any new development will be required to implement best management practices to treat runoff to statewide water quality goals and control flow quantities to maximum allowable flowrates. Maximum allowable discharge flowrates will be governed by predeveloped runoff conditions. Some level of storage, such as a detention pond, could potentially be necessary to achieve these requirements. New developments are required to implement low-impact development (LID) stormwater controls to the maximum extent feasible. Soil conditions on the site may be favorable for the implementation of LID stormwater facilities that infiltrate runoff, but infiltration of stormwater has the potential to impact the landfill's existing groundwater monitoring network. Therefore, the feasibility of on-site infiltration will vary from location-to-location. Ultimately, infiltration testing of in situ soils and feasibility analysis of any proposed infiltration facilities should be performed by a licensed geotechnical engineer. Restrictive covenants require approval from Ecology and Clark County Public Health to construct stormwater facilities at the project site.

Access and Transportation

Access to the site from Interstate 205 (I-205) is available via NE Padden Parkway and NE 94th Avenue. NE Padden Parkway is classified as a PA-4CB urban principal arterial and a T-1 truck route between I-205 and NE 94th Avenue. NE 94th Avenue is classified as an M-2CB urban minor arterial. The County currently has plans to widen NE 94th Avenue, significantly improving vehicle, bicycle, and pedestrian access to the site. Current planned improvements include curb and gutter; a two-way, left-hand turn lane along the entire frontage of the site; and a new 38-foot-wide driveway to the Leichner Campus. There is currently a four-way, signalized intersection at NE Padden Parkway and NE 94th Avenue.

NE 99th Street currently terminates at the north end of the site from both the east and west directions. The County plans to complete a new section of NE 99th Street in the future to allow passage from the east to the west through the site. NE 99th Street is classified as an M-2CB urban minor arterial on both sides of the property. At this time, the extension of NE 99th Street is scheduled for 2018-2020, although funding has not been committed to this project.

Based on the proposed widening of NE 94th Avenue, the relatively short distance to I-205, and the existing size and classification of NE Padden Parkway, this analysis finds that the site has favorable transportation access and circulation. See the attached Sheet C4.0 for additional details of existing transportation infrastructure.

Soils and Topography

Soils on the project site, excluding the closed landfill, consist largely of gravelly loam with some silt loam. Gravelly loam generally has favorable infiltration characteristics, which may be conducive to the use of LID stormwater facilities. Loams vary widely with regard to engineering properties, but generally loams function well as a subgrade material. Compaction capability and drainage can be assumed to be better than those of silts and clays (unfavorable) but not as good as those of sands and gravels (most favorable).

The topography of the site is flat, except for the closed landfill. The closed landfill is built up at a 5 to 8 percent slope to one high point in the middle of the site and a second high point in the northwest corner of the site. The Fleischer property generally slopes at 1 to 3 percent toward the southwest. The Lechner Campus is generally flat, approximately 20 feet lower than the adjacent closed landfill, and has an approximate 5:1 upward slope, toward the northeast corner of the lot. The NE 99th Street ROW and residential property are generally flat, approximately 15 feet lower than the adjacent residential areas, and have an approximate 5:1 upward slope around the east, north, and west boundaries of the project site. See the attached soils map for additional details of existing soil conditions.

