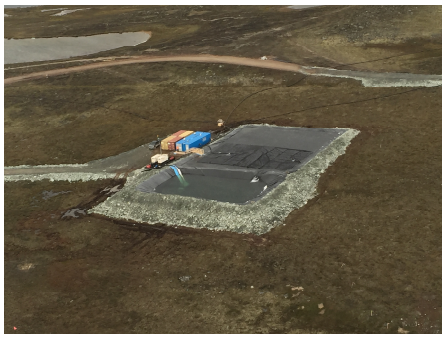
TETRA TECH

AS-BUILT REPORT FOR LAKE DEWATERING 2016 MELIADINE GOLD PROJECT, NUNAVUT



PRESENTED TO
AGNICO EAGLE MINES LIMITED

DECEMBER 12, 2016
ISSUED FOR USE
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AGNICO EAGLE DOCUMENT NUMBER: 6515-C-265-017-132-REP-002

Tetra Tech Industries
5100 Sherbrooke St. East
Montreal, Qc H1V 3R9 CANADA
Tel 514.257.1112 Fax 514.257.0717

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EXECUTIVE SUMMARY

Tetra Tech Industries Inc. (Tetra Tech) was retained by Agnico Eagle Mines Limited (Agnico Eagle) to prepare an as-built report (construction summary) for the 2016 lake dewatering program at the Meliadine Gold Project, Nunavut. Tetra Tech previously provided technical assistance for the design and procurement of temporary dewatering pipelines, pumping stations, and a mobile water treatment plant (MWTP) with a geotube technology for the 2016 lake dewatering program.

ASDR was selected to design and supply the MWTP, the HDPE pipelines, the pump skids and to achieve all installation, commissioning, start up, operation, testing, monitoring and decommissioning activities of all equipment for the 2016 lake dewatering program.

The overall schedules for the 2016 lake dewatering are as follows:

- Installation and commissioning: MWTP, H6 and H17 equipment from August 5th to August 21st 2016; A54 equipment from October 3rd to October 6th 2016.
- Phase 1: Overall dewatering of H17 to Meliadine Lake and then H6 to H17 from August 22th to October 3rd 2016 with TSS removal treatment from September 17th to October 3rd 2016.
- Phase 2: Dewatering of A54 to H17 and H13 to H17 from October 4th to October 12th 2016.
- Decommissioning: MWTP and H17 equipment from October 4th to October 19th; A54 and H13 equipment from October 13th to October 28th.

All civil earthworks were completed before ASDR mobilization to the site. Civil earthwork is not part of this report.

All dewatering activities were done under ASDR supervision. The dewatering of H17 and the treatment of the effluent to Meliadine Lake was completed on October 3rd 2016. The remaining dewatering activities were completed on October 28th, 2016.

On-field quality control done by ASDR comprised visual observations during construction activities and hydro-testing of the pipelines. Sample laboratory testing was conducted mainly off site and consisted of toxicity tests on raw water. Effluent discharged to Meliadine Lake was sampled and tested in compliance with the Metal Mining Effluent Regulations (MMER). Exposure and reference area sampling were also conducted as prescribed by the MMER. On site treatability tests were conducted at commissioning of the MWTP in order to set the MWTP chemicals and rate of treatment before water could be released to the Meliadine Lake. All water monitoring data during operations were recorded by ASDR and submitted to Agnico Eagle.

The total suspended solids (TSS) levels at the MWTP inflow (from H17) as well as at the effluent to Meliadine Lake, were measured on site on an hourly basis. The operation criteria (or “key performance indicator” – KPI) was set at a maximum concentration of 10 mg/L of total suspended solids (TSS) at the effluent to Meliadine Lake. The TSS in the effluent was monitored continuously and if concentrations would not meet the KPI, the effluent was closed and the water from H17 was pumped in a closed circuit through the MWTP until the quality criteria were met. The treatment process was thus optimized until it generated compliant results. At no time during the dewatering operations of H17, the TSS content of the discharged water exceeded the MMER requirements.

This report summarizes the as-built information for MWTP, the pipelines and the associated pumping skids for the dewatering and treatment of H6 and H17 water (Phase 1) and dewatering of A54 and H13 (Phase 2).

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APPENDICES

1.0 INTRODUCTION

Tetra Tech Industries Inc. (Tetra Tech) was retained by Agnico Eagle Mines Limited (Agnico Eagle) to prepare a construction summary (as-built) report for the 2016 lake dewatering program at the Meliadine Gold Project, Nunavut. Tetra Tech previously provided technical assistance for the design and procurement of temporary dewatering pipelines, pumping stations, and a mobile water treatment plant (MWTP) with a geotube technology for the 2016 lake dewatering program.

ASDR was designated to supply the MWTP, the HDPE pipelines, the pump skids and to achieve all installation, commissioning, start up, operation, testing, monitoring and decommissioning activities of all equipment during the project.

This report summarizes the as-built information for MWTP, the pipelines and the associated pumping skids for the project. Civil earthwork is not a part of this report. All dewatering activities were done under ASDR supervision only. Tetra Tech did not witness ASDR work on site.

2.0 OVERALL PROJECT SCHEDULE

The overall schedules for the 2016 lake dewatering project are as follows:

- Installation and commissioning: MWTP, H6 and H17 equipment from August 5th to August 21st 2016; A54 equipment from October 3rd to October 6th 2016.
- Phase 1: Overall dewatering of H17 to Meliadine Lake and then H6 to H17 from August 22th to October 3rd 2016 with TSS removal treatment from September 17th to October 3rd 2016.
- Phase 2: Dewatering of A54 to H17 and H13 to H17 (out of initial scope work) from October 4th to October 12th 2016.
- Decommissioning: MWTP and H17 equipment from October 4th to October 19th; A54 and H13 equipment from October 13th to October 28th.

All civil earthworks were completed before ASDR mobilization to the site. The dewatering of H17 and the treatment of the effluent to Meliadine Lake was completed on October 3rd 2016. The remaining dewatering activities was completed on October 28th 2016.

The as-built drawings for the 2016 lake dewatering project are presented in Appendix A of this report.

3.0 INSTALLATION AND COMMISSIONNING

All HDPE pipelines were delivered in 50 ft long spools welded together on site in 300 ft long pipe spools with flanges at both ends.

All pipeline routing, MWTP and pump skid locations were approved by Agnico Eagle before installation. The temporary pads and access roads for the lake dewatering project were constructed before the installation of the temporary dewatering pipelines, pump skids, and MWTP.

ASDR led the installation, commissioning, start up and operation of the MWTP pad located at southeast of the Industrial Pad, next to the northwest shore of Pond H17.

The installation work was held from August 5th to 21st (approximately 15 days). During this period, the MWTP units were positioned and installed; the Geotube pad (built by Agnico Eagle) was lined with waterproof liner to receive

the Geotubes; and the associated HDPE piping and pumping equipment was installed on site at specific locations (Ponds H6, H17, A54, Meliadine Lake and MWTP). Piping hydro-tests were executed by following the ASTM F 2164-13 specification. See Appendix B for the hydro-test results.

During the same period, two (2) diesel pump skids were installed. One located not less than 31 m from the H17 shore, near the future CP1 jetty location and the other one northwest of H6, at a distance of no less than 31m of both its shore and the shore of H7.

Pump datasheet is attached in Appendix C of this report.

On August 22nd, the dewatering operations from Pond H17 to Meliadine Lake began and were monitored 24 hours per day by the ASDR team. The commissioning phase lasted 24 hours, as no treatment of the water pumped from H17 to Meliadine Lake was required until September 16th 2016 (effluent was compliant with the Metal Mining Effluent Regulations (MMER)). Treatment operations began September 17th as raw water quality was nearing the maximum operation criteria for Total Suspended Solids (TSS).

4.0 DEWATERING - PHASE 1

Phase 1 of the dewatering program was intended to dewater Pond H6 to Pond H17 to Meliadine Lake to facilitate the construction of D-CP1 (late 2016) and CP1 jetty (winter 2017), as well as to ensure sufficient storage capacity of water collected during freshet and summer 2018. Part of Phase 1 was also the treatment of H17 raw water through the chemical treatment plant prior to discharge to Meliadine Lake.

4.1 Chemical Treatment Plant

As described in the Design Report for the chemical treatment for lake dewatering to environment (ASDR & Tetratech, August 2016) submitted as part of the 30-day Notice to Nunavut Water Board (NWB), it was initially planned that the top 0.5 to 1.0 m of freshwater in Pond H17 would be pumped to the physical filtration device (geotubes) to then be discharged into Meliadine Lake without requiring chemical treatment. The top water in H17 was of good quality and, as expected, requiring treatment for TSS only after removal of approximately 0,89m of top water. As initially planned, the main parameter that required chemical treatment is Total Suspended Solids (TSS). Therefore, the proposed chemical treatment philosophy was designed and constructed to remove TSS through a coagulating / flocculation method.

The processing sequence for TSS treatment was the following: coagulation (ferric sulfate/$Fe_2(SO_4)_3$ 12%), balancing pH (caustic soda/NaOH 50%), flocculation (cationic polymer 0.4%), geotubes (suspended solids captation).

4.2 Effluent quality

The quality of the effluent discharged to Meliadine Lake complied with MMER criteria throughout the dewatering process of H17. Water was monitored continuously and if TSS concentration would not meet operation target (lower than MMER criteria), the water was redirected automatically back to H17 and all equipment re-calibrated. The treatment process was thus optimized until results were compliant. Daily and weekly water quality results are shown in Appendix D.

Due to several rainfall events in September 2016, the total volume of water discharged from H17 to Meliadine Lake was larger than initially expected: a total volume of 179,413 m^3 was dewatered from H17 to Meliadine Lake compared to a range of 162,000 m^3 (mean precipitation year) to 201,000 m3 (wet precipitation year).

