November 2019

As Built Report
Saline Effluent Treatment Plant (SETP)

In Accordance with Water License A No. 2AM-MEL1631

Prepared by:
Agnico Eagle Mines Limited – Meliadine Division

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	27/11/2019			As Built Design report

Prepared By: _____ 2019-11-27
Thomas Genty
Environment Engineer

Melissa Simard Digitally signed by Melissa Simard Date: 2019.11.28 06:46:09 -05'00'
_____
Melissa Simard
Resident Engineer

Approved by: _____
Jessica Huza
Environment Superintendent

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1 INTRODUCTION

As required by the Water License A (No. 2AM-MEL1631), this report summarizes the construction and commissioning work associated with the saline effluent treatment plant (SETP). Included in this report is:

- A summary of the characteristics of the feed water of the saline effluent treatment plant, and effluent water discharge to the sea;
- Documentation on field decisions that deviate from the original plans;
- Specifications of equipment;
- As-built drawings; and
- Photographs.

1.1 SITE LOCATION PLAN

The figure 1 presents a site location plan for the saline effluent treatment plant (SETP).

Figure 1 : Location of the SETP

1.2 UNDERGROUND WATER MANAGEMENT STRATEGY

Underground saline water is firstly stored in the underground water storage system comprised of the permanent water stope (capacity of approximately 11,000 m^3), and two temporary storage units (collective temporary capacity of approximately 73,000 m^3). The stored water is then transferred from a main pumping station located on level 200 underground to the surface Saline Ponds or partially to the saline water treatment plant (SWTP feed tanks). Depending on the site saline water balance the surface saline ponds can also feed the SWTP for treatment. The storage capacity is managed to keep the saline pond and stope volumes as low as possible, in order to have enough space for unexpected inflows from the mine workings or for SWTP/SETP shutdowns. The SETP is fed from the SWTP feed tank with raw water.

2 CONSTRUCTION SUMMARY

2.1 CONSTRUCTION SCHEDULE

The construction of the SETP was conducted between March 2019 and the end of July 2019. The commissioning was started in July 2019 before the end of the construction. Construction and commissioning were completed according to the milestone dates shown in Table 1.

Table 1: Construction and Commissioning Milestone

SETP construction schedule		
Activity description	**Starting date**	**Date of completion**
Backfill of SETP Pad	March 20th 2019	March 22th 2019
SETP building erection	April 2nd 2019	April 9th 2019
Electrical and Mechanical equipment and services installation	April 14th 2019	July 29st 2019
Liner installation	June 11th 2019	June 11th 2019
Piping installation around SETP	March 20th 2019	July 22nd 2019
Commissionning and samples testing	July 5th 2019	July 31st 2019
Operation	August 1st 2019	-

2.2 SETP DESCRIPTION

The SETP consists of the two following components which are part of this construction summary:

- The oil and grease separator;
- Total suspended solid (TSS) removal system;
- The ammonia oxidation system by break point chlorination;
- The chlorine removal system with activated carbon;
- The total dissolved solid (TDS) adjustment step;
- Pipelines including: from SWTP to SETP, from Effluent treatment plant (EWTP) to SETP, from SETP to underground mine and from SETP to the pond SP3.

As-built drawings such as the P&ID and final locations of the system components are available in Appendix A (as-built drawings) and B (survey drawings), respectively. Photographs illustrating the system and its compliance with the construction/permitting design and drawings can be found in Appendix C.

2.2.1 SETP COMPONENTS

The purpose of the SETP is to remove TSS, ammonia and oil and grease from underground water. The equipment (TSS removal, ammonia removal, oil and grease separator) has an operational flow rate of 400 m^3/d. It is expected that the SETP will be in use 24 hours, 7 days per week. The volume discharged to the sea after TDS adjustment is set at 800 m^3/day.

2.2.1.1 PROCESS SUMMARY

The saline water feeding the SETP is pumped to the surface or from the saline ponds storage, to be treated first for oil and grease within the SETP. The oil and grease treated water is transferred to a Multiflo® clarifier for TSS removal. The treated water overflows into a chlorination reactor where ammonia is oxidized into nitrogen gas by a hypochlorite solution. The gasses (nitrogen resulting from ammonia destruction) generated by the water treatment unit is discharged to the atmosphere. The excess chlorine in water is treated via granular activated carbon filter prior to the TDS adjustment at 3 % approximately. This TDS adjustment is performed with the treated effluent from CP1 through the EWTP and the final blend is transferred to the pond SP3. From SP3, the water is pumped into tanker trucks and transported to Itivia, where it's released into Melvin Bay via a pumping station, a discharge line and finally into the marine environment via a diffuser.

Figure 2 presents the overall process flow diagram.

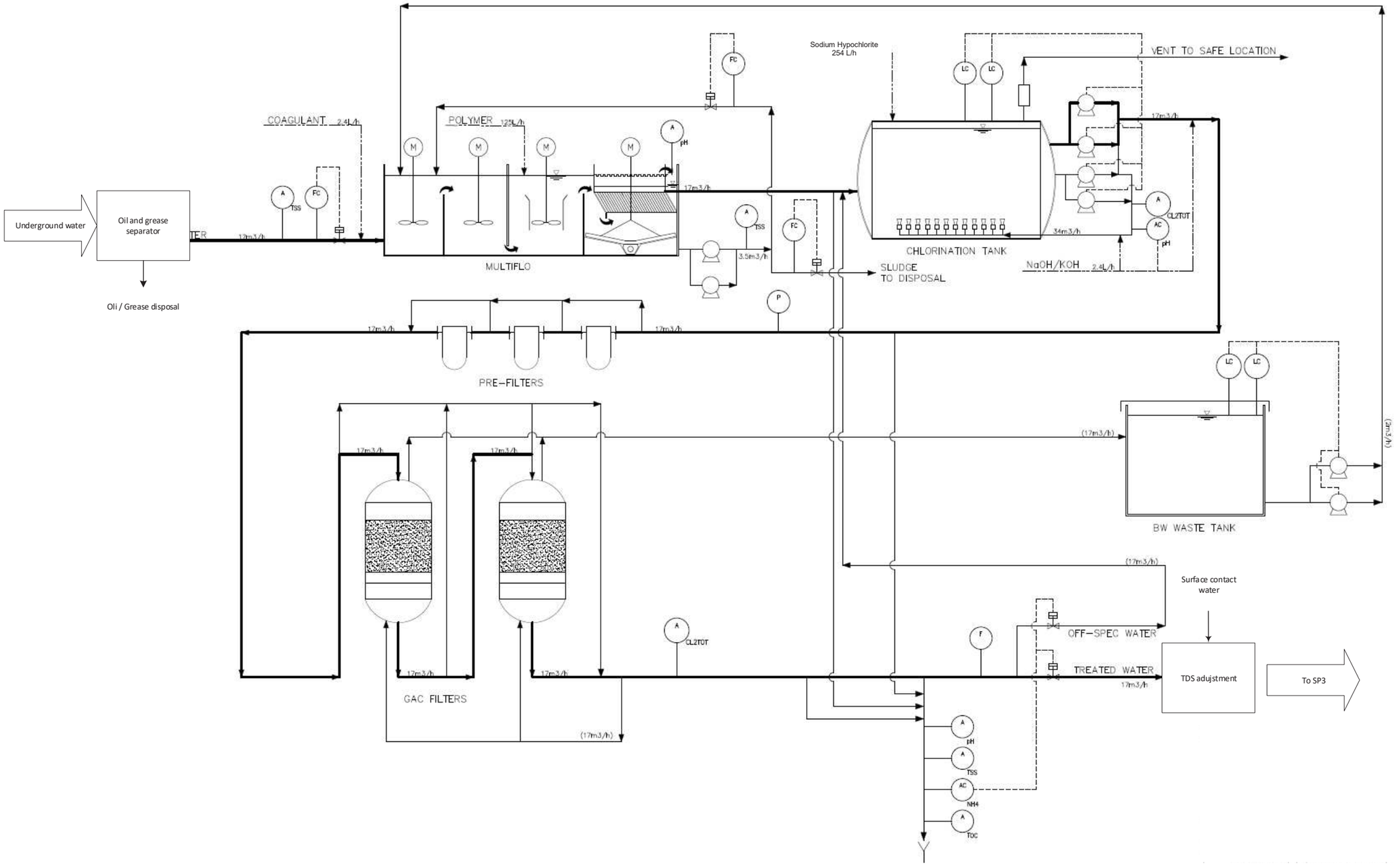

Figure 2 : SETP Flowsheet

2.2.1.2 PROCESS UTILITIES

The service water system is mainly based on reusing distilled water produced within the SWTP. A 21 m^3 clean water reserve tank is used for storage within the SWTP building. This water is reused for polymer solution preparation.

2.2.1.3 REAGENTS

The following reagents are used at the SETP:

- Coagulant : Hydrex 6240 (Veolia) or equivalent
- Anionic polymer : Hydrex 6105 (Veolia) or equivalent
- Caustic blend : Hydrex 9501 (Veolia) or equivalent
- Sodium hypochlorite : (Quadra) or equivalent

Most of the chemicals are supplied in liquid form (and dosed using a dosing skid pump directly into the process) except for the polymer which must be prepared with a dedicated make down unit before dosing. The solutions made with these products are prepared according to the MSDS provided by the suppliers. The updated MSDS are available in the Appendix D.

2.2.1.4 WATER QUALITY

During commissioning, treated water from the SETP was recirculated back into the saline ponds (raw water) until water quality reached the treatment objective. The sample taken on July 22, 2019 show not toxicity toward the three spinned stickleback.

2.2.1.5 CONTROLS

The SETP pumps are equipped with a variable frequency drive (VFD) that allows the flow (feed flow and dosing skids) to be modulated. The functional description is presented in Appendix E.

2.2.2 PIPELINES

The following pipes were installed on site:

- SWTP to SETP;
- SETP to underground mine;
- SETP to Saline Pond 3;
- EWTP to SETP.

Figure 3 presents the specification of each line.

3 FIELD DECISIONS THAT DEVIATE FROM ORIGINAL DESIGN

No variations from the original design were noted during the construction and commissioning of the SETP.

4 AS-BUILT DRAWINGS AND PHOTOGRAPHS

As-built documentation is presented in Appendices A to E:

- P&ID;
- Surface survey;
- Photographs;
- Chemical MSDS;
- Functional description.

