

**National Association of Clean Water Agencies
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**National Pretreatment & Pollution Prevention
Workshop**

IPP Implementation & Case History

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Industrial Pretreatment Program Implementation

Wastewater Discharge Types:

Wastewater Generation and Discharge: Stormwater (Contaminated), household sanitary wastewater, commercial wastewater, industrial/process wastewater, groundwater (Contaminated or inflow)

- (1) Discharge to Surface Waters (Direct Discharge)
- (2) Discharge to Ground Water
- (3) Discharge to Sanitary Sewers (Indirect or Pretreated Discharge)
(For today's discussion)

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Sanitary Sewer Discharge - WWTP Pollution Control Capabilities

(1) Treatment Design Parameters:

- Typical: BOD, TSS, and NH₃
- More Recently: P(T), NO₃, Metals

(2) Treatment/Removal of Pollutants as a by-product of biological treatment

- Biodegrade: O&G/TPHC, organics
- Release to air: Volatile organics
- Sludge Accumulation: Conventional pollutants, Metals, organics (untreated)

Untreated pollutants (not accumulated in the sludge) are released to the stream and subject to the Surface Water Quality Standards (under a NPDES permit)

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Protecting Wastewater Treatment Plant

- (1) Development of plant specific local discharge limits
 - Assess all applicable criteria: Design, NPDES permit requirements, process inhibition and interference, sludge quality interference and worker safety
 - Develop technical based and legally defensible local limits
- (2) Adopt Local Sewer Ordinance or IPP regulations
 - Include local limits, prohibited discharge & federal Pretreatment/Categorical standards
 - Include requirements of Federal 403 CFR 403 pretreatment regulations, Categorical regulations, State pretreatment regulations and local industrial discharge requirements

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How to Control Discharges to a WWTP

- (1) Domestic Discharges:
(Controlled by managing Sewer Capacity Allocations and Wastewater Management Plan based upon the plant flow & loading design criteria)
- (2) Infiltration/Inflow (Stormwater & Groundwater):
(Controlled by sewer conveyance system maintenance, separation of stormwater)
(Typically stormwater discharge to a sanitary sewer is prohibited)
- (3) Industrial, Commercial and other Non-Domestic Discharges:
(Regulated under Industrial Pretreatment Program regulations)

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Develop & Adopt Local Industrial Pretreatment Program (IPP) Regulations

- (1) As a Federal/State Delegated IPP or Local (Non-delegated) IPP
- (2) Develop & Adopt Local Discharge Limitations;
- (3) Tools/Regulations to Control Industrial (Non-domestic) Discharges:
 - Federal Pretreatment & Categorical Regulations (40 CFR 403, 40 CFR 404 to 699);
 - State Pretreatment Regulations;
 - Local and WWTP Specific Pretreatment Regulations
- (4) Develop and adopt local pretreatment regulations using federal and state pretreatment regulations and guidelines. Include provisions for variance and exception and defined enforcement actions.

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Regulating New (and Existing) Non-Domestic Dischargers

- (1) Pre-Application meeting (Helpful tool)
- (2) Submission of permit application & information:
 - Detailed facility and process info
 - Water use & water balance
 - Process wastewater generation and discharge info
 - Wastewater flow and discharge qualitative data
 - Flow schematic
 - Certification
- (3) Conduct Site Inspection
- (4) Issuance of a draft (and public notice)
- (5) Comments, negotiations and issuance of the final discharge permit)

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Permit Types, Requirements & Example:

(1) Major Dischargers: Significant Indirect Users (Volume or loading based)

Major Dischargers: Federal Categorical Industries (CIU, NS-CIU)

Minor Dischargers: Small volume, groundwater, discharge of concern

(2) Typical permit includes:

- Permit/Site Information;
- Statement of Basis
- Discharge Limits
- Sampling & Submission of reports
- Other General Conditions: Other notification & reporting requirements, emergency spills and by-pass notifications, violation notification, pretreatment maintenance & operation, enforcement and penalties, Compliance with local and other regulations and requirements by reference, etc.

