Appendix B

Temporary Discharges (Dewatering) into SPU's Drainage & Wastewater System

Contents

List of Tables

APPENDIX B
Temporary Discharges (Dewatering) into SPU's Drainage & Wastewater System

This document presents Seattle Public Utilities (SPU) standard business practices for evaluating temporary connections and discharges to SPU drainage and wastewater infrastructure.

For all construction projects, the 2009 Stormwater Code has a minimum requirement to "Control Dewatering". Construction Dewatering is also addressed in the 2011 City of Seattle Standard Specifications in sections 8-01.3(2)D; 8-01.3(2)E; 8-01.3 (12), 8-01.3 (12)D.

These guidelines are standard business practices of SPU reviewers (and designers) making decisions about allowing temporary discharges into SPU's infrastructure. This guidance document is meant to aid an SPU employee in the review and decision-making for temporary discharges. It is important to note that reviewers have discretion in every aspect of their decision. It is up to the SPU engineer's judgment to decide on an appropriate balance between SPU's interests, a project's needs, and the ultimate public benefit of allowing the discharge. If challenges to the SPU engineer's decisions arise, they will be resolved through the normal elevation process, starting with the engineer's supervisor.

1.1 DEFINITIONS

Term	Definition
Drainage Water	Stormwater and all other discharges permissible per Seattle Municipal Code (SMC) 22.802.030.A. This includes surface water and groundwater, although either may need to be treated to become a 'permissible discharge".
Groundwater	Water in a saturated zone or stratum beneath the surface of land or a surface water body, permanently, seasonally, or as the result of the tides.
Permissible Discharge	Defined in SMC 22.802.030 as water that has been treated to the extent required so that it may be discharged to the Separated Storm System. (e.g. groundwater with contaminants that may be treated to become 'uncontaminated groundwater', which is a Permissible Discharge.)
PSD	A separated storm main.
POD or POC	Point of Discharge or Point of Connection, respectively. The specified location to which a discharge will connect its temporary discharge. King County used the vernacular POD. The City of Seattle Department of Planning and Development (DPD) uses both.
Process Water	Water that has been used during a process that makes it prohibited from discharging to the separated storm system. Examples include well-establishment water, wheel wash water, tunneling waste, and auger waste. .
Sanitary or Combined Sewer System	Any conveyance system that is ultimately connected to the King County sewer system.
Separated Storm System	The public drainage conveyance system for only drainage water. This could include PSD's (with a dedicated outfall – not PSD's that discharge to the combined sewer system), ditch and culverts, creeks, etc.
SSPTD	Side Sewer Permit for Temporary Discharge (or Dewatering). This permit is issued by DPD's side sewer permitting team.

1.2 WHAT IS DEWATERING? WHY IS IT IMPORTANT?

Dewatering discharges are usually construction-related discharges, including drainage water (surface rainwater and groundwater) and process water. Requests for **temporary discharges**, however, can come from a variety of sources, including water from ships and barges temporarily moored in Seattle and ongoing remediation projects with regular small discharges.
SPU has interest in controlling the amount and rate of discharge into its main lines, as well as how connections to its infrastructure are constructed.

The purpose of reviewing temporary discharges to SPU's drainage and wastewater infrastructure is to decide on an appropriate balance between SPU's interests, a project's needs, and the ultimate public benefit of allowing the discharge. The goal is to:

1. **Abate potential risks** of backing up SPU infrastructure and causing, or contributing to, an overflow event. Backups in SPU's system could cause backups through side sewers and localized flooding. SPU could be required to pay claims for damage associated with these backups, and could be held responsible to Washington State Department of Ecology for overflow events.

2. **Protect the environment**. Provide water-quality requirements for discharges to the Separated Storm System, and determine discharge rate restrictions.

3. **Protect SPU's assets**. Ensure that connections to SPU infrastructure do no harm. Facilitate inspections of those connections (and their removals).

4. **Enable billing**. A clearly established process to permit dewatering discharges will allow the discharges to be billed when reasonable.

1.3 WHAT ARE THE PERMITS INVOLVED? WHO ELSE IS INVOLVED IN THE PROCESS?

As of this writing, there is only an ***informal* process** for administering dewatering decisions.