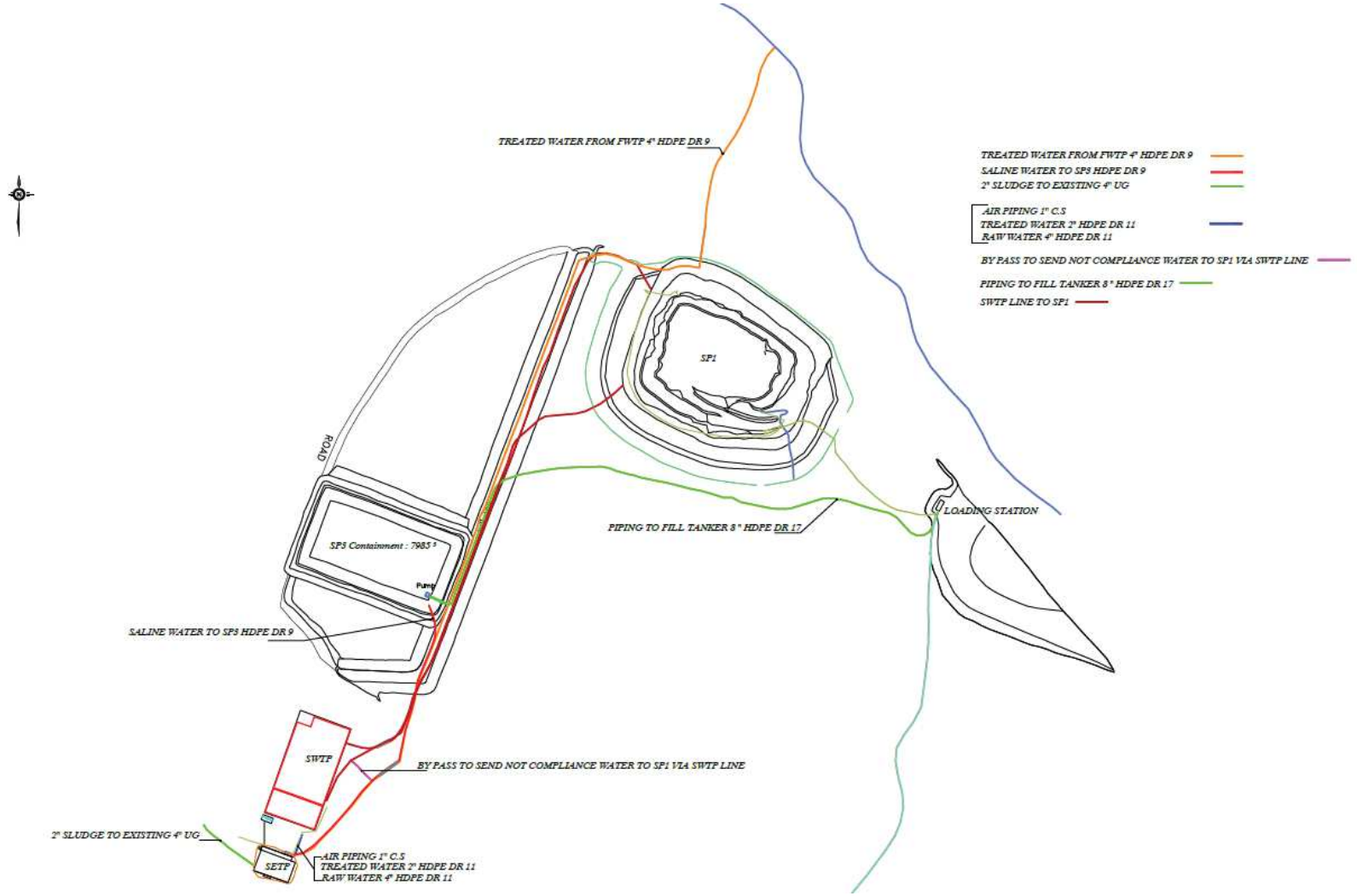

Figure 3 : Piping Survey and Specification

Appendices

Appendix A

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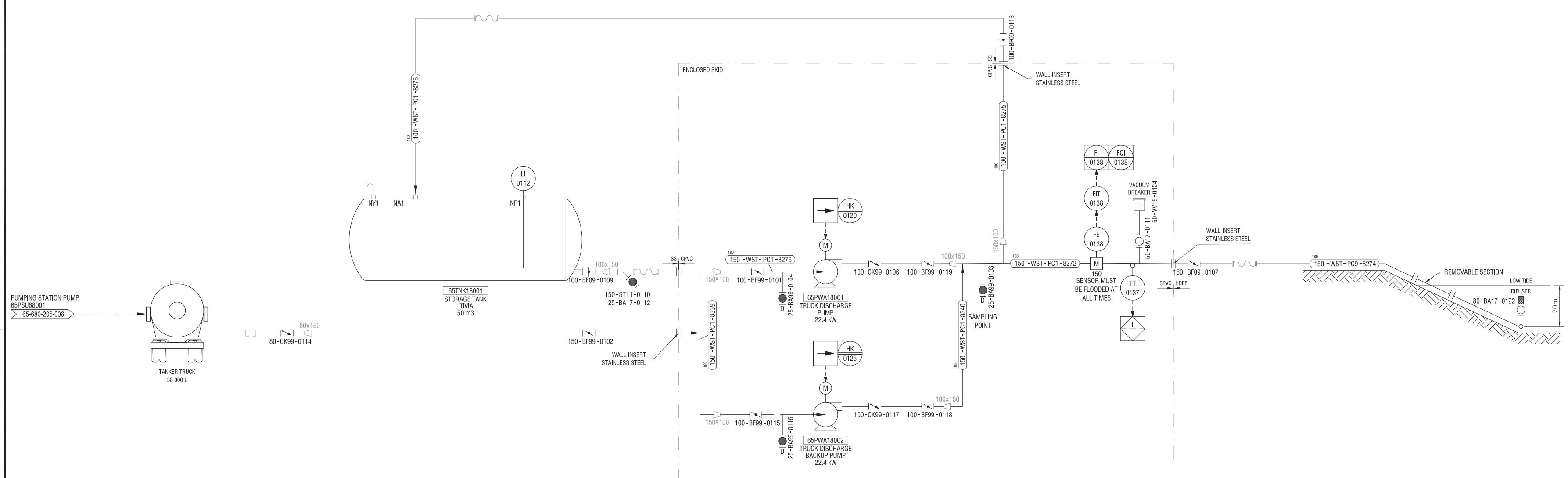

PLAN CLÉ / KEY PLAN	
NOTES GÉNÉRALES / GENERAL NOTES	

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-07-31

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2019-07-31	AS BUILT	S.P.	E.L.	
2	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
1	2019-03-21	GENERAL MODIFICATIONS	J.L.	S.P.	
0	2019-02-07	ISSUED FOR TENDER	S.P.	E.L.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
180 – SALINE EFFLUENT DISCHARGE SYSTEM
205 – PIPING & INSTRUMENTATION DIAGRAM
RANKIN INLET
ITIVIA

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2019-01-17
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-02-07
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-23
NO. DESSIN / DRAWING NO.	65-180-205-001	
NO. PROJET / PROJECT NO.	6528	REVISION 3 — FEUILLE / SHT 1 / 1

FILE NO. 65-180-205-001_R3_ABD.dwg

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DRAWING NO. 65-695-205-202_R1

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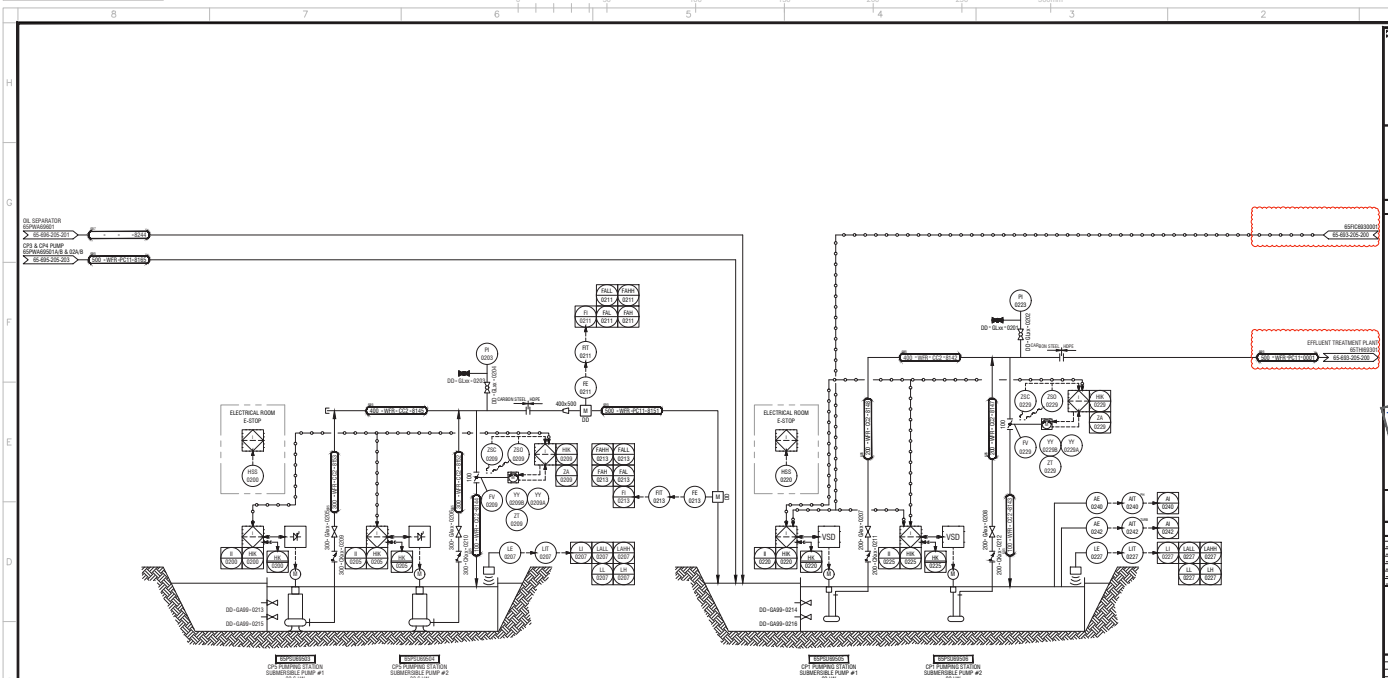

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-01-29

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TYPE / TYPE	# DWG
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1	2019-03-27	MEGR CHANGED	J.L.	S.P.
0	2019-01-29	AS BUILT	S.P.	G.
A	2017-11-17	PRELIMINARY	J.L.	S.P.

REVISIONS

TYPE / TITLE
AGNICO EAGLE – MEADOWBANK DIVISION
695 – ENVIRONEMENT WATER MANAGEMENT
205 – PIPING & INSTRUMENTATION DIAGRAM
CP1 & CP5

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2017-02-22
VÉRIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2017-07-04
APPROUVÉ PAR / APPROVED BY	ERIC LAVOIE, P. Eng.	2019-01-29
ÉCHELLE / SCALE	NO SCALE	DATE 2017-02-22

NO. DESSIN / DRAWING NO. 65-695-205-202

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6528	1	1 / 1

AC-CMP-ARCH D

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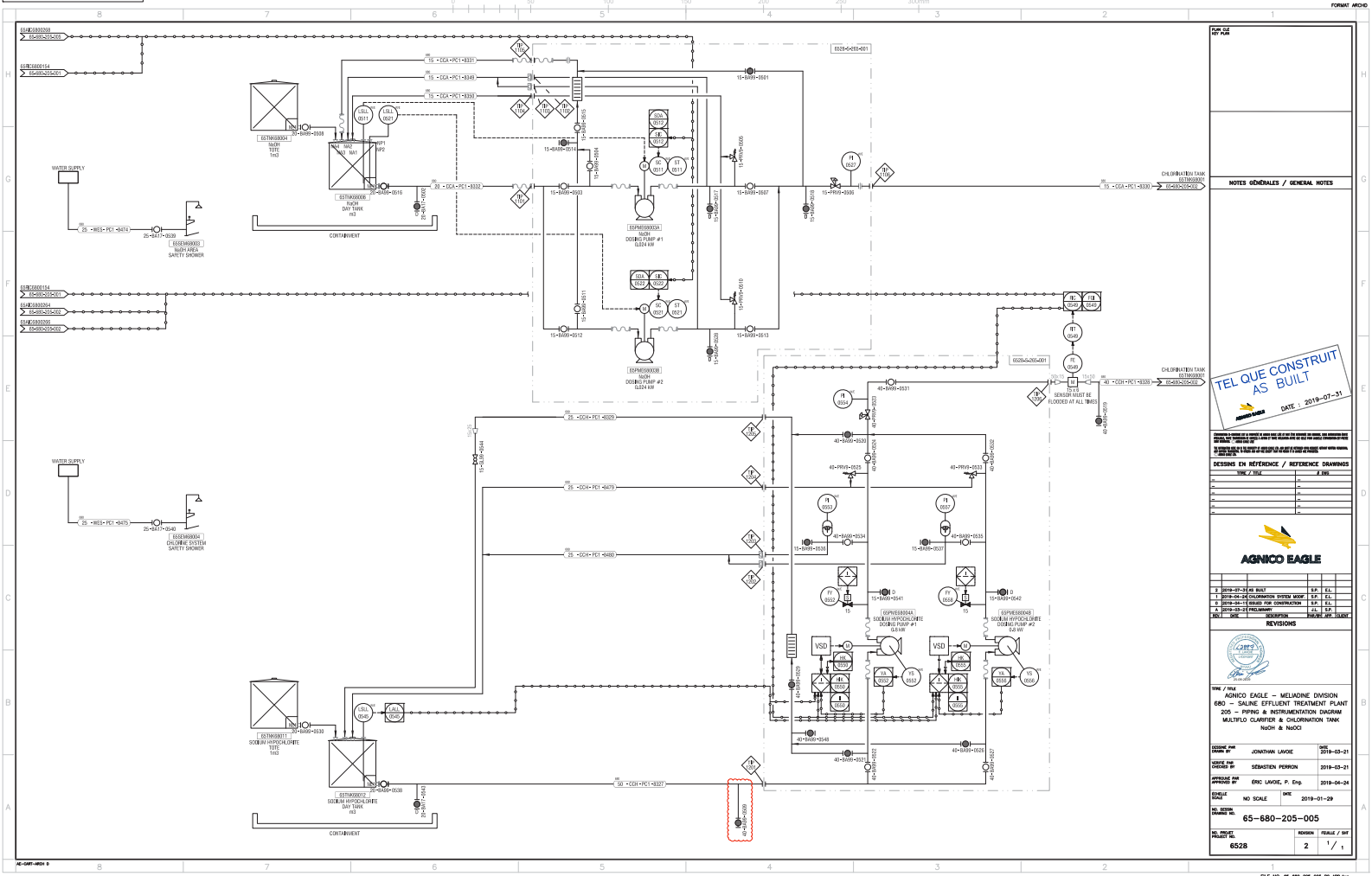

NOTES GÉNÉRALES / GENERAL NOTES

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-07-31

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TYPE / TITLE	# DWG
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REV	DATE	DESCRIPTION	PAR/BY	APP. PAR/BY
3	2019-07-31	AS BUILT	S.P.	E.L.
2	2019-04-24	CHLORINATION SYSTEM MODIF.	S.P.	E.L.
1	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.
A	2019-03-21	PRELIMINARY	J.L.	S.P.