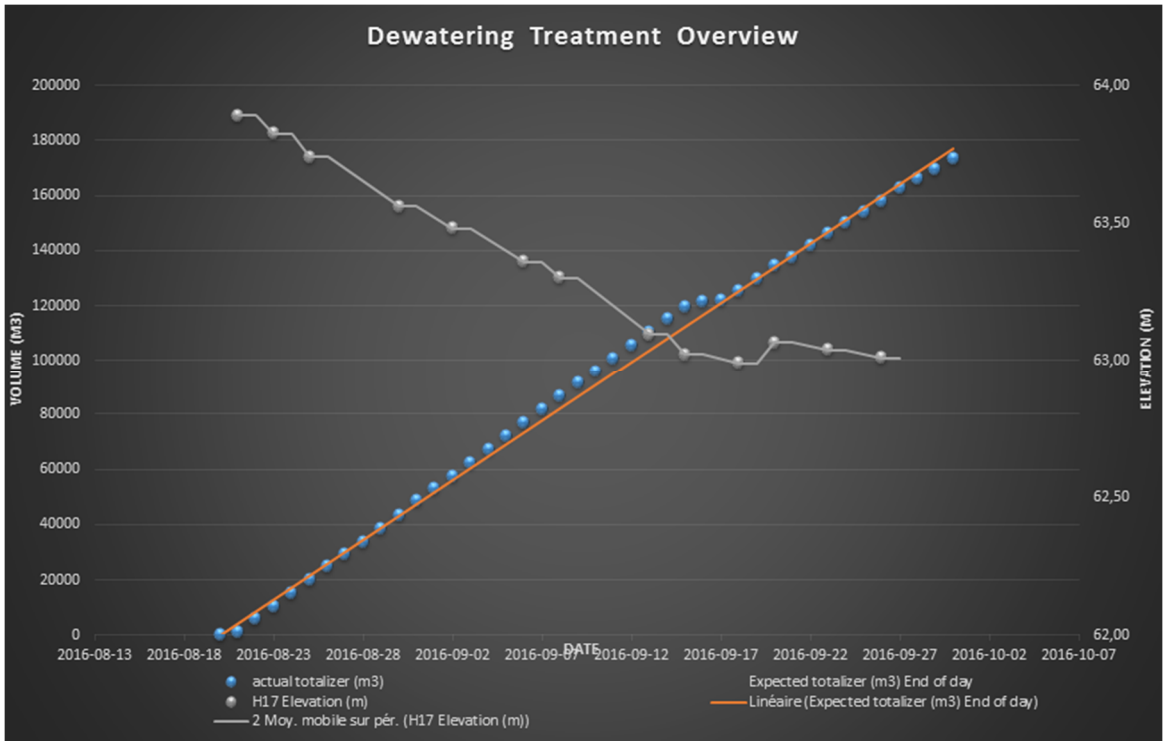


Figure1. Illustration of the dewatering process of Pond H17 to Meliadine Lake.

To facilitate construction of Dyke D-CP1, located south of Pond H17, all water of H6 had to be transferred to H17. A volume of 22,360 m³ of water had been pumped from H6 to drain the lake for the D-CP1 construction (a range of 30,000 m³ (mean precipitation year) to 69,000 m³ (wet precipitation year) was planned).

At the end of Phase 1, the MWTP was decommissioned and prepared for shipping off-site as no further water needed to be discharged to Meliadine Lake. The pump skid used for dewatering Pond H17 was moved to Pond A54 while the pump skid at pond H6 and its HDPE pipeline remained at their original locations.

5.0 DEWATERING - PHASE 2

Once the H17 dewatering was completed, the Phase 2 of the project intended to transfer water from Pond A54 to Pond H17 in order to reduce the water level in A54 for construction of D-CP5 (late 2016) and the CP5 jetty (winter 2017). Additionally, to comply with the License A, Pond H13 was also dewatered to H17 during this phase of the dewatering program.

The pump skid from H17 was relocated on the northeast shore of Pond A54, not less than 31 m from its shore. The original HDPE pipeline running from H17 to the MWTP and Meliadine Lake was dismantled and relocated to allow the dewatering of Pond A54 towards H17. As the water in A54 was considered as contact water, none was discharged to Meliadine Lake, thus no treatment was required. Dewatering of A54 ended on October 12th when cold weather conditions caused the pipeline to freeze. A total volume of 27,600 m³ was transferred from A54 to H17 (a range of 37,000 m³ (mean precipitation year) to 43,000 m³ (wet precipitation year) was initially planned).

The pump skid at Pond H13 was first located on the northwest shore of H13 and was later moved on the west side near H12. A volume of 42,000 m³ of water was pumped from H13 to H17 between October 4th and October 12th.

As Phase 2 of the dewatering program started, construction of D-CP1 begun. Any seepage of water into the dike key trench during the construction of the dyke was pumped to H6 and then transferred to H17 on an as-needed basis.

6.0 DECOMMISSIONNING

Decommissioning activities of the MWTP started on October 3rd and decommissioning of the whole dewatering program equipment was completed on October 28th.

After treatment operation completion on Oct. 3rd 2016, dewatering of Ponds H6, A54 and H13 towards H17 were executed and were pursued until October 12th 2016 when the freezing conditions no longer permitted these pumping activities.

At the end of October, the pump skids were decommissioned and the HDPE pipelines were winterized. Equipment purchased by Agnico Eagle was left on site.

In regards to MWTP and other equipment supplied by ASDR, the lot was decommissioned, packed into seacans and sent back on the last barge on October 19th 2016. Of the lot AEM chose certain equipment for purchase and to keep at site.

7.0 CONSTRUCTION QUALITY CONTROL

After installation of all equipment, a quality control was performed by the ASDR crew to confirm the system integrity. A visual inspection was done on the MTWP process system to confirm no equipment was missing or not properly installed, a hydro test and visual inspection were done on both the MWTP process piping and the HDPE pipelines to confirm the system to be leak-free.

7.1 Deficiencies During Construction

No deficiencies were found during construction and commissioning.

8.0 LIMITATIONS

This report and its contents are intended for the sole use of Agnico Eagle Mines Limited (Agnico Eagle) and their agents. Tetra Tech Industries did not witness ASDR work on site and does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Agnico Eagle or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech Industries' Services Agreement. Tetra Tech Industries' General Conditions are provided in Appendix F of this report.

9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,

Tetra Tech Industries Inc.

Prepared by:
Tetra Tech Industries Inc.
Orphé Beauchemin, P.Eng.
Mechanical Engineer
Direct Line: 514.257.1112 x3463
Orphe.Beauchemin-Theriault@tetratech.com

Reviewed by:
ASDR
Marc Turcotte
Vice President – Water Treatment Division
Direct Line: 819.757.3039 x222
Marc.Turcotte@asdr.ca

Reviewed and approved by:
Tetra Tech Industries Inc.
Benoit Tremblay, P.Eng.
Project Manager
Direct Line: 418.548.5522 x463
Benoit.Tremblay@tetratech.com

Reviewed by:
Guangwen (Gordon) Zhang, Ph.D., P.Eng.
Principal Specialist, Arctic Region
Direct Line: 780.451.2130 x501
GuangwenGordon.Zhang@tetratech.com

PHOTOGRAPHS

Photo 1: MWTP general arrangement under installation

Photo 2: Geotextile membrane installation

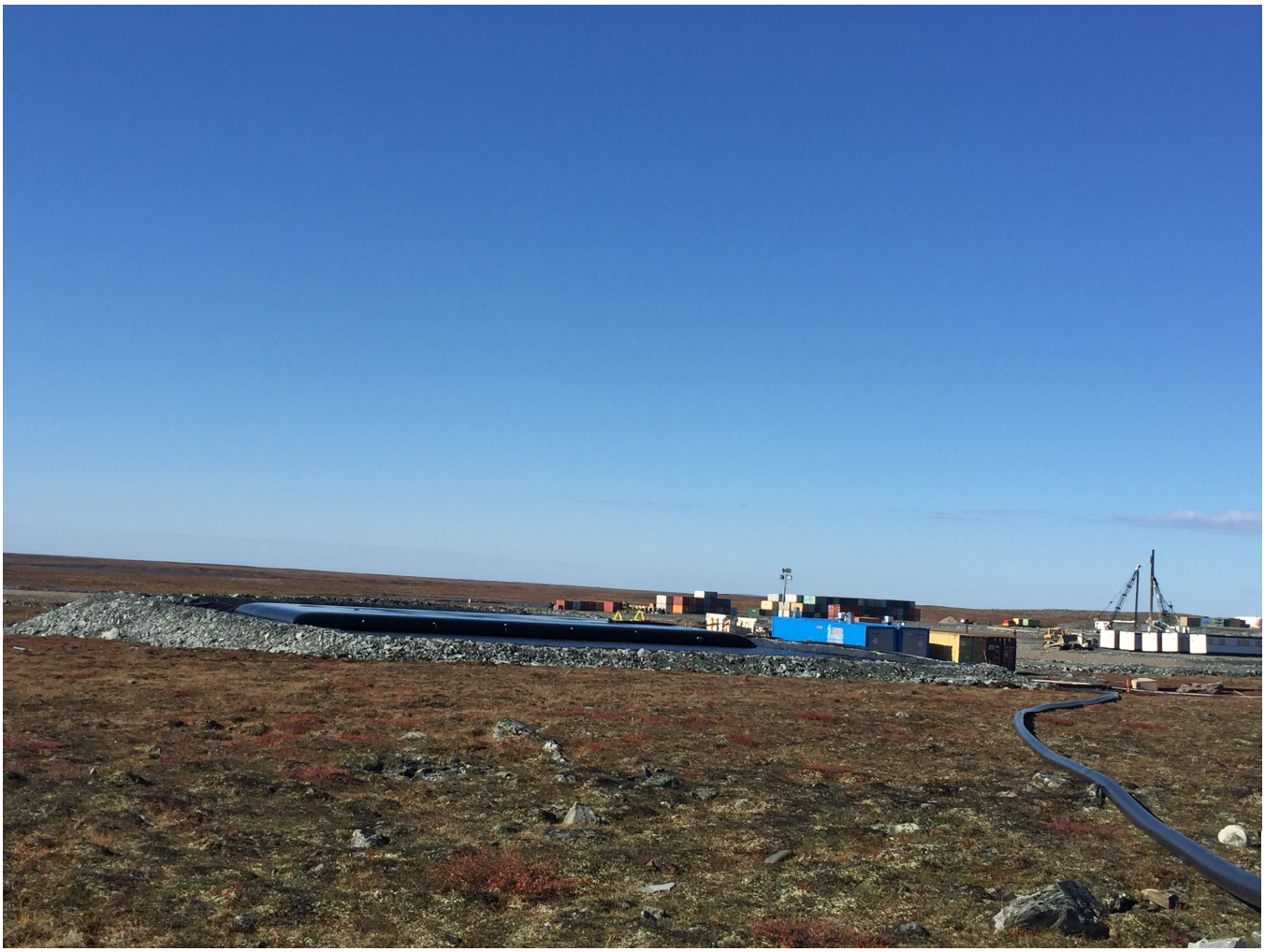
Photo 3: MWTP Chemical warehouse and electrical room by the geotubes pad