When a project connects to the Sanitary or Combined System, it will need to obtain a King County Industrial Waste (KCIW) Discharge Authorization (DA). Sewer fees may be applied to the discharge. If the discharges are charged sewer fees, an account is set up with SPU's Customer Service Branch in association with the KCIW DA. Currently, the contact is **Daniela Schwedas**.

For parcel-based projects that get a DPD construction permit, the DPD Drainage and Side Sewer reviewers also review the dewatering design (included in the Construction Stormwater Control Plan plan). It is DPD's responsibility for communicating discharge-rate restrictions and for approving the point of connection, which should be shown on approved plans in the project's permit set. DPD also coordinates with KCIW staff if the discharge goes to the Sanitary or Combined System.

For **non-SPU capital projects** solely in the ROW, an SPU engineer either in the Plan Review Section (currently Susie Larson) or the assigned SPU drainage reviewer (for a Major Interagency Project) is responsible for reviewing and approving the dewatering connection and discharge

rate. There is no City 'dewatering' permit for these projects; the only City-required permit is the SDOT Street Use Permit. This is why it is important for the reviewer to require the dewatering conditions be included in the project bid documents.

For **SPU CIP projects**, the SPU design team is responsible for designing the dewatering system (and the Construction Stormwater Control Plan design), identifying the point of discharge, and deciding the allowable discharge rates. Again, there is no City 'dewatering' permit for projects in the ROW; the only required permit is the SDOT Street Use Permit. This is why it is important for the SPU reviewer (or designer) to require the dewatering conditions be included in the project bid documents. Some SPU CIP projects might have portions of the projects on land parcels, and DPD should review the dewatering for those portions of projects.

For **large projects that require an Ecology Construction Stormwater General Permit** (projects that will disturb one or more acres of land and discharge to the separated storm system), construction discharges to the separated storm system are regulated by Ecology's Construction Stormwater General Permit. However, the discharge plan should be coordinated with all City permits, and the SPU reviewer (or designer) should still require that necessary restrictions and conditions be included in the project bid documents.

A note to CIP designers: When considering discharging directly to a receiving water body, a permit from the Army Corps of Engineers and others may be required for construction of any structure (e.g., a discharge pipe or dispersion device).

A note for SPU's Field Operations & Maintenance (FOM) discharge: Discharges from SPU Crew work should be in accordance with FOM Standard Operating Procedures for discharges, as well as regulations from King County Industrial Waste. Flow rate and water quality restrictions may apply to FOM discharges.

1.4 WHERE DO I START WITH MY DECISION?

Decide which sewer system the discharge should be permitted to go to. Usually the options are: a combined sewer; a separated sanitary sewer; a storm drain discharging to the combined sewer, a receiving water body, or a creek; or a ditch & culvert system. See Table B-1 for specific flow rate thresholds for different water sources and receiving systems. Many times, it is up to the SPU reviewers (or designers) best judgment as to what system is appropriate for a specific discharge.

The starting point for the decision is that **drainage water belongs in the drainage conveyance system**. However, the pipes available to the project site and the condition of the sewer and drainage systems in the vicinity could affect the approved receiving system.

If a drainage system or receiving water body is available, **drainage water should be treated to become a permissible discharge** (per Stormwater Code 22.802.030) to keep it out of the Sanitary or Combined systems. However, the reviewing engineer should use their best judgment. For example, if a project's discharge is for a very short duration, it might make more sense to allow a connection to the sanitary or combined system instead of testing and treating drainage water to discharge to the PSD. In some cases an economic analysis could assist in making and documenting a decision.

Wastewater and process water needs to be discharged to the sanitary or combined sewer system.

1.5 HOW DO I CHOOSE A POINT OF DISCHARGE?

The preferred allowed POD for construction discharges and all temporary discharges **is a private side sewer or private structure on private property**. However, some construction projects do not have access to an adequate privately owned pipe or structure. Typical examples of this include project sites that are solely located in the ROW (e.g. SDOT roadway projects), projects that are located in areas that don't have side sewers or private inlets that drain to the correct sewer system (e.g. a project on Parks property, or a project on an undeveloped parcel without an existing side sewer).