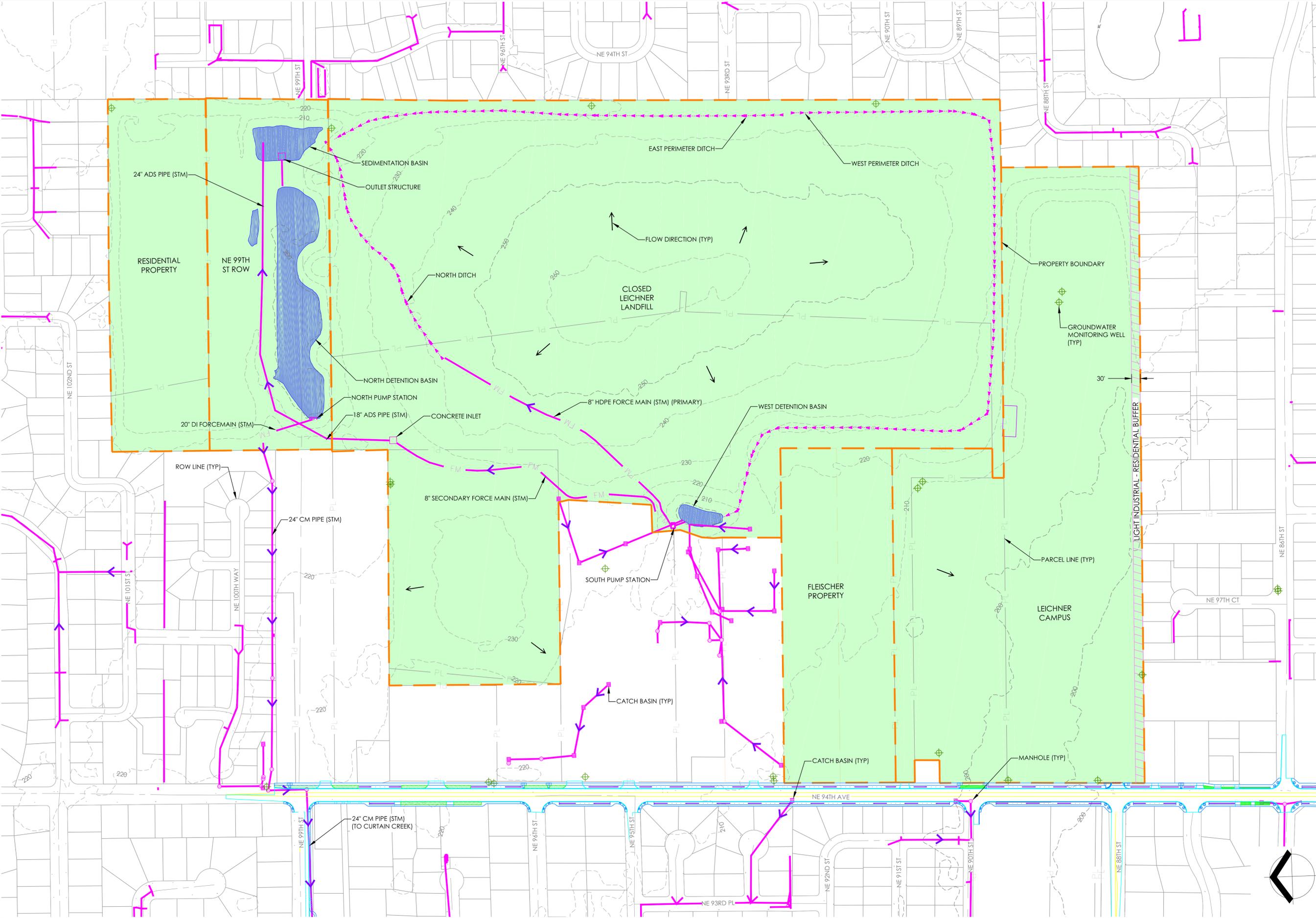
ATTACHMENTS

Sanitary & Water Plan
Power, Communications & Gas Plan
Stormwater Plan
Transportation & Access Plan
Proposed NE 94th Ave Improvements
Soils Map

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**LEICHER LANDFILL SITE
 CONDITIONS**
 CLARK COUNTY
 VANCOUVER, WA

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PROJECT: 905907
 DESIGNED: M. REITER
 DRAWN: M. REITER
 CHECKED: S. FROST
 SCALE



NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.

SHEET TITLE
**EXISTING
 STORMWATER
 INFRASTRUCTURE**
 SHEET
C3.0



