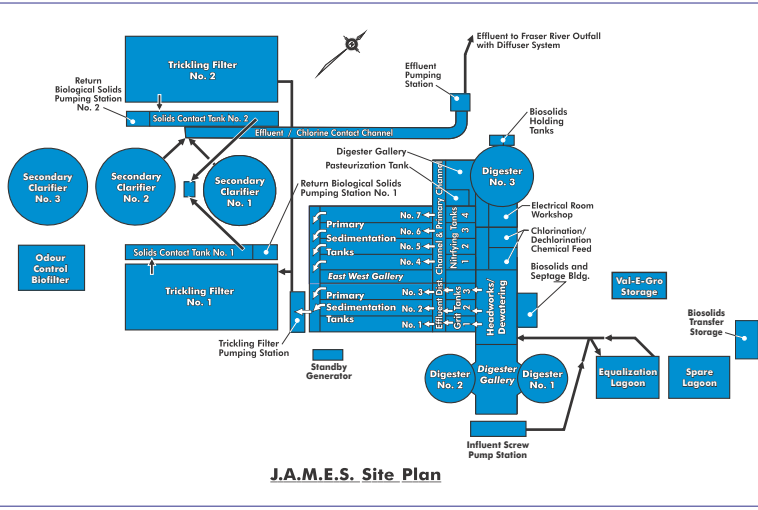


Joint Abbotsford - Mission Environmental System



J.A.M.E.S. Water Pollution Control Centre

OPUS DAYTONKNIGHT



BEFORE THE STAGE VI EXPANSION

The first stage of the J.A.M.E.S. Water Pollution Control Centre (WPCC) was constructed in 1980 to treat the wastewater from 60,000 persons to a treatment level between primary and secondary. In order to treat the increasing volume of strong industrial and commercial waste and to maintain the effluent quality at the required level, chemical addition was implemented. The chemical treatment resulted in a high operating cost for chemicals and produced chemical sludge.

To avoid the high cost of chemicals, and at the same time to improve discharge to the Fraser River, the Water Pollution Control Centre second stage expansion was authorized and completed in 1989. This expansion changed the treatment process to a secondary Tricking Filter-Solids Contact process.

Subsequent upgrades resulted in the

expansion of secondary treatment facilities required because of growing residential and industrial loadings, as well as the connection of new sewerage areas to the plant, such as Mission and Aldergrove.

THE STAGE VI EXPANSION

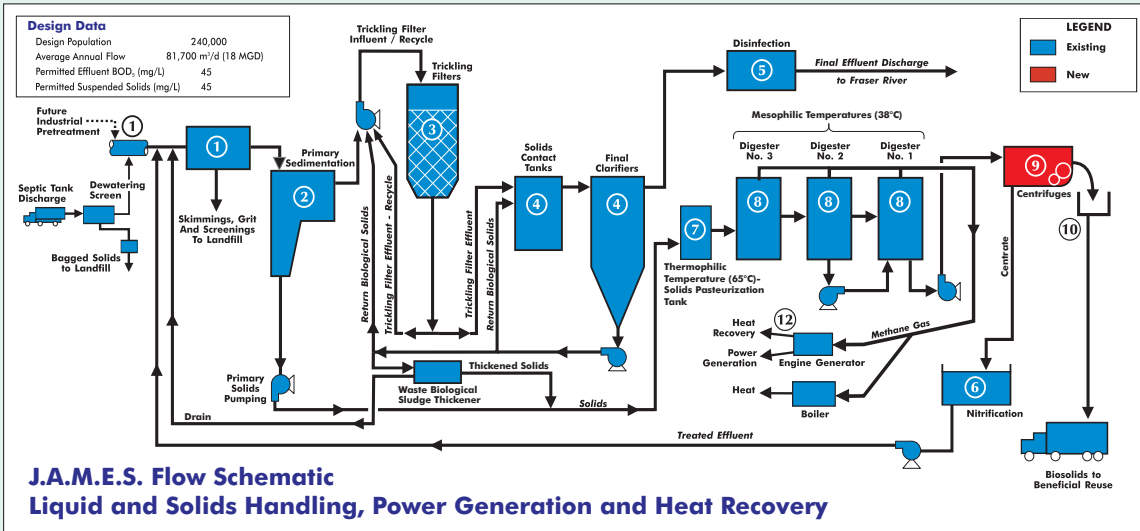
The Stage VI expansion, which was completed in January 2001, increases the treatment capacity of the plant to a sewage equivalent of 240,000 persons. At the design stage, the serviced population and industry was equivalent to 160,000 persons. The expansion approximately doubles the pre-existing primary sedimentation, grit removal and anaerobic digestion facilities. In addition, the Stage VI expansion now provides a nitrification process, a solids pasteurization process and a biosolids thickening and storage facility.