Projects that do not have a side sewer to connect to, but have a new side sewer designed as part of the project, should phase the project to build the side sewer and use it as their POD during the remainder of the construction. This is usually applicable to construction of a parcel-based development.

Discharge is not allowed into a structure with monitoring equipment installed in it, unless approval from the owners of the equipment is obtained. Monitoring equipment can have a variety of ownership and many are unmapped, so it can be a good idea to look into a structure during design to identify unknown factors that could affect discharge location.

The allowed Point of Discharge (POD) can be affected by what infrastructure is available to the project and the project's needed discharge rate and duration.

Listed in order of preference to SPU:

1. Private structure on private property (i.e., a side sewer or a private drain on private property that connects to a side sewer connected to SPU's mainline).
2. Existing unused side sewer in the ROW (condition must be verified).
3. Non-structural connection to SPU infrastructure. This could be discharge to the gutter line with a downstream inlet, surface discharge draining to an SPU MH or CB (i.e., remove the lid and use sandbags to direct flow into the open structure), or a surface pipe with a 90° elbow directing flow into the structure either through the open lid with sandbags and an A-frame sign, or a temporary lid with a porthole cut into it. This would be for a short-term scenario with appropriate flow rates for the POD, and where the project can protect the public from all hazards and protect exposed SPU infrastructure associated with a non-structural connection (i.e., an open MH).
4. Temporary coretap into SPU infrastructure.

1.6 WHAT ARE THE WATER QUALITY REQUIREMENTS FOR THE TEMPORARY DISCHARGE?

For discharge to the sanitary or combined sewer, the water quality discharge limits are set by KCIW. These are found on the KCIW program's website. Because KCIW issues the permit, King County has the authority to enforce these discharge parameters.

For discharge to the Separated Storm System, the discharge shall meet Ecology's Surface Water Quality requirements in WAC-173-201A, for Freshwater or Marine, whichever is applicable. If the source of discharge water is groundwater, then the discharge must also meet all additional parameters listed in MTCA Method A.

1.7 WHAT IS THE MAXIMUM ALLOWED DISCHARGE RATE?

The maximum discharge rate should be specified based on the available capacity of the receiving sewer system, and then possibly further restricted if the connection is made directly to SPU structures.

In general, use the discharge rates in Table B-1 to specify a maximum instantaneous discharge rate. At the reviewer's discretion, this rate can be lowered or raised based on project needs and risk assessment of the sewer capacity. The goal is to determine a discharge rate that adequately balances protecting the City (minimize risk of backups or flooding) and serving the customer's needs.

Factors in assessing the risk to the city include:

Duration of discharge. A one-time batch discharge over the period of a day is not as concerning as a large construction project that will discharge over several years.

Project's required or requested flow rate. Smaller discharges into larger systems (50 gpm to a 24" pipe) are not as concerning as larger discharges to smaller systems (300 gpm to a 12" pipe).

Project's Point of Discharge. If the project can only discharge to the curb or into a public CB, the discharge rate is restricted.

Connection to specific SPU structures. Flow rate restrictions for connections to specific SPU infrastructure:

- For discharge directly into a catch basin, the maximum instantaneous flow rate shall be: 50 gpm with a 6" outfall, and 100 gpm with an 8" outfall. A higher discharge rate may be allowed at the discretion of an SPU engineer based on the collected drainage area of the CB and other factors.

- Discharges into the curb line or into an inlet should take into account the drainage area that the inlet serves, and the capacity of the grate and outfall line.

Known issues of SPU's Infrastructure. There may be data about a pipe downstream for the proposed POD that would lead to heightened concerns about discharges. Sources for this data include: Pipe information in GIS or as-builts, Sewer Capacity Model, Work Order history, and local knowledge. This is more likely to apply to the sanitary or combined sewer system than for the separated storm system.

- **Theoretical pipe capacity calculation (for sanitary or combined sewers).** First, calculate the theoretical pipe capacity for each pipe segment from the proposed discharge point to the confluence with the King County system (or outfall point). One number SPU has been using as a base of appropriate discharge is 10% of full flow capacity. Resources for this calculation include the theoretical flow capacity calculator spreadsheet, and Haestad's FlowMaster.