Photo 4: Geotubes filtration technology in operation

Photo 5: Pond H17 raw water intake pump pad to the MWTP

Photo 6: Meliadine Lake treated water discharge from the MWTP

Photo 7: MWTP general arrangement in operation



APPENDIX A
AS-BUILT DRAWING

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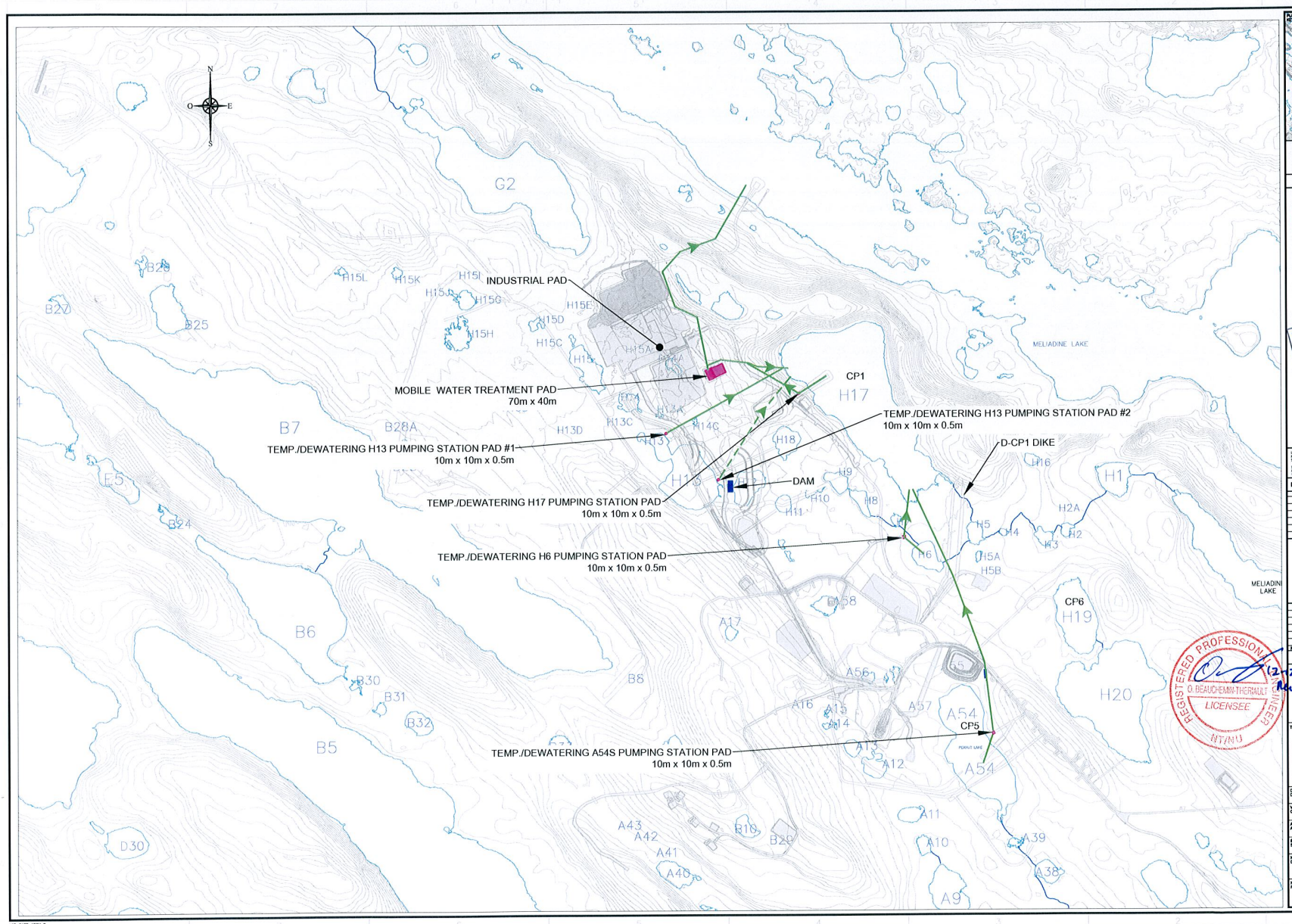
FORMAT ARCH D



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND :

PAD
PIPELINE
SECONDARY PIPELINE

NOTE:
PIPELINE ROUTING HAS BEEN APPROXIMATED

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2016-11-25

DESSINS EN REFERENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	CLIENT
1	2016-11-25	ISSUED FOR AS-BUILT	C.M.	O.B.
0	2016-11-15	ISSUED FOR AS-BUILT	C.M.	O.B.

REVISIONS

REGISTERED PROFESSIONAL ENGINEER O. BEAUCHEMIN-THERAULT LICENSEE NT/NU — 12-12-2016 Rev 1

PROFESSIONAL ENGINEER Orphé Beauchemin Thérault 144389 QUÉBEC — 12-12-2016 Rev 1

TITRE / TITLE
AGNICO-EAGLE – MELIADINE DIVISION
695 – WATER MANAGEMENT
270 – PIPING
DEWATERING PIPELINE
PLAN VIEW

DESSINÉ PAR DRAWN BY	CHRISTOPHER MORIN	DATE 2016-11-15
VÉRIFIÉ PAR CHECKED BY	ORPHÉ BEAUCHAMP	2016-11-15
APPROUVÉ PAR APPROVED BY	ORPHÉ BEAUCHAMP	2016-11-15
ÉCHELLE SCALE	1:6000	DATE 2016-11-15

NO. DESSIN DRAWING NO. 65-695-270-232

NO. PROJET PROJECT NO. 6515/28920 — REVISION 1 — FEUILLE / SHT /

AC-CART-ARCH D

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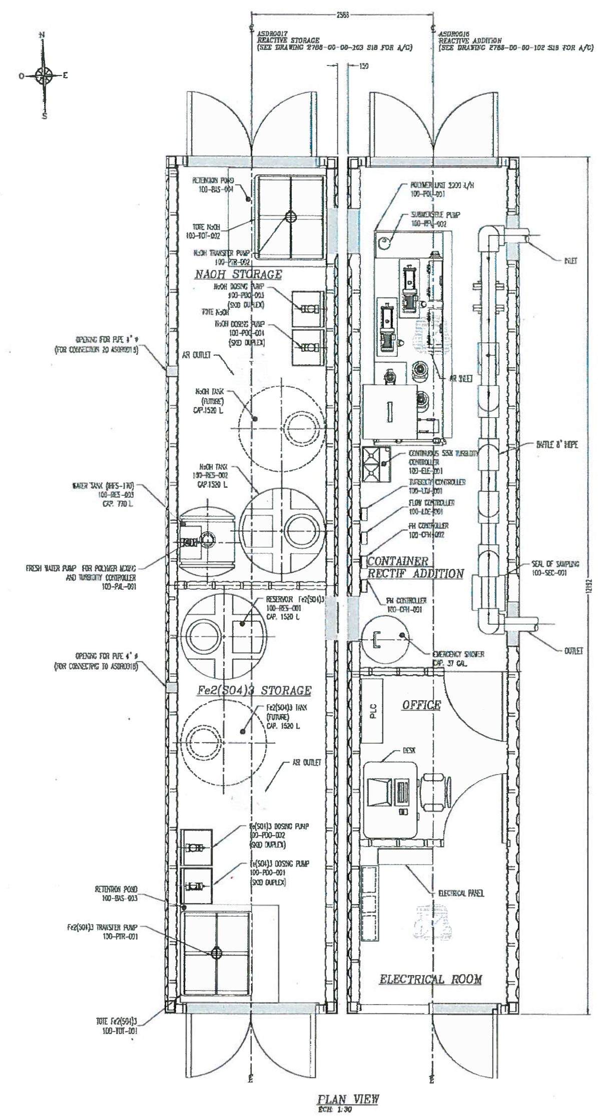

No. DESSIN/DWG No.	TITRE DESSIN DE RÉFÉRENCE/REFERENCE DWG TITLE
–	–

REV.	DATE	RÉVISION	PAR	APP
D	2016-12-08	AS BUILT	M.P.	A.H.G.
C	2016-08-05	FOR PERMIT	M.O	A.G
B	2013-03-08	AVIS POUR COMMENTAIRES	C.C.	C.D.
A	2013-02-26	AVIS POUR COMMENTAIRES	C.C.	C.D.

