CONESTOGA-ROVERS
& ASSOCIATES

HYDE PARK COLLECTION AND AQUEOUS PHASE LEACHATE (APL) TREATMENT SYSTEM OPERATION AND MAINTENANCE MANUAL

HYDE PARK LANDFILL
NIAGARA FALLS, NEW YORK

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TABLE OF CONTENTS

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

TABLE OF CONTENTS

Page

TABLE OF CONTENTS

LIST OF FIGURES
(Following Text)

LIST OF TABLES
(Following Text)

LIST OF APPENDICES

1.0 INTRODUCTION

This operating manual was prepared for the Hyde Park Landfill Collection and Aqueous Phase Liquid (APL) Treatment Systems, which are located within and adjacent to the Hyde Park Landfill (Site).

The Hyde Park Landfill is located in an industrial area in the extreme northwest corner of the Town of Niagara, New York, immediately south of the boundary line between the Towns of Niagara and Lewiston and immediately east of the boundary line between the City of Niagara Falls and the Town of Niagara. Operations at the Site involve collecting, storing, treating, and loading of APL, Non-Aqueous Phase Liquid (NAPL), and solid material collected from the landfill for subsequent disposal.

Groundwater collected in the vicinity of the landfill is transferred to decanters where Dense Non-Aqueous Phase Liquid (DNAPL) is separated from the APL by decanting. The DNAPL is disposed via incineration at a permitted off-Site facility. The APL is treated on Site at the Hyde Park APL Treatment Facility prior to discharge to the Niagara Falls Water Board Sanitary Sewer System. The Collection System and Groundwater Treatment Plant are designed to operate unattended.

The facility is owned by Occidental Chemical Corporation (OCC), with remedial responsibility assigned to Glenn Springs Holdings, Inc. (GSH), an affiliate of OCC. Conestoga-Rovers & Associates (CRA) has been retained by GSH to operate the Site. The personnel responsible for the hazardous waste management activities, including operation of the Collection and APL Treatment Facility at the Hyde Park Landfill is provided in Table 1.1.

1.1 PURPOSE AND SCOPE OF OPERATION AND MAINTENANCE (O&M) MANUAL

The purpose of this operating manual is to provide operating personnel with:

i) A description of the collection and storage system

ii) A description of the APL treatment system

iii) An understanding of the unit operations and control parameters inherent in system operation

iv) The system start-up, normal operating, and shutdown procedures

v) A list of operator actions required in the event of alarm notifications

The Hyde Park Collection and APL Treatment Systems operate under the substantive provisions of the New York State Department of Environmental Conservation (NYSDEC) Treatment, Storage, and Disposal Facility Regulations (6NYCRR 373). Within these regulations, the Site fits the exemption:

373-1.1(d)(1)(xii), Elementary neutralization units or wastewater treatment units

This exemption requires compliance with the following sections of 6NYCRR 373:

i) Personnel Training (373-3.2)

ii) Preparedness and Prevention (373-3.3)

iii) Contingency Plans and Emergency Procedures (373-3.4)

iv) Use and Management of Containers (373-3.9)

v) Tank Systems (373-3.10(k))

vi) Testing, Tracking, and Record Keeping Requirements, Section 376.1(g)(1)(iv)

and:

i) A label or sign stating "Hazardous Waste" must identify all areas, tanks, and containers used to accumulate hazardous waste. In addition, tanks and containers must be marked with other words to identify their contents.

An Integrated Contingency Plan (ICP) to address the above has been prepared for the Site.

Additionally, GSH complies with other applicable law governing the identification and handling of hazardous wastes including but not limited to:

- 6NYCRR 370 Hazardous Waste Management System, General
- 6NYCRR 371 Identification and Listing of Hazardous Waste
- 6NYCRR 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities
- 6NYCRR 376 Land Disposal Restrictions

These regulations are referenced in the appropriate sections of the manual.

Equipment operating procedures and manuals provided by the manufacturers or suppliers are stored in the operations file in the Hyde Park APL Treatment Facility

Control Room (Building HP 5). A set of as-built drawings for the Site is on file in the Hyde Park Landfill Office (Building HP 1).

A thorough review and understanding of this manual and other designated reports is essential for safe, environmentally sound, efficient operation of the facility. Designated reports consist of the following:

i) Hyde Park Collection and APL Treatment System O&M Manual (this document)

ii) Site Specific Health and Safety Plan for Operation and Maintenance Activities

iii) Hyde Park Procedures Manual

iv) Controls Manual

The "Hyde Park Landfill Collection and APL Treatment System Manual" will be updated as significant modifications are made to the system. A formal internal review of the Hyde Park Landfill Collection and APL Treatment System will be performed a minimum of every 5 years. Revisions of the manual will be distributed to the Site and appropriate Regulatory Agencies.

1.2 DEFINITIONS

A brief description of terms used in this manual follow:

AAHH	Analysis Alarm High High
AALL	Analysis Alarm Low Low
AI	Analysis Indicator
AIT	Analysis Indicating Transmitter
APL	Aqueous Phase Liquid
APW	Aqueous Phase Liquid Purge Well
BOD	Biochemical Oxygen Demand; a standard test used in assessing wastewater strength
COD	Chemical Oxygen Demand; a standard measure of oxygen required to react with the organic material in a wastewater
CRA	Conestoga-Rovers & Associates
Decanter	Vessel that is used to separate two different liquids
DNAPL	Dense Non-Aqueous Phase Liquid
EBCS	Existing Barrier Collection System
FI	Flow Indicator
FIC	Flow Indicating Controller

FIT	Flow Indicating Transmitter
FQI	Flow Quantity Indicator
FRP	Fiberglass Reinforced Plastic
FV	Flow Control Valve
GPM	Gallons Per Minute
GSH	Glenn Springs Holdings, Inc
HMI	Human Machine Interface
LAH	Level Alarm High
LAHH	Level Alarm High High
Laminar Flow	A flow in smooth layers without mixing of layers (non-turbulent). Also streamlined flow.
LD	Leak Detection
LI	Level Indicator
LIC	Level Indicating Controller
LIT	Level Indicating Transmitter
LSH	Level Switch High
LSHH	Level Switch High High
LT	Level Transmitter
LV	Level Control Valve
MCC	Motor Control Center
MH	Manhole
NAPL	Non-Aqueous Phase Liquid
NPW	NAPL Purge Well
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSGS	New York State Geological Survey
OBCS	Overburden Barrier Collection System
OCC	Occidental Chemical Corporation
PAHH	Pressure Alarm High High
PCBs	Polychlorinated Biphenyls
PDS	Pressure Differential Switch
PID	Photoionization Detector
PIT	Pressure Indicating Transmitter
PLC	Programmable Logic Controller
PMP	Performance Monitoring Plan
Precipitation	Separation of solids from solution
PW	Purge Well/Pumping Well
RCRA	Resource, Conservation, and Recovery Act
RRT	Requisite Remedial Technology
RW	Recirculation Well

Sacrificial Carbon	Carbon used to remove compounds from the wastewater stream, such as Polychlorinated Biphenyls (PCBs) or Tetrachlorodibenzo-p-dioxins (Dioxin), which would prevent reactivation of the primary carbon adsorbers
SC	Source Control Well
SOC	Soluble Organic Carbon; a standard measure of the organic contaminant level of a wastewater
TOC	Total Organic Carbon; a standard measure of the organic contaminant level of a wastewater
Turbidity	Cloudiness of water caused by suspended solids
USEPA	United States Environmental Protection Agency
VLDPE	Very Low Density Polyethylene
VOC	Volatile Organic Compound; an organic compound with a high vapor pressure; typically the compound evaporates at relatively low temperatures
WAN	Wide Area Network

1.3 BUILDING AND EQUIPMENT NOMENCLATURE

The equipment and buildings and their designations are listed below.

1.3.1 BUILDING NUMBERS

The Building locations are shown on Figure 1.1. A list of the building numbers is as follows:

- HP 1 Office Building
- HP 2 Locker Room Building
- HP 3 Equipment Wash Building
- HP 4 Motor Control Center
- HP 5 Treatment Building
- HP 6 Maintenance Building

1.3.2 SPILL CONTAINMENT AREAS

The Spill Containment Areas are shown on Figure 1.1. A list of the spill containment areas is as follows:

- Decanter Dike
- Equipment Wash Building (Building HP 3)
- Trailer Loading Pad
- Storage Dike
- Treatment Building (Building HP 5)

1.3.3 VESSELS

A list of vessels is as follows:

HP-01	Leachate Storage Tank No. 1	HP-39	Process Water Break Tank
HP-02	Leachate Storage Tank No. 2	HP-40	Pressure Control Tank
HP-03	Decanter No. 1	HP-41	Safety Shower Head Tank
HP-04	Decanter No. 2	HP-42	Coalescing Filter
HP-05	Decanter No. 3	HP-43	Air Dryer Pre-filter
HP-07	Effluent Tank	HP-44	North Air Dryer
HP-08	Backwash Tank	HP-45	South Air Dryer
HP-11	Leachate Storage Tank No. 3	HP-46	Dryer After Filter
HP-12	Leachate Storage Tank No. 4	HP-49	Sand Filter Bed A
HP-13	Leachate Storage Tank No. 5	HP-50	Sand Filter Bed B
HP-15	Wet Air Receiver	HP-51	Sand Filter Bed C
HP-16	Dry Air Receiver	HP-52	Sand Filter Bed D
HP-17	Process Collection Tank	HP-53	Sand Filter Bed E
HP-20	Settler	HP-54	Sand Filter Bed F
HP-26	Sacrificial Carbon Adsorber A	HP-55	Blowdown Tank
HP-27	Sacrificial Carbon Adsorber B	HP-56	Blowdown Separator
HP-31	Main Carbon Adsorber A	HP-57	Boiler
HP-32	Main Carbon Adsorber B	HP-58	Chemical Feed Tank
HP-33	Main Carbon Adsorber C	HP-59	Water Softener
HP-34	Main Carbon Adsorber D	HP-60	Brine Tank

1.3.4 PUMPS

A list of pumps is as follows:

P-11	APL Purge Well Pump 1	P-152B	NAPL Purge Well Pump 6MR
P-12	APL Purge Well Pump 2	P-161LA	NAPL Purge Well Pump 10U
P-101	Wet Well D Pump	P-161LB	NAPL Purge Well Pump 9U
P-102	Wet Well C Pump	P-161LC	NAPL Purge Well Pump 8U
P-104	Source Control Well Pump 2	P-204	Process Collection Tank Pump No. 1
P-111	NAPL Purge Well Pump 1U	P-205	Process Collection Sump Pump
P-112	NAPL Purge Well Pump 4U	P-211	NAPL Purge Well Pump 8M
P-113	Wet Well A Pump	P-212	Process Collection Tank Pump No. 2
P-113A	NAPL Purge Well Pump 1L	P-215	Backwash Transfer Pump
P-114	NAPL Purge Well Pump 2UR	P-222	Backwash Pump
P-115	NAPL Purge Well Pump 2M	P-223	Effluent Pump
P-116	NAPL Purge Well Pump 2L	P-224	Leachate Feed Pump No. 1
P-122	NAPL Purge Well Pump 3M	P-234	NAPL Purge Well Pump 7U
P-123	NAPL Purge Well Pump 3L	P-264	Leachate Feed Pump No. 2
P-124	NAPL Purge Well Pump 4M	P-291-1	Peroxide Addition Pump
P-133	Leachate Recycle Pump	P-293R-1	Diamond Filter Pump
P-134	Decanter Dike Sump Pump	P-293R-2	Diamond Backwash Pump
P-143	Source Control Well Pump 3	P-375	Storage Dike Sump Pump
P-144	Source Control Well Pump 4	P-703	Settler Electrolyte Feeder
P-145	Source Control Well Pump 5		
P-152	NAPL Purge Well Pump 5UR	P-903	Sludge Filter Area Sump Pump
P-152A	NAPL Purge Well Pump 6UR		

1.3.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following minimal protective equipment must be worn by employees in the Hyde Park treatment area:

- Hardhat
- Safety Glasses
- Steel-toe Shoes
- Long Sleeve Shirt

In addition, some areas or conditions may require the use of:

- Chemical Resistant Suit
- Chemical Resistant Boots
- Chemical Resistant Gloves
- Full Face Gas Mask with Carbon Canister
- Hearing Protection

See the Site Specific Health and Safety Plan for Operation and Maintenance Activities at the Hyde Park Treatment Facility, Love Canal Treatment Facility, Durez North Tonawanda Treatment Facility, and Durez NT Inlet Cove (CRA, 2010) for additional safety and health related questions.

2.0 SITE DESCRIPTION

2.1 HISTORY

The Hyde Park Landfill is a disposal facility where approximately 80,000 tons of liquid, sludge and debris chemicals, primarily chlorobenzenes, were placed from 1953 until the landfill was closed in 1975. In 1978, Hooker Chemicals and Plastics Corp., now OCC, capped the landfill with clay. In April 1982, the court approved a Stipulation and Judgment Approving Settlement Agreement (Settlement Agreement) between United States Environmental Protection Agency (USEPA), the NYSDEC, and OCC. Investigations as part of the approved Settlement Agreement indicated significant chemical migration into the bedrock, including the presence of NAPL. Negotiations then led to a second court document, a Stipulation on Requisite Remedial Technology Program (RRT Stipulation), approved by the United States District Court in August 1986.

The RRT Stipulation resulted in installation of the Groundwater Collection, Storage, and Treatment Systems discussed in this manual as well as a final clay/geomembrane cap. Construction activities on the Overburden Collection Systems, NAPL Collection System, Source Control System, APL Collection System, and the final landfill cap were initiated in 1989 and continue to be refined on a routine basis. Additional remedial programs identified in the RRT Stipulation include an Intermediate Formations Study (monitoring ongoing), Deep Formations Study (not required), Community Monitoring Program (ongoing), Gorge Seep Survey (ongoing), and Industrial Protection Program (completed).

Since initiation of remedial activities, responsibility for operation of the Site has been assigned by OCC to GSH.

2.2 SITE BACKGROUND

2.2.1 SITE DESCRIPTION

The Site occupies approximately 23 acres in the northwest corner of the Town of Niagara, New York, adjacent to the Town of Lewiston to the north and the City of Niagara Falls to the west. The location of the Site is shown on Figure 2.1. The Site is bound by Hyde Park Boulevard to the west, New Road (New York Power Authority [NYPA] access road) to the north, Ferro Electronic Materials, Inc. (formerly TAM Ceramics) to the south, and vacant property owned by Armand Cerrone, Inc. to the east.

The Site is located approximately 2,000 feet east of the Niagara River Gorge.

2.2.2 SITE GEOLOGY

The overburden in the immediate vicinity of the Site ranges in thickness from 3 to 34 feet, generally increasing from east to west. The overburden consists of a thin layer of fill (typically 0 to 3 feet thick) overlying a thick regionally present red-brown lacustrine silty clay layer, overlying a layer of silt and sand glacial till (typically 2 to 5 feet thick), overlying the bedrock.

The most recent nomenclature systems are those presented by Zenger (1965), Rickard (1975), and Brett et al (1995). Brett et al (1995) significantly revised the nomenclature system for the Niagara region, building upon regional stratigraphic correlations and formalizing informal unit names. The nomenclature of Brett et al (1995) has been officially recognized by the NYSGS (New York State Geological Survey) and has been adopted for use at the Site.

Lithologic descriptions of the stratigraphic units defined in Brett et al (1995), are summarized in Table 2.1. Only those stratigraphic units relevant to the Site are presented. The descriptions presented in Table 2.1 are also representative of the bedrock in the vicinity of the Site.

The proper names of the stratigraphic units have been shortened for use in Hyde Park Landfill reporting as follows:

Formal Name	*Short Name*
Eramosa Formation	Eramosa
Vinemount Member of the Goat Island Formation	Vinemount
Ancaster Member of the Goat Island Formation	Ancaster
Niagara Falls Member of the Goat Island Formation	Niagara Falls
Pekin Member of the Gasport Formation	Pekin
Gothic Hill Member of the Gasport Formation	Gothic Hill
DeCew Formation	DeCew
Burleigh Hill Member of the Rochester Shale	Rochester Shale

2.2.3 SITE HYDROGEOLOGY

The groundwater flow direction in the overburden is primarily in a downward vertical direction with limited horizontal migration due to the low hydraulic conductivity of the overburden.

The Site is situated between the NYPA power conduit tunnels to the east, the NYPA Forebay to the north, and the Niagara River Gorge to the west. Due to these complexities, extensive studies were conducted between 2000 and 2004 to define the flow zones beneath the Site. The additional studies resulted in the development of a new conceptual model for the Site. The original three-interval conceptual model (Upper/Middle/Lower) was replaced with an 11-flow zone conceptual model. The major elements of the new Site conceptual model are:

- Eleven bedding-parallel (nearly horizontal) groundwater flow zones, FZ-01 being the shallowest and FZ-11 being the deepest
- Recharge to the aquifer from precipitation, the NYPA Forebay, and potentially the NYPA conduits
- Dominant vertical flow in the shallowest flow zones
- Dominant horizontal flow in the deeper flow zones
- Local disruption of flow conditions by remaining wells that are open across multiple flow zones
- Discharge of Site groundwater to the Niagara River Gorge under non-pumping conditions
- Containment of Site groundwater by the bedrock pumping wells under pumping conditions

The investigations were documented in several major reports, and are summarized in the August 2004 report *Comprehensive Remedial Characterization Report, Hyde Park Landfill Site* (RCR-04).

These investigations demonstrated that the conventional hydraulic performance monitoring requirements defined in the RRT were not suitable for the Site due to the hydrogeologic complexity of the Lockport bedrock. The USEPA recognizes that there may be problems with conventional monitoring approaches in *Elements for Effective Management of Operating Pump and Treat Systems* (USEPA, 2002). In this document, the USEPA recommends using converging "lines of evidence" for containment demonstration. This approach was adopted for the performance evaluation

documented in the RCR-04. Several lines of evidence were selected for the performance evaluation:

- Flow directions interpreted from potentiometric surface maps
- Flow directions estimated from vertical gradients
- The distribution of Site-related parameters in groundwater
- The distribution of major ions and the relative age of groundwater
- Groundwater flow modeling

Following these lines of evidence, the RCR-04 concludes that the Bedrock NAPL Plume Containment System satisfies the performance objective of the RRT, and that the RRT containment objective is maintained year-round. Based on the findings in the RCR-04, a *Performance Monitoring Plan* (PMP) was approved in 2006, which defines the new monitoring requirements for the Site.

3.0 COLLECTION AND STORAGE SYSTEM

The Hyde Park Collection and Storage System is comprised of a series of collection systems including:

i) The Source Control (SC) System

ii) The Overburden Barrier Collection System (OBCS)

iii) The Existing Barrier Collection System (EBCS)

iv) The NAPL Plume Containment System Purge Wells (PWs)

v) The APL Plume Containment System Purge Wells (APWs)

These systems are designed to provide appropriate capture of APL and/or NAPL in the areas of concern. Each Collection System pumps APL and/or NAPL via double-contained forcemain piping to the Hyde Park Storage Area. At the Storage area, the groundwater flow from each program is directed to either one of three decanters. Decanter No. 1 (HP-03) collects water from the bedrock purge wells. Decanter No. 2 (HP-04) collects water from the overburden wet wells (Wet Well A, Wet Well C, and Wet Well D). Decanter No. 3 (HP-05) collects water from the SC wells and the bedrock purge wells (PW-8U, PW-8M, PW-9U, and PW-10U). Leachate Storage Tank No. 1 (HP-01) and Leachate Storage Tank No. 2 (HP-02) both collect water from the bedrock APL purge wells. The decanters separate NAPL from APL via gravity separation. APL overflows the decanters into Leachate Storage Tanks No. 1 and No. 2 (HP-01 and HP-02). Leachate Storage Tanks No. 3, No. 4, and No. 5 (HP-11, HP-12, and HP-13) are connected to Leachate Storage Tanks No. 1 and No. 2 (HP-01 and HP-02) via an equalization line between the tanks. NAPL is periodically removed from the decanters for off-Site incineration.

The Collection and Storage System is described schematically on Process Flow Diagrams 1 and 2 (located in Appendix A). The Site layout detailing the location of the Collection and Storage System is depicted on Figures 1.1 and 3.1.

Start-up, normal operation, and shutdown procedures for the collection and storage system are maintained in the Hyde Park Control Room. The following is a detailed description of the components of the Collection and Storage System.

3.1 HYDE PARK REMEDIAL COLLECTION SYSTEMS

The remedial collection systems for the Site are the systems as defined in the 1982 Settlement Agreement and the 1986 RRT Stipulation. These systems have been

periodically modified to attain the objectives of the RRT Stipulation. Presently, the remedial collection systems are composed of the following programs (see Figure 3.1):

i) SC Program

ii) Overburden RRT Program

iii) Lockport Bedrock RRT Program

iv) Niagara Gorge Face Seep Collection/Diversion System

The objectives of each program and current components of the programs are discussed in the following sections.

3.1.1 SOURCE CONTROL SYSTEMS

As per the RRT Stipulation, the purpose of the SC Program is to "...reduce the amount of chemicals migrating downward from the Landfill to the maximum extent practical..." by removing any remaining NAPL from within the landfilled waste materials. The performance criterion is the collection of as much NAPL as is reasonably possible.

3.1.2 COMPONENTS

The SC system is comprised of six pumping wells. However, only five of the six wells are active. SC-1 is inactive due to a separation between the well screen and riser pipe. Each active well is equipped with a level transmitter and pump connected to a double contained forcemain and discharging to Decanter No. 3 (HP-05). A totalizing flow meter is installed on the forcemain prior to entering Decanter No. 3 (HP-05). Table 3.1 provides installation data for the SC wells. The forcemain system is equipped with a leak detection system, which is discussed later in this manual, Section 3.4-Leak Detection System.

SC Extraction Wells

SC-1 (inactive)	SC-4
SC-2	SC-5
SC-3	SC-6

SC Well Pump SC-2 is a positive displacement 1-horsepower pump manufactured by Protech, capable of pumping 5 gallons per minute (GPM). All other SC Well Pumps are all 1-horsepower centrifugal pumps manufactured by Grundfos (Model 10E11) capable of pumping 5 GPM. The pumps are constructed of stainless steel.

3.1.3 OPERATIONS

The SC wells are operated on a periodic basis based on water level in each well. The level for each SC well is recorded daily on the Daily Average Reading Log (see Appendix B). If the well level exceeds the operator-selected set point by 3 feet, the well is manually started. When the level falls 1.5 feet below the set point, the well will automatically stop. The well will also shut down due to automated shutdown sequences, which are discussed later in this manual, Section 6.5.2-Shutdown Sequences.

Since final cap completion, flows from the SC wells have decreased considerably. As of January 2009, the average combined monthly SC flow is less than 30 gallons per month. The majority of liquid removed from these wells is NAPL (based on the annual APL/NAPL ratio tests).

3.2 OVERBURDEN RRT SYSTEM

The Overburden RRT System serves to prevent lateral migration of Site contaminants in the overburden. The system is comprised of two primary components as follows:

i) The EBCS

ii) The OBCS

These systems are shown on Figure 3.2.

3.2.1 EBCS COMPONENTS

The EBCS is an overburden drain collection system consisting of perforated clay tile that completely surrounds the original landfill. It was installed in 1978 at the base of the landfill to provide containment of APL/NAPL seeps that occurred at the perimeter of the clay-capped landfill. In 1994, when the final cap was placed on the landfill, the EBCS was covered by additional remedial wastes and the new clay and very low density polyethylene (VLDPE) cap. Currently, the EBCS serves to collect APL and NAPL within the landfill. The original EBCS consisted of two wet wells (Wet Well A and Wet Well B). However, during the recapping, Wet Well B was converted to a monitoring manhole and leachate now gravity flows through the former wet well to Wet Well A. All flow which gravity drains to Wet Well A is automatically pumped via double-contained

forcemain to Decanter No. 2 (HP-04). A leak detection system is installed with the Wet Well A forcemain and is discussed later in this manual, Section 3.4-Leak Detection System. A cross-section of the EBCS is provided as Figure 3.3. Typical wet well and manhole details including piping and instrumentation configurations are on file in the Hyde Park Office Building. Table 3.2 presents the depths and elevations for each manhole in the system.

Wet Well A Pump (P-113) is a 3-horsepower centrifugal self-priming pump as manufactured by Goulds (Model 3796), capable of pumping 40 GPM at 23 pounds per square inch (psi). The pump is constructed of CD4MCu (a stainless steel alloy).

3.2.2 EBCS OPERATIONS

The EBCS operates continuously. Collected groundwater gravity flows to Wet Well A. When the water level reaches the pump start elevation, the wet well pump energizes sending APL/NAPL via double-contained forcemain to Decanter No. 2 (HP-04). The pump will stop when the water level falls to the stop elevation. The well will also shut down due to automated shutdown sequences, which are discussed later in this manual, Section 6.5.2-Shutdown Sequences. USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

3.2.3 OBCS COMPONENTS

The OBCS is a drain collection system that serves to prevent off-Site migration of APL/NAPL in the overburden. This system was completed in 1990. The OBCS intercepts flow on three sides of the Site (north, west, and south). The flow is directed by gravity to one of two pumping wet wells (Wet Well C and Wet Well D). From the wet wells, the flow is automatically pumped via double-contained forcemain to Decanter No. 2 (HP-04). A leak detection system is installed with the OBCS forcemain and is discussed later in this manual, Section 3.4-Leak Detection System. A typical cross-section of the OBCS is provided as Figure 3.4. Typical wet well and manhole details are on file in the Hyde Park Office Building. Table 3.2 presents the depths and elevations for each manhole in the system.

Wet Well C and D Pumps (P-102 and P-101) are submersible 7½-horsepower centrifugal pumps manufactured by Meyers (Model XP), capable of pumping 50 GPM at 35 psi. The pumps are constructed of ductile iron.

3.2.4 OBCS OPERATIONS

The OBCS operates continuously. Collected groundwater gravity flows to the appropriate wet well (Wet Well C or Wet Well D). When the water level reaches the pump start elevation, the wet well pump energizes sending APL/NAPL via double-contained forcemain to Decanter #2 (HP-04). The pump will stop when the water level falls to the stop elevation. The well will also shut down due to automated shutdown sequences, which are discussed later in this manual, Section 6.5.2-Shutdown Sequences. USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

3.3 LOCKPORT BEDROCK RRT SYSTEM

The Lockport Bedrock RRT System is comprised of two major components as follows:

i) NAPL Plume Containment System

ii) APL Plume Containment System

Both systems include purge wells to remove bedrock APL and/or NAPL, as well as bedrock monitoring wells. The NAPL plume containment system also includes a recirculation well and a hydraulic channel for recirculating groundwater back to the bedrock groundwater regime. This recirculating system has never been operated at the Site as approved by the USEPA.

The requirements for each component are discussed separately in the following two subsections.

3.3.1 NAPL PLUME CONTAINMENT SYSTEM

The primary function of the NAPL Plume Containment System is to intercept APL at the NAPL plume boundary. The system also serves to prevent migration of the NAPL from the Site. The Lockport bedrock was previously divided into the upper, middle, and lower water bearing zones. The Lockport bedrock is currently divided into 11 flow

zones. However; the pumping systems still utilize the three water bearing zones to prevent migration of NAPL from the Site.

As per the RRT Stipulation, Section 4.3.7.1, the performance criteria for the NAPL Plume Containment System are:

i) To prevent lateral NAPL migration to the extent practicable

ii) To prevent lateral APL migration from the NAPL plume to the extent practicable by maintaining an inward hydraulic gradient at the NAPL plume boundary

3.3.1.1 NAPL PURGE WELL COMPONENTS

To achieve an inward hydraulic gradient, a purge well system has been installed within each of the three water bearing zones of the Lockport bedrock. Because of the southward dip of the 11 identified flow zones, the three water bearing zones that the purge wells are divided into do not directly correlate to specific flow zone groupings. These wells are listed below and shown on Figures 3.5, 3.6, and 3.7. Table 3.3 provides installation data for purge wells. Figure 3.8 represents a typical well installation. Details of each purge well are on file in the Hyde Park Control Room.

Upper Bedrock	*Middle Bedrock*	*Lower Bedrock*
PW-1U	PW-2M	PW-1L
PW-2UR	PW-3M	PW-2L
PW-4U	PW-4M	PW-3L
PW-5UR	PW-6MR	
PW-6UR	PW-8M	
PW-7U		
PW-8U		
PW-9U		
PW-10U		

(Note that "R" designates replacement wells).

The recirculation well portion of the system is designed to provide a mechanism for recirculation of APL into the bedrock formation. The APL is intended to promote migration of NAPL towards pumping action and facilitate NAPL removal. The recirculated APL would promote flow of NAPL by maintaining a hydraulic head inside the NAPL Plume, thus increasing hydraulic heads toward the purge wells. At present, the initial recirculation well (RW-3UM) is inactive as approved by the USEPA. This manual will be updated to reflect the operation of the recirculation well after start-up and prior to long-term operation should recirculation be required in the future. Pending demonstration of APL containment across the NAPL plume boundary and successful

implementation of the initial recirculation well, additional recirculation well locations will be evaluated.

The NAPL Purge Well Pump specifications are detailed in Table 3.4.

3.3.1.2 NAPL PURGE WELL OPERATIONS

The NAPL Plume Containment System operates continuously. The Bedrock NAPL Purge Wells are designed to operate based on an operator selected control level specific to each well. Each well is equipped with a continuous pressure/level transducer and flow meter to monitor well performance. The operational range for each pump is selected to maintain adequate drawdown in the well such that an inward gradient is maintained across the identified NAPL plume boundary for the appropriate bedrock zone. From the NAPL purge wells, flow is directed to either Decanter No. 1 (HP-03) or Decanter No. 3 (HP-05) via double-contained forcemain.

The NAPL purge well pumps are controlled by both on/off control and by variable frequency drive control. NAPL purge wells pumps PW-1U, PW-1L, PW-2UR, PW-4U, PW-4M, PW-5UR, PW-6UR, and PW-6MR cycle on and off at 2.5-foot deviations from the set point. NAPL purge wells pumps controlled by variable frequency drives include PW-2M, PW-2L, PW-3M, PW-3L, PW-7U, PW-8U, PW-8M, PW-9U, and PW-10U. The purge well pumps in these wells vary their speed in order to maintain the operator selected level set point. However, the pumps will also cycle on and off at 2.5-foot deviations from the set point if the recharge rate is below the minimum flow of the installed pump.

In the event of an alarm, each well will also shut down due to automated shutdown sequences, which are discussed later in this manual, Section 6.5.2-Shutdown Sequences. USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

3.3.1.3 HYDRAULIC CHANNEL

In January 1995, even though it was not required by the RRT Stipulation, a hydraulic channel was installed north of the Site to allow overburden groundwater to flow vertically to the upper bedrock. The goal of the channel is to promote NAPL flow towards the purge wells by increasing the flow of groundwater in the upper bedrock and eliminate clean overburden water from flowing to Wet Well C for unnecessary

treatment. Evaluations, discussion, and construction information for the hydraulic channel are provided in "Hydraulic Channel Construction Report and Performance Assessment" dated March 1996 and "Hydraulic Channel Performance Report" dated June 1997. Routine maintenance of the Hydraulic Channel is not required. The location of the Hydraulic Channel is depicted on Figures 3.2 and 3.10.

