



# Responsible STORMWATER Handling

Working hand in hand with local water handling authorities, industry can take a responsible role in handling their stormwater resources.

By **CALVIN NOLING**, Engineer and **CLAIRE TONRY**, Attorney and Legal Analyst with StormwaterRx LLC

**Safe and responsible handling of stormwater at an industrial site can provide many benefits for the facility as well as the local water treatment systems.**

**I**n 2004, the EPA estimated that between 23,000 and 75,000 sanitary sewer system overflows occur each year in the United States, resulting in releases of between three and 10 billion gallons of untreated wastewater. Sanitary sewage systems can overflow when the collection system capacity is exceeded due to the combination of sewage discharges, wet weather (infiltration and inflow, and point source stormwater flows), sewer plugging, or when mechanical failures prevent the system from proper operation.

Furthermore, wastewater conveyance and treatment is expensive. Since Congress enacted the Clean Water Act in 1971, communities have spent hundreds of billions of dollars on clean water infrastructure, including wastewater conveyance and treatment systems. In 2002, the EPA estimated that municipalities would need an additional \$331 billion to \$450 billion in capital

expenditures by 2019, while facing funding shortfalls as large as \$177 billion. On top of the capital costs, operating and maintenance costs, including power for wastewater pumping and treatment plant operation, will add considerably to public agency budget requirements.

With such staggering sums in mind, it makes sense for communities to protect and utilize their sanitary sewage infrastructure in the most efficient manner possible. In particular, local officials should scrutinize policies that allow introduction of stormwater, and in particular industrial stormwater, into the sanitary sewer system.

### When to approve?

When should municipalities allow discharges of industrial stormwater to POTWs? The following considerations are vitally important before local officials should allow stormwater to be discharged to the publicly owned sanitary sewer system:

**1. Can the conveyance system handle the additional flow?** Industrial stormwater is infrequently generated and sudden high-volume flows can overwhelm conveyance systems. During storm events, sanitary sewers often are at or near capacity. Overflows or backups of sanitary sewers through manholes and pump stations can be costly, causing permit violations, health hazards and environment damage. Allowing one company permission to use the sanitary sewer for stormwater may precipitate requests from other entities who expect similar treatment. The ability of the conveyance system to handle additional flow from industrial stormwater must carefully be considered.

**2. Can the treatment system handle the additional flow and load?** Even if the flow makes it to the treatment plant, often the unit processes in the facility have difficulty handling abrupt flow increases and pollutant loadings.



**Above is shown an Aquip stormwater filtration system for surface water discharge from an industrial site.**

Problems include:

- Washout of clarifiers due to hydraulic overload or abrupt temperature change;
- Internal plant bypasses or overflows;
- Shock to biological unit processes due to abrupt changes in temperature and organics loading causing pass-through or interference; and
- Overloads to disinfection systems.

Depending on the industry type, industrial stormwater may contain high levels of metals, oils, organics, pesticides, and other toxic pollutants such as PCBs that can be detrimental to the operation of the publicly owned treatment works (POTWs) or the residuals generated in the process. While generalizations can be made about the range of the quality of municipal and point-source (process) wastewaters, industrial stormwater character can vary widely from facility to facility and storm to storm, and should be carefully considered before a POTW makes a blanket decision to accept it.

**“ Expensive POTW infrastructure should be utilized for what it was intended – to treat sanitary sewage ”**

During wet weather periods, some POTWs consistently have trouble meeting permitted biological oxygen demand (BOD) and total suspended solids (TSS) removal requirements. Allowing runoff from industrial operations that is relatively dilute with organics and concentrated with inorganics can further exacerbate this problem.

Industrial stormwater has the potential to cause violations of the POTW's National Pollutant Discharge Elimination System (NPDES) permit and due to dilution, can mask the impact of inorganics present in point-source runoff. Repeat violations by POTWs can lead to fines, costly upgrades and third-party lawsuits.

**3. Can industry provide adequate safeguards to protect POTW infrastructure?** Even if the sewer conveyance and treatment system has capacity to convey and treat industrial stormwater, the municipal authority should assure that the facility will reduce and control pollutants at the point of generation, and be able to do so under any storm conditions any time of the day or night. This may include requiring:

- Preparation and implementation of a pollution prevention plan;
- Spill control, so that spills are contained and do not reach the sewer;
- Segregation of clean and contaminated stormwater. Clean stormwater (e.g. from painted roofs that are not

impacted by process or vented air emissions) should be infiltrated or diverted to a surface discharge point, keeping this flow out of the sanitary sewer system.