REVISIONS

TYPE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
MULTIFLO CLARIFIER & CHLORINATION TANK
NaOH & NaOCl

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	2019-03-21
VÉRIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ERIC LAVOIE, P. Eng.	2019-04-24
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-29

NO. DESSIN / DRAWING NO. 65-680-205-005

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AC-GART-ARCH D

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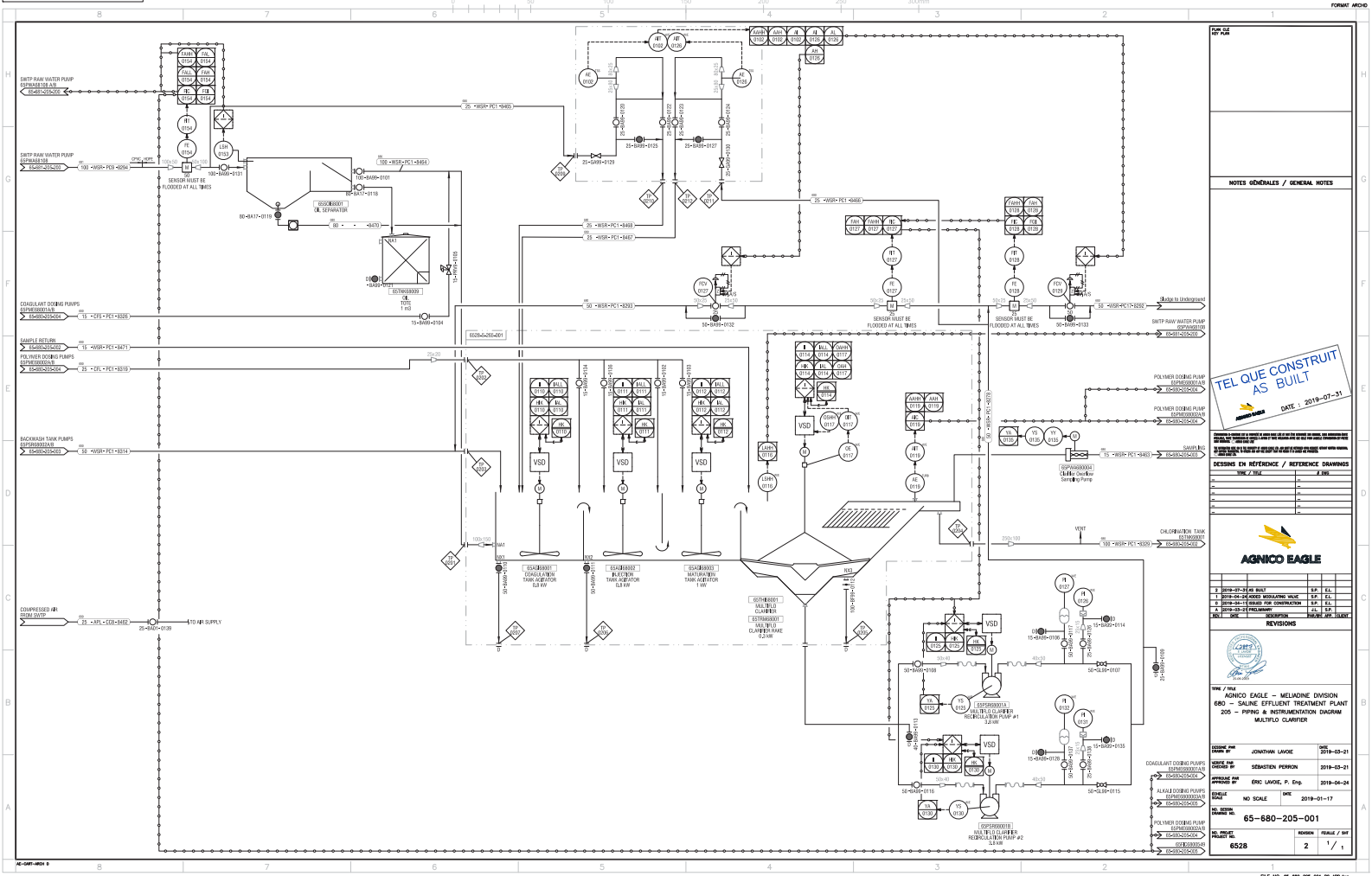

TEL QUE CONSTRUIT AS BUILT
DATE : 2019-07-31

NOTES GÉNÉRALES / GENERAL NOTES

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TYPE / TITLE	# DWG

AGNICO EAGLE

NO.	DATE	DESCRIPTION	PAR/BY	APP.
3	2019-07-31	AS BUILT	S.P.	E.L.
2	2019-04-24	ADDED MODULATING VALVE	S.P.	E.L.
1	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.
A	2019-03-21	PRELIMINARY	J.L.	S.P.

REVISIONS

TYPE / TITLE

AGNICO EAGLE – MEL IADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
MULTIFLO CLARIFIER

DESIGNÉ PAR / DESIGN BY	JONATHAN LAVOIE	2019-03-21
VÉRIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ERIC LAVOIE, P. Eng.	2019-04-24
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN / DRAWING NO. 65-680-205-001

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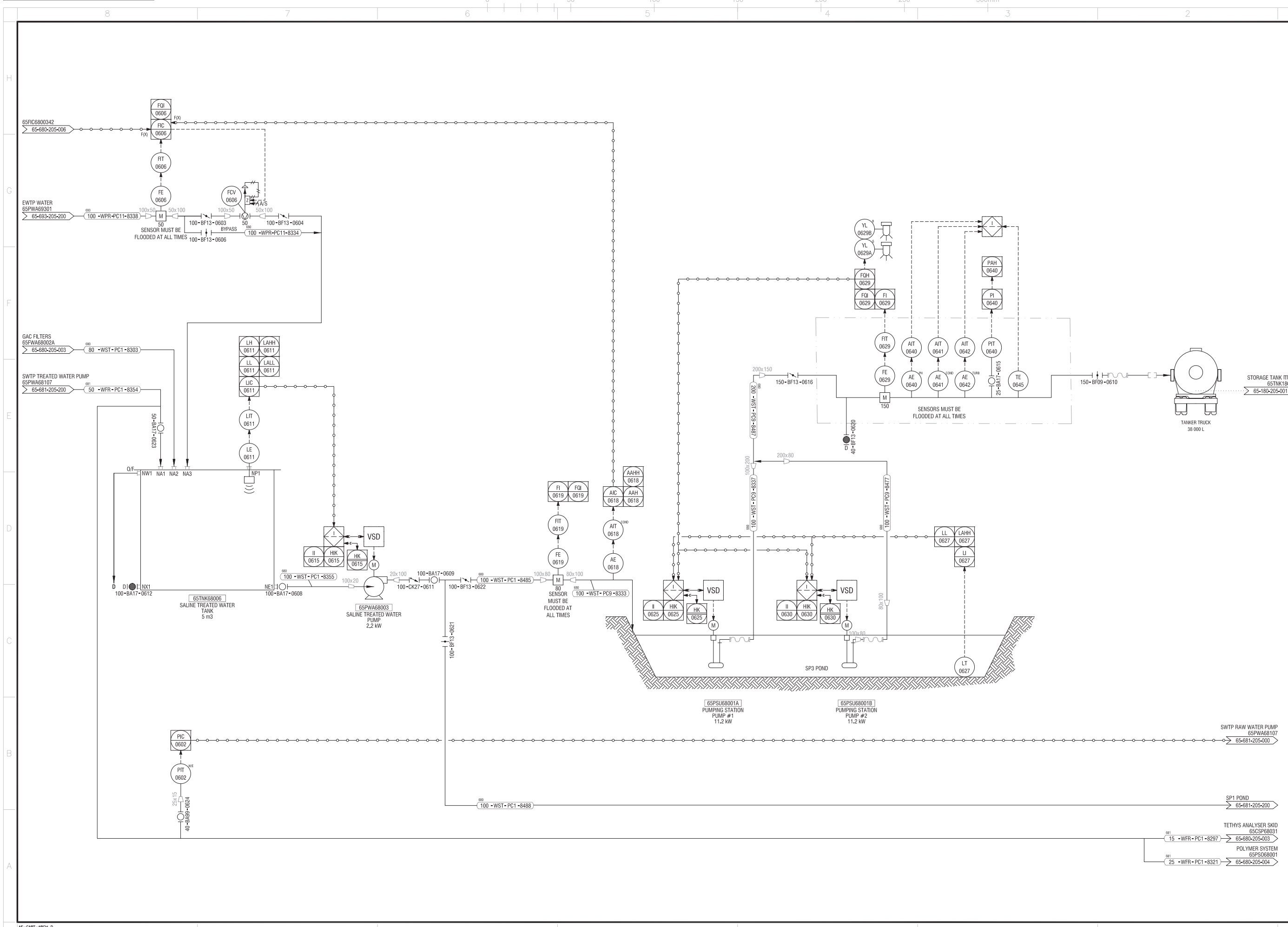

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-07-31

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AGNICO EAGLE

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0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER L2897 E. LAVOIE LICENSEE NT/NU
25-09-2019

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
SP3 POND

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-17

NO. DESSIN / DRAWING NO. 65-680-205-006

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6528	1	1 / 1

AE-CART-ARCH D

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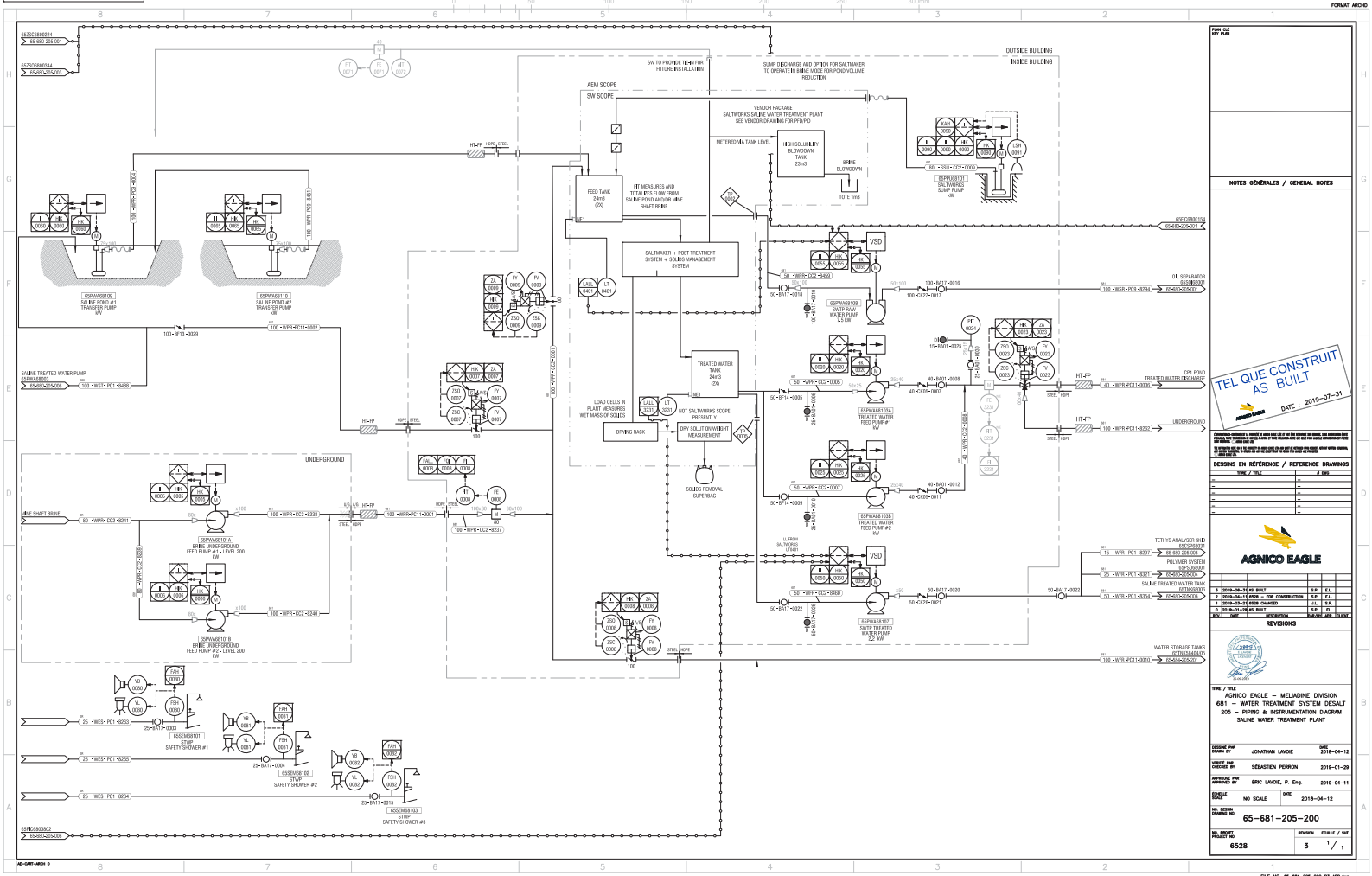