3.3.1.4 RECIRCULATION WELL

The RRT Stipulation proposes recirculating APL from the discharge of the decanters to an injection well. This recirculation of APL is expected to provide an increase in hydraulic head inside the NAPL plume thus increasing hydraulic gradient towards the purge wells. The installed purge well network will capture injected APL. At present, a start-up plan for the installed recirculation well (RW-3UM) has not been submitted as this is not required at this time per USEPA approval. This section will be updated to include pertinent data relevant to the actual operation of the recirculation well and required monitoring following approval of the long-term operation of the recirculation well if required in the future.

A leak detection system is installed in the Recirculation Well chamber and will be discussed later in this manual, Section 3.4-Leak Detection System.

3.3.2 APL PLUME CONTAINMENT SYSTEM

The APL plume contains contaminants which migrated from the NAPL plume before containment was achieved between the NAPL/APL Plume boundary. The APL Plume Containment System serves to contain, by pumping to the extent practicable, APL in the Lockport bedrock northwest of the Site beyond the bedrock NAPL plume boundary. This system specifically addresses that portion of the APL plume that discharges directly to the Niagara River Gorge (referred to as the remediated APL plume in the RRT Stipulation). The system is comprised of two APWs installed near the Niagara River Gorge face. APL Purge Wells No. 1 and No. 2 are sized to remove a flow not to exceed 15 GPM. These wells are intended to contain the APL plume at the gorge face, limiting seep flow, and collect residual contaminants, without drawing NAPL further from the Site.

3.3.2.1 APL PURGE WELL COMPONENTS

To contain the APL plume at the gorge face, limit seep flow, and prevent drawing NAPL further from the Site, APW 1 and APW 2 have been installed. Table 3.5 provides installation data for purge wells. General details of each APL purge well including elevations and layout are on file in the Hyde Park Control Room.

A leak detection system is installed in the forcemain and will be discussed later in this manual, Section 3.4-Leak Detection System.

3.3.2.2 APL PURGE WELL OPERATIONS

The APL Plume Containment System operates continuously. The bedrock APWs are designed to operate based on an operator selected control level specific to each well. Each well is equipped with a continuous pressure/level transducer to monitor well performance. From the APL Purge Wells, flow is directed to Leachate Storage Tank No. 1 (HP-01) and No. 2 (HP-02) via double-contained forcemain.

The APL Purge Well pumps are controlled by variable frequency drive control. The purge well pumps in these wells vary their speed in order to maintain the operator selected level set point. However, the pumps will also cycle on and off at 2.5-foot deviations from the set point if the recharge rate is below the minimum flow of the installed pump.

The wells will also shut down due to automated shutdown sequences, which are discussed later in this manual, Section 6.5.2-Shutdown Sequences. USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

3.4 LEAK DETECTION SYSTEM

The Leak Detection System was rebuilt during the winter of 1999 and updated in 2002. This system is represented on Figure 3.9. The system is designed to provide an alarm to the overall control system and shut down the components of the collection system that may contribute to or be impacted by a leak.

3.4.1 LEAK DETECTION SYSTEM COMPONENTS

To prevent any APL/NAPL that may be released due to a rupture in any remedial system forcemain component, a leak detection system was installed. The Leak Detection System is comprised of double-contained forcemains linked through a series of manholes. Each pump chamber contains a leak sensor. At most manholes, the containment pipe stops at the manhole wall and drains into the bottom of the manhole, while the carrier pipe passes through. Each of these manholes is equipped with one high level switch to detect fluid in the manhole. Each high level switch is set below the top of the manhole or below any electrical panel whichever is lower. This includes all NAPL Purge Wells, APL Purge Wells, SC Wells, and the OBCS and EBCS forcemain systems. Table 3.2 presents the depths and elevations for each manhole in the system. In some cases (i.e., Manhole 54), the containment pipe does not stop at the manhole wall, but carries through the manhole. In this case, the manhole is not equipped with a high level switch.

3.4.2 LEAK DETECTION SYSTEM OPERATIONS

The Leak Detection System provides alarm notification through the overall Site control system. On detection of fluid, the sensor will signal the Programmable Logic Controller (PLC), which in turn will trigger the leak detection alarm for the specific location. The PLC will initiate an automated shutdown sequence. These shutdown sequences are discussed later in this manual, Section 6.5.2-Shutdown Sequences. The sequence will cause a shutdown of any component of the extraction systems that may contribute to or be impacted by the detected leak. When a leak detector alarm is tripped, the Operator will be notified through the Site autodialer system (covered in Section 6.2.3-Autodialer). An automated shutdown is not necessarily indicative of a shutdown of the collection system. USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

4.0 APL/NAPL STORAGE SYSTEM

The APL/NAPL Storage System is comprised of the decanters and equalization tanks that hold the APL and NAPL prior to either shipment off Site for disposal or treatment in the on-Site APL Treatment Plant.

4.1 DECANTERS

Leachate from the Site collection systems is pumped to one of three decanters. The leachate contains APL and a small amount of NAPL. The decanters are used for separation, temporary storage, and measurement of NAPL. A Typical Decanter Detail is shown on Figure 4.1.

The decanters are connected via a manually operated header tree at their inlet (this allows for flows to be diverted, from each forcemain, to both their process decanter and at least one other decanter, in the event that maintenance activities are required). The decanters are located in the Decanter Dike described in Section 4.3.

4.1.1 PROCESS DESCRIPTION

Three gravity decanters are used to separate APL and NAPL within a diked tank farm. The feed to the decanters is as follows:

Decanter	*Feed Source*	
No. 1	NAPL Purge Wells	PW-1U, PW-1L, PW-2UR, PW-2M, PW-2L, PW-3M, PW-3L, PW-4U, PW-4M, PW-5UR, PW-6UR, PW-6MR, PW-7U
No. 2	Overburden Collection Systems (OBCS, EBCS)	Wet Well A, Wet Well C, Wet Well D
No. 3	SC Wells and NAPL Purge Wells	SC-2, SC-3, SC-4, SC-5, SC-6, PW-8U, PW-8M, PW-9U, PW-10U

Leachate is introduced at the center of each decanter through a 10-inch tee, which limits the inlet velocity to avoid re-mixing of the already separated phases. The NAPL phase, with a specific gravity of approximately 1.2 to 1.4, settles to the bottom of the decanter, while the APL phase, with a specific gravity of 1.0, remains above the NAPL. The APL overflows continuously by gravity from topside nozzles on each decanter into a common transfer line to Leachate Storage Tank No. 1 and/or No. 2 (HP-01 and/or HP-02). The NAPL accumulates in the decanters and is periodically pumped from the

bottom of the decanters to a tanker truck for off-Site treatment at a permitted facility. (See Procedure **Loading NAPL from Decanters** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

4.1.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATIONS

Decanters No. 1, No. 2, and No. 3

Equipment #s:	HP-03, HP-04, HP-05
Manufacturer:	Brown Boiler
Size:	8-foot diameter x 32-foot height
Capacity:	11,200 gallons
Material of Construction:	Vinyl Ester-lined Carbon Steel

Approximately 5,800 gallons of the tank's total volume is available at the bottom of the tank for NAPL accumulation.

The height of the overflow nozzles from the bottom of the tank is 31 feet. The height of the nozzles allows for a gravity flow from the decanter to the leachate storage tanks. Each decanter is equipped with a vent to a carbon adsorber and a conservation vent (PSV-102, PSV-104, PSV-106) capable of both pressure and vacuum relief under non-standard operating conditions.

4.1.3 INSTRUMENT AND CONTROL OVERVIEW

Each decanter is equipped with a level indicator and transmitter (LIT-101, LIT-103, LIT-105) to monitor the NAPL/APL interface in the vessel. The level indicators are based on differential pressure using a NAPL specific gravity of 1.3. In addition, each decanter has a high-high APL level switch (LSHH-102, LSHH-104, LSHH-106) to indicate high APL level in the decanter. A high-high level alarm in any decanter will shut down the collection system via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

Each decanter contains temperature switches and heating pads. These heating pads will turn on when the temperature of the decanter falls below the low set point. The heating pads will turn off if the temperature of the decanter rises to the high set point (40°F). These set points are all set locally at the individual decanters.

4.1.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Decanter NAPL Level	80%	N/A	< 80%	N/A	N/A	LIT-101, LIT-103, LIT-105	A, B, C, J, K
Decanter Level, Switch	1 ft from top of tank	N/A	Gravity Overflow	N/A	N/A	LSHH-102, LSHH-104, LSHH-106	A, B, C, J, K
Decanter Pressure Relief	N/A	N/A	0 psi	N/A	N/A	PSV-102, PSV-104, PSV-016	N/A
Decanter Temperature	N/A	N/A	40 – 70°F	N/A	N/A	TI-102, TSH-109, TI-104, TISH-109, TI-106, TISH-109	N/A

4.2 LEACHATE STORAGE TANKS

The Leachate Storage Tanks hold APL prior to treatment through the Hyde Park APL Treatment Facility.

4.2.1 PROCESS DESCRIPTION

The Leachate Storage System consists of a series of five tanks connected via an equalization header. Leachate Storage Tank No. 1 and No. 2 (HP-01 and HP-02) are located in the Decanter Dike (east side of treatment plant); Leachate Storage Tanks No. 3, No. 4, and No. 5 (HP-11, HP-12, and HP-13) are located in the Storage Dike (north side of treatment plant). The equalization line is installed in an open trench linking the Decanter Dike and the Storage Dike.

The system is designed to be able to operate in a secondary-contained, fail-safe manner with between one and five leachate storage tanks available for service. The total volume of leachate storage is approximately 660,000 gallons. Safety features installed in the system; however, limit the maximum spill volume to 158,000 gallons. In the event of high run off during storm events or snow melt, the storage capacity allows for continued operation of the collection systems when the influent flows exceed the maximum treatment capacity of the Hyde Park APL Treatment Facility.

The Leachate Recycle Pump (P-133) allows APL to be recirculated from the Equalization Line back to Leachate Storage Tank No. 1 (HP-01). This recycle is provided for maintenance activities.

4.2.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATIONS

Leachate Storage Tanks No. 1 and No. 2

Equipment #s:	HP-01, HP-02
Manufacturer:	Brown Boiler
Size:	30-foot diameter x 32-foot height
Capacity:	158,000 gallons
Material of Construction:	Vinyl Ester-lined Carbon Steel

Leachate Storage Tanks No. 3, No. 4, and No. 5

Equipment #s:	HP-11, HP-12, HP-13
Manufacturer:	Brown Boiler
Size:	30-foot diameter x 26-foot height
Capacity:	127,000 gallons
Material of Construction:	Vinyl Ester-lined Carbon Steel

Leachate Recycle Pump

Equipment #s:	P-133
Manufacturer:	Goulds, Model: 3796, centrifugal
Size:	3 x 3 – 10, 10 HP
Design Conditions:	180 GPM @ 30 psi
Material of Construction:	CD4MCu (stainless steel alloy)

Each storage tank is equipped with a vent to a carbon adsorber and a conservation vent (PSV-108, PSV-110, PSV-510, PSV-520, PSV-530) capable of both pressure and vacuum relief under non-standard operating conditions.

4.2.3 INSTRUMENT AND CONTROL OVERVIEW

The leachate storage tanks are equipped with level indicators and transmitters that monitor the height of liquid above the transmitter within the tanks. The level indicators are based on differential pressure using an APL specific gravity of 1.0. In addition, each tank has a high-high level float switch as a redundant high level indication. A high-high level alarm from either the transmitter or the level switch will shut down the collection system via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The

alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

Each leachate storage tank is equipped with a spring-loaded/fail-closed valve on the Equalization Line. A high-high level detection in either the Decanter Dike Sump or the Storage Dike Sump will cause these valves to close. This response limits the maximum spill volume to one storage tank.

Each leachate storage tank contains temperature switches and heating pads. These heating pads will turn on when the temperature of the tank falls below the low set point. The heating pads will turn off when the temperature of the tank rises to the high set point (40°F). These set points are all set locally at the individual tanks.

The Leachate Recycle Pump (P-133) is controlled via hand-off-auto switches. The pump may be started in manual mode, by turning the hand-off-auto switch to "hand," and stopped by turning the hand-off-auto switch to "off." If the hand-off-auto switch is turned to "auto," the pump will run until the switch is turned to "off" or the PLC initiates a pump shutdown. If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The pump is followed by a pressure gauge. This gauge can be used to monitor pump performance and aid in troubleshooting pump problems.

4.2.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Leachate Storage Tanks No. 1, No. 2, No. 3, No. 4, and No. 5 Level	80% (high) 90% (high-high)	N/A	0 – 80%	25% (low) (15% (low-low)	N/A	LIT-107, LIT-109, LIT-810, LIT-820, LIT-830	A, B, C, D, J, K
Leachate Storage Tanks No. 1, No. 2, No. 3, No. 4, and No. 5 Level, Switch	2 ft. from top of tank	N/A	0 – 80%	N/A	N/A	LSHH-108, LSHH-110, LSHH-811, LSHH-821, LSHH-831	A, B, C, D, J, K
Leachate Storage Tanks No. 1, No. 2, No. 3, No. 4, and No. 5 Pressure Relief	N/A	N/A	0 psi	N/A	N/A	PSV-108, PSV-110, PSV-510, PSV-520, PSV-530	N/A

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Leachate Storage Tanks No. 1, No. 2, No. 3, No. 4, No. 5 Temperature	N/A	N/A	40 – 70°F	N/A	N/A	TI-109, TISH-108, TI-112, TISH-111, TI-610, TISH-609, TI-620, TISH-619, TI-630, TISH-629	N/A
Leachate Recycle Pump Discharge Pressure	N/A	N/A	55 - 65 psi	N/A	N/A	PI-110	N/A
Leachate Recycle Pump Strainer Differential Pressure	N/A	N/A	0 – 5 psid	N/A	N/A	PI-1004, PI-1005	N/A
Leachate Storage Tank No. 1, No. 2, No. 3, No. 4, and No. 5 Isolation Valve	N/A	N/A	open	N/A	N/A	UV-940, UV-950, UV-910, UV-920, UV-930	E, F, G

4.3 DECANTER DIKE AND STORAGE DIKE CONTAINMENT AREAS

The equalization trench links the Decanter Dike and Storage Dike thus creating one secondary containment area. The linked dike area serves as the secondary containment for the collection system. The capacity of the containment area is approximately 415,000 gallons. The maximum volume of each tank in the Collection system is as follows:

Decanter No. 1 (HP-03)	11,200 Gallons
Decanter No. 2 (HP-04)	11,200 Gallons
Decanter No. 3 (HP-05)	11,200 Gallons
Leachate Storage Tank No. 1 (HP-01)	158,000 Gallons
Leachate Storage Tank No. 2 (HP-02)	158,000 Gallons
Leachate Storage Tank No. 3 (HP-11)	127,000 Gallons
Leachate Storage Tank No. 4 (HP-12)	127,000 Gallons
Leachate Storage Tank No. 5 (HP-13)	127,000 Gallons

When the system is operating at full collection capacity, all five Leachate Storage Tanks are open on the equalization header; the system has a theoretical maximum storage capacity of 697,000 gallons. Realistically, based on equalization between the tanks and

differences in tank height, the maximum storage capacity is approximately 660,000 gallons.

In the event of a leak/spill within the containment dike area, the leachate storage tanks are equipped with spring-loaded/fail-closed valves (UV910, UV920, UV930, UV940, UV950) that will isolate each tank from the equalization header. This isolation will occur on the presence of high-high level in either the Decanter or Storage Sump. This serves to limit the maximum spill volume to a single storage tank (volume 158,000 gallons).

In the event of a breach in a leachate storage tank, the maximum spill volume accounting for fail-safes is 158,000 gallons. Coupled with a 25-year, 24-hour storm event (49,300 gallons in containment dikes), the required spill containment volume is 207,300 gallons with a containment volume of 415,000 gallons. The containment dikes provide sufficient capacity to meet the regulatory requirements as specified in 40 CFR 264.193.

4.3.1 PROCESS DESCRIPTION

Each dike is equipped with a sump and sump pump to facilitate removal of accumulated rainfall. The Decanter Dike Sump Pump (P-134) has the ability to direct water to either the Process Collection Tank (HP-17) or Decanter No. 3 (HP-05). The Storage Dike Sump Pump (P-375) has the ability to direct water to Leachate Storage Tanks No. 1 (HP-01), No. 2 (HP-02), Decanter No. 1 (HP-03), or Decanter No. 2 (HP-04). Operation of the sump pumps is automatic based on sufficient level in the sump.

4.3.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Decanter Dike Sump Pump

Equipment #:	P-134
Manufacturer:	Goulds, Model: 3171, submersible centrifugal
Size:	2.5 x 3 – 11, 5 HP
Design Conditions:	150 GPM @ 40 psi
Material of Construction:	Ductile Iron

Storage Dike Sump Pump

Equipment #:	P-375
Manufacturer:	Goulds, Model: 3171, submersible centrifugal
Size:	1.5 x 3 – 6, 5 HP

Design Conditions: 75 GPM @ 35 psi
Material of Construction: Ductile Iron

The containment dikes are constructed of 8-inch thick reinforced concrete floor slabs with 8-inch thick reinforced concrete walls. All joints are equipped with waterstops and sealed with a polyurethane sealant.

4.3.3 INSTRUMENTATION AND CONTROL OVERVIEW

Each sump pump is controlled using a hand-off-auto switch. In the "hand" position, the pump will continue to run until the switch is turned to "off." In the "auto" position, the PLC will control the pump. The pump will turn on when the level in the sump reaches the high level probe and turn off when the level in the sump reaches the low-level probe.

A high-high level probe will indicate a problem with the sump pump's performance, will isolate all storage tanks, and will shut down the collection system via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer). If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The sumps also contain a redundant high-high level switch as a redundant high level indication. This switch serves with the same functionality as the high-high level probe.

Each sump contains temperature switches and an immersion sump heater. This heater will turn on when the temperature in the sump falls below the low set point (40°F). The heater will turn off when the temperature in the sump rises to the high set point. These set points are all set locally at the sump.

4.3.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Decanter Dike Sump Level	3" from grating	6" from grating (pump on)	6" – 30" from grating	30" from grating (pump off)	N/A	LCL-111, LCH-111, LSHH-111	A, B, C, D, E, F, G, K
Decanter Dike Sump Level, Float	3" – 6" from grating	N/A	N/A	N/A	N/A	LSHH-112	A, B, C, D, E, F, G, K

Decanter Dike Temperature	N/A	70˚F (heater off)	40 – 70°F	40˚F (heater on)	N/A	TCL-115, TCH-115	N/A
Storage Dike Sump Level	6" from grating	10" from grating (pump on)	10" – 18" from grating	18" from grating (pump off)	N/A	LCL-813, LCH-813, LSHH-813	A, B, C, D, E, F, G , J
Storage Dike Sump Level, Float	6" – 9" from grating	N/A	N/A	N/A	N/A	LSHH-814	A, B, C, D, E, F, G, J
Storage Dike Temperature	N/A	70˚F (heater off)	40 – 70˚F	40˚F (heater on)	N/A	TCL-314, TCH-314	N/A
Storage Dike Sump Pump Discharge Pressure	N/A	N/A	35 psi	N/A	N/A	PI-451	N/A

4.4 REGULATORY REQUIREMENTS

Components within the storage system comply with 6NYCRR 373-3.10 Tank Systems. An annual inspection is performed as noted in Section 7.1.6.1.

5.0 APL TREATMENT SYSTEM

The APL treatment process, shown schematically in Process Flow Diagrams 2 and 3 (located in Appendix A), consists of several process steps for the removal of various constituents from the captured groundwater prior to discharge into the Niagara Falls Water Board Sanitary Sewer System. The primary steps in the treatment process are as follows:

i) Process feed, which consists of the transfer of APL from the leachate storage tanks to the filtration system

ii) Filtration, which consists of sand filtration

iii) Carbon treatment, which consists of both sacrificial and regenerable carbon adsorption beds

The Leachate Feed Pumps (P-224 and P-264) transfer APL from the equalization line to the sand filtration system for solids removal. The system flow rate is controlled by the PLC through a flow meter and flow control valve at the discharge of the Leachate Feed Pumps (P-224 and P-264). The flow range for the treatment system is 200 to 400 GPM.

After solids removal, the flow stream enters a train of two sacrificial carbon adsorbers (HP-26 and HP-27) that are connected in series. These carbon adsorbers are utilized to remove the compounds that restrict regeneration of the main carbon adsorbers. Following sacrificial carbon treatment, the stream passes through three Main Carbon Beds in series. These carbon systems are utilized to reduce the concentration of organic contaminants to below discharge limits. After the Main Carbon Adsorbers, the water is directed to the Effluent Tank (HP-07). Peroxide is added to the treated water to eliminate any nuisance odors which may be caused by biological activity in the carbon adsorbers. Water from the Effluent Tank (HP-07) is then pumped to the Niagara Falls Water Board Sanitary Sewer System. Water quality testing of the effluent is performed in accordance with the Niagara Falls Water Board Discharge Permit (No 49), as described in Sections 7.3 and 7.4.

In addition to the direct processing steps for water treatment, the facility contains a solids system to handle solids generated during sand filter and carbon vessel backwash. The solids are recycled through the decanters to allow accumulated solids to settle in the decanters. Solids settled in the decanters are disposed of via incineration with the NAPL at an off-Site permitted facility.

The treatment facility also has a vapor carbon adsorption system for the treatment of vent gases from process equipment.

Start-up, normal operation, and shutdown procedures for the treatment system are maintained in the Hyde Park Control Room. (See Procedures **Start-up Process** and **Shutdown Process** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room). The following is a detailed description of the components of the APL Treatment System.

5.1 PROCESS FEED SYSTEM

The Process Feed System transfers APL from the Leachate Storage System to the APL Treatment System.

5.1.1 PROCESS DESCRIPTION

The Equalization Line which connects all leachate storage tanks is also used as the header to the Process Feed System. APL is pumped to the Sand Filtration System using either Leachate Feed Pump No. 1 (P-224) or Leachate Feed Pump No. 2 (P-264). Operation of the feed pumps is automatic. The flow into the APL Treatment System is also automatic and controlled using a flow meter and flow control valve downstream of the feed pumps.

5.1.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATIONS

Leachate Feed Pump No. 1

Equipment #:	P-224
Manufacturer:	Goulds, Model: 3196 MTX, centrifugal
Size:	3 x 4 – 8G, 50 HP
Design Conditions:	550 GPM @ 75 psi
Material of Construction:	CD4MCu (duplex stainless steel)

Leachate Feed Pump No. 2

Equipment #:	P-264
Manufacturer:	Goulds, Model: 3196 MTX, centrifugal
Size:	3 x 4 – 8G, 50 HP
Design Conditions:	550 GPM @ 75 psi
Material of Construction:	CD4MCu (stainless steel alloy)

5.1.3 INSTRUMENT AND CONTROL OVERVIEW

The Leachate Feed Pumps (P-224 and P-264) are both controlled via hand-off-auto switches. The pumps may be started in manual mode, by turning the hand-off-auto switch to "hand," and stopped by turning the hand-off-auto switch to "off." If the hand-off-auto switch is turned to "auto" the pump will run until the switch is turned to "off" or the PLC initiates a pump shutdown sequence. If an abnormal condition exists, such as high level downstream in the Effluent Tank (HP-07), the PLC will initiate a pump shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). This action will cause the Leachate Feed Pumps (P-224 and P-264) to shutdown, both pumps will be disabled, and the system operator will be notified via the autodialer (covered in Section 6.2.3-Autodialer). The Leachate Feed Pumps (P-224 and P-264) will not be enabled until the shutdown sequence conditions are cleared and acknowledged by an on-Site operator. Once the pumps are enabled, the operator may restart the pumps by placing the pump in automatic mode at the Human Machine Interface (HMI) screen. If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The Leachate Feed Pumps (P-224 and P-264) are designed to run individually. Leachate Feed Pump No. 1 (P-224) is the primary feed pump. Leachate Feed Pump No. 2 (P-264) is the in-line spare to be used under maintenance conditions. However, both pumps are identical and their functionality may be reversed at any time. Under normal operating conditions, one pump should be placed in "auto" and the other pump should be placed in "off." If both pumps are placed in "auto," only the pump enabled at the HMI will operate.

Leachate Feed Pump No. 1 and Leachate Feed Pump No. 2 are both followed by pressure gauges (PI-230 and PI-231). These gauges can be used to monitor pump performance and aid in troubleshooting any pump problems.

The automatic valve, FV-712, operates to maintain a constant flow into the APL treatment system. This flow is monitored using flow transmitter FIT-712. This flow is displayed and trended by the HMI. The constant flow is based on an operator-selected set point with a flow range of 200 to 400 GPM. The flow valve is controlled using a proportional-integral-derivative control block in the PLC. Based on the flow rate measured by FIT-712, the PLC will cause the flow control valve to modulate and maintain the flow set point.

5.1.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Leachate Feed Pump No. 1 Discharge Pressure	N/A	N/A	60 - 80 psi	N/A	N/A	PI-230	N/A
Leachate Feed Pump No. 1 Discharge Pressure	N/A	N/A	60 – 80 psi	N/A	N/A	PI-231	N/A
Leachate Feed Pump No. 1 Basket Strainer Differential Pressure	N/A	N/A	0 – 5 psid	N/A	N/A	DPI-224	N/A
Leachate Feed Pump No. 2 Basket Strainer Differential Pressure	N/A	N/A	0 – 5 psid	N/A	N/A	DPI-264	N/A
System Influent Flow	15% above operator set point	N/A	200 – 400 GPM	N/A	190 GPM	FIT-712	F
System Influent Flow Valve	N/A	N/A	20 – 80 %	N/A	0%	FV-712	F

5.2 SAND FILTRATION SYSTEM

APL is pumped from the storage tanks to the Sand Filtration System. The primary function of the Sand Filtration System is to remove solids from the APL before it reaches the Carbon Adsorption System. If solids accumulate in the carbon system, the adsorbers must be backwashed. This procedure causes a re-stratification of the carbon adsorber and decreases the carbon's efficiency to remove organic compounds, which is the primary function of the Carbon Adsorption System. Solids collected in the Sand Filtration System are backwashed and transferred to Decanter No. 3 (HP-05) which is discussed in Section 5.6 of this manual.

The vendor operations and maintenance manual, "Owners Manual for Diamond High Efficiency Sand Filter Model VSA-630-ASME" by Diamond Water Systems, Inc., is located in the Hyde Park Control Room.

5.2.1 PROCESS DESCRIPTION

The Sand Filtration System removes suspended solids using a variable flow, high rate sand filter system. The APL flows down through the bed and is partially recycled by a pump to maintain a high flow rate through the filter. The filtrate recycling helps to maintain hydraulic equilibrium in the system, preventing solids break through. With a tangential inlet above the bed, the swirling action of the liquid deposits the solids along the edge of the bed.

A backwash cycle is used to remove solids from the sand filtration system. Treated water from the Effluent Tank (HP-07) is used for this cycle, which consists of a 5-minute backwash and a 1-minute rinse. The recommended vendor backwash and rinse flow rate is 60 GPM. The backwash water is then discharged to the Backwash Tank (HP-08) and transferred to Decanter No. 3 (HP-05). (See Procedure **Backwash Sand Filters** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

5.2.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Sand Filtration System, Vessels

Equipment #s:	HP-49, HP-50, HO-51, HP-52, HP-53, HP-54
Manufacturer:	Diamond, Model: VSA-630-5.0-ASME
Size:	30-inch diameter x 58-inch height
Design Conditions:	400 GPM @ 150 psi
Material of Construction:	304 Stainless Steel
Sand Media:	25 Micron Filter Sand

Diamond Filter Pump

Equipment #:	P-293R-1
Manufacturer:	Ingersoll-Dresser, Model: D824, centrifugal
Size:	4 x 3 – 5F, 10 HP
Design Conditions:	400 GPM @ 58 psi
Material of Construction:	316 Stainless Steel

Diamond Backwash Pump

Equipment #:	P-293R-2
Manufacturer:	Ingersoll-Dresser, Model: D824, centrifugal
Size:	3 x 1.5 – 6F, 3 HP
Design Conditions:	60 GPM @ 40 psi
Material of Construction:	316 Stainless Steel

The Sand Filtration System, as manufactured by Diamond Water Systems (Model VSA-630-5.0-ASME), consists of six separate ASME coded vessels (HP-49, HP-50, HP-51, HP-52, HP-53, and HP-54) operating in parallel. These vessels are rated for 150 psig and each vessel is equipped with a pressure relief valve to protect the vessels from over-pressurization. The pressure relief valves are rated at 125 psi.

5.2.3 INSTRUMENTATION AND CONTROLS OVERVIEW

Pressure indicating transmitters (PIT-1106, PIT-1105) are located both upstream and downstream of the Diamond Sand Filter System. These pressures are displayed and trended by the HMI. High pressure detected at either transmitter will cause a shutdown of the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

The sand filter system is controlled internally by a PLC control system developed by Diamond. Flow is directed to and from each vessel via combinations of diaphragm control valves and solenoid valves. The treatment system PLC exchanges data with the Diamond PLC. This allows the status of the pumps and valves to be displayed on the HMI screen as well as allowing the treatment system to automatically shut down the Diamond system if necessary.

Both a 24-hour timer and a differential pressure switch are used by the Diamond system to automatically initiate a backwash cycle of the Sand Filtration System. Backwashing can also be manually initiated by a local push button, through the HMI, or automatically through the PLC based on the differential pressure across the system as indicated by the pressure indicating transmitters. The differential pressure is also displayed and trended by the HMI.

The Diamond Sand Filtration System may be backwashed internally, using the discharge water of one vessel as the backwash influent of another, or externally, using treated water from the Effluent Tank (HP-07) and the Backwash Pump (P-222). The method of backwash is determined via manual valving by the operator. For more information on the operation of the Backwash Pump (P-222), see Section 5.4-Effluent Storage.

Both the Diamond Filter Pump (P-293R-1) and the Diamond Backwash Pump (P-293R-2) are controlled via the vendor-supplied control system; however, the operator can control the pumps locally via mounted start/stop pushbuttons. Each pump is followed by a pressure gauge. This gauge can be used to monitor pump performance and aid in troubleshooting any pump problems.

5.2.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Sand Filter Influent Pressure	95 psi	85 psi	40 – 65 psi	N/A	N/A	PIT-1106	G
Sand Filter Differential Pressure	N/A	N/A	2 – 4 psid	N/A	N/A	DPSH-293	N/A
Sand Filter Pressure Relief	N/A	N/A	< 125 psig	N/A	N/A	PRV-850, PRV-851, PRV-852, PRV-853, PRV-854, PRV-855	N/A
Diamond Filter Pump Discharge Pressure	N/A	N/A	55 – 65 psi	N/A	N/A	PI-293R1	N/A
Diamond Backwash Pump Discharge Pressure	N/A	N/A	35 – 50 psi	N/A	N/A	PI-293R2	N/A

5.3 CARBON ADSORPTION SYSTEM

APL flows from the sand filtration system to the carbon adsorption system. The carbon adsorption system is the primary means for removal of organic compounds. The Carbon Adsorption System includes both the Sacrificial Carbon Adsorbers and the Main Carbon Adsorbers.

5.3.1 SACRIFICIAL CARBON ADSORBERS

Once solids are removed from the APL, it flows through a train of sacrificial carbon adsorbers. The Sacrificial Carbon Adsorbers are designed for the removal of any PCBs and Dioxins that may be present in the APL. These compounds will restrict the ability of the carbon vendor to perform a regeneration of the carbon adsorbers.