ASDR
601, RUE ROYALE
MALARTIC, QUÉBEC
J0Y 1Z0
TEL: (819) 757-3039
FAX: (819) 757-6152
WWW.ASDR.CA

CONCEPT PAR / DESIGN BY	–	DATE –
DESSINÉ PAR / DRAWN BY	CORINA GARCÍA LA SIENRA	DATE 2013-03-08
VÉRIFIÉ PAR / CHECKED BY	DORCEY BOISSONNEAULT, T.P.	DATE 2013-03-08
APPROUVÉ PAR / APPROVED BY	CARL DUFOUR, INC.	DATE 2013-03-08

No. PROJET CLIENT/CLIENT PROJECT No. ENV-1332 R2/R3/R65
CHARGÉ DE PROJET/PROJECT MANAGER DAN MISIANO

TITRE/TITLE
USINES DE TRAITEMENT D'EAU R2/R3/R65
ASDR0018
ARRANGEMENT GENERALE – VUE EN PLAN

No. PROJET/PROJECT No.	ÉCHELLE/SCALE	DATE
MINC-2786	1:30	2013 MARS 22

No. DESSIN/DWG No. 2786-00-00-101 REV. C

APPENDIX B
HYDRO-TEST RESULTS

ASDR

Worker: DAN MISIANO & ANDRÉ MERCIER

Date: 2016-08-17

Quality Control - E-440-08 (40' Treatment module)

Module E-440-08

Inspection points	Compliant	Non compliant	Not applicable	Correction Yes	Correction No	Description / Comments
Vérification composantes électriques						
electrical supply	✓					
electrical panels (115/240V)	✓					
electrical breakers	✓					
ventilation (motorized shutters)	✓					
heating	✓					
lighting	✓					
115v outlets	✓					
Piping - 8" HDPE baffle						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					NO LEAKS
leak inspection	✓					
pumping flowrate (MAX)	m3 / hour: 225					
Piping - PVC 2" (floculant)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 2400					
Piping - PVC 1" (floculant)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 1200					

ASDR

Worker: _____

D _____

Quality Control - E-440-08 (40' Treatment module)

Mod le E-440-08

Inspection points	Compliant	Non compliant	Not applicable	Correction		Description / Comments
				Yes	No	
Tuyauterie / plomberie - PVC 1" (alimentation eau propre)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 45					
Piping- PVC 1/2" #1 (corrosive product)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 100					
Piping- PVC 1/2" #2 (corrosive product)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 100					
Instrumentation inspection						
8" flowmeter	✓					
8" flowmeter display	✓					
pH probes (2x)			—			
pH controler #1	✓					
pH controler #2	✓					
turbidity probe (2x)	✓					
turbidity probe display	✓					
PLC - data logger	✓					
PLC - touch screen	✓					

ASDR

Worker: DAN MISIANO & ANDRÉ MERCIER

Date: 2016-08-17

Qual Control - E-440-08 (40' Treatment mod le)

Module E-440-08

Inspection points	Compliant	Non compliant	Not applicable	Correction		Description / Comments
				Yes	No	
Floc make-up unit						
dosing screw	✓					
automated valves	✓					
rotative flowmeter (polymizer)	✓					
PVC cyclone	✓					
mixer #1	✓					
mixer #2	✓					
floc level probe	✓					
floc high level probe	✓					
hopper low level probe (floc powder)	✓					
1" water supply piping	✓					
1" drainage piping	✓					
1" drainage valves (3x)	✓					
1" poly pump suction piping	✓					
2" poly pump suction piping	✓					
waterproof floc mixing tank inspection (3x)	✓					
waterproof floc overflow inspection	✓					
Infrastructure inspection						
structural integrity of module	✓					
general cleanliness module	✓					
sealing of module	✓					
base integrity of module (base plates)	✓					
quality of exterior cover	✓					

worker signature:

ASDR

Opérateur : DAN MISIANO & ANDRÉ MERCIER

Date : 2016-08-17

Quality Control - E-440-09 (40' product storage module)

Module E-440-09

Inspection points	Compliant	Non compliant	Not applicable	Correction		Description / Comments
				Yes	No	
Vérification composantes électriques						
electrical supply	✓					
electrical panels (115/240V)	✓					
electrical breakers	✓					
ventilation (motorized shutters)	✓					
heating	✓					
lighting	✓					
115v outlets	✓					
Piping - dosing pump skid #1						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
calibration cylinder inspection	✓					
pumping flowrate (MAX)	L / hour: 100					
Piping - dosing pump skid #2						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
calibration cylinder inspection	✓					
pumping flowrate (MAX)	L / hour: 100					
Piping - PVC 1/2" #1 (corrosive product dosage)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 100					

ASDR

Opérateur : Dan Misiano & André Mercier

Date : 2016-08-17

Quality Control - E-440-09 (40' product storage module)

Module E-440-09

Inspection points	Compliant	Non compliant	Not applicable	Correction		Description / Comments
				Yes	No	
Piping - PVC 1/2" #2 (corrosive product dosage)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 100					
Piping - PVC 1" #1 (corrosive product transfer)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: ~~100~~ 50					
Piping - PVC 1" #2 (corrosive product transfer)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 50					
Piping - PVC 1"(clean water supply)						
seal proofing (pressurized air test)	✓					
pressure tests (MAX)	PSI: 70					
pumping trial (water leak test)	✓					
leak inspection	✓					
pumping flowrate (MAX)	L / hour: 50					

ASDR

Opérateur : Dan Misiano & André Mercier

Date : 2016-8-17

Quality Control - E-440-09 (40' product storage module)

Module E-440-09

Inspection points	Compliant	Non compliant	Not applicable	Correction		Description / Comments
				Yes	No	
Instrumentation inspection						
double walled reservoir level probe #1	✓					
double walled reservoir level probe #2	✓					
clean water reservoir level probe	✓					
1" automated valve (clean water)	✓					
automated dosing pump circuit #1	✓					
automated dosing pump circuit #2	✓					
Reservoirs						
1250L double walled reservoir #1	✓					
1250L double walled reservoir #2	✓					
1250L double walled reservoir #3	✓					
1250L double walled reservoir #4	✓					
750L clean water reservoir	✓					
Infrastructure inspection						
structural integrity of module	✓					
general cleanliness module	✓					
sealing of module	✓					
base integrity of module (base plates)	✓					
quality of exterior cover	✓					

Signature de l'opérateur:

ASDR	***Vendor Data Requirements*** ***Pressure Test Plan Form***	***TE-1640 –WTP-Meliadine Project*** ***Cus ref#6515-C-265-017*** Revision #0

General Information / Test Description

Test # (Project number_PT_XXX): TE-1640		**Date:** 2016-08-17	
Customer ref.#: 6515-C-265-017		**Type of test (hydro / pneumatic):** HYDRO	
Weather (sunny/cloudy/partly cloudy): SUNNY		**Temperature (°C):** 14°C	
Location: WWTP & H17-MELIADINE		**Test Description:** PRESSURE TEST 8" HDPE	
Fluid: WATER	**Fluid Temperature (°C):** 14	**Test sketch (Ref #):** /	
Type and size of pipe: 8" HDPE		**Length (m):** 300 m	
Hydro test pump (mod & #): BCE HYDRO -		**Gage spec (scale):** DR17	
Test Pressure requirements (customer) : 100 PSI		**Pressure test procedure signed (included):** YES	

Filling Phase (Duration 1 hr including 30 min. resting time)

Approx. volume to fill (m^3): 18 m^3	**Start time (Filling):** 2:30	**End time (Filling):** 2:35
Air vented (Y/N): YES	**Rest (30 min) End time:** YES	

Pressurizing Phase (Duration 4 hrs after reach the maximum test pressure)

Starting exclusion zone for safety (Hydro test pump area): ✓		**Flag on duty (pressure on):** YES
Maximum test pressure to reach & maintain (psi): 100 PSI		
Start time (Press.): 102 PSI	**End time (Press.):** 98 PSI	**End time (Press.maintain 4 hrs):** 98 PSI

Test Phase (Duration 1 hr)

Starting Pressure Required (max. test pressure minus 10 psi):			
Minimum Final Pressure Acceptance Test (95% of starting pressure test phase):			
Pressure Readings (psi): 102	**(t=0 min):** 102 PSI	**(t=10 min):** /	**(t=20 min):** 100 PSI
(t=30 min): /	**(t=40 min):** 99 PSI	**(t=50 min):** /	**(t=60 min):** 98 PSI
Test Acceptantce : YES – DAN MISIANO			

Approvals

Supervisor in charge of test (print): DAN MISIANO	**Signature:**	**Date:** 2016-08-17
Owner representative (print):	**Signature:**	**Date:**
Witness & Cie name (print):	**Signature:**	**Date:**

APPENDIX C
PUMP DATASHEET

TSURUMI PUMP
1625 Fullerton Court Glendale Heights, IL 60139 • Tel: 1-888-878-7864 • Fax: 1-630-793-0146 • info@tsurumiamerica.com • www.tsurumipump.com

EPT4-150DPJD • 6 INCH DRY PRIME PUMP

Vacuum Assisted, Engine Driven, Heavy Duty Solids Handling Pump

EPT4-150DPJD

Engine Specification:

- Model: John Deere model 4045TF290
- 74 intermittent horsepower @ 2200 RPM
- Four cylinder, four cycle, water cooled diesel engine
- Governor: Mechanical
- Lubrication: Force Feed
- Air Cleaner: Filter element
- Fuel Tank: 60 US gallons
- Run time: Full load (1800 RPM) ~ 24 hours
- Starter: 12 volt electric

Standard Engine Features:

Safety shutdown switches for low oil pressure and high temperature. Instrument panel with temperature and oil pressure gauge, ampmeter, hourmeter and tachometer. Muffler with rain cap. Engine to pump coupling: SAE3 housing with 10" rubber disc drive.

Standard Skid:

Heavy duty fabricated steel frame. Integral fuel tank, lifting bale, lockable fuel tank, and one 1½" clean-out/drain plug

Standard Trailer:

Heavy duty fabricated steel frame, integral fuel tank, fenders, lifting bail, lockable fuel cap, 3500# Anti-torsional axle, two (2) front adjustable leveling jacks and two (2) rear adjustable leveling jacks, one 1½" clean-out plug, fuel gauge, adjustable height tongue with easy conversion from ball hitch to Lunette eye

Trailer Options:

DOT light package, work lights, special tires & wheels, dual axles, diamond plate fenders, electric brakes, lockable enclosed instrument panel, lockable enclosed engine housing, storage box, hose rack and more

Pump Specifications:

- Pump size: 6"X 6" AISI 150# flanges standard
- Suction Cover: ASTM A48 class 30 gray iron
- Wear Ring: ASTM A48 class 30 gray iron
- Volute Casing: ASTM A48 class 30 gray iron
- Volute Cleanout: Handhole type, ASTM A48 class30 gray iron
- Backplate: ASTM A48 class 30 gray iron
- Bracket: ASTM A48 class 30 gray iron
- Mechanical Seal: Tungsten vs. Silicon Carbide seal faces, Viton elastomers, 300 series stainless steel hardware & spring, seal system designed for dry running
- Impeller: Enclosed type, two port, non clog, w/3 inch spherical solids handling capability. ASTM A48 class 30 gray iron
- Bearing Housing: ASTM A48 class 30 gray iron
- Pump-end Bearing: Single row ball – 6313-C3
- Drive-end Bearing: Single row ball – 6313-C3
- Shaft: 1144 Stressproof steel (Other metals available including: 17-4 PH corrosion resistant)
- Lip Seals: CR type, single lip: Bearings, SAE cover - Buna-N, Seal gland – Viton
- Midland 1300 series compressor. Lubricated by engine oil and cooled by engine water
- Separator Spool: Standard steel
- Air/Water chamber: Chamber designed to separate air and water before entering the pump case
- Venturi: Constructed of non-corrosive bronze
- Discharge check valve: Swing type, cast iron w/Buna-N disc (Viton optional)