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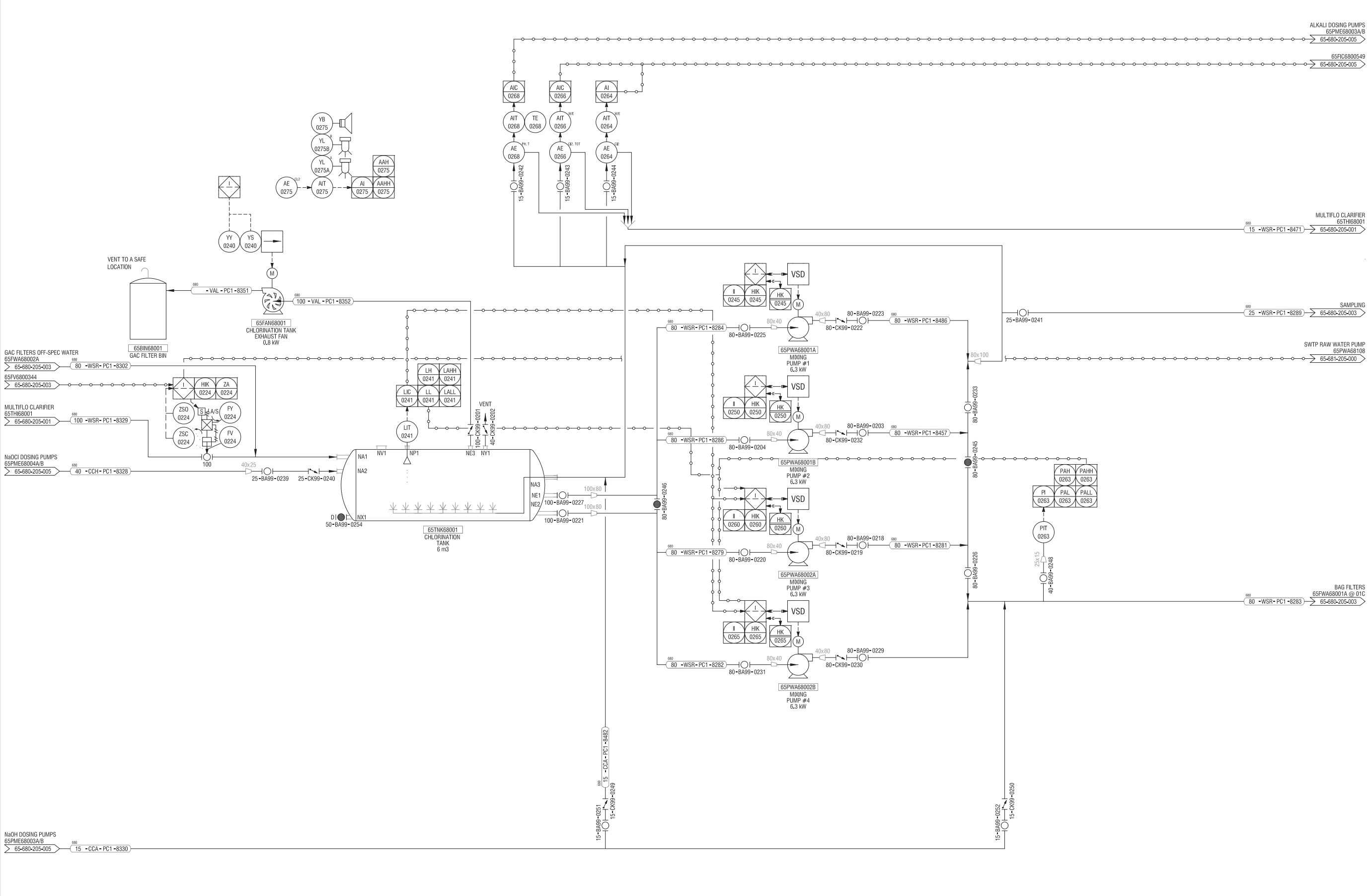

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-07-31

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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
L2897
E. LAVOIE
LICENSEE
NT/NU
25-09-2019

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
MULTIFLO CLARIFIER & CHLORINATION TANK

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-17
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NO. PROJET / PROJECT NO. 6528	REVISION 1	FEUILLE / SHT 1 / 1

AE-CART-ARCH D

FILE NO. 65-680-205-002_R1_ABD.dwg

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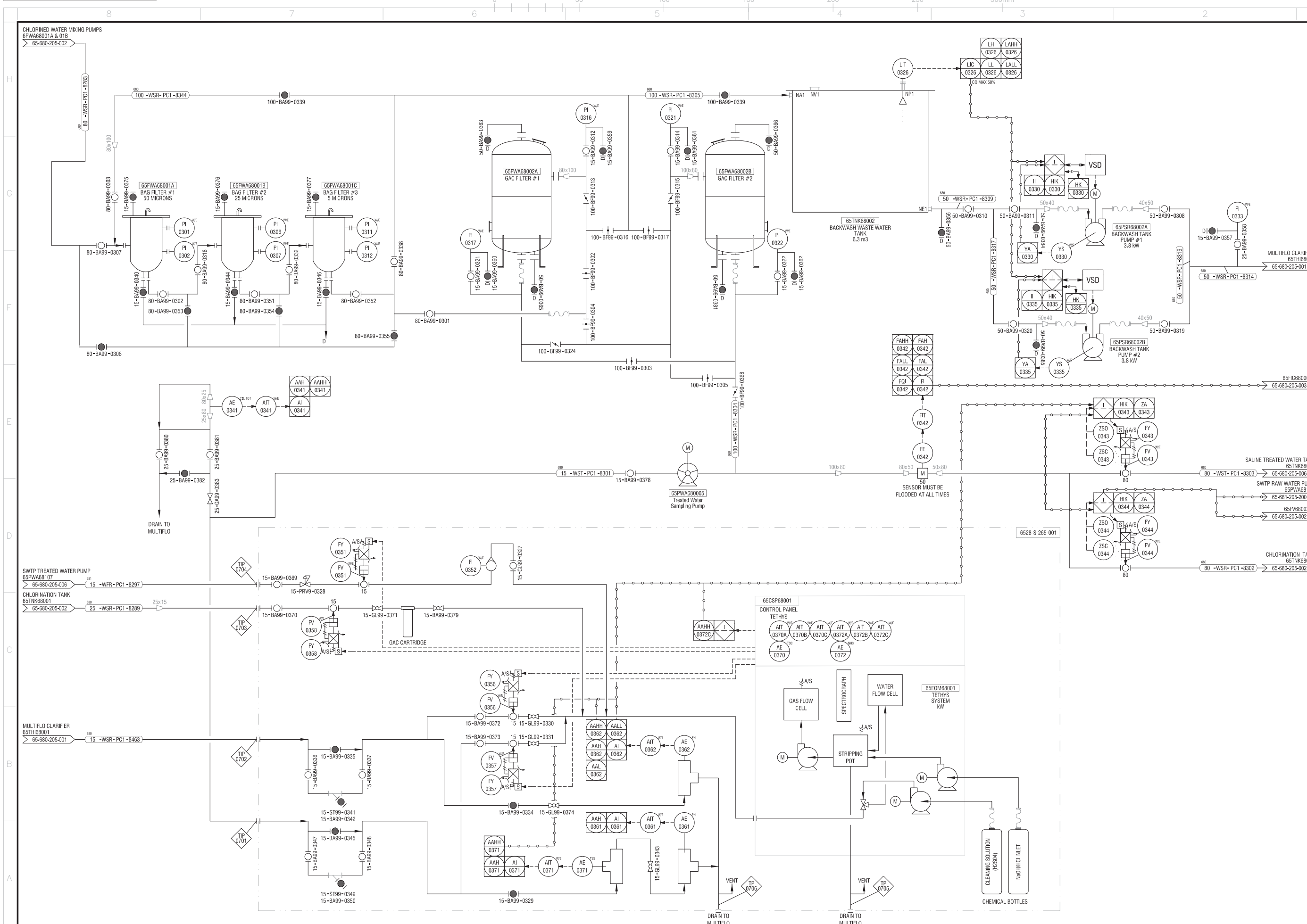

TEL QUE CONSTRUIT
AS BUILT
DATE : 2019-07-31

NOTES GÉNÉRALES / GENERAL NOTES

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2019-07-31	AS BUILT	S.P.	E.L.	
0	2019-04-11	ISSUED FOR CONSTRUCTION	S.P.	E.L.	
A	2019-03-21	PRELIMINARY	J.L.	S.P.	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER L2897 E. LAVOIE LICENSEE NT/NU 25-09-2019

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
MULTIFLO CLARIFIER & CHLORINATION TANK FILTERS

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2019-03-21
VERIFIÉ PAR / CHECKED BY	SÉBASTIEN PERRON	2019-03-21
APPROUVÉ PAR / APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-04-11
ÉCHELLE / SCALE	NO SCALE	DATE 2019-01-17
NO. DESSIN / DRAWING NO.	65-680-205-003	
NO. PROJET / PROJECT NO. 6528	REVISION 1	FEUILLE / SHT 1/1

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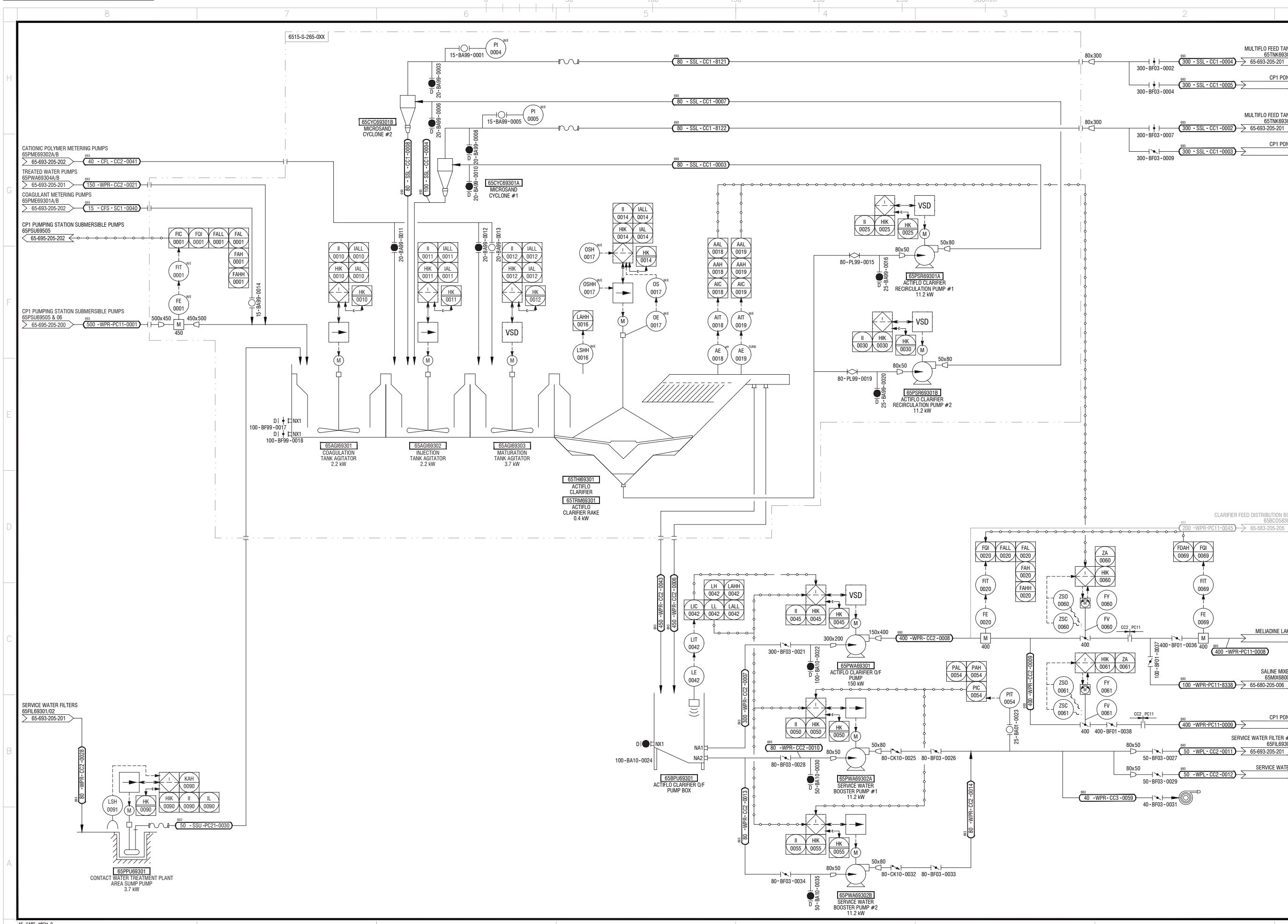