The vendor operations and maintenance manual "Activated Carbon Adsorption System Operating Manual" by Encotech, Inc., is located in the Hyde Park Control Room.

5.3.1.1 PROCESS DESCRIPTION

Filtered APL, now free of suspended solids, passes through the Sacrificial Carbon Adsorbers. PCBs and Dioxins will preferentially adsorb to the carbon. Due to possible contamination by PCBs and Dioxins, spent carbon from the Sacrificial Carbon Adsorbers is incinerated off Site. Process monitoring of the sacrificial carbon adsorbers for breakthrough is performed for dioxins and PCBs. Details on the sacrificial carbon process monitoring are provided in Section 7.3.1-Carbon Treatment Performance Monitoring.

When breakthrough occurs, the carbon from the lead sacrificial carbon adsorber is removed for incineration off Site. The fresh sacrificial carbon adsorber (previously the lead sacrificial adsorber) is placed in service as the polish sacrificial adsorber and the former polish sacrificial adsorber becomes the lead sacrificial adsorber. (See Procedure **Sacrificial Carbon Bed Change** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

Flow is directed to and from each vessel by combinations of manually operated ball valves.

A backwash cycle is used to remove solids from the sacrificial carbon adsorbers. Treated water from the Effluent Tank (HP-07) is used for this cycle, which consists of a minimum 10-minute backflush and a minimum 2-minute rinse. The backwash water is then discharged to the Backwash Tank (HP-08) and transferred to Decanter No. 3 (HP-05). (See Procedure **Backwash Sacrificial Carbon Beds** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

The recommended backwash flow rate for the sacrificial adsorbers is 670 GPM; however, the backwash flow rate can be decreased by injecting compressed air (air scour) into the backwash water. Specifically, an air scour using compressed air at 80 standard cubic feet per minute (scfm) can be introduced at a pressure greater than the backwash water line pressure into the backwash water at the drain connection. An air supply is located near the Sacrificial Carbon Adsorbers for this function

5.3.1.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATIONS

Sacrificial Carbon Adsorption System, Adsorbers

Equipment #s:	HP-26, HP-27
Manufacturer:	Encotech, Model: 20,000 pounds
Size:	120-inch diameter x 108-inch straight sidewall height

Design Conditions: 400 GPM @ 150 psi
Material of Construction: Plasite-lined Carbon Steel
Carbon Media: 8X30 Granular Liquid Phase Carbon

The Sacrificial Carbon Adsorption System consists of a single train of two adsorbers in series. The system, as manufactured by Encotech, consists of two ASME coded vessels (HP-26 and HP-27).

Each vessel is equipped with a pressure relief valve to protect the vessels from over-pressurization. The pressure relief valves are rated at 125 psi.

5.3.1.3 INSTRUMENTATION AND CONTROLS OVERVIEW

Pressure indicating transmitters (PIT-1105, PIT-553) are located both upstream and downstream of the Sacrificial Carbon Adsorbers. These pressures are displayed and trended by the HMI. High pressure detected at either transmitter will cause alarms which will cause a shutdown of the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

The differential pressure across the adsorbers is also monitored at the PLC. A high differential pressure alarm is used to alert the operator to investigate the need for a backwash on the carbon vessels. The differential pressure is also trended in the HMI program.

The vessels are backwashed via a manual operation using the Effluent Pump (P-223) (covered in Section 5.4-Effluent Storage).

5.3.1.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Sacrificial Carbon Bed Influent Pressure	85 psi	75 psi	40 – 65 psi	N/A	N/A	PIT-1105	G
Sacrificial Carbon Bed Pressure Relief	N/A	N/A	< 125 psi	N/A	N/A	PRV-565, PRV-566	N/A

5.3.2 MAIN CARBON ADSORBERS

APL flows from the Sacrificial Carbon Adsorbers to the Main Carbon Adsorbers. The Main Carbon Adsorbers are designed for the removal of any organic compounds from the APL, which were not adsorbed by the sacrificial carbon adsorbers. The carbon vendor regenerates the spent carbon.

5.3.2.1 PROCESS DESCRIPTION

APL, free of PCBs and Dioxins, passes through the Main Carbon Adsorbers where adsorption of organics to the carbon occurs. The spent carbon from the Main Carbon Adsorbers is regenerated off Site. Process monitoring of the main carbon adsorbers for breakthrough is performed. Details on the main carbon process monitoring are provided in Section 7.3.1-Carbon Treatment Performance Monitoring.

The Main Carbon Adsorption System consists of three adsorbers in series, namely the lead, intermediate, and polish adsorbers. When breakthrough occurs, the carbon from the lead main adsorber is removed for regeneration off Site. The fresh carbon main adsorber (previously the lead main adsorber) is placed in service as the polish main adsorber, the former polish main adsorber becomes the intermediate and the former intermediate main adsorber becomes the lead main adsorber. A fourth vessel is maintained empty until a carbon change is required. This allows fresh carbon delivery and spent carbon transfer to occur with a single carbon trailer. (See Procedure **Main Carbon Bed Change** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

Flow is directed through the Main Carbon Adsorption System by a series of u-connections. The arrangement of the system is shown on Figure 5.1. Table 5.1 describes the arrangement of the connections for normal operating conditions. The use of u-connections for directing flow through the Main Carbon Adsorption System decreases the opportunity for contamination of downstream main beds during reconfiguration of the vessel arrangement. The u-connections also simplify the procedure for reconfiguration of the vessel arrangement.

A backwash cycle is used to remove solids from the main carbon adsorbers. Treated water from the Effluent Tank (HP-07) is used for this cycle, which consists of a minimum 10-minute backflush and a minimum 2-minute rinse. The backwash water is then discharged to the Backwash Tank (HP-08) and transferred to Decanter No. 3 (HP-05). The rinse cycle enters the adsorbers through a spray nozzle located at the top of the

vessels. (See Procedure **Backwash Main Carbon Beds** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

The recommended backwash flow rate for the main adsorbers is 670 GPM; however, the backwash flow rate can be decreased by injecting compressed air (air scour) into the backwash water. Specifically, an air scour using compressed air at 80 scfm can be introduced at a pressure greater than the backwash water line pressure into the backwash water at the drain connection. An air supply is located near the Main Carbon Adsorbers for this function

A treated water line and an air supply line are also available for use in carbon transfers. A drain line with a truck connection is also supplied near the adsorbers. This line drains to the Process Collection Tank (HP-17).

5.3.2.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Main Carbon Adsorption System, Adsorbers

Equipment #s:	HP-31, HP-32, HP-33, HP-34
Manufacturer:	ASI, Model: 20,000 pounds.
Size:	120-inch diameter x 127-inch height
Design Conditions:	400 GPM @ 74 psi
Material of Construction:	Epoxy Carbon Steel
Carbon Media:	8X30 Granular Liquid Phase Carbon

The Main Carbon Adsorption System consists of a single train of three adsorbers in series. A fourth adsorber is included in the system to aid in carbon delivery and transfers. The system, as manufactured by ASI, consists of four ASME coded vessels (HP-31, HP-32, HP-33, and HP-34).

Each vessel is equipped with a pressure relief valve to protect the vessels from over-pressurization. The pressure relief valves are rated at 70 psi.

5.3.2.3 INSTRUMENTATION AND CONTROLS OVERVIEW

A pressure-indicating transmitter (PIT-553) is located upstream of the Main Carbon Adsorbers. This pressure is displayed and trended by the HMI. High-high pressure detected at the transmitter will cause a shutdown of the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in

Section 6.2.3-Autodialer). A high-pressure alarm is used to alert the operator to investigate the need for a backwash on the carbon vessels.

The vessels are backwashed via a manual operation using the Effluent Pump (P-223) (covered in Section 5.4-Effluent Storage).

5.3.2.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Main Carbon Bed Influent Pressure	75 psi	65 psi	25 – 45 psi	N/A	N/A	PIT-553	G
Main Carbon Bed Pressure Relief	N/A	N/A	< 70 psi	N/A	N/A	PRV-561, PRV-562, PRV-563, PRV-564	N/A

5.4 EFFLUENT STORAGE

The Effluent Tank (HP-07) serves both as a collection point for treated water and as a source of process water.

5.4.1 PROCESS DESCRIPTION

To insure process water is always available for backwashing, the discharge to the sanitary sewer is controlled to prevent a low level in the Effluent Tank (HP-07) using a level control valve. Discharge flow from the tank is pumped either to the City Sanitary Sewer System or for reuse in the process. The discharge to the City Sanitary Sewer System is monitored using a continuous flow-proportioning sampler. The discharge for reuse in the process may be used for any of the following tasks:

i) Backwash water for the Sand Filtration System using the Backwash Pump (P-222)

ii) Treated water for the Carbon Adsorption System using the Effluent Pump (P-223)

Discharge flow from the tank is via either the Effluent Pump (P-223) or the Backwash Pump (P-222). Operation of both pumps is automatic.

5.4.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Effluent Tank

Equipment #:	HP-07
Manufacturer:	Brown Boiler
Size:	18-foot diameter x 22-foot height
Capacity:	40,000 gallons
Material of Construction:	Carbon Steel

Effluent Pump

Equipment #:	P-223
Manufacturer:	Goulds, Model: 3196 MTX, centrifugal
Size:	4 x 6 – 10H, 10 HP
Design Conditions:	550 GPM @ 30 psi
Material of Construction:	CD4MCu (stainless steel alloy)

Backwash Pump

Equipment #:	P-222
Manufacturer:	Goulds, Model: 3196 MTX, centrifugal
Size:	2 x 3 – 10, 7.5 HP
Design Conditions:	170 GPM @ 30 psi
Material of Construction:	Ductile Iron

The Effluent Tank is vented to atmosphere. No vapor phase activated carbon air treatment is required at the effluent tanks.

5.4.3 INSTRUMENTATION AND CONTROL OVERVIEW

The Effluent Tank (HP-07) is equipped with a level indicator and transmitter (LIT-807) that monitors the depth of liquid in the tank. The level indicators are based on differential pressure using a specific gravity of 1.0. This level is displayed and trended by the HMI. A high-high level alarm will shut down the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

The automatic valve, LV-807, operates to maintain a constant level in the Effluent Tank (HP-07). The constant level is based on an operator-selected set point. The level valve is controlled using a proportional-integral-derivative control block in the PLC. Based on

the detected tank level, the PLC will cause the level control valve to modulate and maintain the tank level set point.

The Effluent Tank (HP-07) contains temperature switches and heating pads. These heating pads will turn on when the temperature of the tank falls below the low set point (40°F). The heating pads will turn off when the temperature of the tank rises to the high set point. These set points are all set locally at the tank.

Both the Effluent Pump (P-223) and the Backwash Pump (P-222) are controlled via hand-off-auto switches. The pumps may be started in manual mode, by turning the hand-off-auto switch to "hand," and stopped by turning the hand-off-auto switch to "off." If the hand-off-auto switch is turned to "auto" the pump will run until the switch is turned to "off" or the PLC initiates a pump shutdown sequence. If the backwash system is valved for internal backwash, the Backwash Pump (P-222) must be in the "off" position. If the backwash system is valved for external backwash, the Backwash Pump (P-222) must be in the "auto" position. If an abnormal condition exists, such as low level upstream in the Effluent Tank (HP-07), the PLC will initiate a pump shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). This action will cause the Effluent Pump (P-223) and the Backwash Pump (P-222) to shut down, both pumps will be disabled, and the system operator will be notified via the autodialer (covered in Section 6.2.3-Autodialer). Neither the Effluent Pump (P-223) nor the Backwash Pump (P-222) will be enabled until the shutdown sequence conditions are cleared and acknowledged by an on-Site operator. If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" must only occur for brief periods during maintenance.

The Effluent Pump (P-223) and the Backwash Pump (P-222) are designed to run independently.

Each pump is followed by a pressure gauge (PI-223, PI-222). This gauge can be used to monitor pump performance and aid in troubleshooting any pump problems.

Effluent flow from the Effluent Tank (HP-07) is totalized in the PLC, and sampled with a continuous flow proportioning sampler as required by the Niagara Falls Water Board Sewer Permit. The Effluent Tank (HP-07) is also equipped with a continuous pH transmitter (AIT-906) and a temperature transmitter (TT-615).

5.4.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Effluent Tank Level	80% (high) 90% (high-high)	N/A	25% – 80%	25%	20%	LIT-807	F, G, I
Effluent Tank Level Control Valve	N/A	N/A	0 – 100%	N/A	N/A	LV-807	H
Effluent Pump Discharge Pressure	N/A	N/A	15 – 25 psi	N/A	N/A	PI-442	N/A
Backwash Pump Discharge Pressure	N/A	N/A	35 - 45 psi	N/A	N/A	PI-441	N/A
Effluent pH	9.5	9.0	6 – 8	5.5	5.0	AIT-906	H
Effluent Temperature	N/A	N/A	60°F	N/A	N/A	TT-615	N/A
Effluent Flow	600,000 gal	500,000 gal	0 – 400 GPM	N/A	N/A	FIT-715	H

5.5 PROCESS COLLECTION TANK AND SUMP

The Process Collection Tank (HP-17) is used to collect any water from indoor tank overflows, or water which would be released from indoor process vessels in the event of process maintenance or a pressure relief valve discharge.

The Process Collection Sump is used to collect blowdown water from both the air compressor and the boiler. This sump also collects any water that accumulates in the building drains. Water collected in the Process Collection Sump is transferred to the Process Collection Tank (HP-17).

5.5.1 PROCESS DESCRIPTION

Water is pumped, using Process Collection Tank Pumps No. 1 and No. 2 (P-204 and P-212), from the Process Collection Tank (HP-17) to Leachate Storage Tank No. 1 (HP-01), Leachate Storage Tank No. 2 (HP-02), Decanter No. 1 (HP-03), or Decanter No. 2 (HP-04). Pumping is automatic based on level control.

The Process Collection Sump is equipped with a sump pump to facilitate removal of accumulated wastewater. The Process Collection Sump Pump (P-205) directs water to

the Process Collection Tank (HP-17). Operation of the sump pump is automatic based on sufficient level in the sump.

5.5.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Process Collection Tank

Equipment #:	HP-17
Manufacturer:	Plas-Tanks
Size:	5-foot diameter x 10-foot length
Capacity:	1,500 gallons
Material of Construction:	FRP – Vinyl Ester

Process Collection Tank Pump No. 1

Equipment #:	P-204
Manufacturer:	Goulds, Model: 3796 MT, centrifugal
Size:	3 x 3 – 10, 7.5 HP
Design Conditions:	160 GPM @ 32 psi
Material of Construction:	Elec NI-DI

Process Collection Tank Pump No. 2

Equipment #:	P-212
Manufacturer:	Goulds, Model: 3796 MT, centrifugal
Size:	3 x 3 – 10, 7.5 HP
Design Conditions:	160 GPM @ 32 psi
Material of Construction:	Elec NI-DI

Process Collection Sump Pump

Equipment #:	P-205
Manufacturer:	Goulds, Model: 3171 ST, submersible centrifugal
Size:	1 x 1.5 – 6, 1 HP
Design Conditions:	20 GPM @ 9 psi
Material of Construction:	Ductile Iron

The Process Collection Tank is equipped with a vent to a carbon adsorber and a conservation vent capable of both pressure and vacuum relief under non-standard operating conditions (PRV-514).

The Process Collection Sump is constructed of a 10-inch thick reinforced concrete floor slab with 6-inch thick reinforced concrete walls. All seams are installed with a waterstop and sealed with a polyurethane sealant.

5.5.3 INSTRUMENTATION OVERVIEW

The Process Collection Tank (HP-17) is equipped with a level indicator and transmitter (LIT-801) that monitors the depth of liquid in the tank. This level is displayed and trended by the HMI. In addition, the tank has a high-high level switch (LSHH-802) as a redundant high level indication. A high-high level alarm from either the transmitter or the level switch will shut down the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer).

To prevent over-pressurization, the vessel has an appropriately sized conservation vent (PRV-514).

Both of the Process Collection Tank Pumps (P-204 and P-212) are controlled via hand-off-auto switches. The pumps may be started in manual mode, by turning the hand-off-auto switch to "hand," and stopped by turning the hand-off-auto switch to "off." If the hand-off-auto switch is turned to "auto" the pump will run until the switch is turned to "off," the PLC shut downs the pump due to level control, or the PLC initiates a pump shutdown sequence. The Process Collection Tank Pumps (P-204 and P-212) are designed to run based on level in the Process Collection Tank (HP-17). Based on operator selected tank level set points, the PLC will enable and disable the pumps. The pumps will be started upon reaching the high level set point and continue to run until the low level set point is reached. This control, however, will only operate if the pump is in "auto." If an abnormal condition exists, such as high level downstream in Leachate Storage Tank No. 1 (HP-01), the PLC will initiate a pump shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). This action will cause both of the Process Collection Tank Pumps (P-204 and P-212) to shut down, both pumps will be disabled, and the system operator will be notified via the autodialer (covered in Section 6.2.3-Autodialer). Neither of the Process Collection Tank Pumps (P-204 nor P-212) will be enabled until the shutdown sequence conditions are cleared and acknowledged by an on Site operator. If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The Process Collection Tank Pumps (P-204 and P-212) are designed to run individually. However, the pumps can run concurrently to achieve faster drawdown from the tank. These pumps transfer water to Leachate Storage Tank No. 1 (HP-01), Leachate Storage

Tank No. 2 (HP-02), Decanter No. 1 (HP-03), or Decanter No. 2 (HP-04) via manual valving.

The Process Collection Sump Pump (P-205) is controlled using a hand-off-auto switch. In the "hand" position, the pump will continue to run until the switch is turned to "off." In the "auto" position, the PLC will control the pump. The pump will turn on when the level in the sump reaches the high level probe (LCH-803) and turn off when the level in the sump reaches the low-level probe (LCL-803).

A high-high level probe (LSHH-803) will indicate a problem with the sump pump's performance, will shut down the APL Treatment System, and will notify the system operator via the autodialer (covered in Section 6.2.3-Autodialer). If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The Process Collection Sump also contains a redundant high-high level switch (LSHH-804) to activate a redundant high level alarm. This switch serves with the same functionality as the high-high level probe.

5.5.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Process Collection Tank Level	80 – 85% (set at HMI)	50 – 80% (pump on – set at HMI)	30 – 80%	30 – 40% (pump off – set at HMI)	N/A	LIT-801	F, G, J
Process Collection Tank Level, Switch	12" from top of tank	N/A	N/A	N/A	N/A	LSHH-802	F, G, J
Process Collection Tank Pressure Relief	N/A	N/A	0 psi	N/A	N/A	PRV-514	N/A
Process Collection Tank Pump Discharge Pressure	N/A	N/A	25 – 35 psi	N/A	N/A	PI-403	N/A
Process Collection Sump Level	4" from top	8" from top (pump on)	8" – 14" from top	20" from top (pump off)	N/A	LCL-803, LCH-803, LSHH-803	F, G, J
Process Collection Sump Level, Float	4" – 6" from top	N/A	N/A	N/A	N/A	LSHH-804	F, G, J

5.6 SOLIDS HANDLING

Solids collected by the APL Treatment System are transferred to the Decanting System for removal with any accumulated NAPL.

5.6.1 BACKWASH TANK

The Backwash Tank (HP-08) collects wastewater that has the potential to have high solid concentrations. Water and solids are then transferred from the Backwash Tank (HP-08) to Decanter No. 3 (HP-05).

5.6.1.1 PROCESS DESCRIPTION

Sand filter and carbon backwash water, water from the Filter Press Sump, and filtrate from the Settler Sludge Filter Press are pumped into the Backwash Tank (HP-08). Water is pumped from the Backwash Tank to Decanter No. 3 (HP-05) for storage and removal with accumulated NAPL.

To optimize system performance, the discharge from this tank is controlled using a magmeter (FIT-701) and a flow control valve (FCV-701).

Discharge from this tank is via the Backwash Transfer Pump (P-215). Operation of this pump is automatic based on tank level.

5.6.1.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Backwash Tank

Equipment #:	HP-08
Manufacturer:	Brown Boiler
Size:	18-foot diameter x 22-foot length
Capacity:	40,000 gallons
Material of Construction:	Vinyl Ester-lined Carbon Steel

Backwash Transfer Pump

Equipment #:	P-215
Manufacturer:	Goulds Model: 3196 MTX, centrifugal
Size:	1.5 x 3 –13, 10 HP

Design Conditions: 150 GPM @ 50 psi
Material of Construction: CD4Mcu (stainless steel alloy)

The Backwash Tank is equipped with a vent to a carbon adsorber and a conservation vent (PRV-518) capable of both pressure and vacuum relief under non-standard operating conditions.

5.6.1.3 INSTRUMENTATION AND CONTROLS OVERVIEW

The Backwash Tank (HP-08) is equipped with a level indicator and transmitter (LIT-806) that monitors the depth of liquid in the tank. The level indicators are based on differential pressure using a specific gravity of 1.0. This level is displayed and trended by the HMI. In addition, the tank has a high-high level switch (LSHH-805) as a redundant high level indication. A high-high level alarm from either the transmitter or the level switch will shut down the APL Treatment System via a shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). The alarm will also cause the on-call operator to be notified via the autodialer (covered in Section 6.2.3-Autodialer). The Backwash Tank (HP-08) contains temperature switches and heating pads. These heating pads will turn on when the temperature of the tank falls below the low set point. The heating pads will turn off when the temperature of the tank rises to the high set point. These set points are all set locally at the tank.

The Backwash Transfer Pump (P-215) is controlled via hand-off-auto switches. The pump may be started in manual mode, by turning the hand-off-auto switch to "hand," and stopped by turning the hand-off-auto switch to "off." If the hand-off-auto switch is turned to "auto" the pump will run until the switch is turned to "off," the PLC shut downs the pump due to level control, or the PLC initiates a pump shutdown sequence. The Backwash Transfer Pump (P-215) is designed to run based on level in the Backwash Tank (HP-08). Based on operator selected tank level set points, the PLC will enable and disable the pump. The pump will be started upon reaching the high level set point and continue to run until the low level set point is reached. This control, however, will only operate if the pump is in "auto." If an abnormal condition exists, such as high level downstream in Decanter No. 3 (HP-05), the PLC will initiate a pump shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). This action will cause the Backwash Transfer Pump (P-215) to shut down, the pump will be disabled, and the system operator will be notified via the autodialer (covered in Section 6.2.3-Autodialer). The Backwash Transfer Pump (P-215) will not be enabled until the shutdown sequence conditions are cleared and acknowledged by an on-Site operator. If the switch is turned to "hand," ALL safety shutdowns are bypassed. The operator must closely monitor the

operation of the pump in "hand." Operation of the pump in "hand" should only occur for brief periods during maintenance.

The pump is followed by a pressure gauge (PI-435). This gauge can be used to monitor pump performance and aid in troubleshooting any pump problems.

The automatic valve, FV-701, operated to maintain a constant flow from the Backwash Transfer Pump (P-215). The constant flow is based on a flow set point selected by the operator. The flow valve is controlled using a proportional-integral-derivative control block in the PLC. Based on the detected flow through flow transmitter FIT-701, the PLC will cause the flow control valve to modulate and maintain the flow set point.

Flow into Decanter No. 3 must not exceed 150 GPM from all sources. Therefore, the PLC must take into account both an operator selected set point and flow from the collection system when operating the flow control valve.

5.6.1.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Backwash Tank, Level	80% (high) 90% (high-high)	N/A	10%– 80%	20%	10%	LIT-806	I
Backwash Tank Level, Switch	2 ft from top of tank	N/A	0 %– 80%	N/A	N/A	LSHH-805	I
Backwash Tank Pressure Relief	N/A	N/A	0 psi	N/A	N/A	PRV-518	N/A
Backwash Transfer Pump Discharge Pressure	N/A	N/A	55 – 65 psi	N/A	N/A	PI-435	N/A
Backwash Transfer Flow rate	N/A	80 GPM (Settler) 100 GPM (Decanter)	20 – 100 GPM	N/A	N/A	FIT-701	N/A
Backwash Transfer Flow Control Valve	N/A	N/A	0 – 100%	N/A	N/A	FV-701	N/A

5.6.2 SLUDGE FILTER AREA SUMP

The Sludge Filter Area Sump is used to collect any cleaning water that collects in the Filter Room. Water collected in the Sludge Filter Area Sump is transferred to the Backwash Tank (HP-08).

5.6.2.1 PROCESS DESCRIPTION

The Sludge Filter Area Sump is equipped with a sump pump to facilitate removal of accumulated wastewater. The Sludge Filter Area Sump Pump (P-903) directs water to the Backwash Tank (HP-08). The sump pump operates automatically using a float switch.

5.6.2.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Sludge Filter Area Sump Pump

Equipment #: P-903
Manufacturer: Little Giant, Model: Electric sump pump
Material of Construction: Steel/polyvinyl chloride (PVC)

The Sludge Filter Area Sump is constructed of a 10-inch thick reinforced concrete floor with 10-inch thick reinforced concrete walls. All seams are installed with a waterstop and sealed with a polyurethane sealant.

5.6.2.3 INSTRUMENTATION OVERVIEW

The sump also contains a high level switch (LSHH-167) as a high level indication. This switch triggers an alarm at the HMI to notify the operator of a high level in the Sludge Filter Room and causes a shutdown of the solids dewatering system.

5.6.2.4 OPERATIONAL SPECIFICATIONS

Parameter	*High Shutdown Condition*	*High Alarm Condition*	*Normal Operating Range*	*Low Alarm Condition*	*Low Shutdown Condition*	*Instrument*	*Shutdown Sequence*
Sludge Filter Area Sump Level	3" from top	N/A	N/A	N/A	N/A	LSHH-167	G

5.7 CHEMICAL ADDITION

Due to the biological growth which occurs in the carbon adsorbers, nuisance odors may be generated. Odor control is accomplished by the addition of hydrogen peroxide to the discharge of the Main Carbon Adsorbers.

5.7.1 PROCESS DESCRIPTION

Peroxide is added to the treated water stream via a chemical metering pump. The operator determines the frequency of pump operation based on olfactory observations. If the operator detects odors, the pump is activated and peroxide added to the treated water until odors are no longer present.

5.7.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATIONS

Peroxide Addition Pump

Equipment #:	P-291-1
Manufacturer:	Alldos, Model: 205, diaphragm
Capacity:	2.9 GPM @ 145 psi
Material of Construction:	PVC

Peroxide is stored in 55-gallon drums on self-contained pads (See Procedure **Peroxide Drum Change** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

5.7.3 INSTRUMENTATION AND CONTROLS OVERVIEW

The Peroxide Addition Pump (P-291-1) is controlled via a local start/stop switch. Once started, the operator may adjust the pumping frequency locally at the pump. The pump will continue to run until the switch is turned to "off" or the PLC initiates a pump shutdown sequence. If an abnormal condition exists, such as low system influent flow, the PLC will initiate a pump shutdown sequence (covered in Section 6.5.2-Shutdown Sequences). This action will cause the Peroxide Addition Pump (P-291-1) to shut down and the pump will be disabled. The Peroxide Addition Pump (P-291-1) will not be enabled until the shutdown sequence conditions are cleared and acknowledged by an on-Site operator.

5.8 VAPOR PHASE CARBON ADSORBERS

Vapor phase carbon adsorption is used for the removal of any volatile organics stripped from the water during process agitation or tank breathing. The Effluent Tank (HP-07)

vents directly to the atmosphere since all volatile organic compounds have been removed from the groundwater by the treatment system.

5.8.1 PROCESS DESCRIPTION

All process tanks except the Effluent Tank (HP-07) are connected to the tank vent carbon adsorbers. The Tank Vent System consists of four parallel trains of two carbon adsorption canisters in series. The carbon is replaced as necessary based on volatile organic monitoring. Spent vapor carbon is regenerated off Site. (See Procedure **Take Hnu Reading on Ventsorb Canisters** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room)

5.8.2 EQUIPMENT DESCRIPTION AND MATERIAL SPECIFICATION

Vapor Phase Carbon Adsorbers

Manufacturer: Calgon
Size: 150 pounds

5.9 UTILITIES

5.9.1 SAFETY SHOWER SYSTEM

The emergency shower system is comprised of the 525 gallon galvanized steel Safety Shower Head Tank (HP-41) and 10 emergency shower and eyewash systems. The Safety Shower Head Tank (HP-41) is fed by the City water lines. The only lines connected to the Safety Shower Head Tank (HP-41) are those feeding the safety shower and eyewash units. Temperature is controlled in the Safety Shower Head Tank (HP-41) by and immersion-type heater. The Safety Shower Head Tank (HP-41) has a low level switch (LSL-818) which sends a signal to the PLC during low level. The following is a summary of the safety shower and eyewash station locations. The locations are shown on Figure 5.2

Station	*Location*
1	East End Storage Dike
2	Central Storage Dike
3	Boiler Room
4	Main Carbon Adsorbers
5	Filter Press Room
6	Diamond Sand Filter Area
7	Settler Sludge Filter Room

Station	*Location*
8	Third Floor
9	Trailer Loading Pad
10	Decanter Dike

The outdoor safety showers, Stations 1, 2, 9, and 10 are electrically traced and insulated.

If a safety shower is activated, an alarm at the PLC will be triggered and the autodialer will be activated to notify the on-call operator (covered in Section 6.2.3-Autodialer). Both high and low temperature sensors are located in the lines going from the Safety Shower Head Tank (HP-41) to the safety shower units. Temperature variances will also alarm at the PLC and show a visual alarm using a rotating red beacon.

5.9.2 COMPRESSED AIR SYSTEM

The compressed air system consists of a model GA18 Atlas Copco and the North and South Air Dryers (HP-44 and HP-45) capable of producing107 cubic feet per minute (cfm) at 105 pounds per square inch per gallon (psig). The Dry Air Receiver (HP-16) provides air to the carbon adsorbers for periodic carbon changes and air scour and to the settler sludge filter for use in the Filter Press System. The compressor also provides air to the instrument air dryer for use at solenoid valves.

The Compressed Air System does require manual starting. However, once activated the compressor runs on an as need basis based on air tank pressure. An improper functioning of the compressed air dryer system will result in an alarm at the PLC. Low Pressure from the air compressor is detected using a low-pressure switch. This will also result in an alarm at the PLC. (See Procedure **Compressor Start-up and Shutdown** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

A larger air compressor, manufactured by Ingersoll Rand, is also available as a back-up or when additional compressed output is required. This compressor is capable of producing 375 cfm at 125 psig. This compressor can provide instrument air for use at solenoid valves, the Settler Sludge Pump (P-902), the Sludge Filter Area Sump Pump (P-903), and additional output for required for carbon changes.

5.9.3 EMERGENCY GENERATOR

An emergency generator, model B20-FGS-18R as manufactured by Winco, is available as power back-up to Wet Well C (P-102) or Wet Well D (P-101) Pumps. This generator has

an output rated at 20 kilowatts (kW), 480 volts AC, and 30 amps. If a power failure occurs, this generator may be manually started by the operator to run either Wet Well C (P-102) or Wet Well D (P-101) Pumps. (See Procedure **Standby Power – Start-up and Shutdown Generator** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

6.0 CONTROL SYSTEMS

Hyde Park Collection and APL Treatment Systems involve a variety of manual and automatic controls. As discussed in this section, automatic controls turn on/off pumps, close valves, and act to provide safe, efficient operation of the collection, storage, and treatment systems. In addition, the control system initiates alarms, trends operational parameters, and notifies personnel in the event of critical situations. Controls are also used to send alarm messages and start/stop pump operation based on tank levels.