* Optional Equipment and Materials: Stainless Steel, CD4MCU & Ductile Iron

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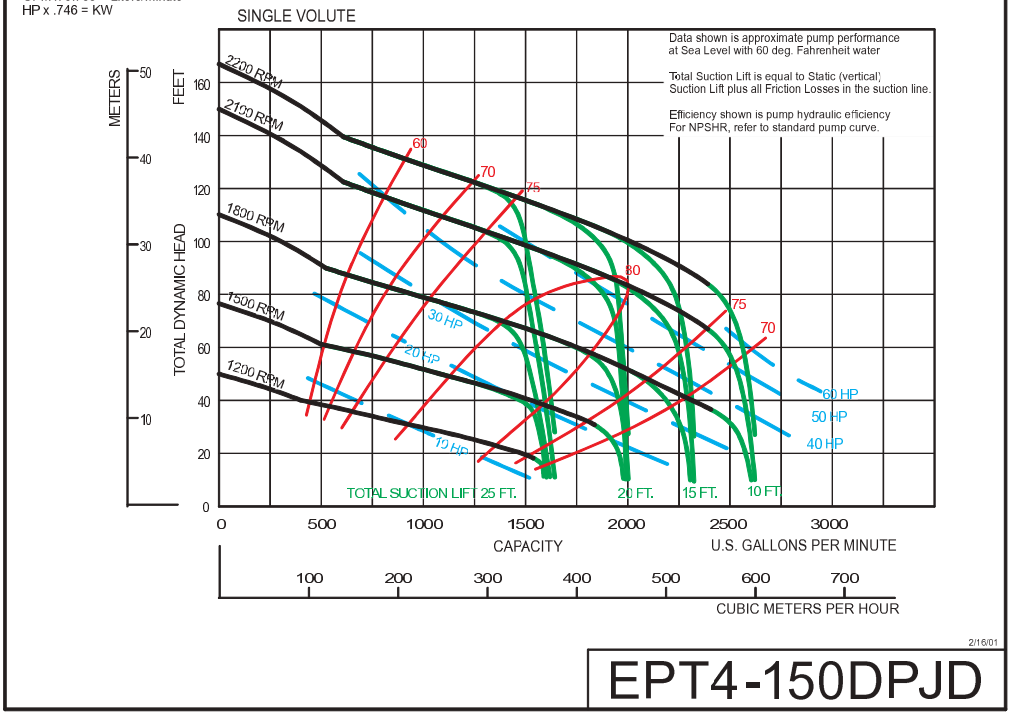
EPT4-150DPJD • 6 INCH DRY PRIME PUMP

Vacuum Assisted, Engine Driven, Heavy Duty Solids Handling Pump

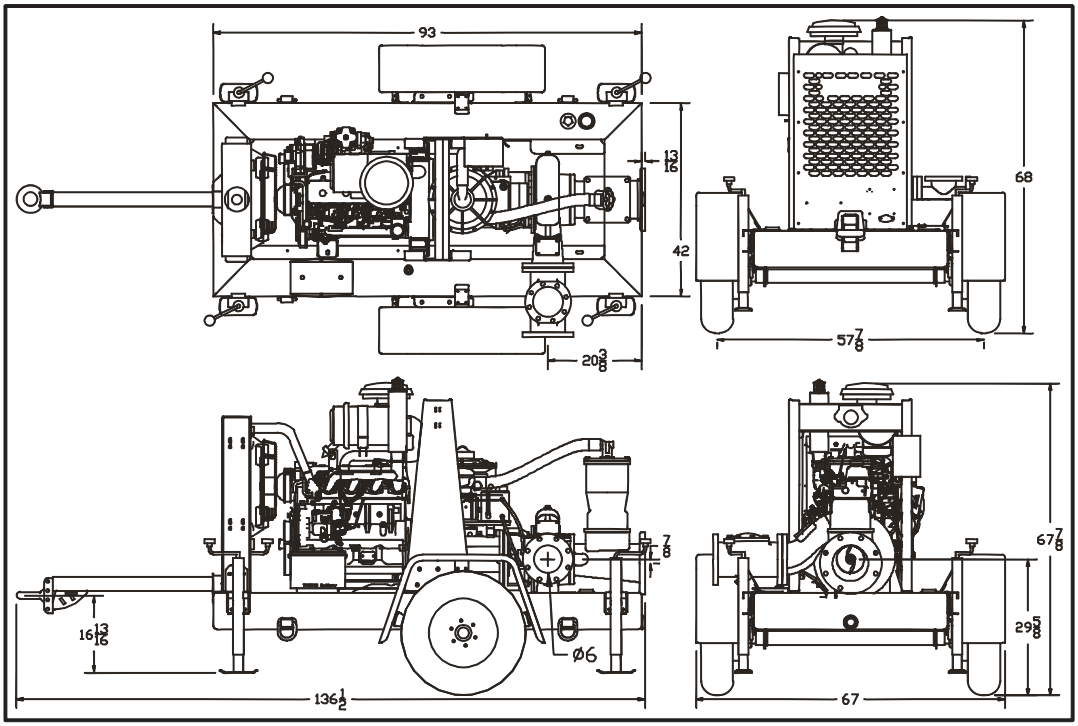
Performance Curves

Feet x .305 = Meters
Inches x 25.4 = Millimeters
GPM x .227 = Cubic Meters/Hour
GPM x 3.785 = Liters/Minute
HP x .746 = KW

Speed	Impeller Dia.	Style	Solids Dia.	N_S	Suction	Discharge	No. vanes
VARIOUS	10.09"	ENCLOSED	3"	3300	6"	6"	2



Dimensions



APPENDIX D
ASDR MONITORED WATER QUALITY RESULTS

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 21, 2016
		Weather conditions (dayshift):	clear, no winds
Dayshift Operator(s)	Simon Moreau McNicoll	**Weather conditions (nightshift):**	cloudy,rain, no winds
Nightshift Operator(s)	Jordan Manac'h & Joesph Hamilton		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	1240	1160							0,0	0,0	0,0
Average	177	166	7,52	0,60	1,50	7,55	0,59	1,50			
Minimum	95	42	7,06	0,41	1,00	7,07	0,38	1,00			
Maximum	209	268	7,66	0,75	2,00	7,77	0,88	2,00			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc	
Ph / volume target							

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	8:00 Straightening of Effluent discharge piping
	14:00 Placing of Geotube
	17:00 Start of pumping of H17 towards Meliadine
	18:35 - Effluent stopped to try to release air pressure
	18:55 - Effluent started
	19:00 Effluent discharge pump will be working on and off depening of the level of the sump, pump is more powerful than H17 pump
	22:30 - Effluent stopped (low level marker reached)
	22:30 - mechanic called to fix tower light
Morning Cross-shift notes	
Night Cross-shift notes	

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 22, 2016
Dayshift Operator(s)	Simon Moreau	**Weather conditions (dayshift):**	9deg, cloudy, windy
Nightshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	7deg,cloudy,strong windy

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4570	4849							0,0	0,0	0,0
Average	191	204	7,65	0,50	1,64	7,71	0,46	1,57			
Minimum	163	0	7,00	0,29	1,00	6,96	0,32	1,00			
Maximum	203	276	8,03	0,86	3,00	8,08	0,66	3,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 - fuelled pump at H17
	4:45 - Effluent stopped (low level marker reached)
	7:00 Monthly Sampling
	10:00 inspection of piping
	13:00 Arrival of the new worker from Sarliaq
	13:30 Setup of the eye-wash stations
	15:30 Stoppage of effluent + inspections of pumps and generato + Fuel
	16:00 inspection of the effluent pipe, it is still straight
	16:30 two of the eye showers are dripping, bucket placed to contain leaks, need to be checked often
	17:30 restarted of effluent
	22:30 mechanic called to fix tower light, needs new starter
Morning Cross-shift notes	overflow detector for sink stayed stuck a few times, must be watched to avoid spill in treatment unit
	turbidity probe for effluent in sink accumulates particles and must be cleaned several times to get more realistic value
	always use black bottom when using T.S.S. probe
Night Cross-shift notes	carefull when fueling the generator, there is a leak in the fuelling tube where you introduce the nozel
	The T.S.S equipment is now all in the sulfate unit
	When the water level in the pad is low the syphoon effect stops gradually

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 23, 2016
		Weather conditions (dayshift):	13deg,clear,strong wind
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	8deg,clear,mild wind
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4525	4416							0,0	0,0	0,0
Average	189	212	7,76	0,48	1,52	7,85	0,42	1,38			
Minimum	103	0	7,55	0,32	1,00	7,65	0,30	1,00			
Maximum	207	342	7,97	0,78	2,00	8,07	0,57	2,00			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	3:45 - Effluent stopped (low level marker reached)
	4:30 - fuelled pump at H17
	6:20 - Effluent restarted
	9:00 - Inspection of effluent piping and the water treatment unit
	10:30 - Increased effluent flow to 340 m3/h, lost of the flowmeter on the plc for an hour
	12:10 - Lowered the effluent flow to 240 m3/h
	14:15 - effluent stopped for purpose of installing an air vent on the discharge piping to stop the siphon effect
	14:30 - installation of air vent on discharge pipe
	16:00 - Inspection of pumps and generator+Fuel
	17:30 - Effluent restarted at 215 m3/h
	18:30 - Someone passed about problems with generator and fueling tank, will pass again tomorrow morning to fix
	21:30 - Truck battery and charger pack not strong enough to jump start tower light , mechanic called to start it
Morning Cross-shift notes	Inspections must be entererd into the computer as well as done by hand
Night Cross-shift notes	Be careful with the generator fueling tank, it is leaking by the pump
	The inspection binder is under the desk
	Add oil in the effluent pump