- Pretreatment including sedimentation to remove trash, oil and dirt, and filtration to remove metals. Pretreatment systems should be designed with adequate capacity and redundancy to assure pretreatment performance whether or not the facility is open for business. Rain does not observe business hours.
- Flow equalization through flow restrictions and limitations (e.g., metered or controlled flow to sanitary sewer connection);
- Financial resources to meet obligations for sewer charges under the proposed conditions.

**4. Are the full costs of managing stormwater included in the proposed connection fees and rates?** Sewer use ordinances are required to assess the costs of managing the POTW infrastructure to users in proportion to the cost of providing service. One user class should not subsidize other user classes. The sewer agency should make sure that its connection fee for accepting stormwater represents the full risk-weighted cost of providing the service, including:

- Is the initial connection fee based on the peak flow to be discharged, as infrastructure upgrades are often required to manage peak flows?
- Will the discharge produce a first flush effect to which high strength surcharges should apply?
- Will the inorganics that predominate in industrial stormwater runoff degrade POTW sewage sludge biosolids quality and risk the beneficial use determination for use or disposal of sewage sludge biosolids? Is there an adequate cost recovery mechanism in place for the added costs of such a determination?
- Does the user fee include allowances for administration, inspections, compliance oversight, increased operator attention to treatment system

operation, and allowances for permit preparation, submittal review, and enforcement?

- Does the agency's capital improvement program represent the true cost of infrastructure renewal and replacement?

**5. Does the industry have options other than use of the POTW?** Many communities grant the use of POTW resources only when it can be demonstrated that there are no other reasonable alternatives for dealing with the stormwater. For example:

- Can effective source prevention measures be implemented? For example, can the pollutant generating activity be done indoors? Can uncontaminated runoff be segregated from contaminated runoff to minimize flow to the POTW?
- Are pretreatment measures available that are specifically designed for the unique flow and chemical characteristics of industrial stormwater?
- Can stormwater be beneficially reused rather than discharged?
- Can on-site treatment and discharge to the storm sewer be implemented in lieu sanitary sewer discharge?

The latter point is particularly pertinent in light of recent advancements in cost-effective and reliable stormwater treatment technologies specifically designed for the unique flow and chemical characteristics of industrial stormwater. Moreover, NPDES industrial stormwater discharge permits often impose stricter standards than local pretreatment standards designed for industrial wastewater. Compare, for example, the EPA's general industrial stormwater permit for direct discharges, which has a 0.636 mg/L copper benchmark concentration, with the Los Angeles Sanitation Districts' 15 mg/L maximum copper concentration limit for discharges to POTWs.

The EPA has determined that industrial facilities are generally capable of reducing stormwater pollutant concentrations (and loads) to the benchmark concentrations in its Multi-Sector General Permit.

Exempting some facilities from generally applicable requirements and shifting the pollutant removal burden to the POTW gives select business a competitive advantage at the expense of taxpayer-subsidized POTWs and water quality.

## Conclusion

Expensive POTW infrastructure should be utilized for what it was intended – to treat sanitary sewage. Careful consideration of the above factors is strongly advisable prior to any commitment to allow use of the sanitary sewer to accept stormwater of any nature, especially industrial stormwater. Communities that have considered such factors typically allow it only in rare and unique situations when no other options are available. **PE**



Calvin Noling is a principal engineer with StormwaterRx LLC. He is involved in water policy development in the Northwest, is a regular invited speaker at regional and national technical conferences, and has published numerous technical

papers on the subject of industrial stormwater. He has a BS and MS in Environmental Engineering, and is a licensed professional engineer in several states.



Claire Tonry is an attorney and legal analyst at StormwaterRx LLC. Ms. Tonry has written on environmental economics and sustainability law and worked on several Clean Water Act legal and administrative matters. She has a B.A. in Environmental

Studies from the University of Oregon and a J.D. and Certificate in Environmental and Natural Resources Law from Lewis & Clark Law School. She is a member of the Oregon Bar.

References are available upon written request. Visit [www.stormwaterx.com](http://www.stormwaterx.com) for more information.