- **SPU Sewer Capacity Model (for combined sewers).** Next, look at the Sewer Capacity Model on ArcView to see if there are modeled shortfalls for the pipes.

- **History of SPU work orders (for all SPU sewers).** Then, look at Field Ops Mapping System (FOMS) to see if there have been work orders on these pipes that indicate decreasing capacity. These would include frequent preventive maintenance cycles (e.g., scheduled root-cutting every 6 months) or responses to backups. To get more information about a specific work order, use the Maximo Reports Access database.

A note to SPU CIP designers: You may need to consult with USM for research assistance if you do not have access to the Sewer Capacity Model.

1.8 DESIGN GUIDELINES FOR CORETAP INTO AN SPU STRUCTURE FOR A TEMPORARY CONNECTION

A coretap into a Brick MH must be below the upper cone of the MH and witnessed by an SPU inspector.

The core hole diameter may not be greater than 8" into a brick structure.

For a coretap into a concrete structure with a cone top, the core location is preferred to be below the cone. A coretap into a concrete cone should be located at ½ the height of the cone.

Tap location may be in the riser section above the cone/top slab and below the frame and grate.

Core location shall be the maximum distance possible from the ladder and any appurtenance in the structure (e.g. outlet trap, inside drop connection piping, flow control piping, etc).

1.9 SPECIAL CONSIDERATIONS TO BE WRITTEN INTO THE PERMIT OR CONTRACT DOCUMENTS

It is important to ensure that restrictions and special conditions are documented in an official, enforceable manner. In many cases, restrictions and special conditions can be included in a permit, but sometimes the only way to document requirements are to include them in a project's plans or specifications.

Permits are typically a King County Industrial Waste Construction Dewatering permit, an SDOT Street Use Permit, or potentially a DPD-Issued SSPTD. For MIPs and other-agency projects, the plan reviewer may require that the conditions are included on the plans, specs, or other contract documents. For SPU CIP project, the conditions should be included as appropriately in the plans, specs, or other contract documents.

Include the following special conditions for each discharge scenario:

1.9.1 When discharge is surface discharges, directed into SPU infrastructure:

a. The Final configuration must be approved by the inspector when discharge occurs on the surface in city ROW.

b. The structure shall be left in as good or better condition as it was prior to the project's connection. If the structure is damaged during work associated with the temporary connection, contractor shall be responsible for repairing or replacing the structure as specified by the SPU inspector.

1.9.2 When discharge is piped into the lid of an existing structure:

a. Discharge pipe must be hard-plumbed and fitted with a 90-degree pipe and must extend at least three feet into the structure;

b. Temporary cover must be placed over the lid of the structure; and

c. Temporary fencing must be placed around the structure to restrict accessibility.

d. The structure shall be left in as good or better condition as it was prior to the project's connection. If the structure is damaged during work associated with the temporary connection, contractor shall be responsible for repairing or replacing the structure as specified by the SPU inspector.

e. During periods where SPU requires access to the structure, SPU representatives reserve the authority to request that discharge through the temporary connection be stopped.

f. Any other requirements, i.e. for a CB, "The sump of the catch basin must be cleaned before and after permitted discharge."

g. Any site-specific instructions about the location, methods, or materials of the connection.

1.9.3 For a Temporary Connection: Coretap to an Existing Manhole:

(Language in italics should be included or modified to be applicable to the individual site)

a. Connection must be scheduled, inspected, and approved by the project's SPU inspector *(specify project's assigned inspector, or by SPU coretap crew. If project needs a coretap, include this language: "Contractors are not allowed to core into mains or structures without prior approval from SPU. To schedule core taps, contact SPU at 206-615-0511 a minimum of 48 hours in advance. SPU shall be on site prior to the start of contractor performed core tap. Contractors performing core taps shall provide the coupon of removed material to SPU.")*.

b. There shall be a maximum of 3" of protrusion of the temporary piping into the structure.

c. There shall be 12" minimum clear on the inside diameter between any two core holes.

d. After the temporary connection is removed, the hole shall be plugged. Remove all pipe (including sand collar), mud in the hole with grout that meets City of Seattle spec 9-12.4(3) (ref. 9-04.3(2)C), and smooth the grout to match the inside face of the structure.