PLAN CLÉ
KEY PLAN

1075, 3e AVENUE EST
VAL-D'OR (QUÉBEC) CANADA J9P 0J7
TÉL. : 819 825-4274 | TÉLÉC. : 819 824-1514 | WWW.WSPGROUP.COM
Ref. 151-06440-10

NOTES GÉNÉRALES / GENERAL NOTES

NOTES :
———— EXISTING

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2019-04-25

BASIC ENGINEERING FINAL APPROVAL PROCESS

NAME	TITLE	APPROVAL SIGNATURE	DATE
P-A BOSSÉ	PROJECT COORDINATOR		
MARTIN GAUMONT	MELIADINE PROCESS PLANT SUPERINTENDANT		
DANIEL SÉGUIN	ENGINEERING MANAGER MELIADINE		

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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5	2019-03-21	6528 CHANGED	J.L.	S.P.	
4	2019-02-08	AS BUILT	J.L.	S.P.	
3	2018-03-22	ISSUED FOR CONSTRUCTION	EL/BF	EL/BF	
2	2017-08-29	ISSUED FOR CONSTRUCTION	C.G.	B.F.	
1	2017-06-21	GENERAL REVISION	E.B.	B.F.	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER L2897 E. LAVOIE LICENSEE NT/NU
25-04-2019

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
693 – FINAL WATER TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
ACTIFLO CLARIFIER

DESSINÉ PAR / DRAWN BY	JONATHAN LAVOIE	DATE 2018-02-02
VERIFIÉ PAR / CHECKED BY	BERTRAND FORTIN, P. Eng. ÉRIC LAVOIE, P. Eng.	2018-03-22
APPROUVÉ PAR / APPROVED BY	BERTRAND FORTIN, P. Eng. ÉRIC LAVOIE, P. Eng.	2018-03-22
ÉCHELLE / SCALE	NO SCALE	DATE 2015-08-05

NO. DESSIN / DRAWING NO. 65-693-205-200

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
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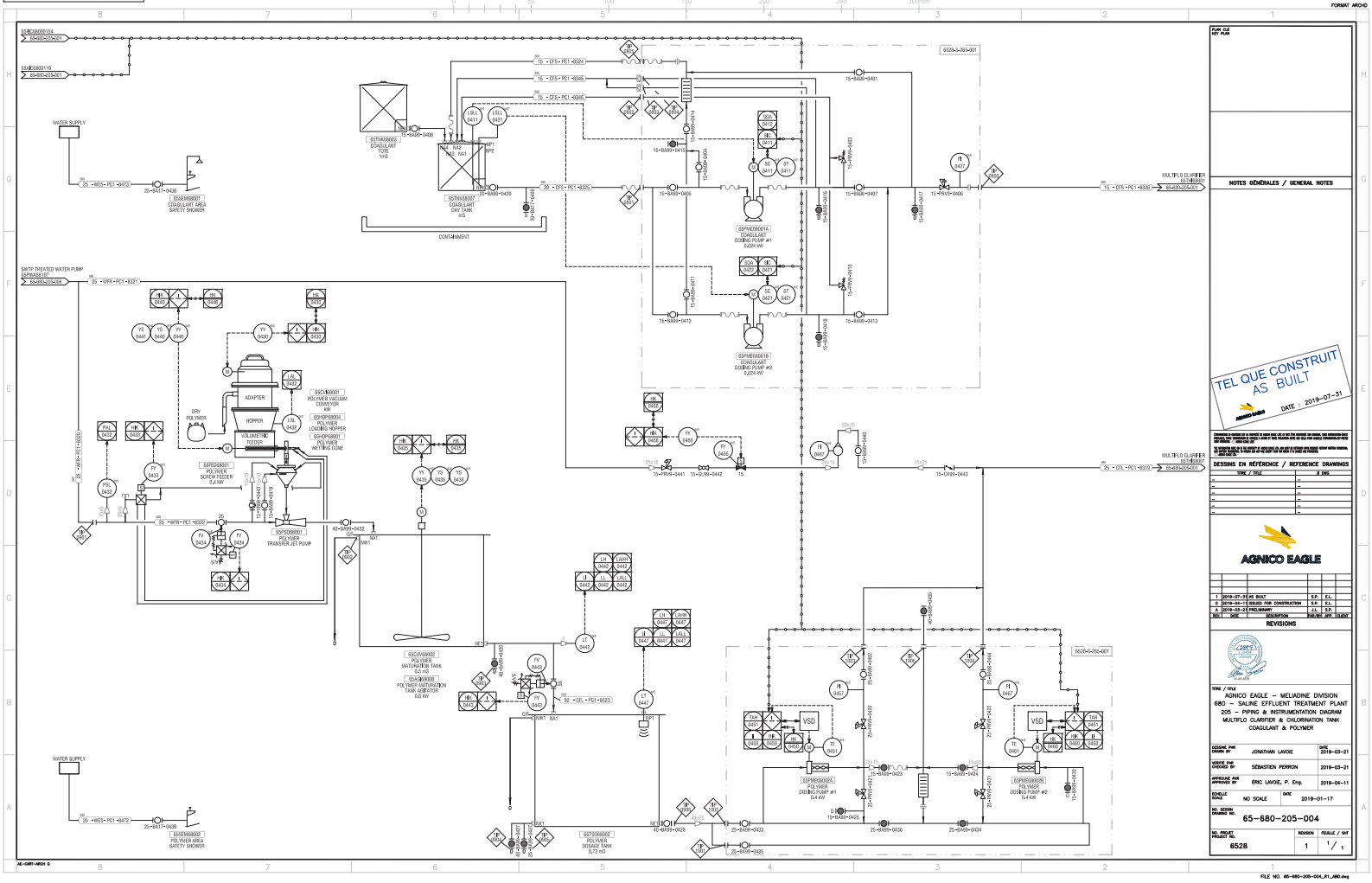
AE-CART-ARCH D

FILE NO. 65-693-205-200_R6.dwg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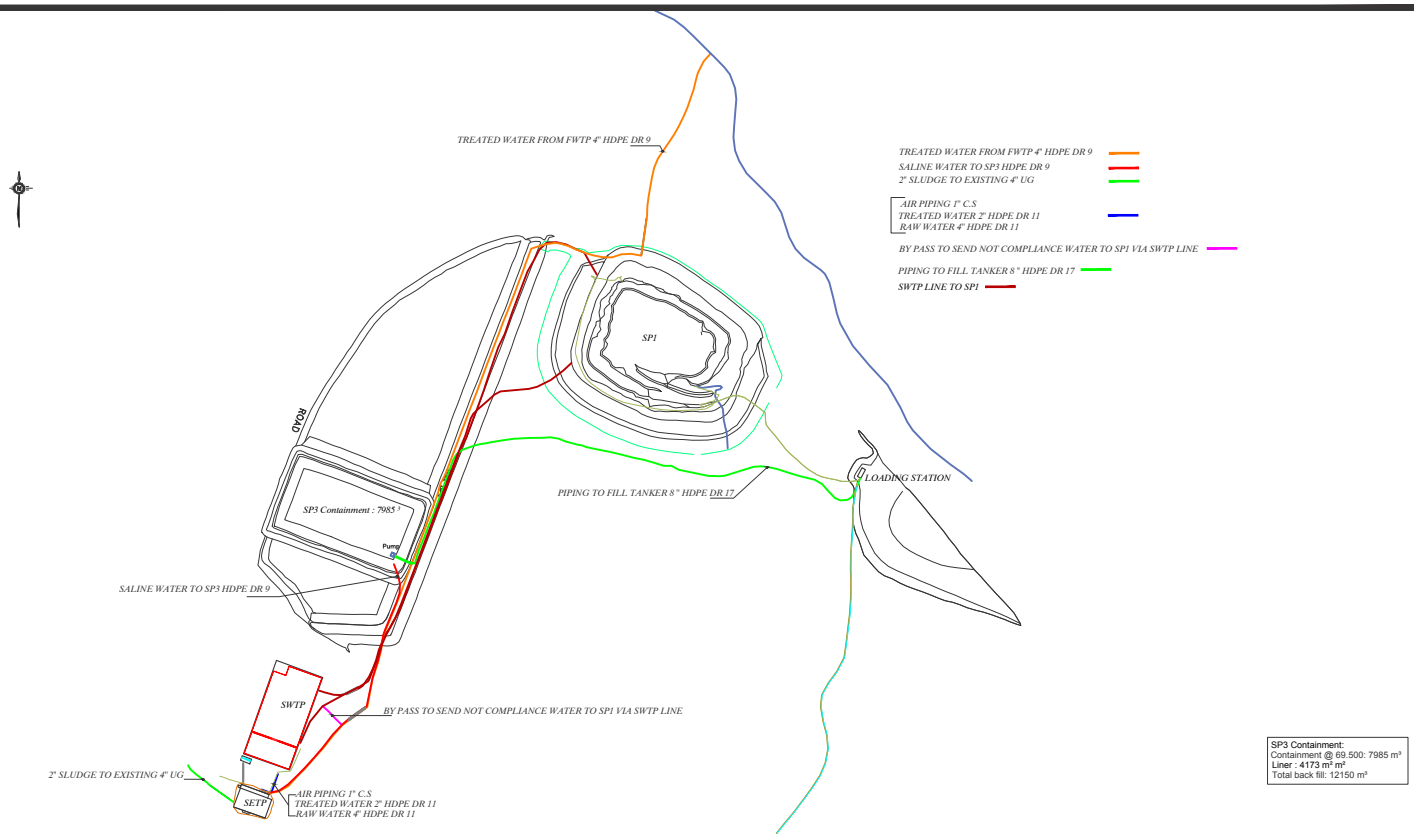
WATER SUPPLY
CONTAINMENT
ADAPTER
HOPPER
VOLUMETRIC FEEDER
DRY POLYMER
NOTES GÉNÉRALES / GENERAL NOTES
TEL QUE CONSTRUIT AS BUILT
DATE : 2019-07-31
DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS
AGNICO EAGLE
REVISIONS
TYPE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
680 – SALINE EFFLUENT TREATMENT PLANT
205 – PIPING & INSTRUMENTATION DIAGRAM
MULTIFLO CLARIFIER & CHLORINATION TANK
COAGULANT & POLYMER
DESIGNED PAR DRAWN BY JONATHAN LAVOIE 2019-03-21
VERIFIE PAR CHECKED BY SÉBASTIEN PERRON 2019-03-21
APPROUVÉ PAR APPROVED BY ERIC LAVOIE, P. Eng. 2019-04-11
ÉCHELLE SCALE NO SCALE DATE 2019-01-17
NO. DESSIN DRAWING NO. 65-680-205-004
NO. PROJET PROJECT NO. 6528
REVISION 1
FEUILLE / SHT 1 / 1
AC-GART-ARCH D
FILE NO. 65-680-205-004_R1_ABD.dwg

Appendix B



HA HAMEL ARPENTAGE	Système de Coord.: NAD83 UTM15	No plan: 6528-180-142-200-R0_ABD_SETP	LAYOUT PIPING SP3 CONTAINMENT: 7985 m³	AGNICO EAGLE	Date des travaux : 2019-05	Dessiné par: Y. HAMEL
	Echelle: NA				Date d'envoi : 2019-10-17	Approuvé par: Hamel Arp.