6.1 PROCESS CONTROL THEORY

Process can be controlled more precisely to give more uniform and higher quality performance by the application of automatic control. Also, processes which respond too rapidly to be controlled by human operators, operations that are routine, hazardous, or located in a remote area, can all be more effectively controlled automatically. The Diamond Sand Filtration System uses the Diamond PLC to operate and automatically control the sand filtration system.

The various aspects of process control can be explained by examining the following:

i) Open and closed loop systems

ii) Feedback control

Open loop control systems are those in which information about the controlled variable is not used to adjust any of the system inputs to compensate for variations in the process variables. The term open loop is often encountered in discussions of control systems to indicate that the uncontrolled process dynamics are being studied.

A closed loop control system implies that the controlled variable is measured and that the result of this measurement is used to manipulate one of the process variables (see Figure 6.1).

In the closed loop control system, information about the controlled variable is fed back as the basis for control of a process variable. This system is given the designation closed loop feedback control. The feedback can be accomplished by an operator (manual control) or by the use of instruments (automatic control).

For manual control, an operator periodically checks the level, using a level transmitter, in the SC wells (see Figure 6.1). If the level is above the desired level, the operator will

start the pump. For automatic control, the PLC compares the level to a preset desired value (set point). If a difference exists, the PLC will start or stop the well pump operation in order to achieve set point (see Figure 6.2).

6.2 CONTROL COMPONENTS

6.2.1 PROGRAMMABLE LOGIC CONTROLLER

A PLC is used as the primary control device. The System PLC receives a series of digital inputs and analog inputs; interprets them based on a written program, then sends a series of digital outputs and analog outputs to control pumps, valves, and a variety of other equipment. The System PLC program is designed to operate the collection systems, storage area and treatment systems in a fail-safe manner. The System PLC also serves to trigger alarms for the process.

The Diamond Sand Filtration System is controlled by a vendor supplied PLC. The Diamond PLC and the System PLC do exchange data. This data exchange allows information from the Diamond PLC to be displayed on the HMI and the System PLC to initiate a shutdown of the Diamond Filtration System.

Some of the purge wells utilize individual remote PLCs to aid in communication with the System PLC. These wells include PW-7U, PW-8U, PW-8M, PW-9U, PW-10U, APW-1, and APW-2. The control set points and process variables are communicated from the System PLC to the remote PLCs through the radio modem system. The control logic as described in the Complex Loop for each pump is contained in the System PLC located in the Hyde Park Control Room. Operational decisions such as Pump On/OFF, Motor Speed, etc. are made in the Main PLC and transferred to the Remote PLC. The one notable exception is in the event of a communications failure in which event the Remote PLC will shut down the well pump.

6.2.2 HUMAN MACHINE INTERFACE

The System PLC is tied in to a HMI software package (Intellution iFix) that allows the operator to view the Collection and APL Treatment process from a computer screen. This system offers flexibility in process control and allows the operator efficient management of the collection and treatment processes. Alarms that are triggered by the PLC are displayed on the top of HMI screen and on the screen display in the process flow (see Appendix C for sample HMI screens).

In addition the operator can trend process parameters over the history of stored data. The interface allows the operator to change pertinent operational set points and start/stop extraction system and treatment system components from the control room.

The operator is provided with all critical process information through the PLC/HMI interface. Some equipment is furnished with stand-alone logic panels, in which case, status indicators are brought back to PLC/HMI to advise the operator of their operation. Several sample HMI screens are included in Appendix C.

The HMI prints a daily report detailing pumping volume for each well, average water level for each well, and storage tank levels.

6.2.3 AUTODIALER

The system is also equipped with an autodialer. The autodialer is programmed to dial out and summon the on-call operator in the event of a Collection or APL Treatment System Priority 1 Alarm. In the event of a power failure the autodialer has a battery backup thus allowing dialing and operator notification. In the event of a shutdown that initiates the autodialer, operator intervention is required to restart the impacted portions of the Collection and APL Treatment Systems. Autodialer alarms are identified in the Appendix D alarm list.

6.3 ALARMS

Alarms are set to advise the operator when conditions are not within the normal limits. The alarms are triggered through the PLC, displayed on the HMI, and if the alarm is critical, communicated via the autodialer (covered in Section 6.2.3-Autodialer) to the on-call operator.

Priority 3 alarms are displayed on the HMI in red near the affected equipment. Priority 2 alarms are displayed on the HMI in red near the affected equipment and they are also displayed at the top of the screen in the alarm banner. Priority 1 alarms pose a threat to the ability to safely handle the APL, NAPL, and/or groundwater, and pre-arranged sequences are initiated to safely shut down the appropriate equipment. These alarm are displayed in red near the affected equipment, displayed at the top of the screen in the alarm banner, and will cause the autodialer (covered in Section 6.2.3-Autodialer) to notify the on-call operator.

Appendix D provides a list of alarms for the Collection and APL Treatment Systems, conditions that trigger the alarm and the events triggered by the alarm.

6.4 COMPLEX LOOPS

Complex loops manage parameters that change within selected ranges during routine operation of a piece of equipment. These loops are typically used as part of the normal automated operation of the equipment. As an example, the level in a well is used to routinely start and stop a pump. These complex loops are described in the "Controls Manual" located in the Hyde Park Control Room.

6.5 CONTROL SEQUENCES

The automated control of each piece of equipment is a combination of operational controls and shutdown sequences.

6.5.1 OPERATIONAL CONTROLS

Alarms are set to advise the operator when conditions are not within the normal limits. In some cases pre-arranged sequences will be initiated when normal limits are exceeded.

The operator is provided with all critical process information in the control room. Equipment must be started locally by the operator, but can be shut down from the control room. The control system indicates if the equipment is operating. Some equipment is furnished with stand-alone logic panels, in which case, status indicators are brought back to the control room to advise the operator of their operation.

6.5.2 SHUTDOWN SEQUENCES

Shutdown sequences are parameters or a series of parameters that indicate that equipment is operating out of normal limits or may be contributing to an undesirable condition. A shutdown sequence triggers an alarm and locks out the designated equipment. The equipment can not be restarted until an operator resets the shutdown sequence alarm.

Full sequence descriptions are in the "Controls Manual" on file in the Hyde Park Control Room. Sequence letters for PLC interlocks are also shown on the process flow sheets in Appendix A.

When any of the sequences are tripped, an alarm statement will be posted on the HMI computer screen and specific automated control actions will occur. A short description of each sequence follows:

6.5.2.1 SEQUENCE A: SHUT DOWN WELL PUMPS TO DECANTER NO. 1

When high-high level is exceeded in any of the decanters, any of the leachate storage tanks, the Decanter Dike Sump, or the Storage Dike Sump, all NAPL Purge Well pumps will be shut off. Out-of-range signals from level transmitters on any of the aforementioned tanks will also cause NAPL Purge Well pumps to shut down. Well pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.2 SEQUENCE B: SHUT DOWN WELL PUMPS TO DECANTER NO. 2

When high-high level is exceeded in any of the decanters, any of the leachate storage tanks, the Decanter Dike Sump, or the Storage Dike Sump, OBCS wet well pumps will be shut off. Out-of-range signals from level transmitters on any of the aforementioned tanks will also cause the OBCS wet well pumps to shut down. Well pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.3 SEQUENCE C: SHUT DOWN WELL PUMPS AND BACKWASH TRANSFER PUMP TO DECANTER NO. 3

When high-high level is exceeded in any of the decanters, any of the leachate storage tanks, the Decanter Dike Sump, or the Storage Dike Sump, all SC Purge Well pumps, PW-8U, PW-8M, PW-9U PW-10U, and Backwash Transfer Pump will be shut off. Out-of-range signals from level transmitters on any of the aforementioned tanks will also cause the SC Purge Well pumps, PW-8U, PW-8M, PW-9U, and PW-10U to shut down. Well pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.4 SEQUENCE D: SHUT DOWN APL PURGE WELL PUMPS TO LEACHATE STORAGE TANKS

When high-high level is exceeded in any of the leachate storage tanks, the Decanter Dike Sump, the Storage Dike Sump, or in the leak detection system along the south forcemain, all APL Purge Well pumps will be shut off. Out-of-range signals from the level transmitters on any of the aforementioned tanks will also cause the APL Purge Well pumps to shut down. Well pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.5 SEQUENCE E: ISOLATE LEACHATE STORAGE TANKS FROM THE EQUALIZATION LINE

When high-high level is exceeded in either the Decanter Dike Sump or the Storage Dike Sump, the isolation valves will be forced close and the Backwash Transfer Pump will be shut down. The closure of these valves will also trigger Sequence F and Sequence G. The isolation valves will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.6 SEQUENCE F: SHUT DOWN LEACHATE FEED PUMPS

When flow control valve FCV-712 is closed or the FIT-712 detects a low flow, the Leachate Feed Pumps (P-224 and P-264) will shut down. Also, if Sequence E or Sequence G is tripped, the Leachate Feed Pumps (P-224 and P-264) will shut down. The shutdown of these pumps will also trigger the shutdown of the Peroxide Addition Pump (P-291-1). The Leachate Feed Pumps (P-224 and P-264) and the Peroxide Addition Pump (P-291-1) will be enabled for normal operation when all applicable sequences are cleared and all required flow conditions are met.

6.5.2.7 SEQUENCE G: SHUT DOWN TREATMENT PLANT

When level in either the Effluent Tank (HP-07), the Process Collection Sump, or the Process Collection Tank (HP-17) exceed high level, or when the inlet pressure to either the sand filter system, the sacrificial carbon adsorbers, or the main carbon adsorbers exceeds the high set point, the Treatment System will shut down. Also, if Sequence E is tripped, the Treatment System will shut down. Out-of-range signals from level transmitters on any of the aforementioned tanks, or from the pressure transmitters in the aforementioned lines, will also cause the system to shut down. The pumps that will be

inhibited from running include the Backwash Transfer Pump (P-215), the Settler Electrolyte Feeder (P-703), the Settler Sludge Pump (P-902), and the Backwash Pump (P-222). The above pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.8 SEQUENCE H: STOP EFFLUENT DISCHARGE TO CITY SEWER

When the totalized daily effluent flow to the city sewer has reached the allowable limit for the 24-hour period, the effluent discharge pH is outside of the allowable range, or bad effluent pH/flow/temperature sensor quality is detected, the level valve on the discharge line is forced closed. The valve will be enabled for normal operation when all applicable conditions are cleared.

6.5.2.9 SEQUENCE I: SHUT DOWN PUMPS TO BACKWASH TANK

When the level in the Backwash Tank (HP-08) exceeds the high-high limit, level in the Effluent Tank (HP-07) falls below the low-low limit, or bad level sensor quality is detected in either the Effluent Tank (HP-07) or the Backwash Tank (HP-08), the Effluent Pump (P-223), the Backwash Pump (P-222), and the Diamond Backwash Pump (P-293R-2) will be shut off. The pumps will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.10 SEQUENCE J: SHUT DOWN STORAGE DIKE SUMP PUMP

When high-high level is exceeded in any of the decanters or any of the leachate storage tanks, the Storage Dike Sump Pump (P-375) will be shut off. Out-of-range signals from level transmitters on any of the aforementioned tanks will also cause the Storage Dike Sump Pump (P-375) to shut down. The pump will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.11 SEQUENCE K: SHUT DOWN DECANTER DIKE SUMP PUMP

When high-high level is exceeded in any of the decanters, any of the leachate storage tanks, the Process Collection Tank (HP-17), or the Process Collection Sump, the Decanter Dike Sump Pump (P-134) will be shut off. Out-of-range signals from level transmitters on any of the aforementioned tanks will also cause the Decanter Dike Sump (P-134)

pump to shut down. The pump will be enabled for normal operation when all applicable levels and conditions are cleared.

6.5.2.12 SEQUENCE L: NORTH FORCEMAIN LEAK DETECTION SHUT DOWN

When a leak is detected along the north forcemain, all wells along the forcemain will be shut off. The pumps will be enabled for normal operation when all leaks are cleared.

6.5.2.13 SEQUENCE M: SOUTH FORCEMAIN LEAK DETECTION SHUTDOWN

When a leak is detected along the south forcemain, all wells along the forcemain will be shut off. The pumps will be enabled for normal operation when all leaks are cleared.

6.5.2.14 SEQUENCE N: 2001 FORCEMAIN LEAK DETECTION SHUTDOWN

When a leak is detected along the 2001 forcemain, all wells along the forcemain will be shut off. The pumps will be enabled for normal operation when all leaks are cleared.

6.5.3 SEQUENCE OVERRIDE

The control system is designed to permit a sequence override. This is activated using a key switch, which is located on the PLC cabinet in the control room. When this switch is activated, selected shutdown sequences are not activated. This override allows the system to continue normal operation during routine maintenance and instrument calibration tasks. In order for this override to be used, **the Site cannot be unmanned**. If this switch is activated for a period of time exceeding one hour, the autodialer (covered in Section 6.2.3-Autodialer) will alarm.

6.6 REMOTE ACCESS

The HMI system is part of a Wide Area Network (WAN) that connects several GSH Sites. This network allows for full control and alarming capabilities of the Hyde Park Collection System and the Hyde Park APL Treatment Facility from any of the other connected GSH Sites.

7.0 MONITORING

The operator is responsible for day-to-day operations of the facility including system monitoring, record keeping, and ensuring that potential problems are attended to with necessary maintenance. Maintenance requirements and intervals are described subsequently in general. A monitoring schedule is included as Figure 7.1.

7.1 ROUTINE OPERATIONS MONITORING

The operator is responsible for day-to-day operations of the facility including system routine, preventive, and required maintenance. These maintenance and monitoring procedures are designed to maintain compliance with the 6NYCRR 373-3.9 Use and Management of Containers and 373-3.10 Tank Systems as well as the monitoring requirements/intent of the RRT Stipulation. Maintenance of the collection and treatment system components will be performed in accordance with the manufacturer's recommendations and standard industrial practice. Monitoring requirements and intervals are described subsequently in general. (See Procedures **Daily/Weekly Process Sampling** and **Quarterly Process Sampling** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

7.1.2 DAILY MONITORING

An inspection of system operation will be made on a seven days per week basis. This will consist of either:

i) A visit to the Site to perform an inspection

ii) Remote viewing of the HMI data through the WAN or dialup

The inspection should verify the operation of each component of the Collection and APL Treatment System. (See Procedure **Facility Inspection** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room). This inspection includes completion of the Collection and APL Treatment System Inspection Log, completion of the WNY Daily Inspection, and review of the Daily Average Reading Log. Logs and Inspection Forms are presented in Appendix B.

7.1.3 WEEKLY MONITORING

An inspection of system operation will be made on a weekly basis. This inspection will include:

i) Perform a visual check; walk through the entire treatment building and tank farm area; check for leaks, overflows, malfunctioning equipment, or signs of vandalism. Document visual check and findings in logbook

ii) An inspection of container storage areas

7.1.3.1 CONTAINMENT DIKES

An inspection of the Decanter Dike and the Storage Dike will be conducted weekly. This inspection will include inspection for leakage into the secondary containment system.

7.1.3.2 EQUALIZATION HEADER VALVES

On a weekly basis, the equalization header valves located at each of the leachate storage tank discharges will be exercised. During exercise, the operator will verify that the valves open and close properly.

7.1.4 MONTHLY MONITORING

7.1.4.1 SUMPS AND PUMPS

A monthly inspection of the dike sumps and sump pumps (including the Decanter, Storage, and Process Collection Sumps) will be performed to verify proper operation. This inspection will include:

i) Manual trip of the sump high-high switch and the redundant high-high float to verify proper shutdowns

ii) Inspection of sump heater (performed weekly from November 1 through April 1)

iii) Verify operation of pump and discharge lines

7.1.4.2 PROCESS VESSELS AND TANKS

A monthly inspection of process vessels and tanks will include:

i) Inspection for leaks, corrosion or cracks

7.1.4.3 FACILITY AREA

Inspect fence perimeter and signs monthly for damage. Repairs and/or replacements will be performed as necessary.

7.1.4.4 VENT ADSORBERS

The carbon canister discharge (gooseneck outlet) will be monitored for volatile organic breakthrough once every month with a photoionization detector (PID). On evidence of breakthrough (readings exceeding 1 part per million [ppm] above background), the carbon canister will be changed.

7.1.4.5 SAFETY SHOWERS

The safety showers will be inspected and tested each month to ensure they are functioning properly.

7.1.4.6 SOURCE CONTROL WELLS

Once each month, or at the frequency indicated in the current PMP, check water levels in the SC wells. If there is sufficient volume, run the pump to drain the well. Record in the operator's logbook.

7.1.5 SEMIANNUAL MONITORING

7.1.5.1 PURGE WELL CHAMBERS (APL AND NAPL)

An inspection of each well chamber will be conducted semiannually (spring and fall). This inspection will include:

ii) Visual inspection of chamber piping

iii) Verification of level transducer reading

iv) Inspection of chamber security

7.1.5.2 OBCS/EBCS WET WELL INSPECTIONS

An inspection of each OBCS/EBCS wet well will be conducted semiannually (spring and fall). This inspection will include:

i) Visual inspection of chamber piping

ii) Verification of level probe performance

iii) Inspection of wet well integrity

iv) Inspection of wet well security

7.1.5.3 OBCS/EBCS MANHOLE INSPECTIONS

An inspection of each OBCS/EBCS manhole will be conducted semiannually (spring and fall). This inspection will include:

i) Inspection of manhole integrity

ii) Verification of manhole depth (see Table 3.2)

iii) Inspection of manhole security

7.1.5.4 LEAK DETECTION MANHOLES

An inspection of each leak detection manhole will be conducted semiannually (spring and fall). This inspection will include:

i) Inspection of integrity of manhole

ii) Measurement and removal of accumulated condensation

iii) Inspection/verification of leak detection level switches and control system action

7.1.6 ANNUAL MONITORING

7.1.6.1 CONTAINMENT DIKES

On an annual basis, a Professional Engineer will assess the physical integrity of the containment dike. This inspection will identify any cracks, gaps, or other structural anomalies that may impact the performance of the containment dikes. The inspection reports are maintained in the Hyde Park Landfill Office. This inspection is performed in compliance with 6NYCRR 373-3.10 Tank Systems.

7.2 ENVIRONMENTAL MONITORING

Each day an operator is required to verify operation of the components of the collection system. This is intended to verify that the well systems are providing adequate drawdown to provide containment of the various APL and NAPL plumes. This may be accomplished through either a visit to the Site or examination of the HMI data through the WAN or dialup.

Additional monitoring of surface water, groundwater, groundwater levels, leachate, gas, or sediment is beyond the scope of this manual. Monitoring of these parameters is covered in another manual.

7.3 TREATMENT PLANT MONITORING

Monitoring of the treatment plant is summarized in the inspection log. A sample inspection log used by the operator is presented in Appendix B.

7.3.1 CARBON TREATMENT PERFORMANCE MONITORING

To ensure that organics are being removed by the Main Carbon Adsorbers, samples are taken before, between, and after the adsorbers, as summarized below.

Item/Indicator	*Criteria*	*Responses if Hi/Lo*
Influent:		
Phenols, VOCs, Organic Acids	Background Data	Monitor influent.
Interstage(s):		
Phenol, VOCs	> 1 mg/L, >1000 lbs. TOC	Schedule carbon change.
	> 300 mg/L	System shutdown.

Item/Indicator	*Criteria*	*Responses if Hi/Lo*
Effluent:		
Phenols	>1 mg/L	Process shutdown.
VOCs	>30 µg/L vinyl chloride	Check carbon adsorber
pH	outside 6-9	sequencing.

Sample analysis for phenols before, between, and after the adsorbers are taken weekly. The TOC total mass loadings are used to determine whether the organic loading to the adsorbers is changing significantly over short periods of time. As total mass loadings and the rate of mass loadings change with time, the frequency and compounds chosen for breakthrough analysis will be evaluated. The evaluation will determine whether current process sampling is adequate to maintain compliance with the current discharge permit.

7.4 ANALYTICAL PROGRAM

The Niagara Falls Water Board sewer permit and the Stipulation and Judgment Approving Settlement Agreement, January 1981 (Settlement Agreement) for the facility requires periodic testing of the effluent discharge and carbon interstage. Refer to the Niagara Falls Water Board permit, significant industrial user (SIU) permit No. 49 for treatment system monitoring requirements.

8.0 SYSTEM OPERATIONS

8.1 EMERGENCY SHUTDOWN

This process is designed to automatically shut down in a safe manner in the event of an electrical utility or instrument air failure. In the event of a power failure, all process equipment will shut down and the leachate equalization line valves will close. The operating ranges for the treatment plant are set to accommodate any gravity drain that would occur on system shutdown. In the event of a power failure or loss of instrument air the autodialer (battery backup provided) will summon the on-call operator (covered in Section 6.2.3-Autodialer). USEPA/NYSDEC will be notified by email of any system shutdowns (except those caused by routine operations or maintenance) that may have an impact on containment or treatment at the Site (piping leaks, impacts to water levels, gradients, etc.)

In the event of an emergency requiring evacuation of the treatment building, the Leachate Collection System can be quickly shut down by pressing the Emergency Stop button located on the PLC panel in the control room.

8.2 UNATTENDED OPERATION

The process is designed to automatically shut down in the event of an electrical utility failure, instrument air failure, or when system parameters are outside of normal operating conditions. These automatic shutdowns will notify an on-call operator using the system autodialer (covered in Section 6.2.3-Autodialer). Based on this information, the operator may access the Site via the WAN to verify the status of all system components. In the event of an automatic shutdown, the operator must go to the Site, investigate the cause of the automatic shutdown, and address the cause before restarting the Collection and APL Treatment Systems.

Before leaving the Site for unattended operation, the operator must complete the Unattended Operator Checklist, Table 8.1.

8.3 UTILITY SHUTOFFS

8.3.1 ELECTRICITY

Electricity to all or parts of the treatment building and the Treatment Tank Farm can be shut off in the Motor Control Center, MCC 200, and MCC 300, located on the west end,

first floor of the treatment building. Electricity to all or parts of the remaining storage and loading areas can be shutoff in the Motor Control Center, MCC 100, located north of the equipment wash building.

8.3.2 NATURAL GAS

The main shutoff valve for natural gas is located on the west outside wall of the treatment building near the south corner.

8.3.3 CITY WATER

City water enters the facility in the utility room, located on the first floor in the southwest corner of the treatment building. A shutoff valve is located on the riser in the extreme southwest corner of the room. This also shuts off water supply to the City Water Break Tank (HP-39).

8.4 WASTE DISPOSAL

8.4.1 NAPL DISPOSAL

NAPL collected from the decanters is sent off Site for incineration. This is accomplished by transferring the NAPL from the Decanters to a tanker trailer for shipment to the off-Site incineration facility. (See Procedure **Loading NAPL from Decanters** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

NAPL transfer and shipping will be performed and documented in accordance with applicable RCRA manifesting requirements (6NYCRR 372).

8.4.2 SACRIFICIAL CARBON

Spent carbon from the sacrificial adsorbers is sent off Site for incineration. This is accomplished by transferring the carbon to a tanker trailer for shipment to the off-Site incineration permitted facility. (See Procedure **Sacrificial Carbon Bed Carbon Change** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

8.4.3 MAIN CARBON

Spent carbon from the main adsorbers is sent off Site to a permitted facility for regeneration. This is accomplished by transferring the carbon to a tanker trailer for off-Site regeneration. (See Procedure **Main Carbon Bed Carbon Change** in the "Hyde Park Procedures Manual" located in the Hyde Park Control Room).

8.4.4 VAPOR CARBON DRUMS

Spent vapor carbon drums are sent off Site for incineration at a permitted facility.

9.0 QUARTERLY/ANNUAL REPORTS

Quarterly and annual reports are to be prepared and submitted in accordance with the July 2006 PMP, or current revision.

10.0 PERSONNEL

10.1 ORGANIZATIONAL CHART

The organizational structure for GSH WNY operating personnel is posted in the Hyde Park Control Room.

10.2 STAFFING REQUIREMENTS

The Hyde Park Collection and Treatment Systems require minimal staffing. The Site is designed to operate unattended with the exception of routine inspections, maintenance activities, and response to alarms by the on-call operator.

10.3 TRAINING

Training for the Operations Staff is covered in Section 4 (Training Program) of the "Site-Specific Health and Safety Plan for Operation and Maintenance Activities." This manual is kept in the Hyde Park Control Room. These training programs and associated documentation are consistent with the requirements of 6NYCRR 373-3.2(g) Personnel Training.

10.3.1 DETAILED JOB TRAINING

The on-the-job training required for a Hyde Park Operator includes:

i) Review of specific requirements of the Hyde Park Landfill Stipulation on Requisite Remedial Technology Program as they pertain to job responsibilities

ii) Review of other environmental and safety regulations applicable to operation of the Collection and APL Treatment Facility

iii) Detailed study and understanding of the "Hyde Park Landfill Collection and APL Treatment System Manual" and the "Controls Manual"

iv) Satisfactory performance of all required record keeping

v) Demonstration of proficiency with Hyde Park operating procedures

10.3.2 TRAINING DOCUMENTATION

Upon completion of formal training to operate the facility, acknowledgement is documented on a sign-off sheet, Figure 10.1, and placed in the employee personnel file.

11.0 RECORDS

11.1 OPERATING INSPECTION

Operations inspection sheets are filed in the Hyde Park Control Room. Examples of the logs are presented in Appendix B. These inspection sheets will be scanned monthly and saved electronically (e.g., as Adobe® Acrobat® files) at Love Canal. Operations logbooks are used to record activities performed while on-Site. Active logbooks are stored in the Hyde Park Control Room. Logbooks are archived in the Hyde Park Supervisors Office located in building HP 01.

11.2 MAINTENANCE/CALIBRATION

Maintenance and calibration records for each piece of equipment are filed in the Hyde Park Control Room.

12.0 REFERENCES

12.1 HYDE PARK DOCUMENTS

12.1.1 CONSENT ORDERS

- Stipulation and Judgment Approving Settlement Agreement, April 1982
- Stipulation on Requisite Remedial Technology Program, August 1986

12.1.2 MANUALS

- Hyde Park Landfill Collection and APL Treatment System Manual
- Hyde Park Controls Manual
- Hyde Park Procedures Manual

12.1.3 HEALTH AND SAFETY

- Site Specific Health and Safety Plan for Operation and Maintenance Activities at the Hyde Park Treatment Facility, Love Canal Treatment Facility, Durez North Tonawanda Treatment Facility, and Durez NT Inlet Cove

12.2 DRAWINGS

A Process Flow Diagram for the Collection and APL Treatment System is attached as Appendix A. Significant equipment, instrumentation and process lines are depicted on this drawing as a reference for operating personnel.

Engineering flow sheets for the Collection and APL Treatment System are filed in the Hyde Park Control Room. All equipment, connecting pipeline, and process instrumentation are shown on these sheets for detailed design and troubleshooting of the system.

12.3 EQUIPMENT VENDOR MANUALS

Manuals for individual equipment are stored in the Hyde Park Control Room.