The repair shall be inspected and approved by the project's SPU inspector (or by SPU coretap crew).

e. The structure shall be left in as good or better condition as it was prior to the project's connection. If the structure is damaged during work associated with the temporary connection, contractor shall be responsible for repairing or replacing the structure as specified by the SPU inspector.

f. During periods where SPU requires access to the structure, SPU representatives reserve the authority to request that discharge through the temporary connection be stopped.

g. *For pumped flows, there shall be a minimum of ten feet of gravity pipe prior to connection to the SPU structure.*

h. *Coretap into a Brick MH must be below the cone and witnessed by an SPU inspector.*

i. *The core hole may not be greater than 8" into a brick structure.*

j. *Coretap into a concrete structure with a cone top: Core location is preferred to core below the cone. Coretap to a concrete cone should be at ½ the height of the cone.*

k. *Connection may be in the riser section above the cone/top slab and below the frame & grate.*

l. *Core location shall be the maximum distance possible from the ladder and any appurtenance in the structure (e.g. outlet trap, inside drop connection piping, flow control piping, etc).*

m. *Any site-specific instructions about the location, methods, or materials of the coretap.*

n. *If conditions warrant a inside drop connection, the following language shall be included:*

   1. *The connection shall be a piped inside drop connection per Standard Plan 233b with the following modifications:*
      - *i. Pipe hangers shall be spaced 5' minimum*
      - *ii. No clean-out will be installed*
      - *iii. The drop shall be terminated at an elbow on the existing shelf, directing flow to the channel.*
   2. *All piping and anchors shall be removed with the rest of the temporary connection. Damage to the structure shall be repaired with grout that meets City of Seattle spec 9-12.4(3) (ref. 9-04.3(2)C), and smoothly applied to match the inside face of the structure. The repair shall be inspected and approved by the project's SPU inspector (or by SPU coretap crew).*

1.9.4 For a Temporary Connection: Coretap to an Existing Catch Basin:

(Language in italics should be included or modified to be applicable to the individual site)

a. The sump of the catch basin must be cleaned before and after permitted discharge.

b. Connection must be scheduled, inspected, and approved by the project's SPU inspector *(specify project's assigned inspector, or by SPU coretap crew. If project needs a coretap, include this language: "Contractors are not allowed to core into mains or structures without*

prior approval from SPU. To schedule core taps, contact SPU at 206-615-0511 a minimum of 48 hours in advance. SPU shall be on site prior to the start of contractor performed core tap. Contractors performing core taps shall provide the coupon of removed material to SPU.")

c. The invert of the discharging pipe must be 2" minimum above the invert of the outlet pipe.

d. There shall be a maximum of 3" of protrusion of the temporary piping into the structure.

e. There shall be 12" minimum clear on the inside diameter between any two core holes.

f. Core location shall be the maximum distance possible from the outlet trap and any appurtenance in the structure.

g. After the temporary connection is removed, the hole shall be plugged. Remove all pipe (including sand collar), mud in the hole with grout that meets City of Seattle spec 9-12.4(3) (ref. 9-04.3(2)C), and smooth the grout to match the inside face of the structure. The repair shall be inspected and approved by the project's SPU inspector (or by SPU coretap crew).

h. The structure shall be left in as good or better condition as it was prior to the project's connection. If the structure is damaged during work associated with the temporary connection, contractor shall be responsible for repairing or replacing the structure as specified by the SPU inspector.

i. During periods where SPU requires access to the structure, SPU representatives reserve the authority to request that discharge through the temporary connection be stopped.

j. *For pumped flows, there shall be a minimum of ten feet of gravity pipe prior to connection to the SPU structure.*

k. *Any site-specific instructions about the location, methods, or materials of the coretap.*

1.10 RESOURCES

Ecology's Surface Water Quality Numeric Criteria
http://www.ecy.wa.gov/programs/wq/swqs/criteria.html