Appendix C

SETP Pictures during construction

SETP Building installation

SETP building erection

SETP electrical installation

Piping to the loading station

Steel frame fabrication

Liner installation

SETP stair installation

Painting of SETP

SETP equipment installation

Saline water & pump skid SP3

Coagulant dosing Skid

Caustic dosing skid

Activated carbon filter and backwash tank

Chlorination reactor and pre-filter skids

Multiflo clarifier and sludge recirculation pumps

Top of the Multiflo

Electrical room

Motor Drive

Mixing tank

Hypochlorite dosing skid and emergency shower

Tethys analyzer skid

Multiparameter analyzer skid

Oils and grease separator

Polymer make down and dosing skid

Appendix D

SAFETY DATA SHEET

Sodium hypochlorite 12%

Section 1. Identification

Product identifier : Sodium hypochlorite 12%

Product code : Q05995

Relevant identified uses of the substance or mixture

Identified uses
Industrial applications

Supplier's details : QUADRA CHEMICALS LTD.
3901 F.X Tessier
Vaudreuil-Dorion, QC
CANADA J7V 5V5
1-800-665-6553

Emergency telephone number (with hours of operation) : **TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK IN CANADA - CALL 1-800-567-7455**

Section 2. Hazard identification

Classification of the substance or mixture : CORROSIVE TO METALS - Category 1
SKIN CORROSION - Category 1
SERIOUS EYE DAMAGE - Category 1
Health Hazards Not Otherwise Classified - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : May be corrosive to metals.
Causes digestive tract burns.
Causes respiratory tract burns.
Causes severe skin burns and eye damage.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep only in original packaging. Wash hands thoroughly after handling.

Response : Absorb spillage to prevent material damage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up. Store in a corrosion resistant container with a resistant inner liner.

Section 2. Hazard identification

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Keep container tightly closed. Do not breathe vapor or spray. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 19.8%

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
Sodium hypochlorite, solid	3 - 20	7681-52-9

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Section 4. First-aid measures

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach. Corrosive to the digestive tract. Causes burns.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
halogenated compounds
metal oxide/oxides
Chlorine gas.

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Absorb spillage to prevent material damage. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Absorb spillage to prevent material damage. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container. Absorb spillage to prevent material damage.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 18°C (64.4°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store in a corrosion resistant container with a resistant inner liner. Store locked up. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Sodium hypochlorite, solid	-

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Physical state : Liquid. [Clear.]

Color : Yellow. Green.

Odor : Chlorine. [Strong]

Odor threshold : Not available.

pH : 11 to 13

Melting point : -6°C (21.2°F)

Boiling point : Decomposition temperature: >40°C (>104°F)

Flash point : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.1 to 1.2 [@ 20°C.]

Density : Not available.

Solubility : Easily soluble in the following materials: cold water.

Dispersibility properties : Not available.

Partition coefficient: n-octanol/water : -3.42

Auto-ignition temperature : Not available.

Decomposition temperature : >40°C (>104°F)

Viscosity : Not available.

Volatility : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : reducing materials
organic materials
metals
acids

Section 10. Stability and reactivity

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Sodium hypochlorite, solid	Eyes - Mild irritant	Rabbit	-	1.31 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Carcinogenicity Classification

Product/ingredient name	IARC	NTP	ACGIH
Sodium hypochlorite, solid	3	-	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Inhalation.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach. Corrosive to the digestive tract. Causes burns.

Section 11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Sodium hypochlorite, solid	Acute EC50 0.67 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours
	Acute LC50 56400 µg/l Marine water	Crustaceans - Palaemonetes pugio	48 hours
	Acute LC50 32 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 32 µg/l Marine water	Fish - Oncorhynchus kisutch - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic NOEC 0.5 mg/l Marine water	Algae - Isochrysis galbana - Exponential growth phase	96 hours
	Chronic NOEC 0.1 ppm Fresh water	Fish - Cyprinus carpio - Young	30 days

Persistence and degradability

Not available.

Section 12. Ecological information

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Sodium hypochlorite 12%	-3.42	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	TDG Classification
UN number	1791
UN proper shipping name	HYPOCHLORITE SOLUTION
Transport hazard class(es)	8 
Packing group	III
Additional information	Not available.

Section 15. Regulatory information

Canada inventory : All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 10 July 2017

Prepared by : Regulatory Affairs

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations
HPR = Hazardous Products Regulations

Procedure used to derive the classification

Classification	Justification
CORROSIVE TO METALS - Category 1	Expert judgment
SKIN CORROSION - Category 1	On basis of test data
SERIOUS EYE DAMAGE - Category 1	On basis of test data
Health Hazards Not Otherwise Classified - Category 1	Calculation method

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

1. Identification

Product identifier	**HYDREX 6105**
Other means of identification	None.
Recommended use	Wastewater Flocculant
Recommended restrictions	PROFESSIONAL USE ONLY

Manufacturer/Importer/Supplier/Distributor information

Manufacturer	
Supplier	Veolia Water Technologies Canada Inc.
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwtcanada-hydrex@veolia.com
24-Hour Emergency telephone	+1-760-476-3962 (Code:333239)
Supplier	Not available.

2. Hazard(s) identification

Physical hazards	Not classified.
Health hazards	Not classified.
Environmental hazards	Not classified.
Label elements	
Hazard symbol	None.
Signal word	None.
Hazard statement	The mixture does not meet the criteria for classification.
Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
Other hazards	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Not available.
Specific hazards arising from the chemical	Material can be slippery when wet. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. For personal protection, see section 8 of the SDS. Slippery when wet.
Methods and materials for containment and cleaning up	This product is miscible in water. Stop the flow of material, if this is without risk. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Material can be slippery when wet. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Protect from sunlight. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, dry place.

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles) and a face shield. Chemical goggles and face shield are recommended.
Skin protection	
Hand protection	Chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Other	Wear suitable protective clothing. Chemical resistant gloves.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Granular Solid.
Physical state	Solid.
Form	Granular. Powder.
Color	Off-white.
Odor	Odorless.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0 hPa estimated
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Limited by viscosity
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Bulk density	750 - 950 kg/m³
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	0.75 - 0.95
pH of 1% Solution	6 - 8

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Ammonia. At thermal decomposition temperatures, carbon monoxide and carbon dioxide. Nitrogen oxides (NOx).

11. Toxicological information

Information on likely routes of exposure

Inhalation No adverse effects due to inhalation are expected.

Skin contact No adverse effects due to skin contact are expected.

Eye contact Direct contact with eyes may cause temporary irritation.

Ingestion Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
HYDREX 6105		
Acute		
Dermal		
LD50	Rabbit	> 10000 mg/kg
Oral		
LD50	Rat	> 5000 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not available.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
HYDREX 6105			
Aquatic			
Acute			
Algae	IC50	Algae	2276 mg/l, 72 hours
Crustacea	EC50	Daphnia	> 100 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	>= 100 mg/l, 96 hours
		Rainbow Trout	> 120 mg/l, 96 hours
		Zebra danio (Danio rerio)	1 - 10 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available.

15. Regulatory information

Canadian regulations

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

Issue date 01-04-2017

Version # 01

Disclaimer Veolia Water Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Technologies' requirement.

Revision information Product and Company Identification: Product Review
Physical & Chemical Properties: Multiple Properties
Ecological Information: Ecotoxicity
HazReg Data: North America

SAFETY DATA SHEET

1. Identification

Product identifier	**Hydrex 6240**
Other means of identification	None.
Recommended use	Wastewater Coagulant
Recommended restrictions	PROFESSIONAL USE ONLY
Manufacturer/Importer/Supplier/Distributor information	
Supplier	Veolia Water Technologies Canada Inc.
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwtcanada-hydrex@veolia.com
24-Hour Emergency telephone	24 Hour Number: +1-760-476-3962 (Code:333239)
Supplier	Not available.

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Serious eye damage/eye irritation	Category 1
Environmental hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May be corrosive to metals. Causes serious eye damage.
Precautionary statement	
Prevention	Keep only in original packaging. Wear eye protection/face protection.
Response	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. Absorb spillage to prevent material-damage.
Storage	Store in a corrosion resistant container with a resistant inner liner.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
Other hazards	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
ALUMINUM, WATER SOLUBLE SALTS, N.O.S.		1327-41-9	30 - < 40
Other components below reportable levels			50 - < 70

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Not available.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	This product is miscible in water. Should not be released into the environment. Prevent entry intc waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Avoid forming spray/aerosol mists. Do not get this material in contact with eyes. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Store in original tightly closed container. Keep only in the original container. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, dry place.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Material	Type	Value	Form
Hydrex 6240	TWA	1 mg/m3	Respirable fraction.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Material	Type	Value
Hydrex 6240	TWA	2 mg/m3

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Material	Type	Value	Form
Hydrex 6240	TWA	1 mg/m3	Respirable.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Material	Type	Value
Hydrex 6240	TWA	2 mg/m3

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Material	Type	Value
Hydrex 6240	TWA	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical goggles and face shield are recommended. Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Chemical resistant gloves.

Other Wear suitable protective clothing. Chemical resistant gloves.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment. Avoid forming spray/aerosol mists.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Clear or Hazy Liquid.

Color Colorless to Yellow

Odor Not significant.

Odor threshold Not available.

pH 0.5 - 1.5

Melting point/freezing point -4 °F (-20 °C)

Initial boiling point and boiling range 219.2 °F (104 °C)

Flash point Not applicable

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	1.34
Relative density	Not available.
Solubility(ies)	
Solubility (water)	100 % Soluble below pH 4.0
Partition coefficient (n-octanol/water)	Not applicable
Auto-ignition temperature	Not available.
Decomposition temperature	> 392 °F (> 200 °C)
Viscosity	Not available.
Other information	
Density	1.34 - 1.40 g/cm³
Dynamic viscosity	30 - 40 cP @ 23°C
Explosive limit	Not applicable
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Percent volatile	40 - 65
Shelf life	8 months
Specific gravity	1.34 - 1.4

10. Stability and reactivity

Reactivity	Reacts violently with strong alkaline substances. This product may react with reducing agents. May be corrosive to metals.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Avoid temperatures exceeding the decomposition temperature. Do not mix with other chemicals. Contact with incompatible materials. Avoid all contact with metal.
Incompatible materials	Strong bases. Bases. Strong oxidizing agents. Reducing agents. May be corrosive to metals. Metals. Sulfites. Iron hypochlorites. Avoid contact with carbon steel and galvanized surfaces.
Hazardous decomposition products	No dangerous reaction known under conditions of normal use. Thermal decomposition may emit HCl.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Causes serious eye damage.
Ingestion	Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity	Not known.

Product	Species	Test Results
Hydrex 6240		
Acute		
Oral		
LD50	Rat	> 2000 mg/kg (35 % solution)

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Not available.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity Because of the low pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

Product		Species	Test Results
Hydrex 6240			
Aquatic			
Acute			
Crustacea	EC50	Daphnia	98 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	665 mg/l, 48 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability Not applicable.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

UN number	UN3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminum Chloride Solution)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	D
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (Polyaluminum Chloride Solution)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	8L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Polyaluminum Chloride Solution)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

IATA; IMDG; TDG

15. Regulatory information

Canadian regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Toxic Chemical Substances (TCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date 01-09-2019

Version # 01

Disclaimer Veolia Water Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Technologies' requirement.

Revision information

Product and Company Identification: Product Review
Composition / Information on Ingredients: Ingredients
Physical & Chemical Properties: Multiple Properties
Toxicological Information: Toxicological Data
Ecological Information: Ecotoxicity
Transport Information: Experimental Data
Regulatory Information: Risk Phrases - Labeling
GHS: Classification

SAFETY DATA SHEET

1. Identification

Product identifier	**Hydrex 9501**
Other means of identification	None.
Recommended use	Industrial Process Water Treatment
Recommended restrictions	PROFESSIONAL USE ONLY
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	
Supplier	Veolia Water Technologies Canada Inc.
Address	2000 Argentia Road, Plaza IV, Suite 430 Mississauga, ON L5N 1W1 Canada
Contact Person	Hydrex Product Specialist
Telephone	(905) 286-4846
Fax	(905) 286-0488
e-mail	vwtcanada-hydrex@veolia.com
24-Hour Emergency telephone	+1-760-476-3962 (Code:333239)
Supplier	Not available.