The nitrification process treats the high strength wastewater that is generated in the biosolids dewatering process and reduces the concentration of ammonia effluent released into the Fraser River in high concentrations.)

The pasteurization process provides a "Class A" level of treatment for the biosolids, which allows the biosolids to be re-used for a wide range of purposes including silviculture, horticulture, parkland, golf courses, mine reclamation and use as a garden compost. A marketed fertilizer, Val-E-Gro, is produced at the WPCC.

The J.A.M.E.S. WPCC is the third largest secondary treatment plant in British Columbia.

Treatment Processes



- 1. HEADWORKS** - The influent is discharged into the treatment by two screw pumps. Rags, sticks, plastics and other objects are removed from the influent, compressed and discharged to a waste hopper, in conjunction with grit from a grit separator system and skimmings from a skimmings dewatering screen. Septic waste is discharged through a separate dewatering screen with the solids being discharged into a bag and transported to a landfill.
- 2. PRIMARY SEDIMENTATION** - Wastewater is held in a quiescent state for 2 to 7 hours. Lighter particles float and are skimmed off to a skimmings well. Heavy particles sink and are raked into sumps where they are pumped to the solids pasteurization tank.
- 3. TRICKLING FILTERS** - The settled wastewater is distributed over plastic media plates where dissolved organics are absorbed on growing biomass and particles

- are filtered out or trapped. A cloudy trickling filter effluent is then pumped to the solids contact tank.
- 4. SOLIDS CONTACT TANKS and SECONDARY CLARIFIERS** - The cloudy trickling filter effluent is combined with settled solids from the clarifiers and mixed in the solids contact tank before settling is again provided in the clarifiers. The now clear water flows to a final disinfection step. Some of the settled solids are returned to be remixed with the biotoler effluent; the remainder is pumped to a waste biological sludge thickener and, from there, to the pasteurization tank.
 - 5. DISINFECTION** - A chlorine solution is injected into the clarified secondary effluent as it enters a chlorine contact tank. The clarified effluent is retained in this tank for a period of time to allow the chlorine to react with the effluent. As chlorine can be hazardous to

- fish, any residual chlorine is neutralized by the injection of a sulphur dioxide solution into the flow prior to its discharge into the Fraser River.
- 6. NITRIFICATION** - The high strength liquid from the biosolids dewatering process (centrate), contains relatively high concentrations of ammonia that are toxic to fish. The nitrification process reduces the ammonia concentration to acceptable levels and returns the flow to the head of the plant for subsequent treatment prior to discharge into the Fraser River.
 - 7. SOLIDS PASTEURIZATION** - Solids from the primary sedimentation tanks are pumped into a thermophilic (high temperature) pasteurization process tank. The pasteurization process reduces pathogenic bacteria (disease causing organisms) to negligible concentrations.

8. SOLIDS STABILIZATION - The solids from the pasteurization process are then pumped to three anaerobic digesters. Stabilized biosolids are produced which are greatly reduced in organic content and odour. Methane gas is also produced as a by-product; this gas is combusted in the Treatment Centre's boilers for digester heating and building areas.

9. BIOSOLIDS DEWATERING - Once digested, the stabilized biosolids are dewatered to a dry soil-like consistency by centrifuges.

10. BIOSOLIDS STORAGE - The dewatered biosolids are temporarily stored on site and are routinely delivered to reclamation sites in the B.C. Interior and elsewhere. This product is classified as "Class A" biosolids, which are considered virtually disease-free and are suitable for unrestricted use for a wide range of applications. Some of the biosolids are mixed with woodchips and sand to provide a marketed fertilizer called Va-E-Gro.

11. ODOUR CONTROL - All grated channels are covered in the headworks, biosolids and septage receiving areas, and the biosolids dewatering area. The foul air from these areas, together with that from the pasteurization process, is directed to a soil/wood biofilter. The pasteurization foul air is pre-treated in a scrubber system.

12. POWER GENERATION AND HEAT RECOVERY - Methane gas is produced as part of the digestion process. This gas is used to fuel an engine generator and a boiler. Approximately 180KW of electrical energy is generated and used at the Centre. Heat recovered from the engine generator and heat from the boiler system is used to heat the biological solids. The boiler is also used for space heating. A 1500 kW standby genset is available to provide power for all equipment.

The Abbotsford-Mission J.A.M.E.S. Water Pollution Control Centre provides a secondary level of treatment and is one of the most cost-effective wastewater treatment facilities in British Columbia. The process produces a high quality effluent, is energy-efficient, is operator friendly and has a high resistance to shock loading. ♦