King County Industrial Waste Program
http://www.kingcounty.gov/environment/wastewater/IndustrialWaste.aspx

SPU Field Ops Mapping System (FOMS)
http://fieldoperationsmappingsystem/ergis/

SPU Capacity Model GIS Layer

Access through ArcGIS, or could request USM to look up any shortfalls (Gary or Sahba). Permission from Gary Schimick or Sahba Mohandessi and Scott Reese or Holli Brandt: Usmgis/Seperated Systems/ArcReader/Maps/Sep_Systems_Base_Map

Theoretical Pipe Flow Capacity calculator
Excel spreadsheet, available in the J:PlanReview/Dewatering folder; additional resources are the online pipe flow calculator, and Haestad's FlowMaster, purchase this through IT to download onto your computer.

Online Pipe Flow Calculator
http://www.calctool.org/CALC/eng/civil/hazen-williams_g

Maximo Reports
This is an SPU application. You can have IT push it to your computer. It is located at N: MAXAPPS.

TABLE B-1

Guideline for Flowrate Thresholds for temporary discharges to SPU infrastructure				
	Discharge Water Source			
Discharge Pipe System	Surface Water	Uncontaminated Groundwater	Process Water	Contaminated Surface and/or Ground Water
PS[2] (wet season)[1]	230 gpm[5] for 'batch' discharge	8-in pipe: 65 gpm >8-in pipe: 200 gpm[7]		Surface Water: 230 gpm[5] for 'batch' discharge Groundwater: 25,000 gpd
PS[2] (dry season)[1]	230 gpm[5] for 'batch' discharge	8-in pipe: 65 gpm >8-in pipe: 200 gpm[7]		Surface Water: 230 gpm[5] for 'batch' discharge Groundwater: 75,000 gpd
PSS[2] (wet season)	not allowed	not allowed	25,000 gpd	not allowed[3]
PSS[2] (dry season)	not allowed	not allowed	75,000 gpd	
PSD discharging to PS[2] (wet season)	230 gpm[5] for 'batch' discharge	8-in pipe: 65 gpm >8-in pipe: 200 gpm[7]	not allowed	not allowed[4]
PSD discharging to PS[2] (dry season)	230 gpm[5] for 'batch' discharge	8-in pipe: 65 gpm >8-in pipe: 200 gpm[7]		
PSD to Receiving Water (wet season)	No Limitation[6]	230 gpm[5]	not allowed	not allowed
PSD to Receiving Water (dry season)	No Limitation[6]	230 gpm[5]		
PSD discharging to listed or non-listed creek basin (wet season)	230 gpm[5] for 'batch' discharge	230 gpm[5]	not allowed	not allowed
PSD discharging to listed or non-listed creek basin (dry season)	230 gpm[5] for 'batch' discharge	230 gpm[5]		
Ditch & Culvert, or Capacity Constrained Basin (wet season)	230 gpm[5] for 'batch' discharge	230 gpm[5]	not allowed	not allowed
Ditch & Culvert, or Capacity Constrained Basin (dry season)	230 gpm[5] for 'batch' discharge	230 gpm[5]		

[1] Wet Season is November 1 through April 31; Dry Season is May 1 through October 31

[2] Discharges to the public sanitary and combined systems must receive a King County Industrial Waste Discharge Permit.

[3] Proposed drainage water discharge to PSS must receive SPU & KC special permission. A max 25,000/75,000 gpd rate for all discharges may be considered.

[4] Discharge may be allowed if there isn't a PS available, and if the PSD directly discharges into a combined system (opposed to a diversion structure or daylighting in a pond prior to confluence)

[5] PSD discharge limitation of 230 gpm is based on 10% theoretical capacity of a standard 12" pipe at a 2% slope.

[6] General condition is that the discharge shall not cause or contribute to a flooding condition. The maximum discharge rate should be specified based on the pipe size and potential to cause a flooding condition. If weather condition is rainy during discharge, the max discharge rate shall be 230 gpm.

[7] If sewer main is 8-in, the maximum discharge rate shall be 65 gpm; 12-in main 200 gpm; larger main 230 gpm