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3
	Hazardous to the aquatic environment, long-term hazard	Category 3

Label elements

Signal word	Danger
Hazard statement	May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage. Harmful to aquatic life. Harmful to aquatic life with long lasting effects.
Precautionary statement	
Prevention	Keep only in original packaging. Do not breathe mist or vapor. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor/paramedic. Wash contaminated clothing before reuse. Absorb spillage to prevent material-damage.
Storage	Store in corrosive resistant container with a resistant inner liner.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards None known.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Sodium Hydroxide		1310-73-2	35
Other components below reportable levels			65

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Dry chemical, foam, carbon dioxide, water fog.

Unsuitable extinguishing media Not available.

Specific hazards arising from the chemical Water reactive material.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Do not get water inside container.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Do not get water on spilled substance or inside containers. Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Cover with DRY earth, DRY sand, or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Do not allow water to get into container because of violent reaction and possible flash fire. Avoid forming spray/aerosol mists. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged exposure. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Never allow product to get in contact with water during storage. Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Keep only in the original container. Keep container dry. Store in a building without sprinklers. Store away from incompatible materials (see Section 10 of the SDS). Store in cool, dry place.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)

Components	Type	Value
Sodium Hydroxide (CAS 1310-73-2)	Ceiling	2 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Chemical goggles and face shield are recommended. Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate chemical resistant clothing. Chemical resistant gloves.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment. Avoid forming spray/aerosol mists.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance Clear

Physical state Liquid.

Form Liquid.

Color Colorless

Odor Odorless.

Odor threshold Not available.

pH 13.5 - 13.8

Melting point/freezing point < 5 °F (< -15 °C)

Initial boiling point and boiling range Not available.

Flash point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies)

Solubility (water) 100 %

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Bulk density	1.44 g/cm³
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	1.43 - 1.49

10. Stability and reactivity

Reactivity	Reacts violently with strong acids. This product may react with oxidizing agents. May be corrosive to metals.
Chemical stability	Material reacts with water. Instability caused by excessive moisture.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.
Conditions to avoid	Exposure to water vapor. Contact with incompatible materials. Do not mix with other chemicals.
Incompatible materials	Reacts violently with water. Strong acids. Acids. Strong oxidizing agents. This product may react with reducing agents. Oxidizing agents. Metals. Chlorinated hydrocarbons. Maleic anhydride. Glycol.
Hazardous decomposition products	Sodium oxides. Hydrogen.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause irritation to the respiratory system. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result.

Information on toxicological effects

Acute toxicity Harmful if swallowed.

Product	Species	Test Results
Hydrex 9501		
Acute		
Dermal		
LD50	Rabbit	>= 3000 mg/kg Calculated
Oral		
LD50	Rat	>= 600 mg/kg Calculated

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Causes severe skin burns and eye damage.
Serious eye damage/eye irritation	Causes serious eye damage.

Respiratory or skin sensitization

Canada - Alberta OELs: Irritant

Sodium Hydroxide (CAS 1310-73-2)	Irritant

Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not available.
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.
Chronic effects	Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Product		Species	Test Results
Hydrex 9501			
Aquatic			
Acute			
Crustacea	EC50	Daphnia	>= 200 mg/l, 48 hours
Fish	LC50	Fish	>= 200 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Consult authorities before disposal. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel] The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

UN number	UN1719
UN proper shipping name	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium Hydroxide, Potassium hydroxide)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	II
Environmental hazards	Marine pollutant only when containing 10% or more substances identified as marine pollutants or severe marine pollutant when containing 1% or more substances identified as severe marine pollutants
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN1719
UN proper shipping name	Caustic alkali liquid, n.o.s. (Sodium Hydroxide, Potassium hydroxide)
Transport hazard class(es)	
Class	8
Subsidiary risk	-

Packing group	II
Environmental hazards	No.
ERG Code	8L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN1719
UN proper shipping name	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium Hydroxide, Potassium hydroxide)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

IATA; IMDG; TDG

15. Regulatory information

Canadian regulations

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

Issue date 10-28-2016

Version # 01

Disclaimer Veolia Water Technologies is not able to anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use and or non respect of Veolia Water Technologies' requirement.

Revision information

Product and Company Identification: Product Review
Composition / Information on Ingredients: Ingredients
Physical & Chemical Properties: Multiple Properties
Toxicological Information: Toxicological Data
Ecological Information: Ecotoxicity
Transport Information: Proper Shipping Name/Packing Group
Regulatory Information: Canada
Material Attributes & Uses; Experimental Data: Material Attributes
HazReg Data: North America

Appendix E

Functional Description
Saline Effluent Treatment Plant (SETP)

Appendix B

				Sébastien Perron Instrumentation	Eric Lavoie Digitally signed by Eric Lavoie Date: 2019.09.25 14:04:46 -04'00'
2019-09-19	R1	As Built	Sébastien Perron	Sébastien Perron	Éric Lavoie
2019-04-24	R0	For design report	Sébastien Perron	Alain Corriveau	Éric Lavoie
Date	**Rev.**	**Status**	**Prepared by**	**Checked by**	**Accepted by**

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1 INTRODUCTION

The following document describes the typical operation of the Saline effluent treatment plant (SETP) itself, sludge system, treated water system, service water system. The functional description includes also the chemical dosing system.

2 PLC

The main PLC Panel (65PLC68001) which will control the system will be located in the Saline Effluent Treatment Plant electrical room. This panel will control the system feed pumps, oil and grease separator, Multiflo clarifier, break point chlorination, cartridge filters, carbon filters, saline mixing tank and submersible pumps to fill trucks, as well as reagents.

Another PLC (65PLC680002), supplied by Veolia, will control the polymer dosing skid.

The fresh water addition feed for mixing is controlled by an existing PLC (65PLC69301) in the Effluent Water Treatment Plant. Communication will be made through an existing fiber optic network on site.

The measurement for water quality prior to loading the truck will be connected in a remote I/O (65IOP68001) located in a pumping station beside the truck connection. This remote I/O is connected to the main PLC via optic fiber.

3 HMI

Three Schneider Magelis HMI will be installed, one on main PLC panel (65HMI68011), one on field close to the Multiflo Clarifier (65HMI68001), one on remote I/O panel in truck filling station (65HMI68021).

65HMI68001 and 65HMI68011

Screen 1: Feed, Oil and Grease Separator

- SWTP Raw Water Pump (65PWA68108)
- SWTP Raw Water Level Transmitter (65LT6810401)
- SWTP Raw Water Pump Flowmeter (65FIT6800154) and his accumulator (65FQI6800154)
- Oil Separator High Level Switch (65LSH6800153)

Screen 2: Multiflo Clarifier

- Coagulation Tank Agitator (65AGI68001)
- Injection Tank Agitator (65AGI68002)
- Maturation Tank Agitator (65AGI68003)
- Multiflo Clarifier Rake (65TRM68001)
- Multiflo Clarifier Rake High Torque Switch (65OSHH6800117)
- Multiflo Clarifier High Level Switch (65LSH6800116)
- Multiflo Clarifier Recirculation Pumps (65PSR68001A and B) and their broken tube detectors
- Multiflo Clarifier Recirculation Flowmeter (65FIT6800127) and Control Valve (65FCV6800127)

- Sludge Discharge Valve (65FV6800128)
- Sludge Discharge Flowmeter (65FIT68000128) and his accumulator (65FQI6800128)

Screen 3: Chlorination Tank

- Chlorination Tank Feed Valve (65FV6800224)
- Chlorination Tank Level (65LIT6800241)
- Chlorination Tank Exhaust Fan (65FAN68001)
- Chlorination Tank Mixing Pumps (65PWA68001A, 01B, 02A, 02B)
- Chlorination Tank Mixing Pumps Pressure Transmitter (65PIT6800263)
- Chlorine Analyzer (65AIT6800275)

Screen 4: Filtration

- Saline Treated Water Transmitter (65FIT6800342) and his accumulator (65FQI6800342)
- Saline Treated Water Tank Valve (65FV6800343)
- Recirculation Valve to Chlorination Tank (65FV6800344)
- Backwash Waste Water Tank Level Transmitter (65LIT6800326)
- Backwash Tank Pumps (65PSR68002A and B) and their broken tube detectors

Screen 5: Saline Treated Water Mix

- Fresh Water Flow Transmitter (65FIT6800606) and his accumulator (65FQI6800606)
- Fresh Water Flow Control Valve (65FCV6800606)
- SWTP Treated Water Level Transmitter (65LT6813231)
- SWTP Treated Water Pump (65PWA68107)
- Saline Treated Water Tank Level Transmitter (65LIT6800611)
- Saline Treated Water Pump (65PWA68003)
- Mixed Water Flow Transmitter (65FIT6800619) and his accumulator (65FQI6800619)
- SP3 Pond Level Transmitter (65LT6800627)

Screen 6: Pumping Station (view only, controlled from 65HMI68021)

- Pumping Station Pumps (65PSU68001A and B)
- SP3 Pond Level Transmitter (65LT6800627)
- Pumping Station Pressure Transmitter (65PIT6800640)
- Pumping Station Flow Transmitter (65FIT6800629) and his accumulator (65FQI6800629)
- Pumping Station Indicating Lights Red and Green (65YL6800629A and B)

Screen 7: Samplers

- Multiflo Clarifier Feed Total Suspended Solid Analyzer (65AIT6800102)

- ---
- Multiflo Clarifier Overflow Turbidity Analyzer (65AIT6800119)
- Multiflo Clarifier Overflow PH Analyzer (65AIT6800362)
- Multiflo Clarifier Overflow TOC Analyzer (65AIT6800370)
- Multiflo Clarifier Overflow NH3 Analyzer (65AIT6800372)
- ---
- Multiflo Clarifier Recirculation Total Suspended Solid Analyzer (65AIT6800126)
- ---
- Chlorination Tank PH Analyzer (65AIT6800268)
- Chlorination Tank Temperature (65TE6800268)
- Chlorination Tank Total Chlorine Analyzer (65AIT6800266)
- Chlorination Tank Chlorine Analyzer (65AIT6800264)
- Chlorination Tank TOC Analyzer (65AIT6800370)
- Chlorination Tank NH3 Analyzer (65AIT6800372)
- ---
- Saline Treated Water Total Chlorine Analyzer (65AIT6800341)
- Saline Treated Water Total Suspended Solid Analyzer (65AIT6800371)
- Saline Treated Water PH Analyzer (65AIT6800361)
- Saline Treated Water TOC Analyzer (65AIT6800370)
- Saline Treated Water NH3 Analyzer (65AIT6800372)
- ---
- Mixed Water Conductivity Analyzer (65AIT6800618)
- ---
- Pumping Station PH Analyzer (65AIT6800640)
- Pumping Station Conductivity Analyzer (65AIT6800641)
- Pumping Station Turbidity Analyzer (65AIT6800642)
- Pumping Station Temperature Transmitter (65TE6800645)

Screen 9: Reagents

Coagulant

- Coagulant Dosing Pumps(65PME68001A and B)

Polymer – TBC with Veolia's PLC/HMI

- Polymer Loading Hopper Low Level Switch (65LSL6800432)
- Polymer Feeder Solenoid Valve (65FY6800422)
- Polymer Make-Up Water Low Pressure Switch (65PLS6800432)

- Polymer Make-Up Water Valve (65FV6800434)
- Polymer Maturation Tank Level Transmitter (65LT6800442)
- Polymer Transfer Valve (65FV6800443)
- Polymer Dosage Tank Level Transmitter (65LT6800447)
- Polymer Dosing Pumps (65PME68002A and B)
- Polymer Dosing Pumps Temperatures (65TE6800451 and 0461)
- Polymer Dosing Pumps Water Valve (65FY6800466)
- System Run Command
- System Status and Alarms

Alkali

- Alkali Dosing Pumps(65PME68003A and B)

Sodium Hypochlorite

- Chlorine Analyzer (65AIT6800275)
- Sodium Hypochlorite Tank Low Level Switch (65LSL6800545)
- Sodium Hypochlorite Dosing Pumps Flow Meter (65FIT6800549)
- Sodium Hypochlorite Dosing Pumps (65PME68004A and B)

Screen 10: Gaz Detection

- Chlorine Analyzer (65AIT6800275)

65HMI68021

Screen 1: Pumping Station (view only, controlled from 65HMI68021)

- Pumping Station Pumps (65PSU68001A and B)
- SP3 Pond Level Transmitter (65LT6800627)
- Pumping Station Pressure Transmitter (65PIT6800640)
- Pumping Station Flow Transmitter (65FIT6800629) and his accumulator (65FQI6800629)
- Pumping Station Indicating Lights Red and Green (65YL6800629A and B)

4 MOTOR CONTROL

Saline Treatment Plant will be operated locally only. Monitoring only will be done remotely.