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Typical IPP Permit – Statement of Basis

- (1) A flow limit is imposed to control sewer and treatment plant capacities. The permit flow limit is based upon the existing sewer discharge agreement between the Authority and the company.
- (2) The BOD₅, TSS, and NH₃-N discharge limits and surcharge provisions are based upon the Authority regulations. A BOD₅ concentration over 250 mg/L, TSS over 250 mg/L and NH₃-N over 40 mg/L are subject to the Authority surcharge provision. However, a concentration over BOD₅ (1,000 mg/L), TSS (1,000 mg/L), and NH₃-N (80 mg/L – Daily Max.; 40 mg/L – Monthly Avg.) permit limits are subject to enforcement actions.
- (3) The pH and Oil & Grease limitations are based upon the Authority regulations.
- (4) The monitoring requirements for COD, TDS, Phosphorus, Phenols, and Cobalt parameters are imposed to collect data to determine if any future discharge limitations are warranted for these parameters. The monitoring for Cobalt is included because of its use in the manufacturing.
- (5) In a letter dated 9/30/98, USEPA had determined that the facility is subject to 40 CFR § 433 Metal Finishing Categorical Standards (not 40 CFR § 471 Non-Ferrous Metal Forming). The facility has indicated that its regulated chemical etching operations have not changed since 1982. Therefore, company's metal finishing operations are subject to 40 CFR § 433.15: Pretreatment Standards for Existing Sources (PSES).

Based upon information provided by the company on 9/15/05, enclosed "Table 1" lists waste streams generated at the facility, estimated volumes of streams, and streams subject to 40 CFR 433 and/or Authority regulations. The facility generates and discharges approximately 52% of wastewater from the regulated categorical processes. A combined discharge location (DSN-01 Manhole) has been selected by the Authority to regulate the facility's discharge to the Authority and a Combined Waste Stream Formula (CWSF) is used to calculate permit limits.

Enclosed "Table-1" lists 40 CFR § 433 Categorical limits (in columns 2 and 3), CWSF (at 52.4% dilution) based 40 CFR § 433 Categorical limits (in columns 4 and 5), and Authority local discharge limits (in columns 6 and 7). Column 8 and Column 9 list the daily maximum and monthly average limits calculated for the company's discharge by selecting the most stringent of the 40 CFR § 433 and Authority limits. These limits are applicable at the combined discharge outfall "DSN-01 Manhole". Therefore, the basis for proposed metal limits are:

40 CFR 433 based Limits: Cadmium (Daily maximum and Monthly average), Chromium (Daily maximum and Monthly average), Copper (Daily maximum and Monthly average), Lead (Daily maximum and Monthly average), Nickel (Monthly average), Silver (Daily maximum and Monthly average), Zinc (Daily maximum and Monthly average), Cyanide (Daily maximum and Monthly average), and TTO (Daily maximum).

Authority Regulations Based Limits: Arsenic (Daily maximum), Mercury (Daily maximum), and Nickel (Daily maximum).

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Permit Discharge Limits & Monitoring (Example)

TABLE - 1: EFFLUENT LIMITS DETERMINATION TABLE
(Northern NJ - Metal Finishing Industry)

DISCHARGE AND SAMPLING LOCATION: HDC - 1 Manhole (Outfall DSN - 01)