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 24, 2016
		Weather conditions (dayshift):	sunny, little wind
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	clear, little wind
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m^3	m^3		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4692	4843							0,0	0,0	0,0
Average	195	202	7,74	0,51	1,96	7,71	0,44	1,40			
Minimum	188	95	7,58	0,32	1,00	7,41	0,28	1,00			
Maximum	207	249	7,97	0,98	4,00	7,90	0,67	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:00 - fuelled pump at H17
	8:30 Fixing of a leak on the piping that returns to the raw water lake
	10:50 contact with Larry to ask him to send mecanics to fix the towerlight
	13:00 try to fix fresh water intake valve
	15:00 Advise Yves Chiasson (H&S) for tower light
	15:00 H17 & meliadine inspection
Morning Cross-shift notes	If tubidity probes value get to high, preform a flush and clean ends with a kimwipe; fixes the problem
	Someone will come in the morning to try to fix the generator and fuel tank
Night Cross-shift notes	Nobody fixed the tower light

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 25, 2016
		Weather conditions (dayshift):	12 degree,cloudy, windy
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	8 degree, cloudy, strong wind
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4722	4782							0,0	0,0	0,0
Average	196	199	7,78	0,52	1,84	7,69	0,44	1,25			
Minimum	186	112	7,65	0,32	1,00	7,35	0,19	1,00			
Maximum	214	247	7,93	0,98	4,00	0,67	7,90	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcut inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	8:00 try to fix the output of pump 1, too much pressure (stopeed the pump 30 minutes)
	10:00 installed a bypass valve on the fresh water intake in the caustic division
	13:00 installed the backup wire on the effluent pipe
	14:30 Jack Dutil visited the ASDR installation
	15:00 fixed the output of pump 1, changed the O ring (stopped the pump 30 minutes)
	18:00 Lifted all flexible lines off rocks to avoid any potential tears
	19:00 tightened all bolts on 8'' baffle inside WWTP
	21:00 fusion machine stored into 40' container
	3:00 change cracked piece in the baffle, H17 pump stopped for 45min
Morning Cross-shift notes	Fuel tank at H17 is empty
Night Cross-shift notes	fuel is full everywhere
	tower light fixed
	ferric division door fixed
	Tight the bolts on the 8'' baffle
	Place the milk crates in the caustic division in the seacans please

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 26, 2016
		Weather conditions (dayshift):	12 degree,cloudy, windy
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	7 degree, cloudy,a little light rain
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4484	4565							0,0	0,0	0,0
Average	187	190	7,59	0,48	1,54	7,71	0,42	1,20			
Minimum	91	169	7,38	0,26	1,00	7,53	0,09	1,00			
Maximum	203	215	7,82	0,83	2,00	7,87	0,77	2,00			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	3:30 - H17 pump stopped to change cracked piece leaking on Baffle
	4:10 - H17 pump restarted
	8:00 - Validation of the calibration of pH meterss
	13:00 - fixed the fresh water pump and fixed some leaks in it's piping
	15:00 - inspections of the pumps
	15:30 - fueling of H17 inspection of oil, short stop of 5 minutes
	17:00 - Visite from Phillip Technician for the Environnement
Morning Cross-shift notes	
Night Cross-shift notes	There a few drops falling of the fresh water valves, I tried to fix it but it is still leaking a little bit (1 or 2 drops per minutes)

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events	03:30	04:10	Broken piece on baffle created leak	piece cracked	fixed
	15H30	15:35	Inspection of oil on pumps	inspection	fixed

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 27, 2016
		Weather conditions (dayshift):	8'c
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	3'c
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4582	4662							0,0	0,0	0,0
Average	191	194	7,64	0,40	1,68	7,79	0,33	1,24			
Minimum	173	172	7,61	0,12	1,00	7,56	0,16	1,00			
Maximum	205	211	7,82	0,71	3,00	8,00	0,54	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcut inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	9:30 Fueling of the red tanks
	10:00 removal of wooden box from seacans because they were stacked ontop of each other when the seacans were moved
	10:30 Meeting with Maxime from the mecanic department to prepare the oil change on the pumps and the generator for next week
	11:30 Visit from Floyd, Health and safety, to do an inspection of the work site and give safety recommendations
	13:00 Addition of a fire instinguisher near the Effluent pump, a barricade on the edge of the sump, and a rope to be able to climb out of the sump if someone were to fall in as recommended by Floyd
	15:00 Fuelling of pumps and generator
	16:00 Daily inspections
Morning Cross-shift notes	
Night Cross-shift notes	Send the weekly report and the time sheet with the daily report
	Prepare the templates for next week

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 28, 2016
		Weather conditions (dayshift):	13'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	5'C
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4425	4448							0,0	0,0	0,0
Average	185	186	7,62	0,38	1,38	7,57	0,30	1,17			
Minimum	0	0	7,51	0,06	1,00	7,11	0,16	1,00			
Maximum	213	212	7,75	0,68	3,00	7,84	0,41	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcut inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 - Fueling of pump at H17
	6:00 tightening of the barricade on the pad to make sure it doesn't fall in the sump with strong winds
	6:15 maintainance of the valve on the Eye-wash that was loosing pressure
	6:30 fixing on the doors to make sure that the strong winds don't break them when opening
	7:30 Fueling of the red tanks
	8:00 Cleaning of the Sulfate division
	9:30 Went to health and safety to get new inspections logs for the pick up trucks
	10:30 organisation of a space in the Sulfate division for the floculant
	11:40 injection point to the baffle (90' adaptor) broke, stopped all pumping to fix
	13h:05 restarted pumping of H17 and effluent
	15:30 Fueling of the pumps, the towerlight and the generator
Morning Cross-shift notes	
Night Cross-shift notes	weekly sampling in the morning around 5 am
	A good cleaning of both trucks

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	11:40	13:05	Waterspill in waterplant	Injection point joint broke	Fixed

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 29, 2016
Dayshift Operator(s)	Simon Moreau	**Weather conditions (dayshift):**	14'C
Nightshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	6'C

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4865	4867							0,0	0,0	0,0
Average	203	203	7,68	0,35	1,36	7,57	0,28	1,08			
Minimum	194	193	7,59	0,11	1,00	7,32	0,11	1,00			
Maximum	213	211	7,77	0,54	2,00	7,71	0,46	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 - Fueling of pump at H17
	5:00 - Weekly Sampling
	8:00 fueling of red tanks
	10h inspections
	11h placed the gaz containers in seacans on membrane
	11h15 cleaning of the chimcals injections skids
	14h arrival of Michel
	15:00 fueling of pumps and generators
	16:00 Visit from Steve Tober of the Health and Safety department. He suggests to put signs ''authorized personnel only'' on the seacans that contain chemical products
	20:00 Inspected and cleaned all spare 1'' and 1/2'' pieces
Morning Cross-shift notes	
Night Cross-shift notes	seperate the plastics pieces that are screwed together in the milk crates, clean all the pieces

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 30, 2016
		Weather conditions (dayshift):	11'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	4'C
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m^3	m^3		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4853	4891							0,0	0,0	0,0
Average	203	204	7,64	0,29	1,36	7,60	0,21	1,16			
Minimum	158	182	7,49	0,09	1,00	7,45	0,10	1,00			
Maximum	247	234	7,84	0,58	2,00	7,77	0,31	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	3:20 Calibration of pH meters
	4:30 Fueling of the pump at H17
	6:30 fueling of the fuel tanks
	6:30 inspection of the WWTP and the equipment near the plant
	6:45 Fixed the TSS oven's door
	7:00 Pressurized safety showers
	7:00 Sylvain Chartier and Martin visited the WWTP site
	9:00 Removal of the anchor (left after the monthly sampling) from Meliadine lake
	9:30 Monthly inspection of all the Fire extinguishers
	15:00 H17 inspection
	18:00 moved Fusion machine to the back on the 40' sea can
	20:00 cleaned and inspected remaining fittings
Morning Cross-shift notes	
Night Cross-shift notes	more fittings to clean and inspect , inventory only the good pieces
	fusion machine is blocking access to the equipment in the sea can; if possible, move it to the back

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	August 31, 2016
		Weather conditions (dayshift):	8' C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	6'C
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4827	4898							0,0	0,0	0,0
Average	201	204	7,76	0,24	1,52	7,70	0,17	1,20			
Minimum	184	187	7,63	0,13	1,00	7,62	0,11	1,00			
Maximum	218	219	7,90	0,47	3,00	7,78	0,28	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 fueled the pump at H17
	7:00 inspected the depth of the raw water succion in H17; currently only 30 cm of water over it, suction will be straightened out into deeper section of H17 later this week
	7:00 fueled the red tanks
	9:00 departure of Michel
	13:00 arrival of Jerry at the WWTP
	14:00 fueled the pumps, towerlight, and generator
	18:00 Cleaned the baffle in WWTP
	19:00 prepared all September report templates
	19:00 installed a temporary hinge on one of the generator doors so it closes properly; broke during the day
Morning Cross-shift notes	
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 1, 2016
		Weather conditions (dayshift):	14'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	2'C
Nightshift Operator(s)	Jordan Manac'h		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4464	4719							0,0	0,0	0,0
Average	187	197	7,72	0,37	1,33	7,69	0,22	1,08			
Minimum	15	93	7,57	0,17	1,00	7,57	0,11	1,00			
Maximum	206	254	7,88	0,59	2,00	7,83	0,39	2,00			

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
Ph / volume target						

Prodcuct inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 Fueled pump at H17
	8:00 fueling of red tanks
	9:00 Meeting with Floyd from health and safety to do the JHA to move the suction in H17
	9:30 Gathered the equipment needed to move the suction; chest waders, life jackets, reserved the commander for tomorrow
	10:00 Filled out JHA, Floyd will be the spotter to make sure everything is done safely
	12:30 meeting with Rejean Falardeau to discuss who is in charge of the maintance for our mecanical equipment
	13:00 meeting with Sylvain to discuss who is in charge of the maintance for our mecanical equipment
	13:30 arrival of the mecanic to do the oil changes on all of our machines. Rejean Falardeau's team took care of it.
	13:45 meeting with Floyd to approve the plan to move the suction in H17
	14:20 to 15:35 oil change on h17 pump, raised the effluent flow to be able to have room in the pad during Effluent pump oil change
	15:40 stopped effluent pump to do the oil change
	16:15 restarted the effluent pump
	16:45 Alex of the Environment department asked to solidify and straighten the retention pads
	18:00 Solidified the retention pads for generator and tower light; no more screws, will be finished tomorrow (pads for pumps)
Morning Cross-shift notes	
Night Cross-shift notes	Sign the JHA sheet
	try to make the retention pad straighter, it is a request from the environment department