Manual Mode: the control room operator will operate equipment using the HMI screen start and stop button. This mode considers safety, mechanical and process interlocks. The Local/Remote selector must be set to Remote mode.

Auto mode: the equipment is operated by the PLC based on field conditions. This mode considers safety, mechanical and process interlocks. The Local/Remote selector must be set to Remote mode.

Local Mode Operation: This Mode is used by operation locally. In this mode the operator will select between the Auto mode or Manual mode. Reset Button and Interlock button and conventional start and stop.

Fig 1 shows Local Operation mode on HMI Local.

Remote mode: This mode is used by the control room operator. It will not be used in Saline Treatment Plant since everything will be operated locally.

Fig 2 shows Remote mode on HMI Local. In this mode the start button is not functional, and the stop button is used as an E-Stop and give an alarm on the control room HMI. This mode will not be used for Saline Treatment Plant since it will always be operated locally.

Local mode Maintenance: This mode permits operation of the equipment locally without any process interlocks. Safety and mechanical interlocks remain. This mode is used primarily for maintenance purposes. In order to switch an equipment to Local maintenance mode, the maintenance technician must communicate with the control room operator and request that the control room operator make the switch to Local Maintenance mode. When maintenance is complete, the control room operator must be contacted again to return to remote mode to give full control to control room operator.

Fig 3 shows Local Maintenance mode on HMI Local. In this mode the start button is used as a jog button, the stop button is used as a conventional Stop. The start button can easily be set as a conventional start button.

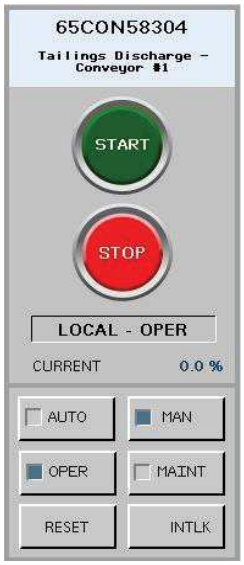

Fig 1 Local Operation

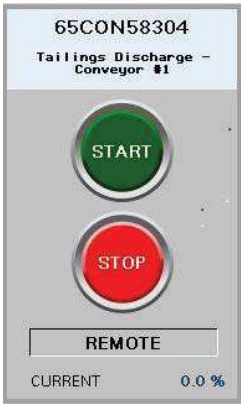

Fig 2 Remote Operation

Fig 3 Maintenance

5 OPERATION

5.1 FEED, OIL AND GREASE SEPARATOR

Water to be treated is pumped from the SWTP Raw Water Tanks. The speed of the pump is controlled with a flow loop (65FIC6800154). The Pump will stop under these circumstances:

- SWTP Raw Water Tank Low Level (65LAL6810401)
- Oil Separator High Level Switch (65LSH6800153)
- Multiflo Clarifier High Level Switch (65LSH6800116)

- Chlorination Tank High Level (65LAHH6800241)
- Recirculation mode to chlorination tank for off-spec water (65ZSC6800343)

5.2 MULTIFLO CLARIFIER MORE DETAILS WITH VEOLIA FUNCTIONAL DESCRIPTION (APPENDIX)

Polymers and Coagulent are added to the tank in order to clarify water. The Multiflo Clarifier is equipped with three agitators one rake and two pumps. Coagulation Tank Agitator (65AGI68001), Injection Tank Agitator (65AGI68002), Maturation Tank Agitator (65AGI68003). These agitators will be stopped in case of Low Current Alarm (IALL). Multiflo Clarifier Rake (65TRM68001) will stop hardwired on activation of Multiflo Clarifier Rake High Torque Switch (65OSHH6800117). Multiflo Clarifier High Level Switch (65LSH6800116) will stop feed pump. Multiflo Clarifier Recirculation Pumps (65PSR68001A and B) pump sludge through Multiflo Clarifier Recirculation Flowmeter (65FIT6800127) and Control Valve (65FCV6800127) where turbidity of sludge is analyzed. When turbidity is high enough, the recirculation valve will close and Sludge Discharge Valve (65FCV6800128) open in order to discharge high turbidity water. Discharged water is calculated using Sludge Discharge Flowmeter (65FIT68000128) and his accumulator (65FQI6800128).

5.3 CHLORINATION TANK MORE DETAILS WITH VEOLIA FUNCTIONAL DESCRIPTION (APPENDIX)

Multiflo Clarifier Overflow is sent to Chlorination Tank by Chlorination Tank Feed Valve (65FV6800224). Sodium Hypochlorite in injected in tanks in order to remove NH4 and TOC. Level in tank is controlled with Chlorination Tank Level Controller (65LIC6800241) and the speed of Chlorination Tank Mixing Pumps (65PWA680002A and 02B)

5.4 FILTRATION MORE DETAILS WITH VEOLIA FUNCTIONAL DESCRIPTION (APPENDIX)

Filters are only operated manually. Pressure Indicators and manual valves are installed before and after each filter so the operator can manually start a backwash.

When Operator makes backwash, the water is sent to Backwash Waste Water Tank and then pumped back to Multiflo Clarifier.

The Backwash Waste Water Tank Level Controller (65LIC6800326) sets the speed of Backwash Tank Pumps (65PSR68002A and B) in order to have a constant level in the tank.

When Saline Treated Water is inside limits in terms of Turbidity, PH, NH3, TOC, it will be sent to Saline Treated Water Tank with Saline Treated Water Tank Valve (65FV6800343). If water is set Off-Spec, it will be recirculated to Chlorination Tank with Recirculation Valve to Chlorination Tank (65FV6800344). This will also stop SWTP Raw Water Pump (65PWA68108) and close Chlorination Tank Feed Valve (65FV6800224)

5.5 SALINE TREATED WATER MIX

Treated water will be pumped in Saline Treated Water Tank and then pumped to Saline Mixer and SP3 Pond through Saline Treated Water Pump (65PWA68003). This pump speed will be controlled by the Saline Treated Water Tank Level Controller (65LIC6800611).

Fresh water from EWTP will be added to the tank, measured with the Fresh Water Flow Transmitter (65FIT6800606), controlled with Fresh Water Flow Control Valve (65FCV6800606) with a ratio of the Saline Treated Water Transmitter (65FIT6800342) and fine-tuned with the Mixed Water Conductivity Analyzer (65AIT6800618). SWTP Treated Water Pump (65PWA68107) will occasionally pump into the Saline Treated Water Tank, when so, the ration is adjusted and Mixed Water Conductivity Analyzer (65AIT6800618) will continue to fine-tune the opening of the Fresh Water Flow Control Valve

(65FCV6800606). Since we have a good idea of salt concentration, this control loop is more stable and safer if the ever conductivity sensor fail. Total water sent to SP3 pond is measured by Mixed Water Flow Transmitter (65FIT6800619) and his accumulator (65FQI6800619).

5.6 PUMPING STATION (VIEW ONLY, CONTROLLED FROM 65HMI68021)

The Pumping Station Pumps (65PSU68001A and B) are submersible pumps installed in SP3 Pond. They will be controlled by Start and Stop button on 65HMI68021 screen, as well as a Pumping Station Pressure Controller (65PIC6800640). The SP3 Pond Low Level (65LL6800627) and Pumping Station High Pressure Alarm (65PAHH6800640) will stop the pumps.

These pumps are used to fill the Tanker Truck to Itivia. In a container are installed Pumping Station Water PH Analyzer (65AIT6800640), Pumping Station Conductivity Analyzer (65AIT6800641), Pumping Station Turbidity Analyzer (65AIT6800642), Pumping Station Temperature Transmitter (65TE6800645). These instruments are used to record water quality and stop the pump in case water is off spec.

The Pumping Station Flow Transmitter (65FIT6800629) and his accumulator (65FQI6800629) are used to limit the amount of water sent in trucks each day. A counter will limit pumping to 800 cum each day and will reset after each shift. The Pumping Station Indicating Lights Red and Green (65YL6800629A and B) indicate if trucks can fill or not. The flowmeter will also prevent the truck to overfill; it will automatically stop the pump after 38 cum.

The Operator will connect his truck to the hose, open manual valves, and start the pump from inside the Pumping Station. He will be able to stop the pumps from the touch screen.

5.7 SAMPLERS

Each signal is brought in a PLC algorithm to control and dose each reagent. Alkali, Polymer, Chlorine...

Multiflo Clarifier Feed Total Suspended Solid Analyzer (65AIT6800102)

Multiflo Clarifier Overflow Turbidity Analyzer (65AIT6800119)

Multiflo Clarifier Recirculation Total Suspended Solid Analyzer (65AIT6800126)

Control Coagulant and Polymer Dosing Pumps

Multiflo Clarifier Overflow PH Analyzer (65AIT6800362)

Chlorination Tank PH Analyzer (65AIT6800268)

Control Alkali Dosing Pumps

Multiflo Clarifier Overflow TOC Analyzer (65AIT6800370)

Chlorination Tank TOC Analyzer (65AIT6800370)

Multiflo Clarifier Overflow NH3 Analyzer (65AIT6800372)

Chlorination Tank NH3 Analyzer (65AIT6800372)

Control Chlore Dosing Pumps

Chlorination Tank Temperature (65TE6800268)

Chlorination Tank Total Chlorine Analyzer (65AIT6800266)

Chlorination Tank Chlorine Analyzer (65AIT6800264)

Display and alarm only

Saline Treated Water Total Chlorine Analyzer (65AIT6800341)

Saline Treated Water Total Suspended Solid Analyzer (65AIT6800371)

Saline Treated Water PH Analyzer (65AIT6800361)

Saline Treated Water TOC Analyzer (65AIT6800370)

Saline Treated Water NH3 Analyzer (65AIT6800372)

Set water to Off-Spec and recirculate to Chlorination Tank. Stop Feed Pump.

Mixed Water Conductivity Analyzer (65AIT6800618)

Fine-tune the addition of fresh water for the Saline Water Treated Tank and Saline Mixer

Pumping Station Water PH Analyzer (65AIT6800640)

Pumping Station Conductivity Analyzer (65AIT6800641)

Pumping Station Turbidity Analyzer (65AIT6800642)

Pumping Station Temperature Transmitter (65TE6800645)

Sets Water to Off-Specs and stop Pumping Station Pumps

5.8 REAGENTS

Coagulant

Coagulant Dosing Pumps (65PME68001A and B) pump in Multiflo Clarifier Feed Pipe and will be controlled by Multiflo Clarifier Feed Total Suspended Solid Analyzer (65AIT6800102) and Multiflo Clarifier Overflow Turbidity Analyzer (65AIT6800119).

Polymer – *more details with Veolia Functional Description (appendix)*

Polymer System is supplied by Veolia and has his own PLC (65PLC68002). A vacuum conveyor will take polymer bags to a mixing tank then a distribution tank.

Polymer dosing pumps (65PME68002A) pump in Multiflo Clarifier and will be controlled by Multiflo Clarifier Feed Total Suspended Solid Analyzer (65AIT6800102) and Multiflo Clarifier Overflow Turbidity Analyzer (65AIT6800119).

Alkali

Alkali Dosing Pumps (65PME68003A and B) pump into Chlorination Tank and are controlled by Multiflo Clarifier Overflow PH Analyzer (65AIT6800362), Chlorination Tank PH Analyzer (65AIT6800268) and Saline Treated Water PH Analyzer (65AIT6800361).

Sodium Hypochlorite

Sodium Hypochlorite Pumps (65PME68004A and B) will be controlled by NH3 concentration in Multiflo Clarifier Ammonia Analyzer (65AIT6800372A), Chlorination Tank Ammonia Analyzer (65AIT6800372B) and Saline Treated Water Ammonia Analyzer (65AIT6800372C).

5.9 GAZ DETECTION

Chlorine Analyzer (65AIT6800275) will give a local and remote alarm in case of high concentration.