WASTEWATER PRETREATMENT SYSTEM
DESCRIPTION SUMMARY
5-15-2009

1.0 INTRODUCTION

Aramark Uniform Services is a full service company for the laundering of garments, linens, floor mats, mops, etc (SIC Code 7218 Industrial Laundries). The end product from this production unit is clean clothes (clothes refer to all items laundered including floor mats and linen). The water usage, pounds of clothes cleaned, wastewater flow, and wastewater treatment chemicals are tracked and logged on a daily basis.

2.0 WASHROOM (LAUNDERING OPERATIONS)

The industrial wastewater generated from the washroom contains the following physical characteristics:

- pH: 11.5 S.U.
- Temperature: 110°F - 130°F
- Flow: 80,000 - 120,000 GPD (Average)
- Constituents: Solids, Oil & Grease, Fluorides, Chlorides, Sulfates, Nitrates, and other materials at low concentrations

3.0 WASTEWATER RECEIVING PITS

Wastewater leaving the washroom is collected in a 6,000 gallon holding pit before being introduced into the wastewater treatment system. There is only one process generating industrial wastewater, which eliminates the possibility of mixing incompatible waste streams.

4.0 HEAT EXCHANGER

Warm wastewater (110°F - 130°F) from the collection pit is pumped through the heat exchanger to minimize the amount of energy required to pre-heat incoming water to the washroom.

5.0 SHAKER SCREENS

A small motor produces a gyratory motion that results in a combination horizontal and vertical movement of the fine filtering screen. The resulting motion separates the laundry dirt and suspended solids from the hot wastewater. The filter screen removes solids above screen mesh size, which limits the size of solids entering the Tube Bundle and minimizes the possibility of plugging the tubes. The solids are analyzed annually in accordance with EPA Toxicity Characteristic Leaching Procedure (TCLP). Disposal of solids is via dumpster.

6.0 EQUALIZATION TANK

The equalization tank is used for storing and mixing of wastewater over a fixed period of time. This produces a uniform and steady volume of discharge, which reduces the peak concentration of the waste as it enters the treatment system after it has passed through the heat exchanger and then the shaker screen. The equalization tank includes a mixer to prevent accumulation of settled materials.

7.0 TUBE BUNDLE

The Tube Bundle allows for efficient mixing of modified clays, coagulants, and flocculants. The Tube Bundle process is configured in a long pipe of constant diameter (~ 20' in length). Mixing energy and reaction time is constant in any given cross section of the pipe thereby allowing the suspended solids to contact the conditioning chemicals equally. The result is better solid/liquid separation at lower chemical and energy consumption.

8.0 DISSOLVED AIR FLOATATION CELL (DAF CELL)

The Dissolved Air Filtration (DAF) cell is an Eimco Circular DAF system. The DAF cell is designed to treat a flow of 250 GPM. The wastewater flow is from the Tube Bundle to the DAF cell by pump.

Microscopic air bubbles are produced and mixed with flocculated wastewater containing the suspended contaminants. The small bubbles attach themselves to the suspended particles, which gives them a net positive buoyancy. The buoyant clusters of particles and bubbles rise smoothly to the surface forming a float, which is removed by skimming.

There are two EDUR DAF Recycle Pumps – one pump is active and one pump for backup. Air and recycled "clean" effluent is introduced to the pump suction. Under pump discharge pressure this air/effluent mixture becomes supersaturated with air micro bubbles. This enriched stream is then recycled back into the dirty effluent and fed to the DAF unit. Up to 35% air can be achieved with 100% saturation and micro bubble size smaller than 30 micron.

An outer ring is provided to minimize short circuit currents. A 0.5 HP motor propels the top and bottom skimmers. Floating sludge from the cell flows by gravity to the sludge tank. Settled sludge must be pumped to the sludge storage tank. Floating sludge must be removed on an hourly basis, and settled sludge should be removed daily to prevent carry-over of solids into the city sewer system.

When removing sludge from the bottom, it is recommended that the skimmer be run at the end of the day, allowing the disturbed solids to resettle. Also when operating the skimmer, the sludge pump should be run intermittently (i.e., 2 min ON, 5 min OFF, etc.). This allows the sludge hopper to fill with sludge and also reduces the risk of pumping water to the sludge holding tank.

In comparison to sedimentation clarification technology, DAF technology is much more cost effective with lower engineering design costs, lower installation cost, one-third the process time, and overall a more effective technology.

9.0 SLUDGE HOLDING TANK/PERLITE SLUDGE MIXING TANK

There is a 3,000-gallon sludge holding tank that receives sludge from the DAF cell. The sludge is then pumped to the 1,200-gallon Sludge Mixing tank where Perlite (siliceous rock) is introduced into the sludge and thoroughly mixed.

10.0 SLUDGE FILTER PRESS/SOLID WASTE DISPOSAL

After the sludge is thoroughly mixed it is pumped to the Pacific Filter Press. The filter press dewaters the sludge and produces a filter cake. The effluent generated from the filter press is pumped to the pit for recycling. The filter cake is dropped into a 20 cubic yard dumpster.

The treatment capacity of the Pacific Filter Press is approximately 25 cubic feet (0.93 cubic yards) per press run. There are one to two press runs per day depending on the type of production. The filter press generates approximately one full 20 cubic yard dumpster per month or 240 cubic yards per year. Aramark Uniform Services currently has a contract with Waste Management (see below) for disposal of 300 cubic yards per year. The wastewater treatment sludge (filter cake) is considered a "special waste" in accordance with Mass DEP 310 CMR 19.061, which requires disposal into an approved landfill. The sludge filter cakes are analyzed annually in accordance with EPA Toxicity Characteristic Leaching Procedure (TCLP).