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events	14:20	15:35	oil change on H17 pump, effluent still pumping	250h mainteance	yes
	15:40	16:15	Oil change on effluent pump, H17 still pumping	250h mainteance	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 2, 2016
		Weather conditions (dayshift):	10'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	6'C
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	4118	4252							0,0	0,0	0,0
Average	188	184	7,80	0,26	1,22	7,66	0,20	1,17			
Minimum	28	8	7,58	0,16	1,00	7,54	0,13	1,00			
Maximum	222	214	7,90	0,50	2,00	7,73	0,26	2,00			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
pH / volume target						

Product inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	4:30 Fueled pump at H17
	6:30 planification of the moving of the suction with Floyd
	6:45 Stopping pump at H17 and start suction moving
	8:00 Moving suction line is done, now 45 cm of water over it
	14:00 Oil change and maintenance on the electric generator
	15:50 Restarting operations
	20:00 Site inspection and walk the pipe to the discharge
Morning Cross-shift notes	Need more 1'' screws to finish solidifing the retention pads
Night Cross-shift notes	New Nuna night team tonight, might not be aware they need to do check-ups (call nuna supervisor, Jim Cardinal, on channel 2 if no one shows)

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events	06:45	08:00	moving of H17 suction	Not enough water over it	yes
	14:02	15:50	no electricity	Oil change on generator	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 3, 2016
		Weather conditions (dayshift):	rain and windy, 7'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	rain and windy, 5'C
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4878	4828								NaOH Consumption	
Average	203	201	7,62	0,64	1,96	7,56	0,40	1,48	0,80		
Minimum	192	172	7,37	0,06	1,00	7,48	0,03	1,00	0,40	Floc Consumption	
Maximum	213	228	7,84	2,09	3,00	7,67	1,62	3,00	1,20		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
pH / volume target						

Product inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15 Site inspection and walk the pipe to H17 lake
	04:20 Fueling pumg H17 / Effluent
	7:00 inspection of the field between H6 and H17 to figure out a way to limit the erosion
	9:00 email sent to Dan and Michel to tell them the state of the field between H17 and H6
	9:30 discussion with Philip and Alex of how to limit the erosion
	10:00 installation of a membrane under the H6 discharge pipe to limit the erosion
	13:00 sent emails to Michel to show him te progression of the erosion limitation
	15:00 fueling of machines
	20:00 Site and pipe inspection
Morning Cross-shift notes	
Night Cross-shift notes	when preparing templates for next week, please modify the today's head bord of template for every days of the week, it changed

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 4, 2016
		Weather conditions (dayshift):	strong winds, rain
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	sunny and calm
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4778	4767								NaOH Consumption	
Average	199	198	7,44	1,33	2,64	7,43	1,04	2,16	1,68		
Minimum	170	163	7,33	0,47	1,00	7,33	0,48	1,00	1,20	Floc Consumption	
Maximum	213	264	7,48	2,57	3,00	7,54	1,68	3,00	2,40		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
pH / volume target						

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	00:30 Drop the effluent debit cause by an higher geotube®, vegetal into raw water were in cause
	02:00 Activate geotube® and get up effluent flow
	04:15 Site inspection
	04:30 Fill up pumps
	8:00 Activation of the Geotube, inspection of the pipe in meliadine lake, everything OK
	8:30 Bringing of 10 cinder blocs to the plant to do an anchor for the turbidity shield
	11:00 Gas refill of the GMC pick up truck (grey one)
	11:30 Correction of the daily repport
	19:00 Site and pipe inspection
Morning Cross-shift notes	The template of Daily-Weekly operational report is now up to date
Night Cross-shift notes	Weekly sampling tonight around 5 am, add two 500ml samples of H6 for El-Hadji

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 5, 2016
Dayshift Operator(s)	Simon Moreau	**Weather conditions (dayshift):**	6'C, rain
Nightshift Operator(s)	Alexandre Julien	**Weather conditions (nightshift):**	5'C, rain

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4791	4958								NaOH Consumption	
Average	200	206	7,49	0,61	1,50	7,46	0,69	1,46	1,72		
Minimum	195	193	7,38	0,30	1,00	7,37	0,30	1,00	1,00	Floc Consumption	
Maximum	205	241	7,58	0,86	3,00	7,52	1,13	3,00	2,60		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
pH / volume target						

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15 Site and equipment inspection
	04:30- Fueling pump at H17 and at Effluent
	04:15 Sampling 2x 500 mL bottle of H6 lake for El Hadji from ASDR
	05:00 Weekly effluent sampling (Delivery samples to env. Tech at 05:50)
	7:00 Carriage of the material for the installation of the turbidity net on the shore of H-17
	8:00 Bringing of a plastic tub to H17 which is going to be use as a raft to carry the material
	10:00 Cleaning of th GMC pick up truck
	11:00 Sealing of the roof on spots that were leaking inside the plant while it was raining
	14:30 fueling tanks
	15:00 inspections
	19:00 Site and pipe inspection (to H17 and to discharge in Meliadine lake)
Morning Cross-shift notes	
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 6, 2016
		Weather conditions (dayshift):	rain, 7'C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	Sunny 6'C
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L		NaOH Consumption	
Total	4793	4991									
Average	200	209	7,58	0,61	1,50	7,49	0,62	1,46	0,68	Floc Consumption	
Minimum	190	184	7,45	0,25	1,00	7,42	0,23	1,00	0,20		
Maximum	211	240	7,73	0,91	3,00	7,58	0,96	3,00	1,20		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**	
pH / volume target							

Products inventory on site	**Fe2(SO4)3**		**Qty (L)**	
	NaOH		**Qty (L)**	
	FLOC		**Qte (kg)**	
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15- Fueling pump H17 and inspection
	7:00 Inspection of Health and safety service, everything ok, Signing of the JHA by floyd for the installation of th turbidity net, He will be the spotter
	8:00 Visit of Sylvain Chartier and Craig to see the pad and understand it a bit more for the next year installation
	14:00 Meeting with the surveyor to ask him to take the level of H17
	14:20 Bringing the chest wader and the life jackets to the plant for the installation of the turbidity net
	15:00 Visit by Sylvie Moreau of the ASDR's water treatment plant
	15:20 Fueling of the pumps and generator
	18:15 Daily WWTP inspection
	19:00 Site and pipe inspection (to H17 and to discharge in Meliadine lake)
Morning Cross-shift notes	
Night Cross-shift notes	There will have a blast at 19:00
	Leave the water high enough in the pad tomorrow morning, I will shut down the H-17 pump the time I will work around the suction

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 7, 2016
		Weather conditions (dayshift):	17 'C sunny
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	11'C
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4603	4578								NaOH Consumption	
Average	192	192	7,70	0,48	1,33	7,57	0,34	1,32	1,08		
Minimum	50	155	7,50	0,16	1,00	7,51	0,09	1,00	0,20	Floc Consumption	
Maximum	211	226	7,84	0,93	2,00	7,63	0,79	2,00	1,80		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**		
pH / volume target								

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	24000
	NaOH	20	**Qty (L)**	20000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15- Fueling pump H17 and inspection
	8:40 Stop of H-17 pump to install turbidity shield
	9:40 restart of H17 pump
	13:00 arrival of Dan Misiano on site and ordered material
	15:00 Fueling of pumps and generator
	16:00 inspection of the installation of the turbidity net in H17, everything OK
	19:00 Pipe and site inspection
Morning Cross-shift notes	
Night Cross-shift notes	keep a look on the flow of raw water, to make sure the turbidity net doesn't restrain it

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events	08:40	09:40	Stoppage of H17 pump	Install turbidity net	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 8, 2016
		Weather conditions (dayshift):	10' C
Dayshift Operator(s)	Simon Moreau	**Weather conditions (nightshift):**	
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L		NaOH Consumption	
Total	4664	4785									
Average	195	199	7,72	0,56	1,60	7,60	0,42	1,48	0,92	Floc Consumption	
Minimum	112	190	7,52	0,22	1,00	7,52	0,17	1,00	0,20		
Maximum	202	205	7,95	1,93	3,00	7,73	0,65	3,00	1,60		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**	
pH / volume target							

Products inventory on site	**Fe2(SO4)3**		**Qty (L)**	
	NaOH		**Qty (L)**	
	FLOC		**Qte (kg)**	
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15- Fueling pump H17 and inspection
	9:15-9:45 Stoppage of H17 pump to stabilize the turbity screen around suction
	14:00 fueling of red tanks
	19:00 Daily pipe and WWTP inspection
Morning Cross-shift notes	
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events	09:15	09:45	Stoppage of H17	stabilize the turidity net	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 9, 2016
		Weather conditions (dayshift):	7'C, sunny
Dayshift Operator(s)	Simon Moreau (am) , Jordan Manac'h (pm)	**Weather conditions (nightshift):**	5'C Cloudy
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4743	4830								NaOH Consumption	
Average	198	201	7,70	0,52	1,60	7,62	0,50	1,52	0,40		
Minimum	193	190	7,49	0,15	1,00	7,52	0,18	1,00	2,60	Floc Consumption	
Maximum	202	209	7,92	0,87	3,00	7,72	0,94	3,00	1,70		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
pH / volume target						

Products inventory on site	**Fe2(SO4)3**	**Qty (L)**	
	NaOH	**Qty (L)**	
	FLOC	**Qte (kg)**	
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)** 0
	NaOH	N	**Qte (L)** 0
	FLOC	N	**Qte (kg)** 0

Daily Overview	04:00 Inspection and filled up pump and generator
	6:00 Morning inspections
	10:00 Departure of Dan and Simon
	12:00 Arrival of Jordan
	15:00 Fueling of pumps and generator
	19:00 Daily inspection of pipe and site
Morning Cross-shift notes	Yannick Hamel will be the day supervisor this weekend
	Take pictures of any unexpected events or progress, contact Dan if anything happens and send pictures by emails
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 10, 2016
		Weather conditions (dayshift):	9'C, Cloudy
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	7'C, Cloudy
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L	mg/L		
Total	4746	4838								NaOH Consumption	
Average	198	202	7,75	0,57	1,62	7,64	0,45	1,52	1,68		
Minimum	192	198	7,60	0,33	1,00	7,57	0,14	1,00	1,20	Floc Consumption	
Maximum	202	213	7,87	0,99	3,00	7,72	0,78	3,00	2,20		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
pH / volume target						