FIGURES

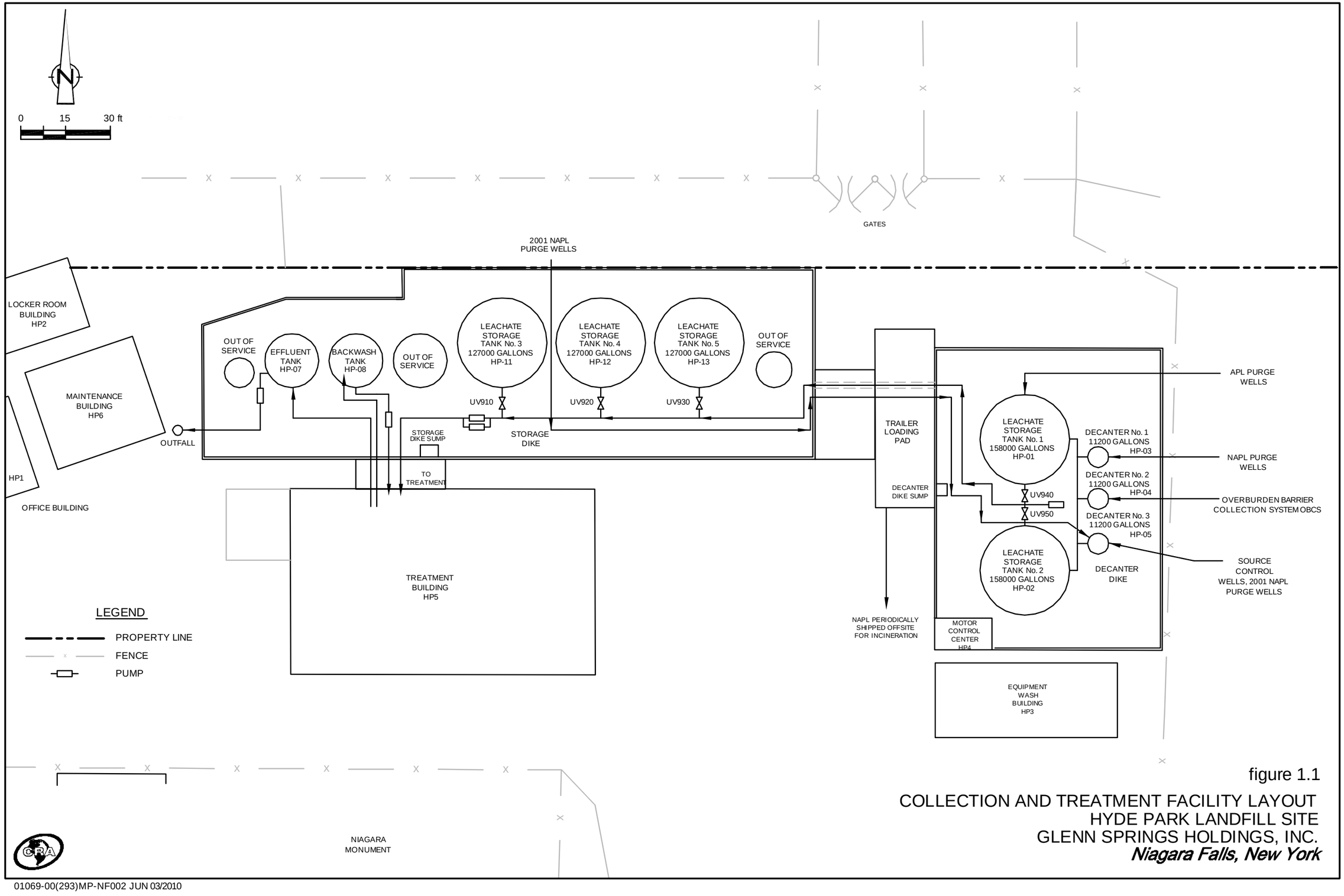
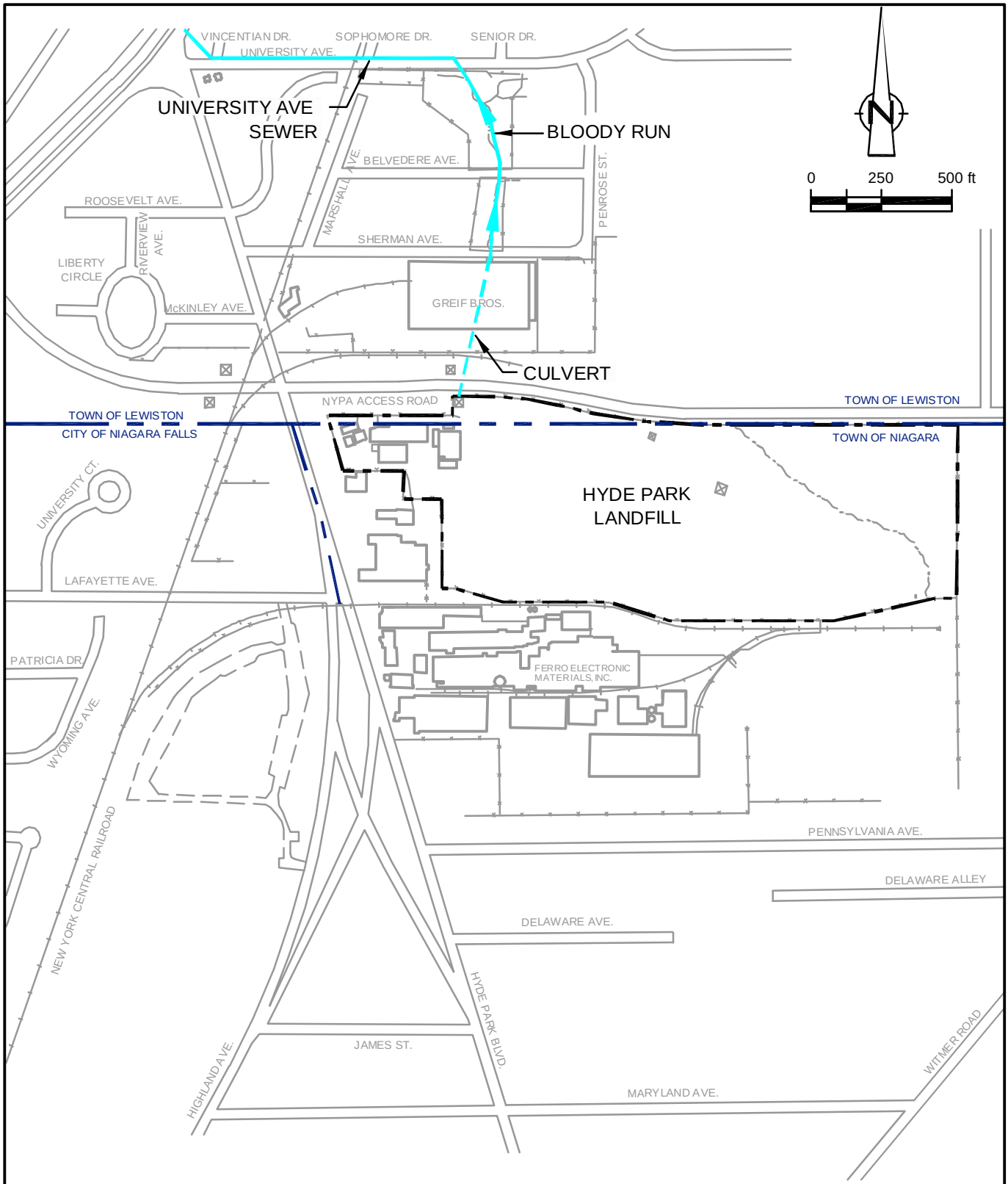


figure 1.1

COLLECTION AND TREATMENT FACILITY LAYOUT
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York



LEGEND

PROPERTY LINE

figure 2.1

SITE LOCATION
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

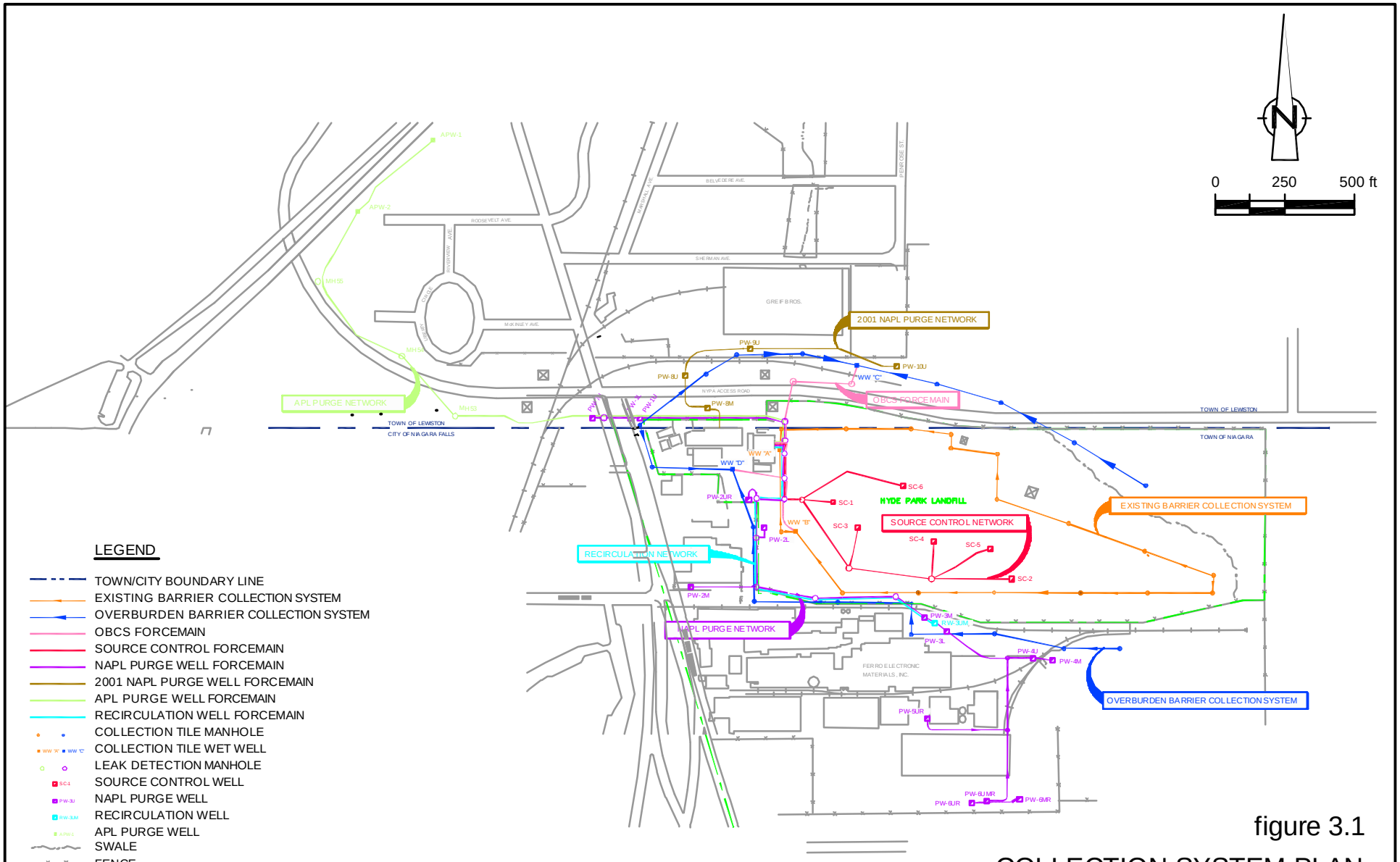
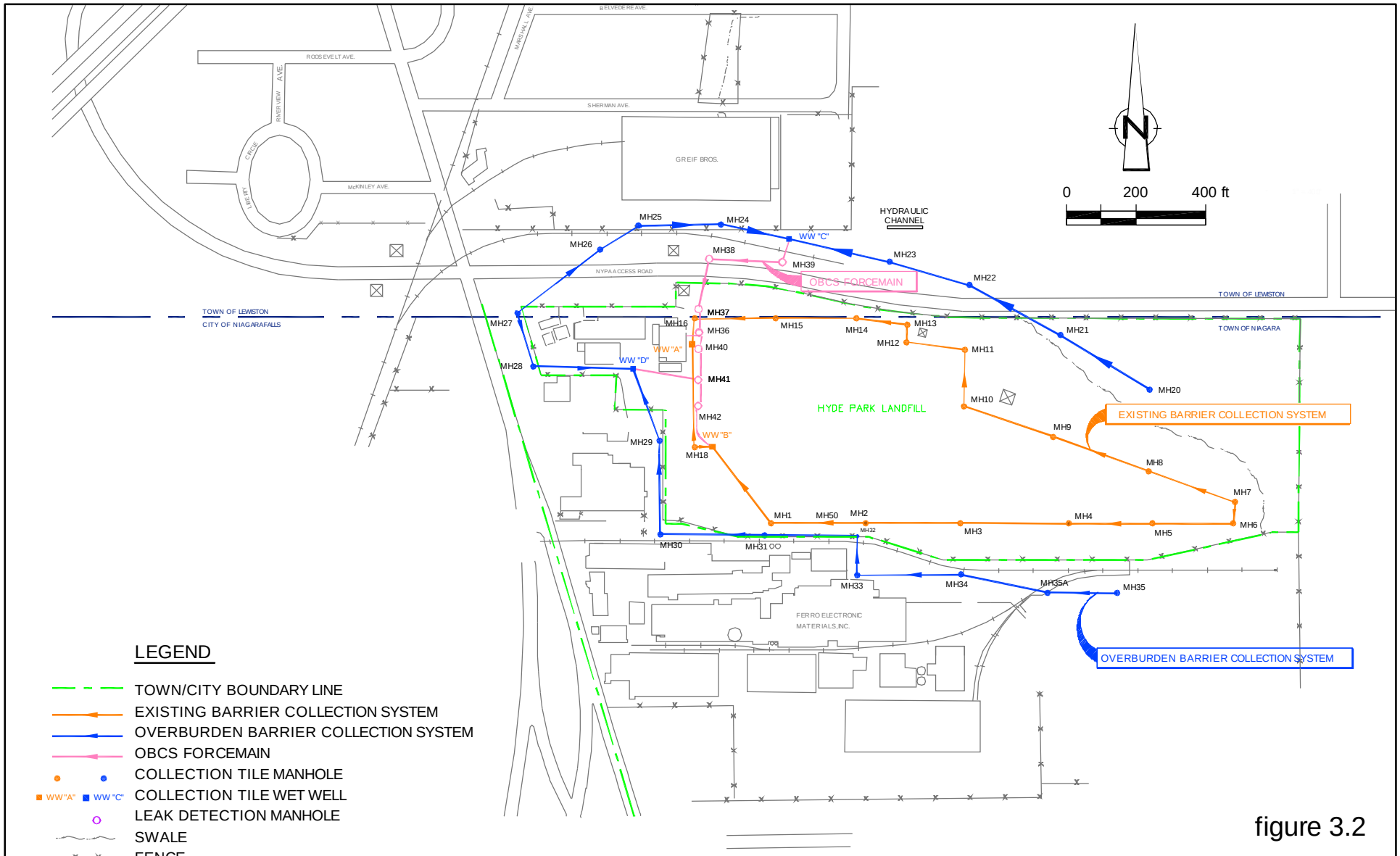


figure 3.1

COLLECTION SYSTEM PLAN
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

01069-00(293)GN-NF003 JUN 03/2010



LEGEND

- TOWN/CITY BOUNDARY LINE
- EXISTING BARRIER COLLECTION SYSTEM
- OVERBURDEN BARRIER COLLECTION SYSTEM
- OBCS FORCEMAIN
- COLLECTION TILE MANHOLE
- WW "A" WW "C" COLLECTION TILE WET WELL
- LEAK DETECTION MANHOLE
- SWALE
- FENCE
- RAILWAY

figure 3.2

OVERBURDEN RRT SYSTEM
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

CRA

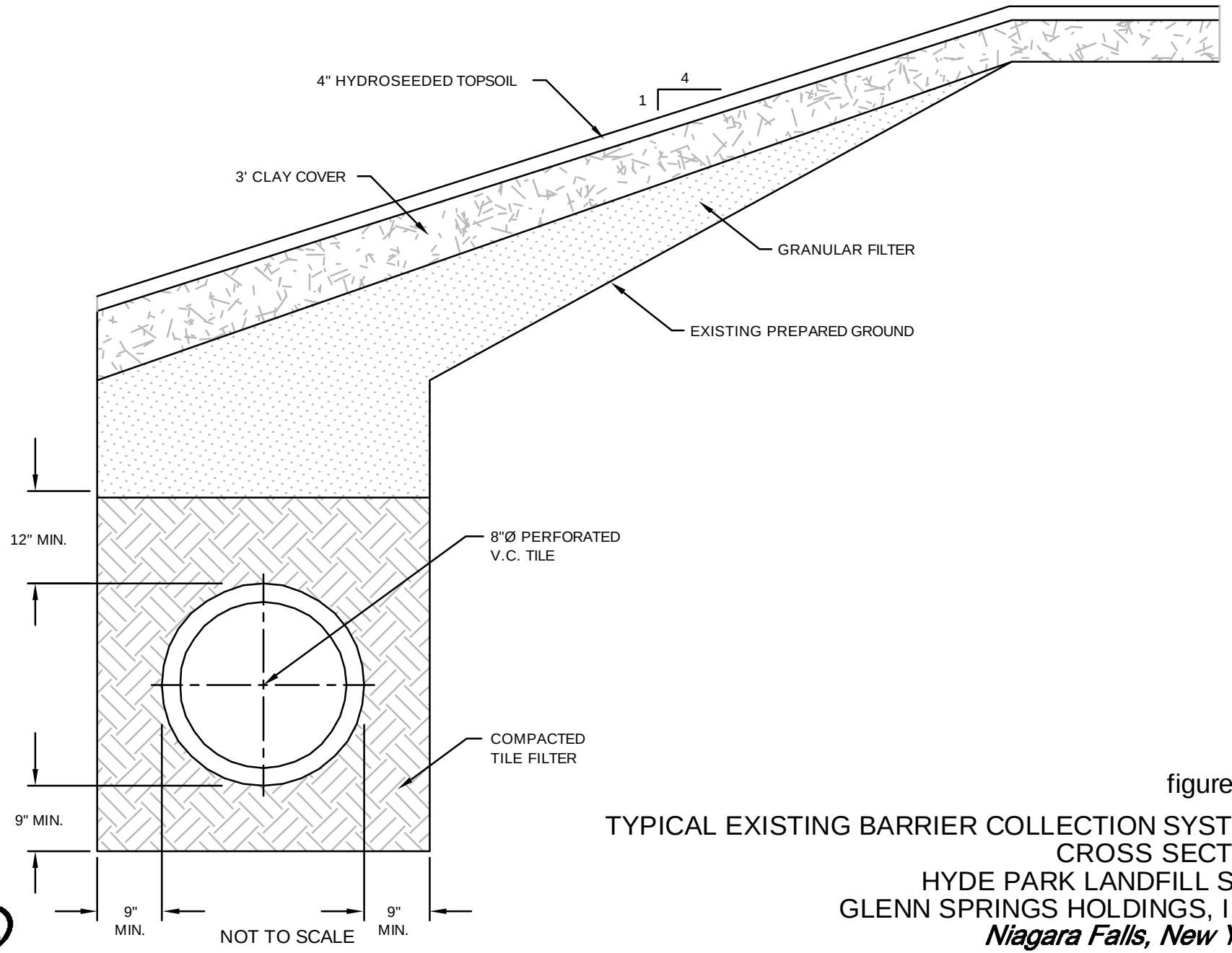


figure 3.3

TYPICAL EXISTING BARRIER COLLECTION SYSTEM
CROSS SECTION
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

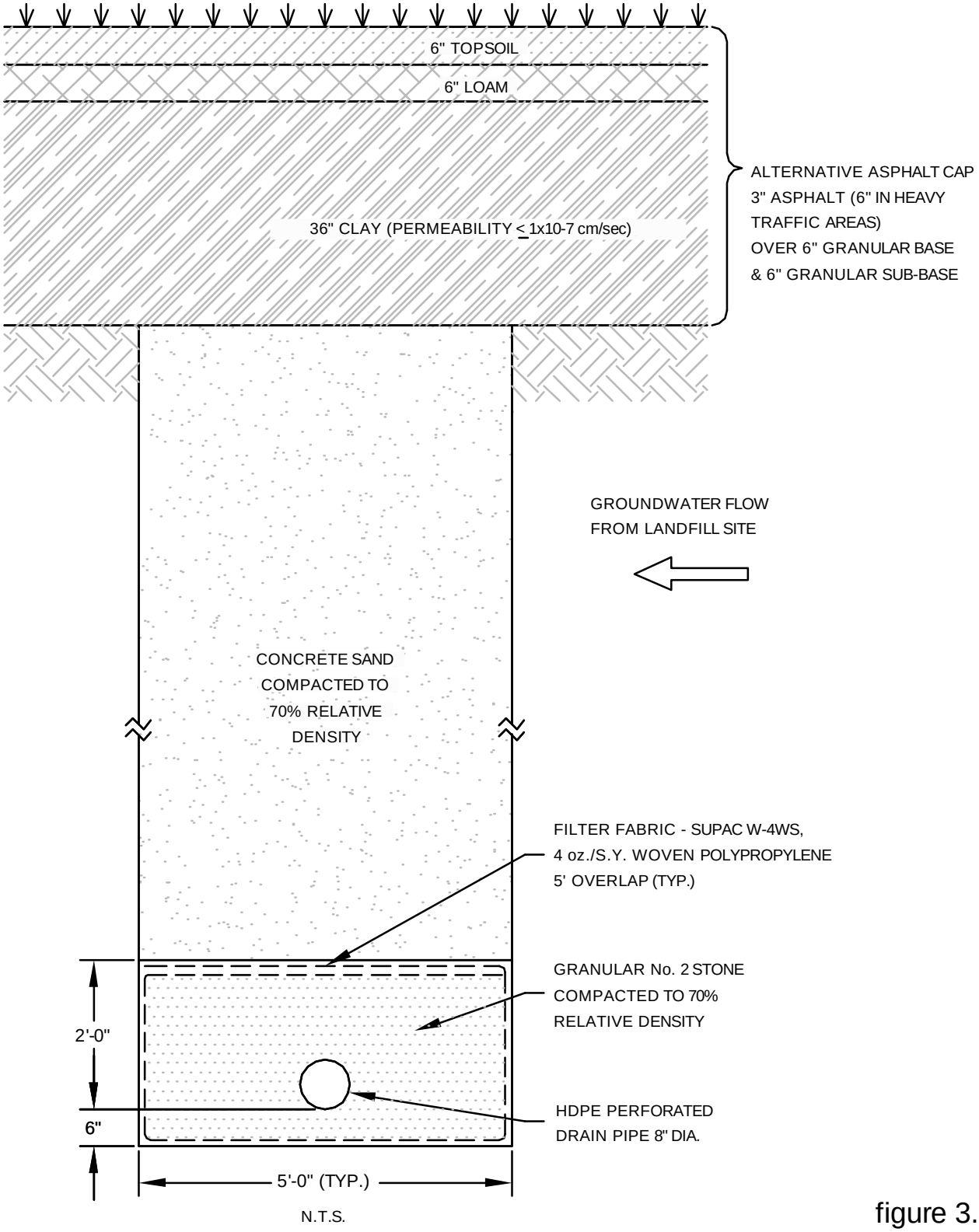


figure 3.4

TYPICAL OVERBURDEN BARRIER COLLECTION SYSTEM
CROSS - SECTION
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

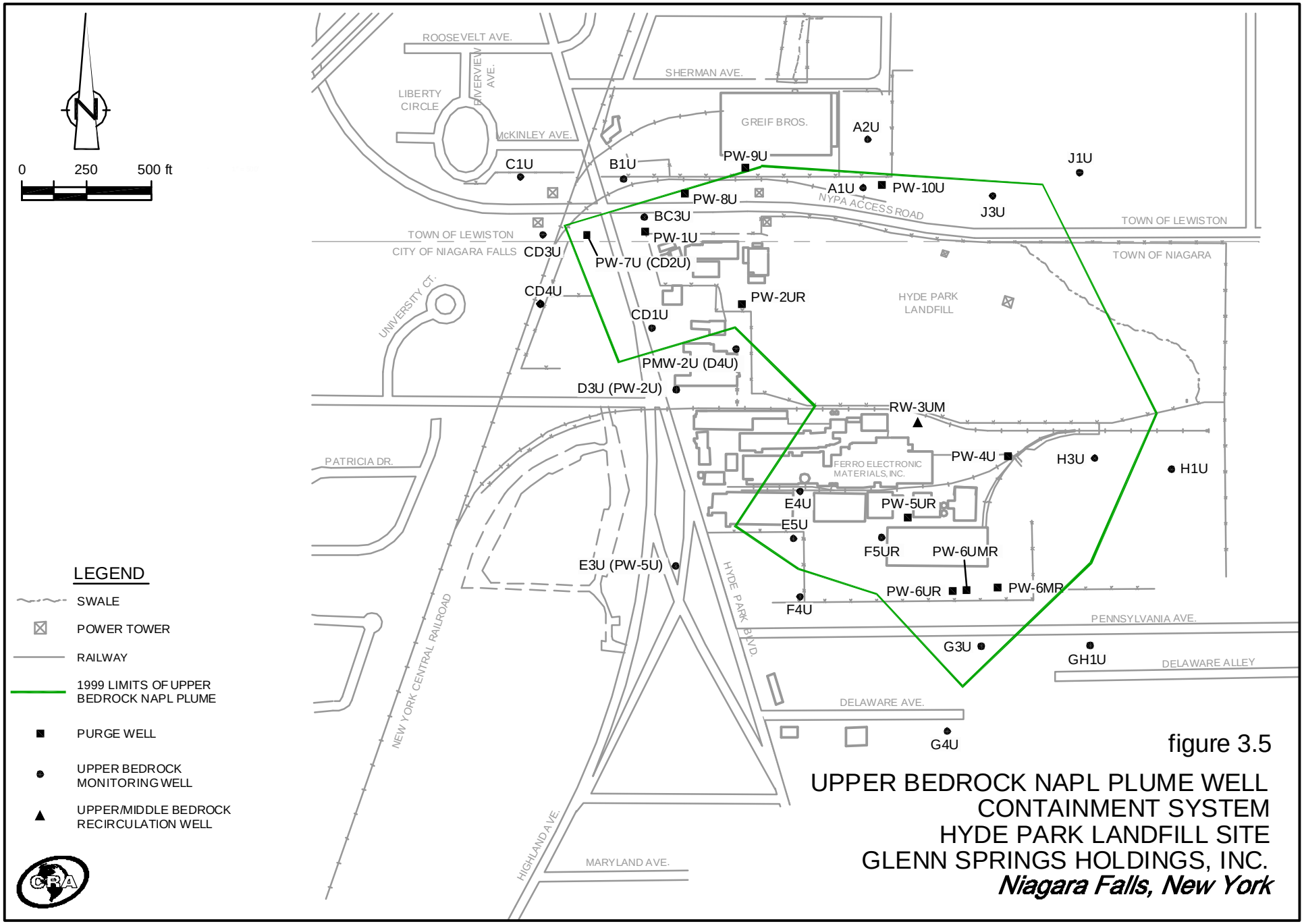


figure 3.5

UPPER BEDROCK NAPL PLUME WELL CONTAINMENT SYSTEM
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

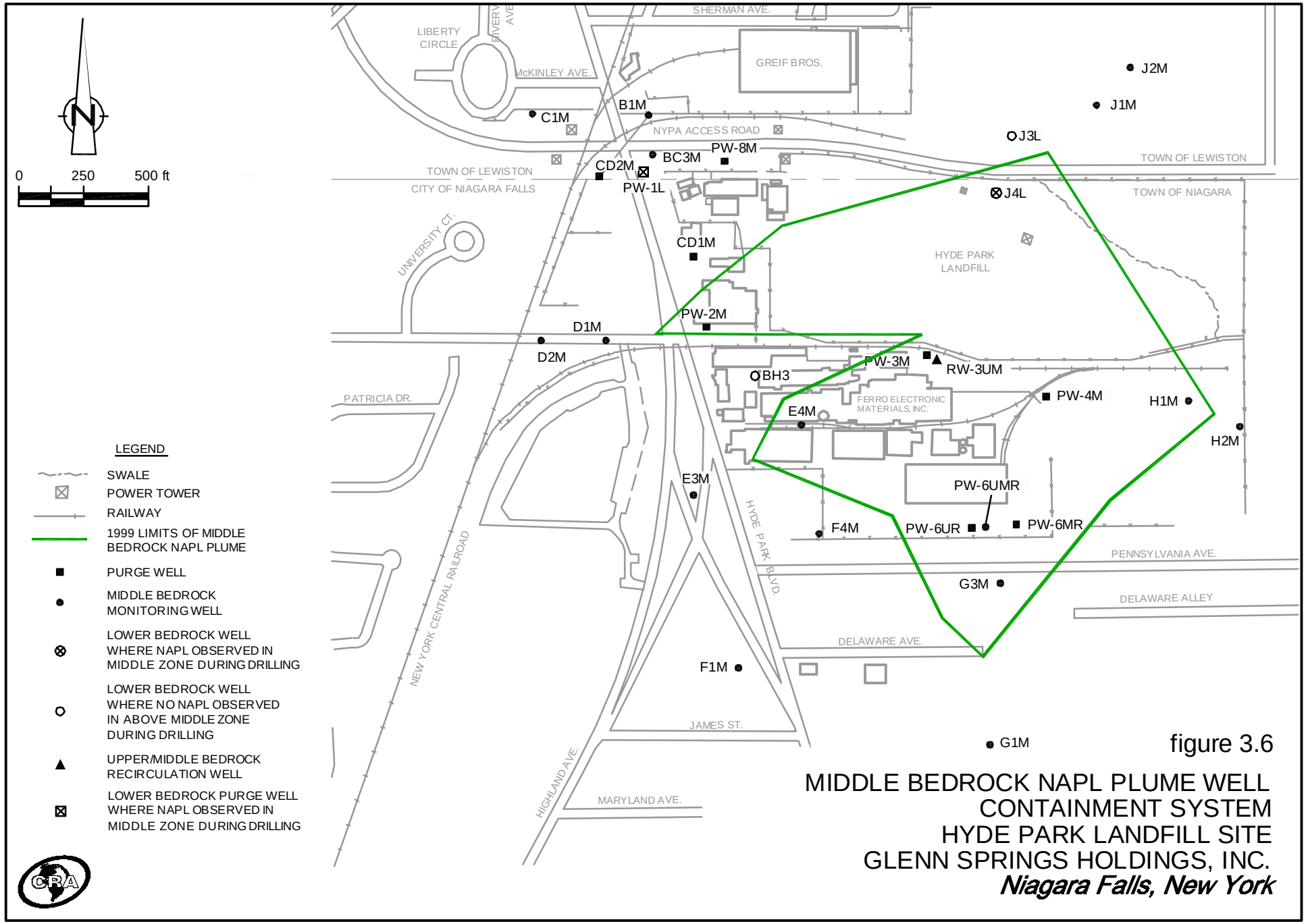


figure 3.6

MIDDLE BEDROCK NAPL PLUME WELL CONTAINMENT SYSTEM
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

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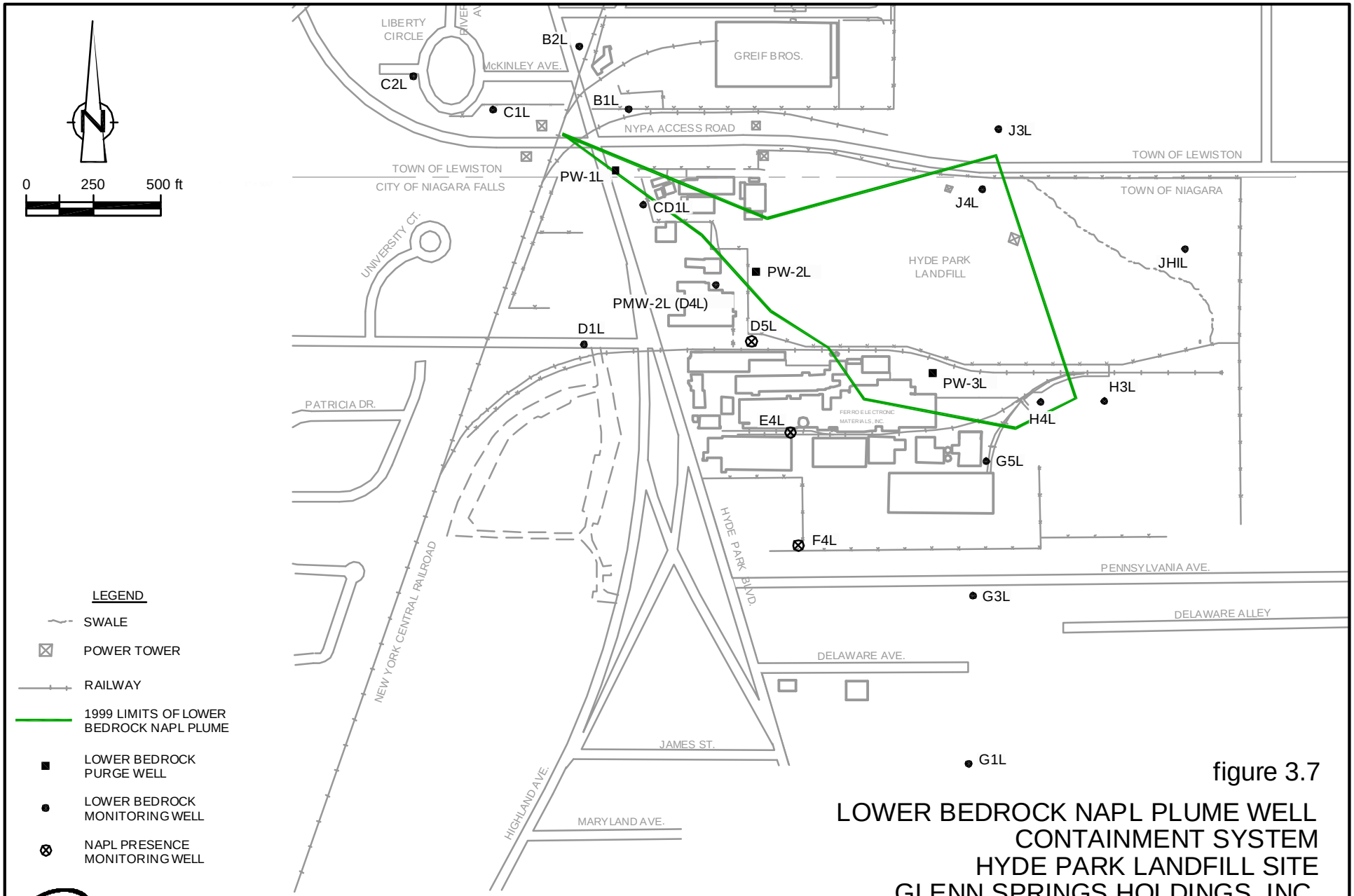

figure 3.7

LOWER BEDROCK NAPL PLUME WELL CONTAINMENT SYSTEM
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

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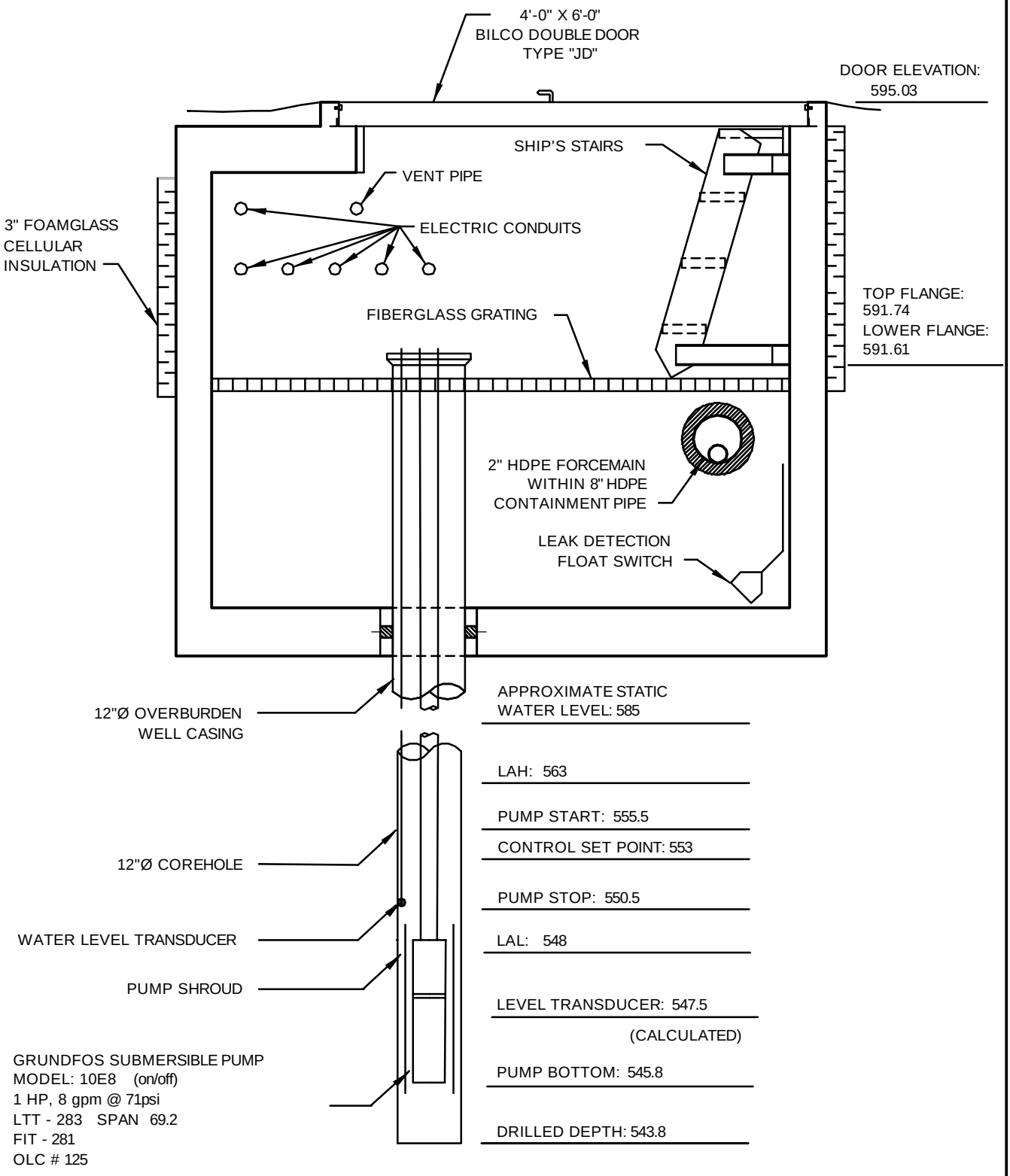

figure 3.8

TYPICAL PURGE WELL SCHEMATIC
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