REGULATED POLLUTANTS	40 CFR 433 CATEGORICAL LIMITATIONS				DISCHARGE LIMITS		PERMIT LIMITS	
	For Process Wastewater Only		CWSF Applicable To the site		(Applicable To Total Discharge)		(Outfall DSN - 01)	
	(With 00% Dilution)		(With 52.1% Dilution)					
	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.
FLOW (gpd)	N/A	N/A	N/A	N/A	Report	72,000	Report	72,000
BOD5 (+)	N/A	N/A	N/A	N/A	1000.0	N/A	1000.0	1000.0
COD	N/A	N/A	N/A	N/A	Report	N/A	Report	Report
TSS (+)	N/A	N/A	N/A	N/A	1000.0	N/A	1000.0	1000.0
TDS	N/A	N/A	N/A	N/A	Report	N/A	Report	Report
NH3-N (+)	N/A	N/A	N/A	N/A	80.0	N/A	80.0	40.0
Phosphorus	N/A	N/A	N/A	N/A	Report	N/A	Report	Report
Oil & Grease	N/A	N/A	N/A	N/A	100.0	N/A	100.0	100.0
pH (in SU)	5.50 - 9.50		5.50 - 9.50	N/A	5.50 - 9.50	N/A	5.50 - 9.50	N/A
Arsenic (As)	N/A	N/A	N/A	N/A	0.85	N/A	0.85	Report
Cadmium (Cd)	0.69	0.26	0.33	0.12	0.40	N/A	0.33	0.12
Chromium (Cr)	2.77	1.71	1.33	0.82	1.50	N/A	1.33	0.82
Cobalt (Co)	N/A	N/A	N/A	N/A	Report	N/A	Report	Report
Copper (Cu)	3.38	2.07	1.62	0.99	4.40	N/A	1.62	0.99
Lead (Pb)	0.69	0.43	0.33	0.21	0.40	N/A	0.33	0.21
Mercury (Hg)	N/A	N/A	N/A	N/A	0.14	N/A	0.14	Report
Nickel (Ni)	3.98	2.38	1.91	1.14	1.40	N/A	1.40	1.14
Silver (Ag)	0.43	0.24	0.21	0.11	2.20	N/A	0.21	0.11
Zinc (Zn)	2.61	1.48	1.25	0.71	2.00	N/A	1.25	0.71
Cyanide	1.20	0.65	0.57	0.31	0.80	N/A	0.57	0.31
Phenols	N/A	N/A	N/A	N/A	Report	N/A	Report	Report
Total Toxic Organics (**)	2.13	N/A	1.02	Report	Report	N/A	1.02	Report

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Case History:

- (1) Typical/Standard Permit: Industry subject to local regulations and local limits;
- (2) Beverage Manufacturer (High BOD loadings)
 - High BOD and load variations;
 - WWTP had available loadings but NPDES BOD discharge restriction;
 - Allowed high BOD5 but upper cutoff concentration & loads limits
- (3) Electronic Chip Manufacturer (Arsenic discharge):
 - Subject to 40 CFR 433 regulations;
 - But WWTP subject to low arsenic limit based upon SWQS;
 - Imposed stringent local arsenic limit and required additional pretreatment
- (4) Phosphorus discharge (High discharge volume):
 - WWTP NPDES permit compliance concern & treatment cost;
 - Imposed local limits, required pretreatment and isolation (offsite disposal) of concentrated waste stream.

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Case History (Continued):

(5) Phosphorus Discharge (Low volume/load):

- Low discharge volume;
- Process control in place and remaining phosphorus not from process source;
- Provided variance under the “Exception Provision” of the local regulations along with internal control and periodic monitoring (proposed).

(6) Cosmetic Manufacturer (High TDS):

- WWTP does not control TDS, in fact adds TDS due to the chemical treatment;
- SWQS (Drinking water) based TDS local limit
- Allowed higher TDS local limits, required industry internal TDS controls, limited treatment, isolating high-strength TDS stream for disposal (Pending)

(7) Metal Finisher (Nickel discharge):

- High nickel discharge/slugs;
- Inspection, investigation and identified pretreatment issue;
- Denied higher permit limit and assessed penalties;
- With improved O&M and added treatment capacity, facility in compliance.

(8) Molybdenum (NCCW bleed) Discharge:

- Low local limit for molybdenum
- Required source control and product substitution (Cooling tower chemical)
- Allowed compliance schedule to bring in compliance.

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Other Industrial Wastewater Permitting Issues :

- (1) Pharmaceutical chemicals
 - Difficulty in identifying pollutants, Expensive testing, Confidential info/data
 - No Federal Categorical regulations/guidelines,
 - Released untreated (possible prohibition/control under WWTP bypass criteria)
- (2) Pharmaceutical (40 CFR 439) Ingredients use in various manufacturing (Cosmetic industry, Soaps, etc.)
- (3) Bio-diesel (No categorical, Local control under FOG & loading limits)
- (4) Microbreweries (Issues: BOD loads, alcohol discharge, worker safety)
- (5) Fracking wastewater discharge (Data collection) (Prohibited in NJ).

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