Waste Management
Turnkey Landfill
90 Rochester Neck Rd.
Rochester, NIH. 03839
Waste Profile # 55981

Contact Heather Sidmore
1 800 963 4776
Solid Waste # DES-SW-SP-95001

The effluent generated from the filter press passes through an Oil/Water Separator before it is pumped to the wastewater receiving pit for recycling. Any oil accumulated is transferred to a 275-gallon Waste Oil Tank located in the Hazardous Waste - Waste Oil Accumulation area for proper management prior to disposal.

Aramark Uniform Services is registered with the Mass DEP as a Very Small Quantity (VSQG) of Hazardous Waste (Safety Kleen Parts Cleaner) and VSQG of Waste Oil (oil collected in Oil/Water Separator and waste oil from Fleet Servicing operations of 45 vehicles). The waste solvent generated per calendar month is approximately 11-gallons, and the waste oil generated per month is approximately 5-gallons.

The sludge generated by the wastewater treatment system does not meet the definition of hazardous waste as specified in 310 CMR 30.010 or as identified in 310 CMR 30.110. However, if the characteristics of sludge change in the future and become hazardous waste by definition, Aramark Uniform Services will comply with hazardous waste management rules at 310 CMR 30.605 for the IWPS to treat hazardous industrial wastewater or hazardous industrial wastewater sludge.

11.0 PH ADJUSTMENT TANK/EFFLUENT DISCHARGE TO SEWER

The pH adjustment system consists of a 1,000-gallon tank, mixer, chemical addition pump, and pH probe. The pH of the wastewater exiting the DAF Cell Tank is approximately 11.5 S.U. The alkalinity is automatically adjusted to a pH of approximately 7.0 (between 5.5-10.5) by the addition of Sulfuric Acid (H_2SO_4). There is an audible alarm that will sound at the pump control panel if pH is out of set point range. After pH adjustment the effluent is pumped from the pH neutralization tank into the city sewer at Outfall #001. There is a 1" sampling port conveniently located just prior to the discharge location, which is used to collect samples to be analyzed in accordance with the GLSD Permit monitoring requirements.

12.0 SECONDARY CONTAINMENT

The wastewater treatment system is enclosed in a berm with a containment capacity greater than 22,000-gallons, which is the volume of the largest tank (20,000-gallons) plus 10%. The other chemical storage tanks that are located inside the wastewater treatment room but outside of the bermed area have individual secondary containment, mostly via double wall systems incorporated as part of the tank design. Should Totes or other small containers located outside of the bermed area rupture, the floor is slopped inward toward the bermed area. The floor will serve as secondary containment for these smaller containers of chemicals.

13.0 EMERGENCY AUTOMATIC SHUTOFF CONTROLS

If the water level in the EQ Tank reaches 12-feet, an alarm will sound at the control panel. If the water level in the EQ Tank reaches 14.5-feet, the control panel will automatically shutdown the main water feed to the Washroom, which will eliminate wastewater flow to the wastewater treatment system.

The pH neutralization tank contains a pH probe. If the pH is measured outside of the range of 5.5-10.5, an alarm will sound at the panel. Wastewater treatment operators will manually shutdown the main water feed to the Washroom, which will eliminate wastewater flow into the sewer system. The wastewater treatment system and clean water feed to the Washroom will not be restarted until the cause of the emergency has been identified and resolved.

The wastewater treatment system design does not allow discharge bypass wastewater or allow discharge of bypass wastewater through any sewer connection. Intentional bypassing due to an emergency condition is prohibited.

14.0 WASTEWATER TREATMENT SYSTEM FLOW DESIGN CAPACITY

There are currently no EPA Categorical Industrial User (CIU) Standards in 40 CFR, Chapter I, Subchapter N for Industrial Laundries Point Source Category. The general provisions in 40 CFR 403 does apply. In June of 1999 EPA withdrew a 1997 proposed rule to develop and promulgate national categorical pretreatment standards for Industrial Laundries.

The Greater Lawrence Sanitary District (GLSD) has developed and implemented Rules and Regulations for Industrial Dischargers. The Facility has a Local wastewater discharge permit (#403-6) with the GLSD.

The flow design capacity of the wastewater treatment system is 250 GPM, which is defined by the limitation of the DAF Cell treatment system. The GLSD permit lists the volumes of wastes to be discharged on page 4, which includes a limit of 229 GPM. Based on the design limits of the DAF system and the volume limitations as specified in the permit, the flow design treatability capacity has been determined as follows below:

SYSTEM FLOW CAPACITY BASED ON GPM (MAX)		
Limiting Factor	**GPM**	**% Capacity**
DAF Design Flow	250	MAX
Actual GPM <188: DAF 250 GPM Design Flow	< 188	133%
Actual GPM <188: GLSD 229 GPM Permit Limit	< 188	122%

The current wastewater treatment system design meets or exceeds the GLSD discharge Rules and Regulations effluent limitations. The current wastewater treatment system has been designed to prevent the intentional diversion of wastewater that does not meet discharge standards. The wastewater treatment system is equipped to treat at least 120% of design flow.

In addition, current wastewater treatment system design is in accordance with Mass DEP New Sewer System Extension and Connection Permit Program regulations 314 CMR 7.05(2)(g) Industrial Users: 3. Design, and Construction Standards for IWPS.