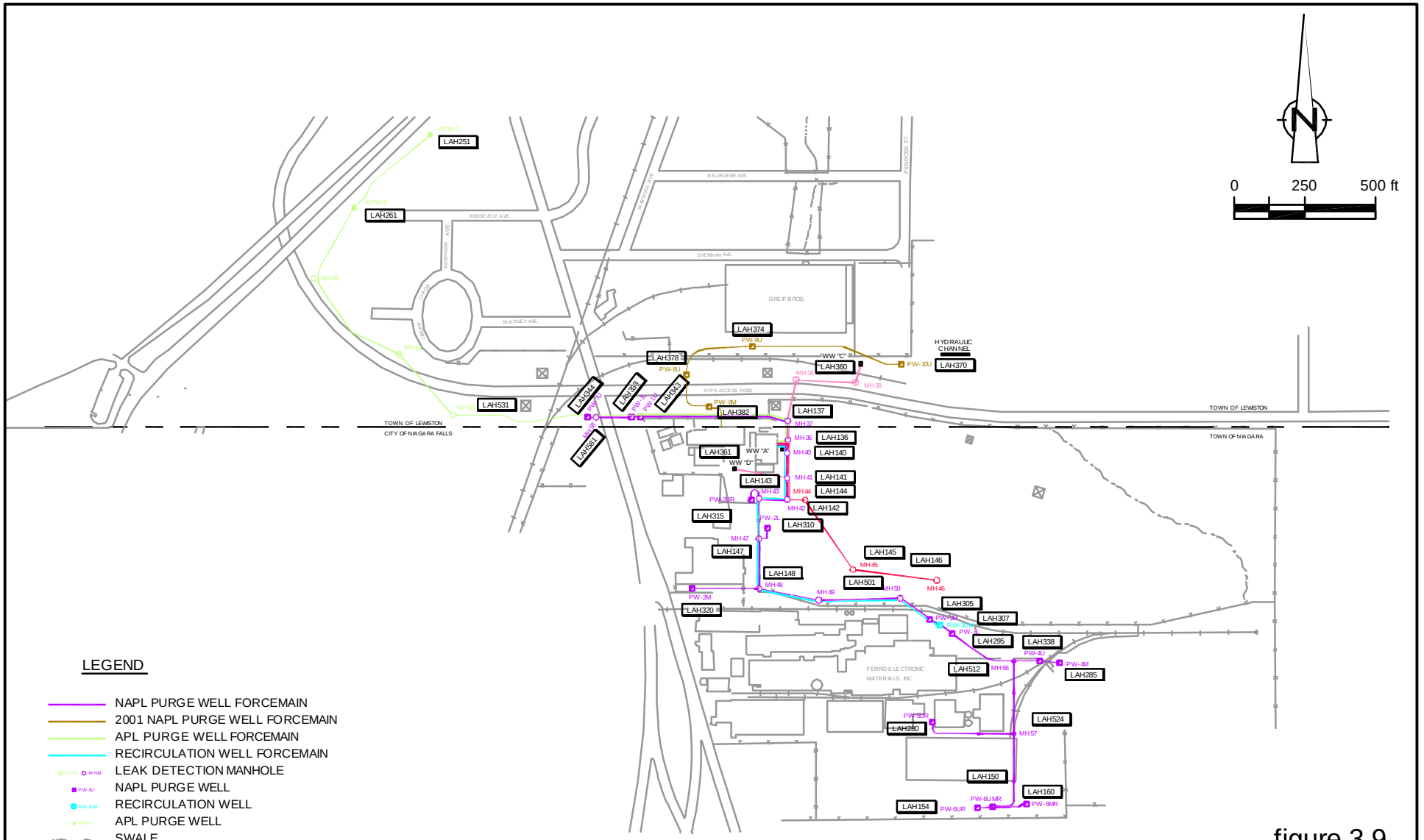

figure 3.9

PLC BASED LEAK DETECTION ELEMENTS
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

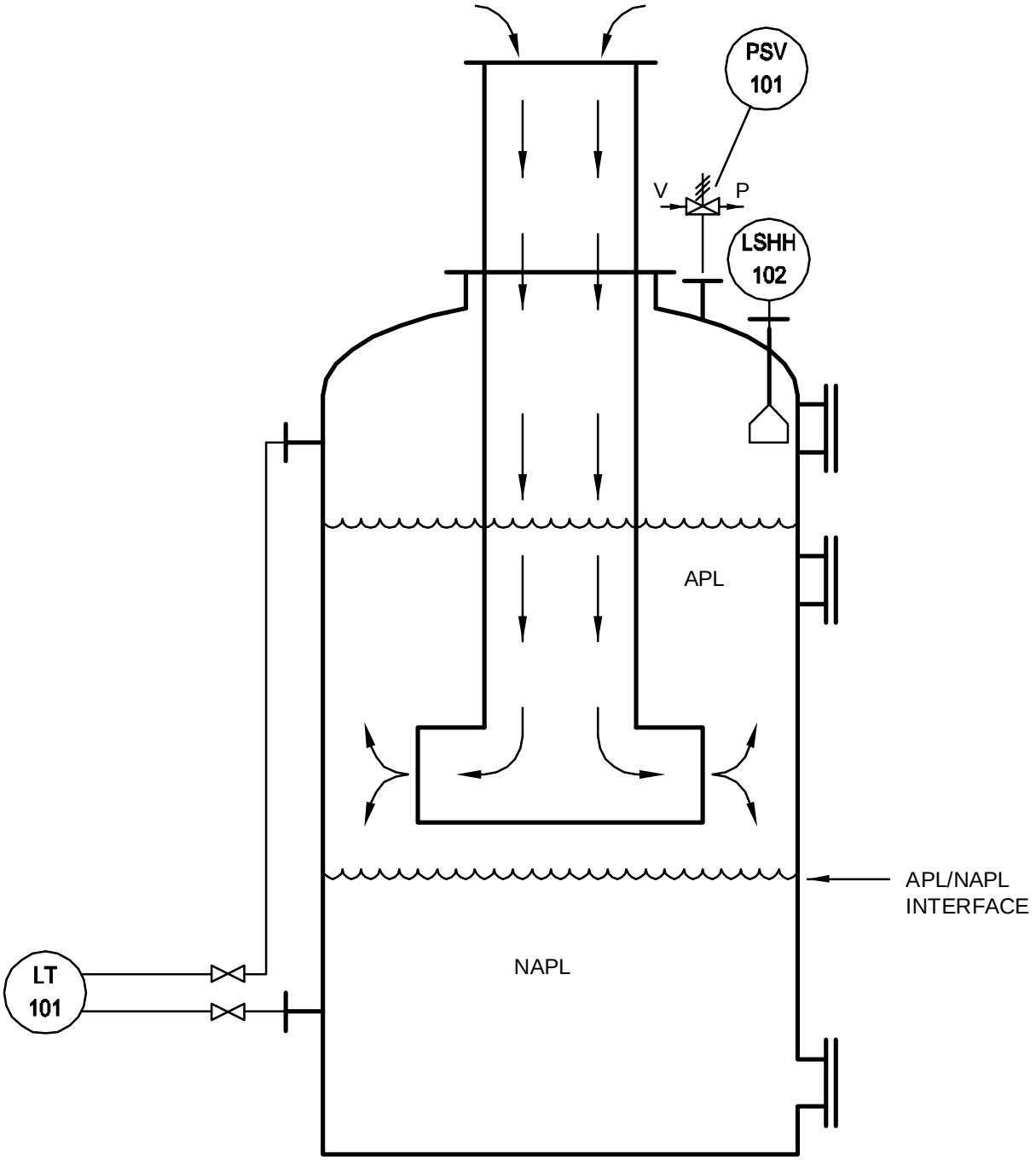

figure 4.1

DECANTER DETAIL
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

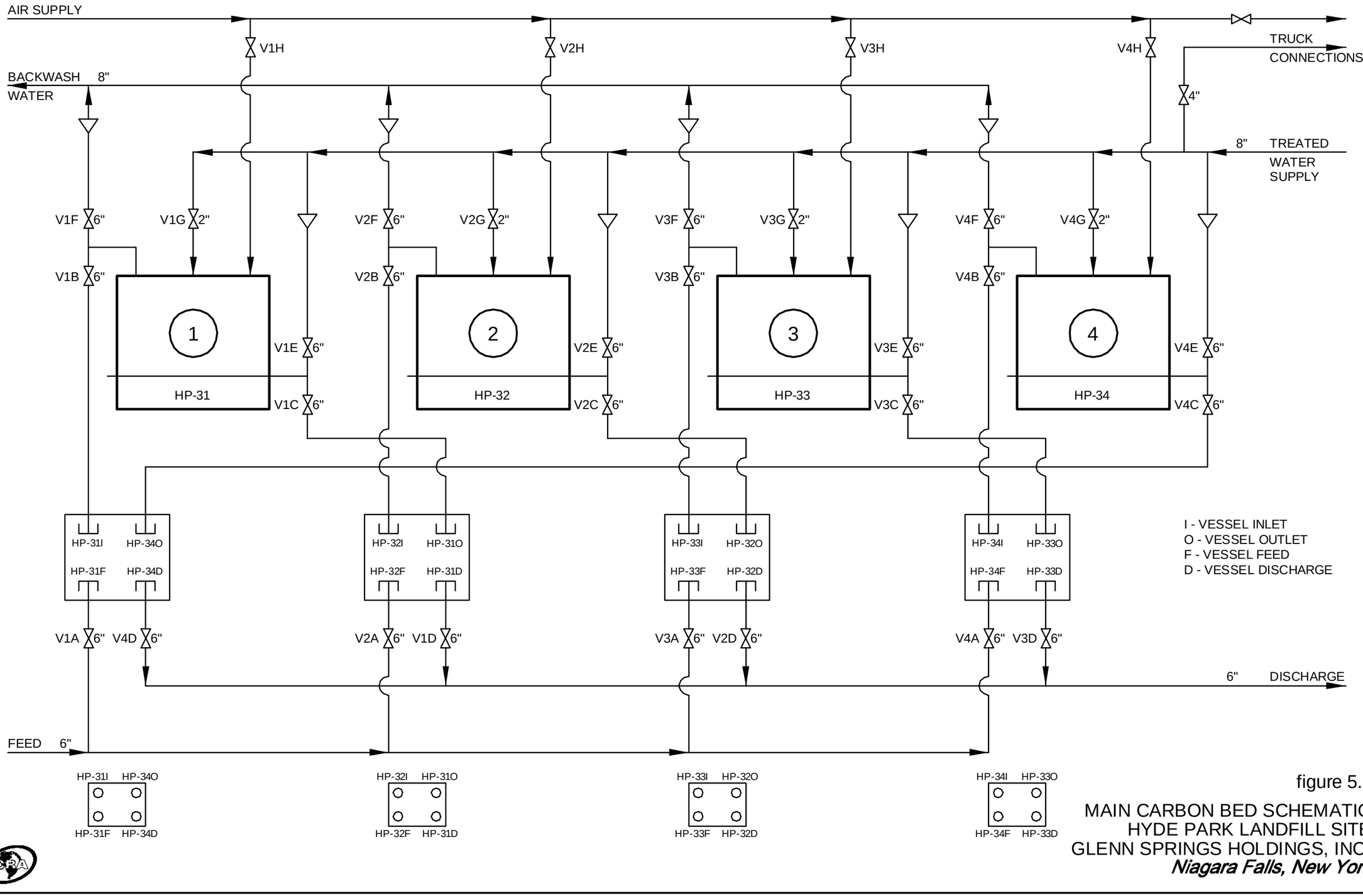

figure 5.1

MAIN CARBON BED SCHEMATIC
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

0 15 30 ft

GATES

LOCKER ROOM BUILDING HP2

MAINTENANCE BUILDING HP6

HP1

OFFICE BUILDING

OUTFALL

UV910 UV920 UV930

STORAGE DIKE SUMP

2

STORAGE DIKE

1

TO TREATMENT

TRAILER LOADING PAD

9

DECANTER DIKE SUMP

10

UV940

UV950

DECANTER DIKE

MOTOR CONTROL CENTER HP4

EQUIPMENT WASH BUILDING HP3

3rd Flr

SAFETY SHOWER HEAD TANK

6 1st Flr

8 3rd Flr

5 2nd Flr

TREATMENT BUILDING HP5

3 1st Flr

7 1st Flr

4 1st Flr

LEGEND

2 SAFETY SHOWER

NIAGARA MONUMENT

figure 5.2

SAFETY SHOWER LOCATIONS
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

01069-00(293)MP-NF003 JUN 03/2010

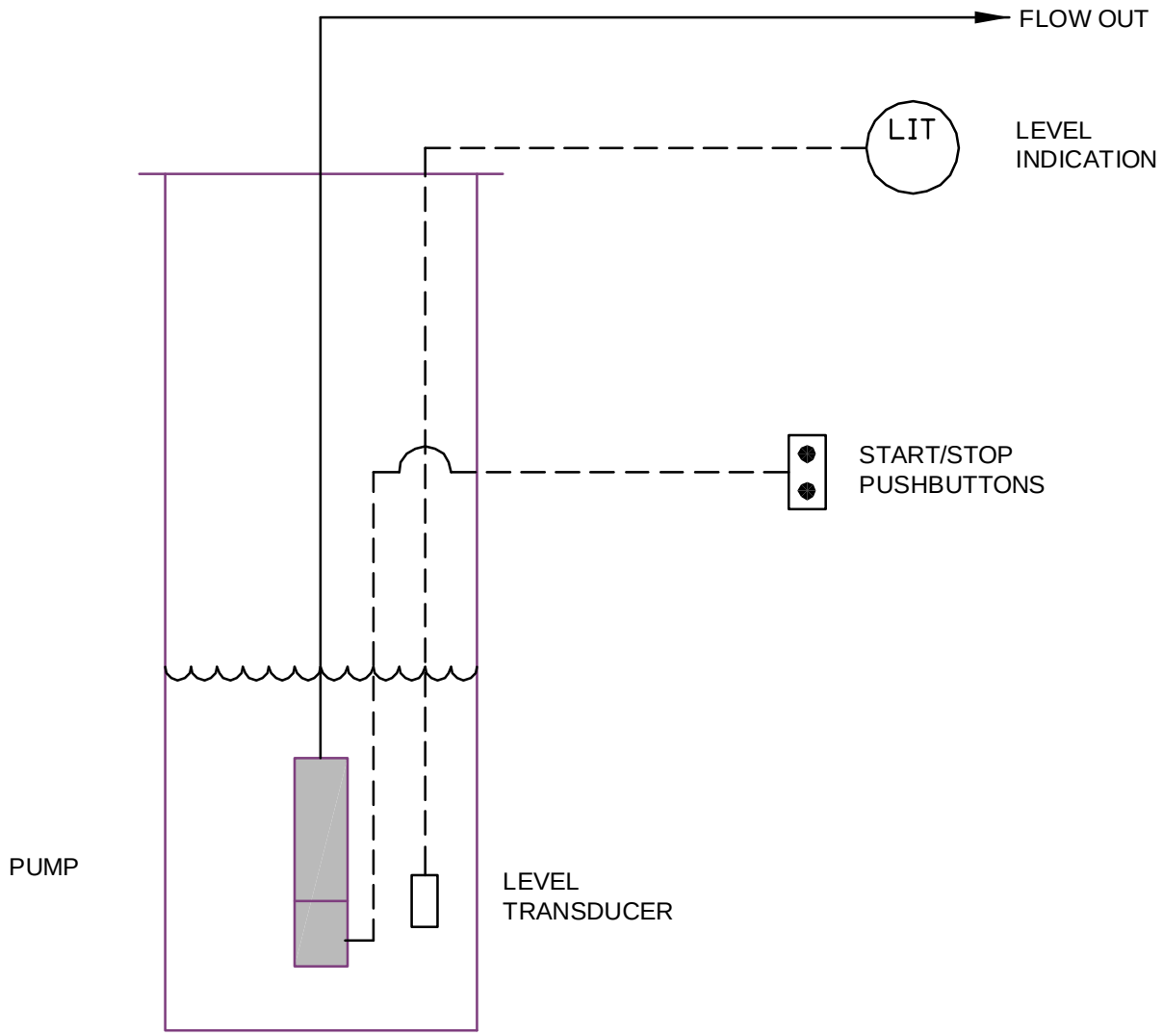

figure 6.1

CLOSED LOOP/MANUAL CONTROL
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

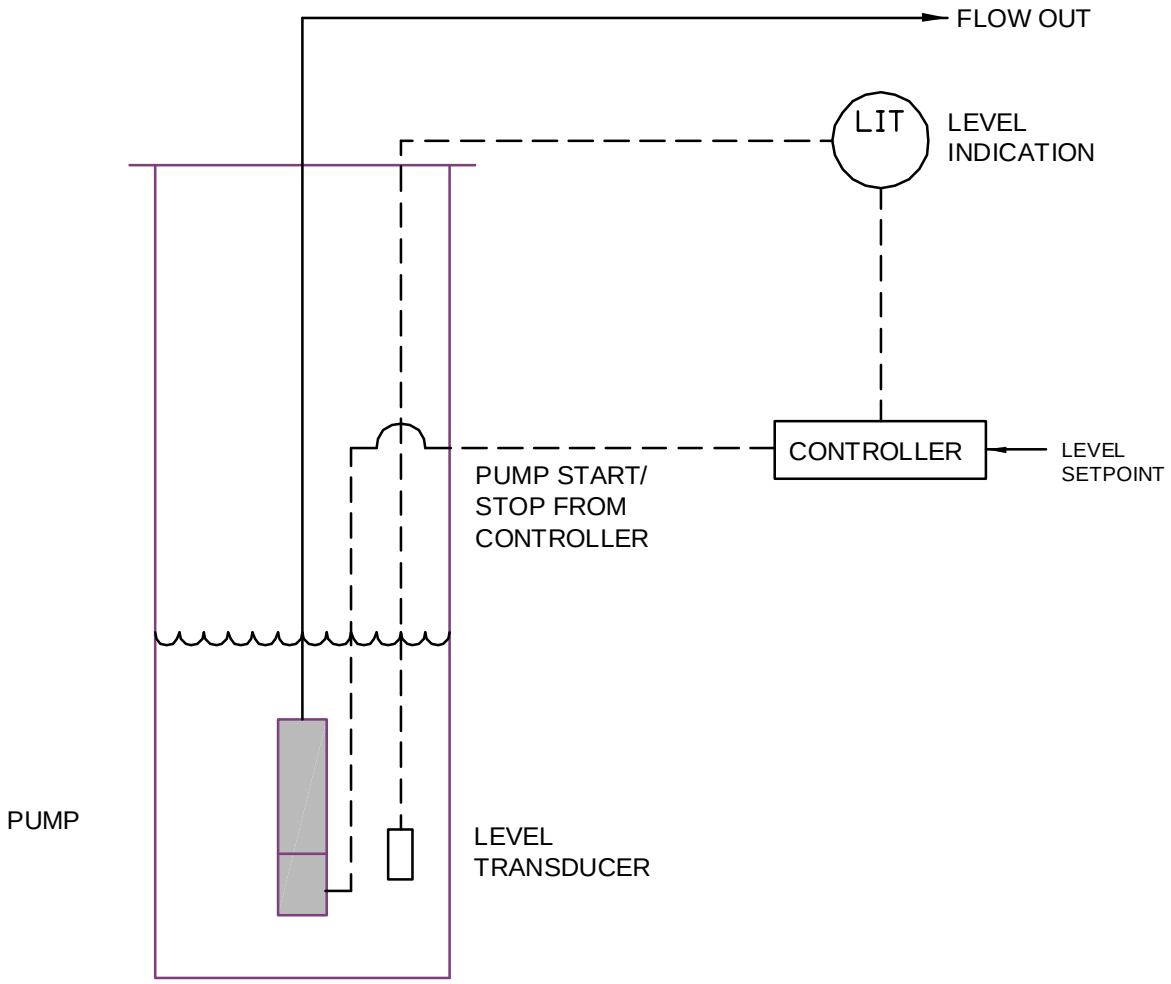

figure 6.2

CLOSED LOOP/AUTOMATIC CONTROL
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

ID	Task Name	r	January	February	March	April	May	June	July	August	September	October	November	December	Janu
		51 52	1 2 3 4 5	6 7 8 9	10 11 12 13	14 15 16 17 18	19 20 21 22	23 24 25 26	27 28 29 30 31	32 33 34 35	36 37 38 39	40 41 42 43 44	45 46 47 48	49 50 51 52 53	1
1	**7.1.2 Daily**														
2	**7.1.2 System Operations**		■	■	■	■	■	■	■	■	■	■	■	■	
264	**7.1.3 Weekly**														
265	**7.1.3 System Operations**		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	
318	**7.1.3.2 Tank Valves**		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	
371	**7.1.4 Monthly**														
372	**7.1.4.1 Sumps and Pumps**		■	■	■	■	■	■	■	■	■	■	■	■	
385	**7.1.4.2 Vessels/Tanks**		■	■	■	■	■	■	■	■	■	■	■	■	
398	**7.1.4.3 Fence**		■	■	■	■	■	■	■	■	■	■	■	■	
411	**7.1.4.4 Vent Adsorbers**		■	■	■	■	■	■	■	■	■	■	■	■	
424	**7.1.4.5 Safety showers**		■	■	■	■	■	■	■	■	■	■	■	■	
437	**7.1.5 Semi-annual**														
438	**7.1.5.1 Purge Wells (Spring)**					■									
440	**7.1.5.1 Purge Wells (Fall)**											■			
442	**7.1.5.2 OBCS/EBCS wet wells (Spring)**					■									
444	**7.1.5.2 OBCS/EBCS et wells (Fall)**											■			
446	**7.1.5.3 OBCS/EBCS manholes (Spring)**					■									
448	**7.1.5.3 OBCS/EBCS manholes (Fall)**											■			
450	**7.1.5.4 Leak detection manholes (Spring)**					■									
452	**7.1.5.4 Leak detection manholes (Fall)**											■			
454	**7.1.6 Annual**														
455	**7.1.6.1 Containment dikes**								■						

figure 7.1

MONITORING SCHEDULE
HYDE PARK LANDFILL SITE
GLENN SPRINGS HOLDINGS, INC.
Niagara Falls, New York

FIGURE 10.1

GLENN SPRINGS HOLDINGS, INC.
COLLECTION AND APL TREATMENT SYSTEM
OPERATOR TRAINING ACKNOWLEDGEMENT

The undersigned has been formally trained on the Hyde Park Collection and Aqueous Phase Liquid (APL) Treatment System in accordance with the Hyde Park Landfill Collection and APL Treatment System Operation and Maintenance (O&M) Manual.

NAME:_____ DATE:_____

SUPERVISOR:_____ DATE:_____

TABLES

TABLE 1.1

PROJECT CONTACTS
OPERATION AND MAINTENANCE MANUAL PLAN
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Glenn Springs Holdings, Inc.

Operations Manager
Mr. Joseph Branch - (231) 670-6809
Fax - (231) 894-4033
Glenn Springs Holdings, Inc.
7601 Old Channel Trail
Montague, MI 49437

Operations Coordinator
Mr. Clinton J. Babcock - (972) 687-7506
Fax - (972) 687-7524
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TABLE 1.1

PROJECT CONTACTS
OPERATION AND MAINTENANCE MANUAL PLAN
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Agency Representatives

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TABLE 2.1

REGIONAL LITHOLOGIC DESCRIPTIONS
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK
(Brett et al, 1995)

	Lithologic Description	*Unit Thickness*	*Contact With Overlying Unit*
Eramosa Formation	Dark brownish-gray, thin to thick bedded, bituminous dolomite, commonly vuggy	38 to 50 feet	Typically sharp, occurs at the basal stromatolitic marker bed of the Guelph Dolomite
Vinemount Member of the Goat Island Formation	Light to dark gray, medium to thin bedded, very fine-grained, argillaceous, bituminous, dolomite with thin shale partings	17 to 20 feet, anomalously thin (9 to 10 feet thick) at two locations in the Niagara region	Commonly gradational, but often sharp where the overlying unit is thick-bedded
Ancaster Member of the Goat Island Formation	Medium ash-gray, thin to medium bedded, fine grained dolomite with abundant chert nodules	2 to 25 feet. The thickness tends to be compensatory, such that the Ancaster Member is thick where the Niagara Falls Member is thin and vice versa	Abrupt and often demarcated by a 1- to 2-inch thick black shale, also described for the Niagara Falls area as being gradational and difficult to establish
Niagara Falls Member of the Goat Island Formation	Light olive to brownish-gray, sucrosic, medium grained, thick to massive bedded, porous and vuggy dolomite, containing stromatoporoids	3 to 15 feet	Sharp but conformable, color and texture typically change from dark and medium-grained below the contact to pale buff and finer-grained above
Pekin Member of the Gasport Formation	Argillaceous, dark gray, fine-grained, thin to medium bedded, dolomicrite with local bioherms and flanking fossiliferous facies	Up to 33 feet but was noted to vary significantly	Varies from gradational to sharp
Gothic Hill Member of the Gasport Formation	Thick to massive bedded, dark olive gray to light pink, crinoidal grainstone and crinoidal dolomite	3 to 21 feet	Sharp and conformable, obvious due to the distinctive lithological change
DeCew Formation	Dark gray to olive gray, argillaceous to sandy, fine-grained dolomite with stringers of crinoid ossicles, internal soft sediment deformation structures	4.5 to 11.8 feet	Sharp and unconformable
Burleigh Hill Member of the Rochester Shale	Dark to medium gray, highly calcareous to dolomitic mudstone	30 feet near Lewiston to 23 feet thick at the Niagara Falls	Gradational and often difficult to establish in the Niagara region

TABLE 3.1

LANDFILL SOURCE CONTROL WELL
PHYSICAL DATA SUMMARY
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Purge/ Recovery Well No.	*Casing/ Flange (ft. AMSL)*	*Drilled Well Bottom* [1] *Depth (ft.)*	*(ft. AMSL)*	*Non-Operational Water Levels* [2] *(ft. AMSL)*	*Typical Operational Water Levels (ft. AMSL)*	*Typical Pump Rate (gallons per month)*
SC-1	623.79	43.1	580.6	603.0	*	*
SC-2	626.50	35.9	590.6	605.3	597	<25
SC-3	638.48	47.3	591.2	600.9	597	<25
SC-4	639.67	51.5	588.2	605.4	595	<25
SC-5	635.05	33.6	601.5	605.4	608	<25
SC-6	629.78	42.2	587.6	595.0	593.6	<25

Notes:

* Out of service.

NA Not applicable.

(1) Depth is measured from the casing/flange to the base of the well at the conclusion of drilling.

(2) Typical elevation of groundwater when extraction system is not operating.

TABLE 3.2

COLLECTION SYSTEM
MANHOLE ELEVATIONS
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

System	*Manhole Number*	*Rim Top Elevation (feet)*	*MH Invert Elevation (feet)*	*Depth (feet)*
Existing Barrier Collection System	MH1	605.30	594.67	10.63
	MH2	608.94	597.87	11.07
	MH3	618.73	601.57	17.16
	MH4	622.05	604.87	17.18
	MH5	625.15	606.87	18.28
	MH6	620.20	609.47	10.73
	MH7	620.40	610.47	9.93
	MH8	624.13	605.47	18.66
	MH9	620.37	599.57	20.80
	MH10	615.44	596.87	18.57
	MH11	608.11	595.62	12.49
	MH12	607.36	594.47	12.89
	MH13	601.39	593.87	7.52
	MH14	606.71	592.97	13.74
	MH15	609.28	591.57	17.71
	MH16	599.13	589.47	9.66
	MH18	607.80	592.47	15.33
	WW-A	603.17	585.07	18.10
	WW-B	608.83	588.87	19.96
Overburden Barrier Collection System	MH20	610.53	605.37	5.16
	MH21	605.70	599.27	6.43
	MH22	600.13	592.87	7.26
	MH23	598.98	586.55	12.43
	MH24	592.25	581.79	10.46
	MH25	591.82	583.07	8.75
	MH26	593.38	583.90	9.48
	MH27	596.67	585.63	11.04
	MH28	596.56	579.21	17.35
	MH29	598.70	582.40	16.30
	MH30	599.15	587.87	11.28
	MH31	599.89	589.60	10.29
	MH32	601.81	591.51	10.30
	MH33	601.51	592.01	9.50
	MH34	605.14	597.14	8.00
	MH35A	611.56	603.88	7.68
	MH35	612.34	605.19	7.15
	WW-C	597.43	578.33	19.10
	WW-D	597.95	575.20	22.75

TABLE 3.2

COLLECTION SYSTEM
MANHOLE ELEVATIONS
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

System	*Manhole Number*	*Rim Top Elevation (feet)*	*MH Invert Elevation (feet)*	*Depth (feet)*
OBCS Forcemain	MH38	594.65	586.89	7.76
	MH39	597.17	590.64	6.53
NAPL Purge Well Forcemain	MH36	603.06	593.92	9.14
	MH37	598.57	588.82	9.75
	MH40	603.75	595.17	8.58
	MH41	605.02	595.44	9.58
	MH42	605.50	596.94	8.56
	MH43	598.02	590.32	7.70
	MH47	598.56	591.46	7.10
	MH48	598.91	589.76	9.15
	MH49	600.08	590.88	9.20
	MH50	600.89	592.29	8.60
	MH51	594.27	589.00	5.27
	MH52	594.00	587.90	6.10
	MH56	604.35	597.85	6.50
	MH57	605.75	596.55	9.20
	MH58	595.82	586.2	11.63
Source Control Forcemain	MH44	616.81	605.19	11.62
	MH45	618.83	609.18	9.65
	MH46	624.45	610.24	14.21
APL Purge Well Forcemain	MH53	590.50	579.10	11.40
	MH54	589.50	580.60	8.90
	MH55	572.40	566.30	6.10

TABLE 3.3

NAPL PLUME CONTAINMENT SYSTEM PURGE AND RECIRCULATION WELL
PHYSICAL DATA SUMMARY
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Purge/ Recirculation Well No.	*Door/ Rim (ft. AMSL)*	*Casing/ Flange (ft. AMSL)*	*Drilled Well Bottom* [1]		*Approximate Non-Operational Water Levels* [2] *(ft. AMSL)*	*Operational Set Point Water Levels (8/99) (ft. AMSL)*	*Design Pump Rate (gpm)*	*Typical Pump Rate (8/99) (gpm)*
			Depth (ft.)	*(ft. AMSL)*				
PW-1U	596.71	593.55	58.8	534.7	575	547	2	0 - 2
PW-1L	596.86	593.55	106.8	486.8	545	497	10	5 - 10
PW-2UR	599.97	598.14	52.2	545.9	585	559	2	0 - 2
PW-2M	600.31	596.94	93.3	503.6	555	517	20-30	8 - 12
PW-2L	600.82	597.53	115.6	481.9	555	493	10	2 - 5
PW-3M	601.53	598.17	101.8	496.4	555	517	3	0 - 3
PW-3L	602.74	599.35	123.5	475.9	555	508	15	10 - 20
PW-4U	608.26	605.23	54.2	551.0	590	571	6	0 - 3
PW-4M	610.29	607.22	108.4	498.8	550	516	0.3	0 - 2
PW-5UR	595.03	606.59	62.8	543.8	585	553	9	5 - 10
PW-6UMR *	603.28	613.85	124.7	489.2	587	-	-	-
PW-6UR	612.13	608.95	61.0	548.5	588	558	2	0 - 2
PW-6MR	614.17	611.09	118.6	492.9	525	503	6	0 - 5
RW-3UM **	602.13	593.93	37.2	556.7	590	-	-	-
PW-7U	595.72	592.94	60.3	532.58	567	553	6	-
PW-8U	593.56	589.78	51.0	538.78	569	551	4-5	-
PW-8M	596.89	593.18	81.5	512.22	522	524	7-8	-
PW-9U	591.79	588	41.2	546.8	568	559	3-4	-
PW-10U	597.84	594.01	31.5	562.51	578	575	3-4	-

Notes:

(1) Depth is measured from the casing/flange to the base of the well at the conclusion of drilling.

(2) Typical elevation of groundwater when extraction system is not operating.

* Currently used for manual NAPL recovery.

** Groundwater recirculation well.

TABLE 3.4

NAPL PURGE WELL SPECIFICATIONS
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Purge Well No.	*Pump No.*	*Manufacturer*	*Model*	*Horsepower (HP)*	*Design*	*Material of Construction*
PW- 1U	111	Grundfos	10E8	1	10 gpm at 57 psi	Stainless Steel
PW- 1L	113A	Grundfos	25E8	3	14 gpm at 83 psi	Stainless Steel
PW- 2UR	114	Grundfos	10E8	1	5 gpm at 40 psi	Stainless Steel
PW- 2M	115	Grundfos	40S30	3	30 gpm at 73 psi	Stainless Steel
PW- 2L	116	Grundfos	16E13	3	3 gpm at 79 psi	Stainless Steel
PW- 3M	122	Grundfos	10E11	3	5 gpm at 82 psi	Stainless Steel
PW- 3L	123	Grundfos	60550-9	5	19 gpm at 93 psi	Stainless Steel
PW- 4U	112	Grundfos	10E8	1	11 gpm at 52 psi	Stainless Steel
PW- 4M	124	Grundfos	10E8	1	5 gpm at 80 psi	Stainless Steel
PW- 5UR	152	Grundfos	10E8	1	8 gpm at 71 psi	Stainless Steel
PW- 6UR	152A	Grundfos	10E8	1	5 gpm at 65 psi	Stainless Steel
PW- 6MR	152B	Grundfos	25E8	1.5	10 gpm at 70 psi	Stainless Steel
PW- 7U	234	Grundfos	5E21	1	6 gpm at 95 psi	Stainless Steel
PW- 8U	211	Grundfos	5E8	0.5	8 gpm at 46 psi	Stainless Steel
PW- 8M	161LC	Grundfos	10E8	0.5	5 gpm at 82 psi	Stainless Steel
PW- 9U	161LB	Grundfos	5E8	0.5	4 gpm at 41 psi	Stainless Steel
PW- 10U	161LA	Grundfos	16E13	0.5	4 gpm at 36 psi	Stainless Steel

TABLE 3.5

APL PLUME CONTAINMENT SYSTEM PURGE WELL
PHYSICAL DATA SUMMARY
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Purge Well No.	*Door/ Rim (ft. AMSL)*	*Casing/ Flange (ft. AMSL)*	*Drilled Well Bottom*		*Approximate Non-Operational Water Levels (ft. AMSL)*	*Operational Water Levels (ft. AMSL)*	*Typical Pump Rate (gpm)*
			Depth (ft.)	*(ft. AMSL)*			
APW-1	569.0	565.35	73.8	491.6	538.0	507.0	2-3
APW-2	574.0	570.42	73.4	497.0	521.0	512.0	2-3

TABLE 5.1

MAIN CARBON BED VALVING SERIES
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Valve Number			*HP-31 to HP-32 to HP-33*	*HP-32 to HP-33 to HP-34*	*HP-33 to HP-34 to HP-31*	*HP-34 to HP-31 to HP-32*
V-	1	A	OPEN	CLOSED	CLOSED	CLOSED
V-	1	B	OPEN	CLOSED	OPEN	OPEN
V-	1	C	OPEN	CLOSED	OPEN	OPEN
V-	1	D	CLOSED	CLOSED	OPEN	CLOSED
V-	1	E	CLOSED	CLOSED	CLOSED	CLOSED
V-	1	F	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	A	CLOSED	OPEN	CLOSED	CLOSED
V-	2	B	OPEN	OPEN	CLOSED	OPEN
V-	2	C	OPEN	OPEN	CLOSED	OPEN
V-	2	D	CLOSED	CLOSED	CLOSED	OPEN
V-	2	E	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	F	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	A	CLOSED	CLOSED	OPEN	CLOSED
V-	3	B	OPEN	OPEN	OPEN	CLOSED
V-	3	C	OPEN	OPEN	OPEN	CLOSED
V-	3	D	OPEN	CLOSED	CLOSED	CLOSED
V-	3	E	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	F	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	A	CLOSED	CLOSED	CLOSED	OPEN
V-	4	B	CLOSED	OPEN	OPEN	OPEN
V-	4	C	CLOSED	OPEN	OPEN	OPEN
V-	4	D	CLOSED	OPEN	CLOSED	CLOSED
V-	4	E	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	F	CLOSED	CLOSED	CLOSED	CLOSED
U-Connections			HP-31F TO HP-31I HP-31O TO HP-32I HP-32O TO HP-33I HP-33O TO HP-33D	HP-32F TO HP-32I HP-32O TO HP-33I HP-33O TO HP-34I HP-34O TO HP-34D	HP-33F TO HP-33I HP-33O TO HP-34I HP-34O TO HP-31I HP-31O TO HP-31D	HP-34F TO HP-34I HP-34O TO HP-31I HP-31O TO HP-32I HP-32O TO HP-32D

TABLE 5.1

MAIN CARBON BED VALVING SERIES
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Valve Number			*HP-31*	*HP-32*	*HP-33*	*HP-34*
V-	1	A	CLOSED	CLOSED	CLOSED	CLOSED
V-	1	B	CLOSED	CLOSED	CLOSED	CLOSED
V-	1	C	CLOSED	CLOSED	CLOSED	CLOSED
V-	1	D	CLOSED	CLOSED	CLOSED	CLOSED
V-	1	E	OPEN	CLOSED	CLOSED	CLOSED
V-	1	F	OPEN	CLOSED	CLOSED	CLOSED
V-	2	A	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	B	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	C	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	D	CLOSED	CLOSED	CLOSED	CLOSED
V-	2	E	CLOSED	OPEN	CLOSED	CLOSED
V-	2	F	CLOSED	OPEN	CLOSED	CLOSED
V-	3	A	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	B	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	C	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	D	CLOSED	CLOSED	CLOSED	CLOSED
V-	3	E	CLOSED	CLOSED	OPEN	CLOSED
V-	3	F	CLOSED	CLOSED	OPEN	CLOSED
V-	4	A	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	B	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	C	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	D	CLOSED	CLOSED	CLOSED	CLOSED
V-	4	E	CLOSED	CLOSED	CLOSED	OPEN
V-	4	F	CLOSED	CLOSED	CLOSED	OPEN
U-Connections			-	-	-	-

TABLE 8.1

HYDE PARK LANDFILL
UNATTENDED OPERATOR CHECKLIST

Before leaving the Hyde Park Facility for unattended operation, the following tasks will be completed.

1. Walk through Diked Areas and verify that there are no leaks.

2. Walk through Treatment Building and verify that there are no leaks.

3. Verify system flow setpoint at the HMI is appropriate for current storage.

4. Verify proper valving for Sand Filter Backwash. Sand Filters may be backwashed internal to the Diamond system or using a treated water supply from the Effluent Tank.

5. Verify proper valving for Backwash Water transfer. Backwash water may be transferred from the Backwash Tank to either the Settler or Decanter No. 3. Verify setpoint for flow through this system at the HMI.

6. Address any current alarms displayed at the HMI. The Site may NOT be left unmanned if any Priority 1 or Priority 2 alarms are active.

7. Verify from HMI screen that all pumps are in "AUTO." Pumps may NOT be left if the switches are in the "HAND" position.

8. Verify from HMI screen that all control valves are in "AUTO." Control valves may NOT be left in the "MANUAL" or "CLOSE" position.

9. Verify from HMI screen that all sequence shutdown alarms are enabled. Sequence alarms may NOT be left in the "OVERRIDE" position. The sequence key switch at the control panel will be turned to "OFF."

10. Verify that WebServer is running on host computer.

11. Enable autodialer.

APPENDIX A

DRAWINGS

APW

NPW

SC

APW1 | APW2 | LD MH 55 | LD MH 54 | LD MH 53 | LD MH39 | LD MH38 | LD MH37 | LD MH36

NAPL PW 7U | LD MH 58 | NAPL PW 1L | NAPL PW 1U | NAPL PW 2L

NAPL PW 6U | NAPL PW 5U | LD MH 52 | LD MH 51 | NAPL PW 2U | NAPL PW 2M | LD MH48 | LD MH47 | LD MH43 | LD MH42 | LD MH41 | LD MH40

NAPL PW-6MR | NAPL PW-6UR | PW-6UMR | NAPL PW-5UR | LD MH57 | NAPL PW 4M | NAPL PW 4U | LD MH56

NAPL PW 3L | RW-3UM | NAPL PW 3M | LD MH 50 | LD MH 49 | PW-2UR

NAPL PW 10U | NAPL PW 9U | NAPL PW 8U | NAPL PW 8M | OBCS WET WELL D | OBCS WET WELL C | EBCS WET WELL A | EXISTING BARRIER COLLECTION SYSTEM 19 MANHOLES NUMBER 1 THRU 19 | OVERBURDEN COLLECTION SYSTEM

SOURCE CONTROL WELL 5 | SOURCE CONTROL WELL 4 | SOURCE CONTROL WELL 2 | LD MH 46 | SOURCE CONTROL WELL 3 | LD MH 45 | SOURCE CONTROL WELL 6 | SOURCE CONTROL WELL 1 | LD MH 44

APW LEACHATE TKS SHEET 2
WET WELL C DECANTER 3 SHEET 2
DECANTER 3 SHEET 2
PURGE WELLS DECANTER 1 SHEET 2
WET WELL D DECANTER 2 SHEET 2
SOURCE CONTROLS DECANTER 3 SHEET 2
WET WELL A DECANTER 2 SHEET 2

LEGEND

AAHH	ANALYSIS ALARM HIGH HIGH
AALL	ANALYSIS ALARM LOW LOW
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATING TRANSMITTER
APW	AQUEOUS-PHASE LIQUID PURGE WELL
EBCS	EXISTING BARRIER COLLECTION SYSTEM
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FQI	FLOW QUANITY INDICATOR
FV	FLOW CONTROL VALVE
LAH	LEVEL ALARM HIGH
LAHH	LEVEL ALARM HIGH HIGH
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER
LV	LEVEL CONTROL VALVE
MH	MANHOLE
NAPL	NON-AQUEOUS PHASE LIQUID
NPW	NAPL PURGE WELL
OBCS	OVERBURDEN BARRIER CONTROL SYSTEM
PDS	PRESSURE DIFFERENTIAL SWITCH
PIT	PRESSURE INDICATING TRANSMITTER
PW	PURGE WELL
SC	SOURCE CONTROL
UV	MILTI-VARIABLE ELEMENT
.....	NO LONGER IN SERVICE

PROCESS FLOW DIAGRAM No. 1
MILLER SPRINGS REMEDIATION MANAGEMENT
HYDE PARK LANDFILL SITE
TOWN OF NIAGARA, NEW YORK

01069-00(293)EF-WF001 JULY 29, 2004

APW WELLS
SHEET 1
WET WELL C
SHEET 1
2001 NPW
SHEET 1
NPW WELLS
SHEET 1
WET WELL D
SHEET 1
SOURCE CONTROL
SHEET 1
EBCS WELLS
SHEET 1

NAPL — TO OFF-SITE INCINERATION

PROCESS COLL.
SHEET 3
SETTLER
SHEET 3

BW TANK
SHEET 2

FIT 306
FIT 308
FIT 307

SEQ.A,B,C,J,K
LI 101
LIT 101
LAHH 102
LSHH 102

SEQ.A,B,C,J,K
LI 103
LIT 103
LAHH 104
LSHH 104

SEQ.A,B,C,J,K
LI 105
LIT 105
LAHH 106
LSHH 106

VENTSORB DRUM

DECANTER No. 1
11,200 GALLONS

DECANTER No. 2
11,200 GALLONS

DECANTER No. 3
11,200 GALLONS

SEQ.A,B,C,D,J,K
LI 107
LIT 107
LAHH 108
LSHH 108

No. 1 LEACHATE STORAGE TANK
156,000 GALLONS

SEQ. E
OL 940
UV 940

SEQ.A,B,C,D,J,K
LI 109
LIT 109
LAHH 110
LSHH 110

No. 2 LEACHATE STORAGE TANK
156,000 GALLONS

VENTSORB DRUMS

SEQ. E
OL 950
UV 950

SEQ.A,B,C,D,E,F,G
LAHH 111
LSHH 111

SEQ.A,B,C,D,E,F,G
LAHH 112
LSHH 112

DECANTER DIKE SUMP PUMP

LEGEND

AAHH	ANALYSIS ALARM HIGH HIGH
AALL	ANALYSIS ALARM LOW LOW
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATING TRANSMITTER
APW	AQUEOUS-PHASE LIQUID PURGE WELL
EBCS	EXISTING BARRIER COLLECTION SYSTEM
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FQI	FLOW QUANITY INDICATOR
FV	FLOW CONTROL VALVE
LAH	LEVEL ALARM HIGH
LAHH	LEVEL ALARM HIGH HIGH
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER
LV	LEVEL CONTROL VALVE
MH	MANHOLE
NAPL	NON-AQUEOUS PHASE LIQUID
NPW	NAPL PURGE WELL
OBCS	OVERBURDEN BARRIER CONTROL SYSTEM
PDS	PRESSURE DIFFERENTIAL SWITCH
PIT	PRESSURE INDICATING TRANSMITTER
PW	PURGE WELL
SC	SOURCE CONTROL
UV	MULTI-VARIABLE ELEMENT

SAND FILTERS
SHEET 3
PROCESS COLL.
SHEET 3
CARBON BEDS
SHEET 3
CARBON
SHEET 3

TREATED WATER SUPPLY

SEQ.A,B,C,D,J,K
LI 830
LIT 830
LAHH 831
LSHH 831

SEQ.A,B,C,D,J,K
LI 820
LIT 820
LAHH 821
LSHH 821

SEQ.A,B,C,D,J,K
LI 810
LIT 810
LAHH 811
LSHH 811

SEQ. E
OL 930
UV 930

SEQ. E
OL 920
UV 920

SEQ. E
OL 910
UV 910

FV 712

SEQ. F
FI 712
FIT 712

LEACHATE FEED PUMP No. 1

LEACHATE FEED PUMP No. 2

VENTSORB DRUMS

SEQ.A,B,C,D,E,F,G
LAHH 814
LSHH 814

SEQ.A,B,C,D,E,F,G
LAHH 813
LSHH 813

STORAGE DIKE SUMP PUMP

SEQ.F,G,H,J
LAHH 807
LIC 807
LIT 807

EFFLUENT TANK

SEQ.H
AAHH 905
AALL 905
AI 905
AIT 905

SEQ.H
FI 715
FQI 715
FIT 715

LV 807

EFFLUENT PUMP

BACKWASH PUMP

TO SEWER

TREATED WATER SUPPLY

SAND FILTERS
SHEET 3

PROCESS FLOW DIAGRAM No. 2
MILLER SPRINGS REMEDIATION MANAGEMENT
HYDE PARK LANDFILL SITE
TOWN OF NIAGARA, NEW YORK

01069-00(293)EF-MF002 JAN 28, 2004

DECANTER 1 & 2
SHEET 2
EQUAL. HEADER
SHEET 2
DEC 3
SHEET 2

SEQ. F.C.J
LAHH 802
LSHH 802
SEQ. F.C.J
LAHH 804
LSHH 804
SEQ. F.C.J
LAHH 803
LSHH 803
SEQ. F.C.J
LIC 801
LIT 801

PROCESS COLLECTION SUMP PUMP
PROCESS COLLECTION TANK PUMPS A & B
PROCESS COLLECTION TANK

BACKWASH WATER

SEQ. F.C
LAHH 806
LSHH 806
SEQ. I
LIC 808
LIT 808

BACKWASH TANK

FV 701
FIC 701
WATT
FIT 701

BACKWASH TRANSFER PUMP

SETTLER/ FLOCCULATOR

SLUDGE
TO OFF-SITE DISPOSAL

SEQ. F.O
PI 1106
PIT 1106

LEACHATE FEED
SHEET 2
STORAGE SUMP
SHEET 2
EFFLUENT TANK
SHEET 2
EFFLUENT PUMP
SHEET 2

BACKWASH WATER

PDS

FILTER PUMP
SAND FILTER BACKWASH PUMP
SAND FILTERS

SEQ. F.O
PI 1105
PIT 1105

SEQ. F.O
PI 553
PIT 553

SACRIFICIAL CARBON BEDS
LEAD BED
INTERMEDIATE BED
MAIN CARBON ADSORBERS
POLISH BED

BW PUMP
SHEET 2

BACKWASH FEED

LEGEND

AAHH	ANALYSIS ALARM HIGH HIGH
AALL	ANALYSIS ALARM LOW LOW
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATING TRANSMITTER
APW	AQUEOUS-PHASE LIQUID PURGE WELL
EBCS	EXISTING BARRIER COLLECTION SYSTEM
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FQI	FLOW QUANITY INDICATOR
FV	FLOW CONTROL VALVE
LAH	LEVEL ALARM HIGH
LAHH	LEVEL ALARM HIGH HIGH
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER
LV	LEVEL CONTROL VALVE
MH	MANHOLE
NAPL	NON-AQUEOUS PHASE LIQUID
NPW	NAPL PURGE WELL
OBCS	OVERBURDEN BARRIER CONTROL SYSTEM
PDS	PRESSURE DIFFERENTIAL SWITCH
PIT	PRESSURE INDICATING TRANSMITTER
PW	PURGE WELL
SC	SOURCE CONTROL
UV	MILTI-VARIABLE ELEMENT

PROCESS FLOW DIAGRAM No. 3
MILLER SPRINGS REMEDIATION MANAGEMENT
HYDE PARK LANDFILL SITE
TOWN OF NIAGARA, NEW YORK

01069-00(263)EF-NF003.DWG JUN 18, 2002

APPENDIX B

LOGS AND INSPECTION FORMS

TABLE B.1

GLENN SPRINGS HOLDINGS, INC.
DAILY AVERAGE READING LOG
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

TIME: **DATE:**

*EXTRACTION WELLS***

***Note: This data is for the day before the above printed date.*

Well	*Status*	*Flow Daily Avg. (GPM)*	*Elevation Daily Avg. (ft)*	*Elevation Set Point (ft)*	*Integrator Daily Total (gal)*	*Integrator Running Total (KGAL)*
PW 1U						
PW 1L						
PW 2UR						
PW 2M						
PW 2L						
PW 3M						
PW 3L						
PW 4U						
PW 4M						
PW 5UR						
PW 6UR						
PW 6MR						
PW 7U						
PW 8U						
PW 8M						
PW 9U						
PW 10U						
APW 1						
APW 2						
Chart Total						
ALL PWs						
SC 2						
SC 3						
SC 4						
SC 5						
SC 6						
ALL SCs						
WW A						
WW C						
WW D						
EFFLUENT						

TANK LEVELS

Tank	*Level (ft)*
Decanter 1	
Decanter 2	
Decanter 3	
Storage 1	
Storage 2	
Storage 3	
Storage 4	
Storage 5	
Effluent	
Backwash	
pH	

TABLE B.2

GLENN SPRINGS HOLDINGS, INC.
COLLECTION AND APL TREATMENT SYSTEM
INSPECTION LOG
HYDE PARK LANDFILL SITE
NIAGARA FALLS, NEW YORK

Hyde Park Readings					
Level -- Stg #1 / Stg #2	/	/	/	/	/
Level -- Stg #3 / Stg #4 / Stg #5	/ /	/ /	/ /	/ /	/ /
Effluent Tank Level					
Effluent Tank pH					
Collection Tank Level					
Sand Filter Pressure (PT-1106)					
Sac Bed Pressure (PT-1105)					
Main Bed Pressure (PT-553)					
Influent Flow (FIT-712)					
Effluent Flow (FIT-715)					
Backwash Transfer Flow (FIT-701)					
Compressed Air Pressure					
Wet Well Flows (A / C / D) GPMs	/ /	/ /	/ /	/ /	/ /
Bedrock Well Flow (FI-366) GPMs					
Initials					
	Comments				
Date:					

GLENN SPRINGS HOLDINGS, INC.

WNY Daily Inspections

Table B.3

Date: _____

Love Canal: _____	S-Area: _____
Hyde Park: _____	NT: _____

Inspected By: _____

Satisfactory

Y / N **Security:** Fence; Postings/Signs; Buildings; Lighting; and Security Systems.

Y / N **Communications:** Phone Systems; Network(s); Auto-dialers; and HMIs.

Y / N **Utilities:** Gas; Electric; and Water/Sewer.

Y / N **Housekeeping:** Garbage; Fence Lines; Walkways/Roadways; Control Room; Locker Room; Offices; Auxiliary Buildings; Maintenance Work Areas; MCCs; and Process.

Y / N **Process:** Tanks and Associated Piping; Containment; and Sumps.

Y / N **Storage Dikes:** Tanks; Decanters; Sumps; and Piping.

Y / N **Containment:** Secondary and Leak Detection.

Y / N **Vehicles:** Secure and Operating Properly.

Y / N **Container Storage Area:** Container(s) Non-Leaking, Non-Corroded; Closed; Labeled; and Contained. (Stored containers meet all applicable regulations).

Earliest Stored Drum Date _____ (<90 Days)

Quantity of Containers _____

Precipitation Reading _____ Inches Month to Date (Reset Beginning Of Month)

COMMENTS: _____

_____

_____

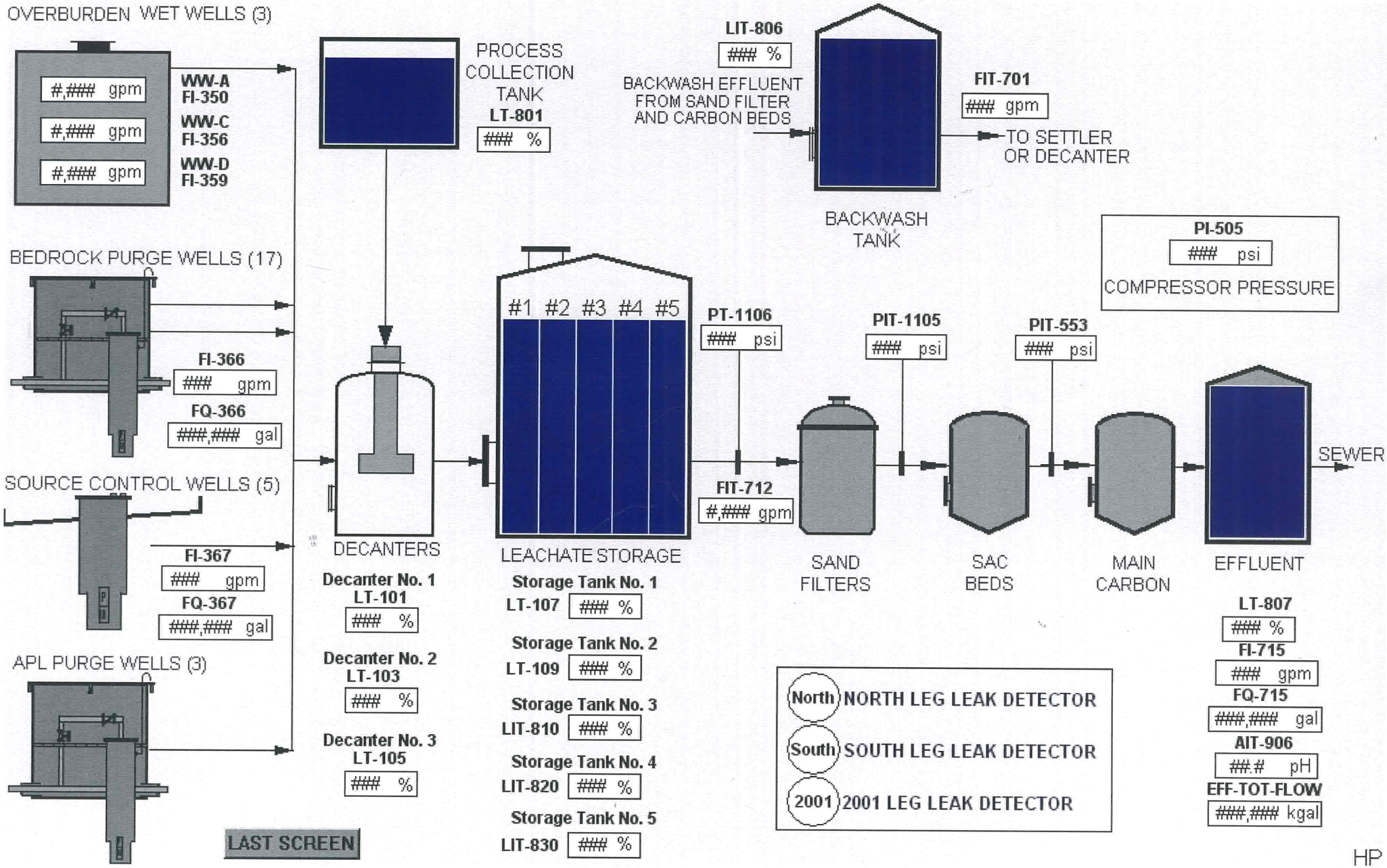
_____

If any Inspections item(s) are NOT Satisfactory, comment above and describe what corrective actions were taken.

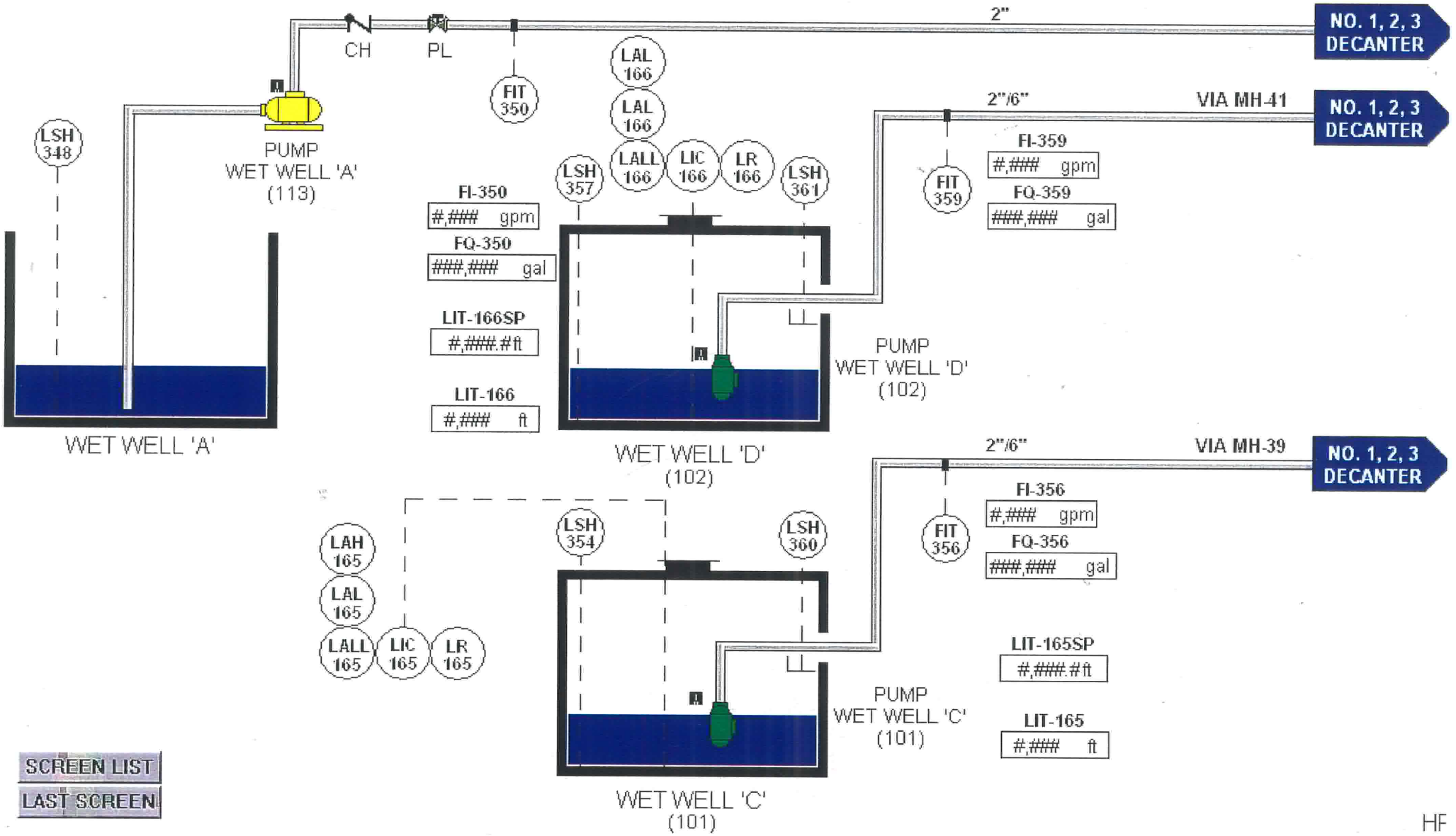
Signature: _____

APPENDIX C

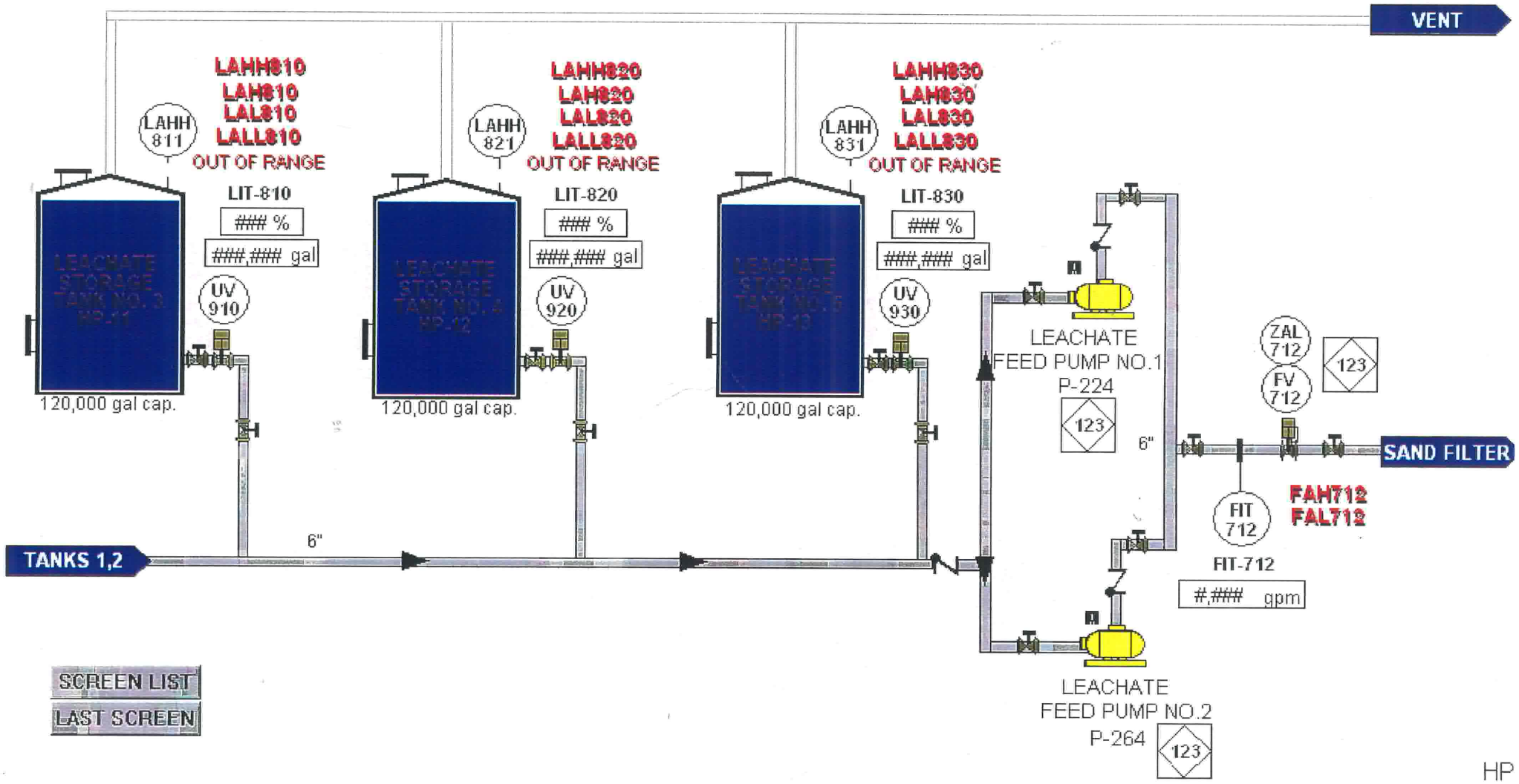
SAMPLE HMI SCREENS


OVERBURDEN WET WELLS (3)
#,### gpm
#,### gpm
#,### gpm
WW-A
FI-350
WW-C
FI-356
WW-D
FI-359
PROCESS COLLECTION TANK
LT-801
%
LIT-806
%
BACKWASH EFFLUENT FROM SAND FILTER AND CARBON BEDS
FIT-701
gpm
TO SETTLER OR DECANTER
BACKWASH TANK
PI-505
psi
COMPRESSOR PRESSURE
BEDROCK PURGE WELLS (17)
FI-366
gpm
FQ-366
###,### gal
#1 #2 #3 #4 #5
PT-1106
psi
PIT-1105
psi
PIT-553
psi
SOURCE CONTROL WELLS (5)
FI-367
gpm
FQ-367
###,### gal
FIT-712
#,### gpm
SEWER
DECANTERS
LEACHATE STORAGE
SAND FILTERS
SAC BEDS
MAIN CARBON
EFFLUENT
Decanter No. 1
LT-101
%
Decanter No. 2
LT-103
%
Decanter No. 3
LT-105
%
Storage Tank No. 1
LT-107 ### %
Storage Tank No. 2
LT-109 ### %
Storage Tank No. 3
LIT-810 ### %
Storage Tank No. 4
LIT-820 ### %
Storage Tank No. 5
LIT-830 ### %
LT-807
%
FI-715
gpm
FQ-715
###,### gal
AIT-906
##.# pH
EFF-TOT-FLOW
###,### kgal
APL PURGE WELLS (3)
North NORTH LEG LEAK DETECTOR
South SOUTH LEG LEAK DETECTOR
2001 2001 LEG LEAK DETECTOR
LAST SCREEN
HP

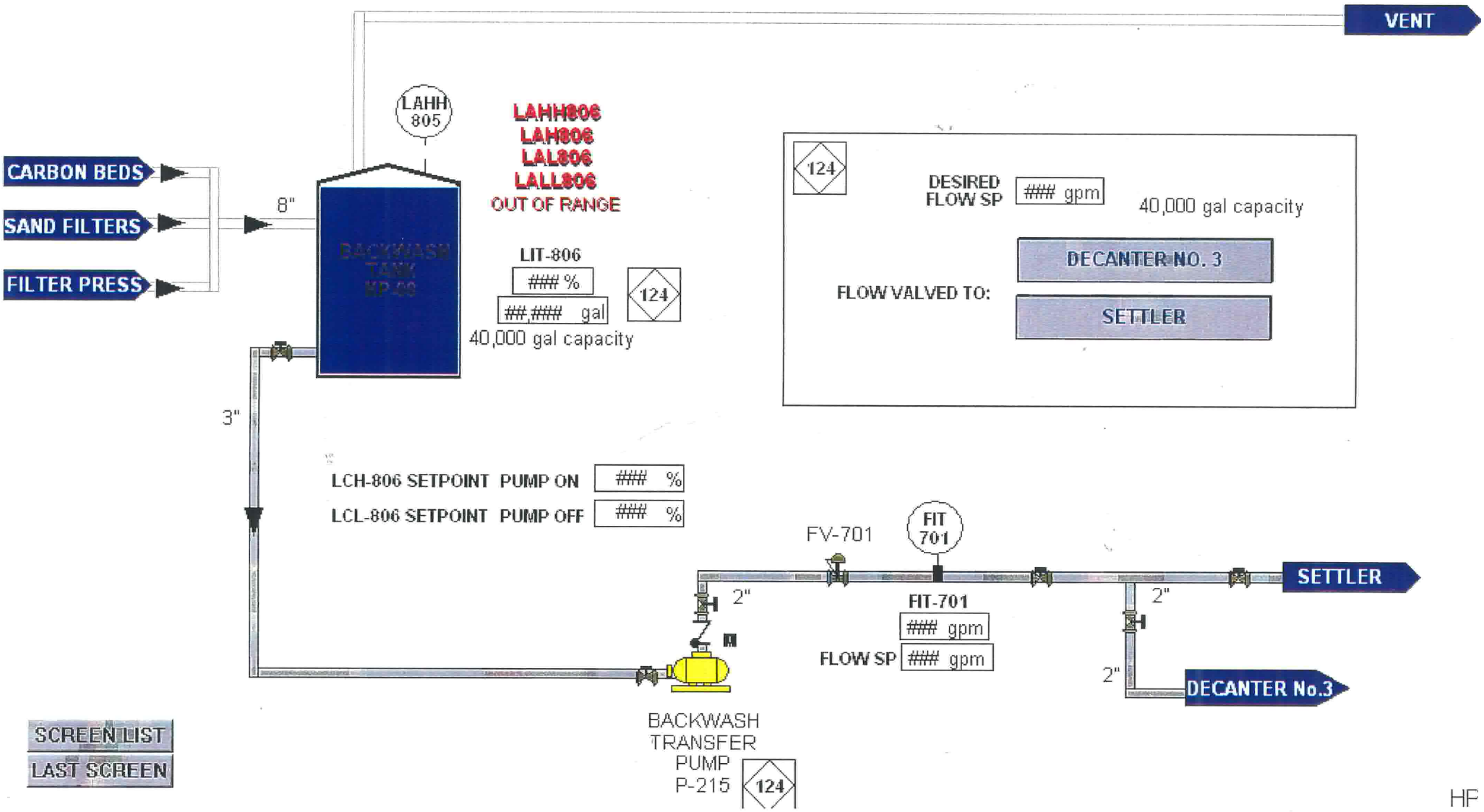
OVERBURDEN BARRIER COLLECTION SYSTEMS



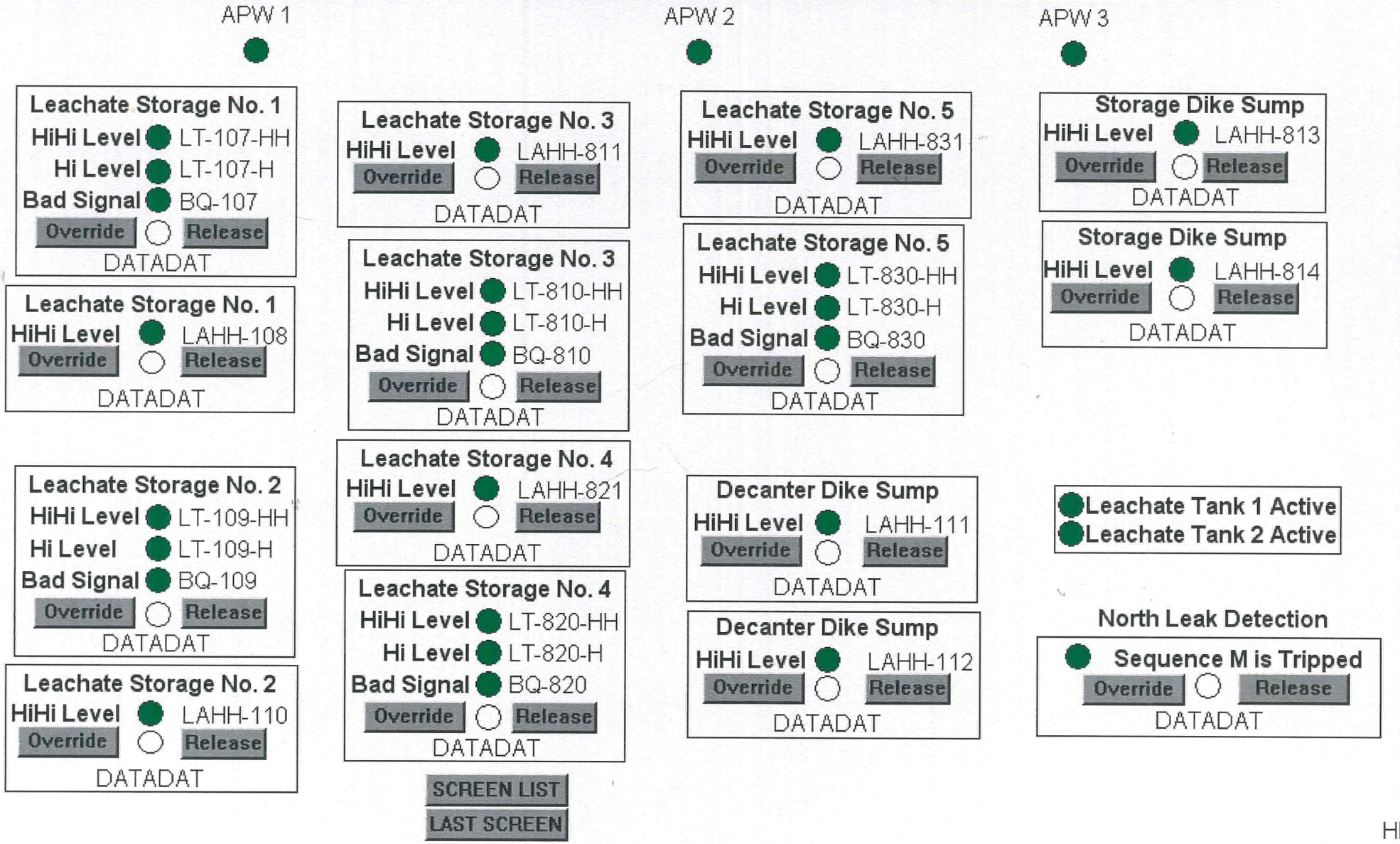
LEACHATE STORAGE TANKS NO. 3, 4, AND 5



BACKWASH TANK



SEQUENCE D: SHUTDOWN APWs TO LEACHATE STG TANKS



HP

APPENDIX D

ALARMS AND RESPONSES

APPENDIX D

ALARMS AND RESPONSES

The process alarms on the PLC/HMI Control System are listed in the attached table with the appropriate operator response.

Alarm notations are defined as follows:

X Y Z 1 0 0

Instrument Loop Number

X ***Measured Value***	***Y*** ***Instrument Function***	***Z*** ***Condition***
A - Analyzer (pH, CO, or hydrocarbons)	A - Alarm	LL - Low Low
F - Flow	C - Controller	L - Low
L - Level	I - Indicator	H - High
M - Moisture	Q - Totalizer	HH - High High
P - Pressure	S - Switch	
T - Temperature	V - Valve	
Z - Switch		
U - Universal		

Examples: Wet well "A," LAH 348, is a Level Alarm High (or high level alarm) on Wet Well "A." The loop number, 348, ties to a tag on the Process and Instrumentation Drawings, indicating the location of the alarm and other field instrument ties.

A full list of symbols utilized on the Process and Instrumentation Drawings is shown on the Legend Sheet in the drawing package.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
LAH-136, LAH-137, LAH-138, LAH-139, LAH-140, LAH-141, LAH-142, LAH-143, LAH-144, LAH-145, LAH-146, LAH-147, LAH-148, LAH-149, LAH-150, LAH-154, LAH-156, LAH-157, LAH-160, LAH-251, LAH-261, LAH-271, LAH-280, LAH-285, LAH-290, LAH-295, LAH-305, LAH-307, LAH-310, LAH-315, LAH-320, LAH-333, LAH-338, LAH-343, LAH-344, LAH-354, LAH-360, LAH-370, LAH-374, LAH-378, LAH-382, LAH-511, LAH-512, LAH-521, LAH-522, LAH-523 LAH-524, LAH-541, LAH-551, LAH-581	1	Leak detection	The level in the applicable chamber or manhole has reached the high level switch.	Shuts down respective wells based on forcemain leak location. Autodialer to advise on-call operator.	Inspect chamber or manhole for fluid.
LAHH-107, LAHH-108, LAHH-109, LAHH-110, LAHH-810, LAHH-811, LAHH-820, LAHH-821, LAHH-830, LAHH-831	1	Leachate storage tank 1,2,3,4, and 5 high high level	The APL level in the applicable Leachate Storage Tank has reached the high high level for a minimum of 15 seconds.	Flow to the applicable Leachate Storage Tanks will stop. Shut down APL Purge Wells, NAPL Purge Wells, and Source Control Wells. Autodialer to advise on-call operator.	Verify proper operation of Leachate Feed Pumps.
LBQ-107, LBQ-109, LBQ-810, LBQ-820, LBQ-830	1	Leachate storage tank level out of range	The applicable Leachate Storage Tank level signal is below 4 mA or above 20 mA.	Stop well flow to Decanters and shutdown Leachate Feed Pumps. Autodialer to advise on-call operator.	Verify proper operation of transmitter.
LAHH-101, LAHH-102, LAHH-103, LAHH-104, LAHH-105, LAHH-106	1	Decanter high high level	The APL level in the applicable Decanter has reached the high high level for a minimum of 15 seconds.	Flow to applicable Decanter will be stopped. Leachate Feed Pumps will shut down. Autodialer to advise on-call operator.	Verify the normal overflow valve is open. Verify flow through the normal over flow sightglass. If there is a blockage, arrange a repair.
LBQ-101, LBQ-103, LBQ-105	1	Decanter level out of range	The applicable Decanter level signal is below 4 mA or above 20 mA.	Shut down flow to applicable Decanter. Shut down Leachate Feed Pumps. Autodialer to advise on-call operator.	Verify proper operation of transmitter.
LAHH-111 , LAHH-112	1	Decanter dike sump high level	The level in the Decanter Dike Sump has reached the high level switch for a minimum of 15 seconds.	Flow to Decanters and Leachate Storage 1, 2 will stop. Leachate Storage 3,4,5 will be isolated from the equalization line. Shut down Leachate Feed, and Effluent Pumps. Autodialer to advise on-call operator.	Inspect Decanters, Leachate Storage Tanks, Backwash Tank, Effluent Tank, and associated piping for leaks. Arrange repairs as necessary.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
LAHH-813, LAHH-814	1	Storage dike sump high level	The level in the Storage Dike Sump has reached the high level switch for a minimum of 15 seconds.	Flow to Decanters and Leachate Storage 1, 2 will stop. Leachate Storage 3,4,5 will be isolated from the equalization line. Shut down Leachate Feed, and Effluent Pumps. Autodialer to advise on-call operator.	Inspect Decanters, Leachate Storage Tanks, Backwash Tank, Effluent Tank, and associated piping for leaks. Arrange repairs as necessary.
LAHH-167	1	Filter press room sump high level	The level in the Filter Press Room Sump has reached the high level switch for a minimum of 15 seconds.	Flow to Decanters and Leachate Storage 1, 2 will stop. Leachate Storage 3,4,5 will be isolated from the equalization line. Shut down Leachate Feed, and Effluent Pumps. Autodialer to advise on-call operator.	Inspect Filter Press Room, and associated piping for leaks. Arrange repairs as necessary.
LAHH-392	1	Sewer manhole high level	The level in the Sewer Manhole has reached the high level switch for a minimum of 15 seconds.	Flow from the Effluent Tank will stop. Autodialer to advise on-call operator.	Investigate Effluent Pump and Effluent control valve operation. Inspect manhole for debris. Arrange repairs as necessary.
FAH-712	1	Influent high deviation Flow	The influent flow has reached 15% of the flow setpoint for a minimum of 10 seconds.	Shut down Leachate Feed Pumps. Autodialer to advise on-call operator.	Check Leachate Feed pumps and controls. Arrange repairs as necessary.
FAL-712	1	Influent low flow	The influent flow has fallen below 190 gpm for a minimum of 10 seconds.	Shut down Leachate Feed Pumps. Autodialer to advise on-call operator.	Check Leachate Feed pumps and controls. Arrange repairs as necessary.
AAH-906	1	Effluent high pH	Effluent pH exceeds 9.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Calibrate pH probe.
AAHH-906	1	Effluent high high pH	Effluent pH exceeds 9.5 for 15 seconds.	Stop effluent discharge to City sewer.	Calibrate pH probe.
AAL-906	1	Effluent low pH	Effluent pH falls below 5.5.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Calibrate pH probe.
AALL-906	1	Effluent low low pH	Effluent pH falls below 5 for 15 seconds.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Calibrate pH probe.
ABQ-906	1	Effluent pH out of range	The effluent pH flow signal is below 4 mA or above 20 mA.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Verify proper operation of transmitter.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
FAH-733	1	Safety shower tank high discharge flow	Flow from the Safety Shower Tank exceeds switch setpoint FSH-733.	Operator warning. Autodialer to advise on-call operator.	Check if someone is in shower. Summon help, if needed.
FBQ-715	1	Flow out of range	The applicable flow signal is below 4 mA or above 20 mA.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Verify proper operation of transmitter.
FQAHH-715	1	Total daily effluent high high Flow	Effluent flow to sewer exceeds 600,000 gallons.	Stop effluent discharge to City sewer. Autodialer to advise on-call operator.	Verify proper shutdown of treatment system.
LAHH-801, LAHH-802	1	Process collection tank high high level	The water level in the Process Collection Tank is has reached the high high level for a minimum of 15 seconds.	Shut down Treatment System Pumps. Autodialer to advise on-call operator.	Check pumps and controls. Check for high volume source and secure.
LAHH-803, LAHH-804	1	Process collection sump high high level	The water level in the Process Collection Sump has reached the high high level for a minimum of 15 seconds.	Shut down Leachate Feed Pumps. Autodialer to advise on-call operator.	Check sump pump. Check for source of water.
LAHH-805, LAHH-806	1	Backwash tank high high level	The water level in the Backwash Tank has reached high level for a minimum of 15 seconds.	Stop all system backwashes.	Check pumps and controls.
LBQ-806	1	Level out of range	The level signal from the Backwash Tank is below 4 mA or above 20 mA.	Operator warning.	Verify proper operation of transmitter.
LAHH-807	1	Effluent tank high high level	The water level in the Effluent Tank has reached 90% for a minimum of 15 seconds.	Shut down Leachate Feed Pumps. Autodialer to advise on-call operator.	Investigate Effluent Pump and Effluent control valve operation. Inspect manhole for debris. Arrange repairs as necessary.
LAH-807	1	Effluent tank high level	The water level in the Effluent Tank has reached 80% for a minimum of 2 seconds.	Operator warning.	Check Effluent Pump and controls. Check sampler pH, correct as needed. Discharge to sanitation sewer.
LALL-807	1	Effluent tank low low level	The water level in the Effluent Tank has fallen below 20% for a minimum of 15 seconds.	Level valve closes and Effluent Pump recycles water through the Effluent Tank. Autodialer to advise on-call operator.	Check, secure, flow to sanitation sewer. Check Effluent Tank and associated piping for leakage. Check recycle flows to process.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
LBQ-807	1	Level out of range	The level signal from the Effluent Tank is below 4 mA or above 20 mA.	Disable Settler Feed, Settler Electrolyte Feeder, Backwash, and Effluent Pump.	Verify proper operation of transmitter.
PAHH-1106	1	Sand filter high high influent pressure	The pressure at the inlet to the Sand Filters has reached 95 psi for a minimum of 15 seconds.	Disable Treatment system. Autodialer to advise on-call operator.	Check system differential pressures. Initiate a backwash if necessary.
PAHH-1105	1	Sac beds high high influent pressure	The pressure at the inlet to the Sac Beds has reached 85 psi for a minimum of 15 seconds.	Disable Treatment system. Autodialer to advise on-call operator.	Check system differential pressures. Initiate a backwash if necessary.
PBQ-1106, PBQ-1105, PBQ-553	1	Pressure out of range	The pressure signal from the respective transmitter is below 4 mA or above 20 mA.	Disable Treatment system. Autodialer to advise on-call operator.	Verify proper operation of transmitter.
PAHH-553	1	Main beds high high influent pressure	The pressure at the inlet to the Main Beds has reached 75 psi for a minimum of 15 seconds.	Disable Treatment system. Autodialer to advise on-call operator.	Check system differential pressures. Initiate a backwash if necessary.
ZAL-712	1	Process feed valve alarm	The Process Feed Valve is closed.	The Leachate Feed Pumps will be disabled.	Check the Process Feed Valve for proper operation.
LAH-105, LAH-260, LAH-270	2	APL purge well pump high level	The APL level in the applicable APL Purge Well is greater than 5 feet above the setpoint.	Operator Alarm.	Verify pump is operational.
LAH-203, LAH-208, LAH-209, LAH-210, LAH-211	2	Source control well high level	The level in the applicable Source Control Well is greater than 5 feet above the setpoint.	Operator Alarm.	Manual operation of well pump during next site visit.
LAH-107, LAH-109, LAH-810, LAH-820, LAH-830	2	Leachate storage tank 1,2,3,4,5 high level	The APL level in the applicable Leachate Storage tank has reached 80% for a minimum of 15 seconds.	Operator Alarm.	Verify proper operation of Leachate Feed Pumps.
LAL-818	2	Safety shower tank low level	The water level in the Safety Shower Tank has fallen below LSL-818.	Operator Alarm.	Check water supply.
LAH-806	2	Backwash tank high level	The water level in the Backwash Tank has reached 80%.	Operator Alarm.	Check pumps and controls.
MAH-907	2	Air compressor air dryer high moisture	Moisture above MSH-907 is detected.	Operator Alarm.	Verify proper operation of air dryer.
PAH-1106	2	Sand filter high influent pressure	The pressure at the inlet to the Sand Filters has reached 85 psi for a minimum 15 seconds.	Operator Alarm.	Check system differential pressures. Initiate a backwash if necessary.
PAH-1105	2	Sac beds high influent pressure	The pressure at the inlet to the Sac Beds have reached 75 psi for a minimum 3 seconds.	Operator Alarm.	Check system differential pressures. Initiate a backwash if necessary.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
PAH-553	2	Main beds high influent pressure	The pressure at the inlet to the Main Beds have reached 65 psi for a minimum of 3 seconds.	Operator Alarm.	Check system differential pressures. Initiate a backwash if necessary.
ZA-908	2	Air dryer valve alarm	The Air Dryer Valve exceeds the position limit switch, ZA-908.	Operator Alarm.	Check the Air Dryer Valve for proper operation.
LAL-105, LAL-260, LAL-270	3	APL purge well pump low level	The APL level in the applicable APL Purge Well is greater than 5 feet below the setpoint.	Operator Warning.	Inspect well pump for proper operation.
LALL-105, LALL-260, LALL-270	3	APL purge well pump low low level	The APL level in the applicable APL Purge Well is greater than 10 feet below the setpoint.	Operator Warning.	Inspect well pump for proper operation.
LAL-203, LAL-208, LAL-209, LAL-210, LAL-211	3	Source control well low level	The level in the applicable Source Control Well is greater than 5 feet below the setpoint.	Operator Warning.	Verify well pump is shutdown.
LALL-203, LALL-208, LALL-209, LALL-210, LALL-211	3	Source control well low low level	The level in the applicable Source Control Well is greater than 10 feet below the setpoint.	Operator Warning.	Verify well pump is shutdown.
LAH-151, LAH-162, LAH-283, LAH-318	3	NAPL purge well high level	The NAPL level in the applicable NAPL purge well is greater than 10 feet above the setpoint.	Operator Alarm.	Inspect well pump for proper operation.
LAH-172, LAH-288, LAH-298, LAH-308, LAH-313, LAH-323, LAH-336, LAH-341, LAH-346, LAH-373, LAH-377, LAH-381, LAH-385	3	NAPL purge well high level	The NAPL level in the applicable NAPL purge well is greater than 5 feet above the setpoint.	Operator Warning.	Inspect well pump for proper operation.
LAL-151, LAL-162, LAL-172, LAL-283, LAL-288, LAL-298, LAL-308, LAL-313, LAL-318, LAL-323, LAL-336, LAL-341, LAL-346, LAL-373, LAL-377, LAL-381, LAL-385	3	NAPL purge well low level	The NAPL level in the applicable NAPL purge well is greater than 5 feet below setpoint.	Operator Warning.	Verify well pump is shutdown.
LALL-151, LALL-162, LALL-172, LALL-283, LALL-288, LALL-298, LALL-308, LALL-313, LALL-318, LALL-323, LALL-336, LALL-341, LALL-346, LALL-373, LALL-377, LALL-381, LALL-385	3	NAPL purge well low low level	The NAPL level in the applicable NAPL purge well is greater than 10 feet below setpoint. (LALL-298 is low level when NAPL level is greater than 5 feet below setpoint).	Operator Warning.	Verify well pump is shutdown.
LAL-107, LAL-109, LAL-810, LAL-820, LAL-830	3	Leachate storage tank 1,2 low level	The APL level in the applicable Leachate Storage Tank has fallen below 25%.	Operator Warning.	Check applicable Leachate Storage Tank and associated piping for leakage. Verify extraction system is operational.

APPENDIX D
HYDE PARK TREATMENT FACILITY
COLLECTION AND STORAGE SYSTEM ALARM LIST

Tag	*Priority*	*Description*	*Condition*	*Sequence/Loops*	*Response*
LALL-107, LALL-109, LALL-810, LALL-820, LALL-830	3	Leachate storage tank 1,2 low low level	The APL level in the applicable Leachate Storage Tank has fallen below 15% for a minimum of 15 seconds.	Operator Warning.	Check applicable Leachate Storage Tank and associated piping for leakage. Verify extraction system is operational.
LAL-806	3	Backwash tank low level	The water level in the Backwash Tank has fallen below 20% for a minimum of 15 seconds.	Operator warning.	Check pumps and controls.
LALL-806	3	Backwash tank low low level	The water level in the Backwash Tank has fallen below 10% for a minimum of 15 seconds.	Operator warning.	Check pumps and controls.
LAL-807	3	Effluent tank low level	The water level in the Effluent Tank has fallen below 25% for a minimum of 10 seconds.	Operator warning.	Check, secure, flow to sanitation sewer. Check Effluent Tank and associated piping for leakage.
FQAH-715	3	Total daily effluent high Flow	Effluent flow to sewer exceeds 500,000 gallons.	Operator warning.	Verify proper totalization. Acknowledge approaching Daily Effluent Total.
TAH-643	3	Safety shower tank high discharge temperature	Temperature from Safety Shower discharge exceeds TSH-643.	Operator warning.	Schedule immediate inspection of circuit.
TAL-643	3	Safety shower tank low discharge temperature	Temperature from Safety Shower discharge falls below TSL-643.	Operator warning.	Check power supply to heat trace.