Products inventory on site	**Fe2(SO4)3**	**Qty (L)**	
	NaOH	**Qty (L)**	
	FLOC	**Qte (kg)**	
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)** 0
	NaOH	N	**Qte (L)** 0
	FLOC	N	**Qte (kg)** 0

Daily Overview	04:15 Daily inspection of pumps
	04:30 Fueling pumps
	06:00 Daily inspection of pipes and site
	08:00 Filled all fuel tanks
	14:00 Started pumping from H6 towards H17; pump on idle
	15:30 Fueled all pumps and generator
	15:30 H6 suction not well anchored down, keeps popping up and sucking air
	18:00 Started from H6 to H17 pumping
	19:30 Daily pipe and pump inspection (Meliadine lake; H17; H6)
	21:00 Sampling discharge from H6 to H17 (7,21 pH; 8,21 NTU; 1,04 ppm Fe)
Morning Cross-shift notes	
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 11, 2016
		Weather conditions (dayshift):	8'C, Cloudy
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	5'C, Cloudy
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4742	4837								NaOH Consumption	
Average	197	201	7,62	0,61	1,64	7,58	0,54	1,40	1,20		
Minimum	192	195	7,48	0,27	1,00	7,51	0,20	1,00	0,60	Floc Consumption	
Maximum	202	215	7,75	1,19	2,00	7,68	0,85	2,00	2,00		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target						

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	00:30 Stopped H6 pumping (Not enough water)
	04:15 Daily pumps and generator inspection
	04:30 Filled pumps
	6:30 Started H6 pumping
	7:00 Filled fuel tanks
	9:00 Stopped H6 pumping, not enough water above the suction
	15:30 fueled pumps and generator
	16:00 Schedule a mechanic to do the maintance on the pumps (H17 and Effluent) tomorrow
	18:15 Daily site inspection
	19:00 Pipe and pumps inspection (from H17 to Meliadine lake)
Morning Cross-shift notes	I have stop the H6 pump at midnight, not enough water to continue, the suction has been taking air.
	The lake seem to have drop, we'll take a pictures in the day shift
	I will put pictures of the discharge pumping from H6 in the daily email
Night Cross-shift notes	Weekly sampling tomorrow morning

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 12, 2016
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (dayshift):**	10'C, Sunny
Nightshift Operator(s)	Alexandre Julien	**Weather conditions (nightshift):**	6'C, Sunny

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4738	4843								NaOH Consumption	
Average	197	202	7,59	0,70	1,76	7,56	0,61	1,64	1,08		
Minimum	183	196	7,45	0,53	1,00	7,47	0,38	1,00	0,20	Floc Consumption	
Maximum	204	219	7,74	0,99	2,00	7,65	0,79	2,00	1,60		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target						

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15 Pumps inspection and fueling
	05:00 Weekly sampling
	6:00 Daily inspection of WWTP and pumps
	8:00 Filled fuel tanks
	8:30 Added buoy to H6 line to try and limit the amount of air it sucks in
	9:00 Started pumping H6 into H17
	12:00 Stopped H6 pumping
	15:30 Fueled pumps and generator
	16:00 Six inches of water left above the suction of the H17 pump
	17:30 Maintenance pushed back to tomorrow due to time restrictions
	19:00 Daily pipe and site inspection
	20:00 Not enough water to start the H6 pump
Morning Cross-shift notes	
Night Cross-shift notes	Try to pump H6 after the blast tonight

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 13, 2016
		Weather conditions (dayshift):	8'C, Light rain + Strong winds
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	2'C Strong winds, snowing and raining
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4548	4718								NaOH Consumption	
Average	190	197	7,58	1,63	3,54	7,58	1,11	2,76	1,28		
Minimum	114	136	7,49	0,64	2,00	7,52	0,62	1,00	1,00	Floc Consumption	
Maximum	206	210	7,69	3,75	9,00	7,64	2,35	6,00	1,80		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target						

Products inventory on site	**Fe2(SO4)3**		**Qty (L)**	
	NaOH		**Qty (L)**	
	FLOC		**Qte (kg)**	
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:15 Pumps inspection and fueling
	06:15 Started pumping from H6
	07:00 Filling of fuel tanks
	07:00 Daily inspection of WWTP and pumps
	09:00 Stopped pumping from H6
	11:45 Start of strong winds ; raise turbidity of H17 raw water
	14:40 to 15:10 Stopped H17 pump to do maintenance
	15:10 to 15:30 Stopped Effluent pump to do maintenance
	15:30 Fueled pumps and generators
	15:45 Picked up sent material from warehouse
	16:00 Started pumping from H6
	17:00 Stopped pumping from H6
	19:00 Daily inspections
Morning Cross-shift notes	
Night Cross-shift notes	Be careful of the changes to the water due to the rain and strong winds

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 14, 2016
		Weather conditions (dayshift):	3'C , Sunny
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	2'C Cloudy
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4635	4670								NaOH Consumption	
Average	193	195	7,57	1,44	2,72	7,54	1,31	2,76	4,16		
Minimum	185	192	7,42	1,02	2,00	7,46	1,06	2,00	2,80	Floc Consumption	
Maximum	200	200	7,70	2,95	5,00	7,60	1,81	4,00	5,20		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**	
ph / volume target							

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:45 Pumps and genarator inspection
	05:00 Fueling pumps
	06:00 Inspection of WWTP and pumps
	06:15 Started pumping from H6
	08:45 Stopped pumping from H6
	13:00 Arrival of Joseph at the WWTP
	14:00 4'' of water left above the suction of the h17 pump
	15:30 Fuelled pumps and generator
	16:20 Arrival of Michel at WWTP
	18:15 Daily WWTP inspection
	19:15 Pipe inspection (From H17 to Meliadine Lake)
	23:00 Fueled pick up (SAR-15)
Morning Cross-shift notes	
Night Cross-shift notes	

	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
Operation stops / unplanned events					

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 15, 2016
		Weather conditions (dayshift):	3'C , Cloudy
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	1'C, snowing
Nightshift Operator(s)	Alexandre Julien		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4313	4361								NaOH Consumption	
Average	180	182	7,62	1,56	2,52	7,58	1,33	2,30	1,28		
Minimum	123	132	7,57	1,14	2,00	7,52	1,08	2,00	0,40	Floc Consumption	
Maximum	200	206	7,68	2,45	3,00	7,60	1,70	3,00	2,60		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target						

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	04:45 Pumps and generator inspection
	05:00 Fueling pumps and towerlight
	06:15 Started pumping from H6
	07:00 Inspection of WWTP and pumps
	08:00 Filled fuel tanks
	09:00 Stopped pumping from H6
	14:00 Measured depth of H17 and A54 to the deepest spots
	15:30 Fueled pumps and generator
	17:05 Suction from H17 Starting to pump air bubbles
	18:00 Drop raw and effluent flow at 135 m³/h to prevent from taking air
	18:30 Started pumping from H6 to H17
	21:00 Stopped pumping from H6 to H17
	22:00 T.S.S portable does'nt work good
Morning Cross-shift notes	
Night Cross-shift notes	

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 16, 2016
		Weather conditions (dayshift):	2'C , Snowing
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	2'C
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	10
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3498	1924								NaOH Consumption	6,0
Average	152	128	7,54	5,60	3,17	7,56	1,29	-	-		
Minimum	51	70	7,37	1,17	3,00	7,53	1,04	-	-	Floc Consumption	0,22
Maximum	189	174	7,62	44,32	4,00	7,60	2,16	-	-		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**	
ph / volume target							

Products inventory on site	**Fe2(SO4)3**	23	**Qty (L)**	23000
	NaOH	19	**Qty (L)**	19000
	FLOC	39	**Qte (kg)**	975
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	y	**Qte (L)**	1000
	NaOH	y	**Qte (L)**	1000
	FLOC	y	**Qte (kg)**	25

Daily Overview	04:45 Pumps, generator and site inspections
	05:00 Pumps and towerlight fueling
	6:30 Used fusion machine to make a 120' extension
	7:00 TSS probe working properly again
	8:00 Filled fuel tanks
	11:00 Stopped H17 pump to install 120' extension
	12:45 Started H17 pump
	13:00 MES in water being pumped from H17 is at 244 mg/L ; watching how it reacts in Geotube , when Effluent will reach 7 mg/L H17 will be pump in a closed circuit in the hopes that the sediments will eventually decant and the water will become clear again
	14:15 Depth of H13 is 54'' (deepest distance while on foot)
	14:30 Put H17 pumping in closed circuit (Effluent was at 7 mg/L)
	15:30 Started H6 pump
	18:00-22:00 Filling of the chemicals tanks
	19:00 stopped H6 pump
	23:00 Fixing of the polymer pipe 1'' that had a broken sceal
	23:40 starting of the water treatment
Morning Cross-shift notes	
Night Cross-shift notes	

Operation stops / unplanned events

Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 17, 2016
		Weather conditions (dayshift):	5'C , Raining
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	2'C
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	131
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	2599	655								NaOH Consumption	90,0
Average	155	60	7,59	5,13	36,46	7,29	2,35	6,44	7,20		
Minimum	127	35	7,11	3,11	27,00	8,14	0,83	4,00	7,20	Floc Consumption	0,20
Maximum	201	86	8,12	7,89	57,00	7,69	4,04	12,00	7,20		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target		11		6		20,00%

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	40	**Qte (kg)**	1000
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	23:45 starting of treatment
	3:45 starting of effluent to meliadine lake
	4:15 shut down for electrical shut down of generator
	06:00 H17 running in a closed loop, no electricity in WWTP
	07:30 Electrician called to change generator
	11:50 Switched generator, 1st generator in need of mechanical repairs
	12:00 Daily Inspection of WWTP and pumps before starting operations
	12:45 Started Effluent pump towards Meliadine Lake
	13:20 Stopped pumping into Meliadine and running in a closed loop
	13:30 Got air bubbles in the H17 pump, flowrate dropped to 135 m3/h
	13:45 Started TSS treatment
	15:00 Daily Inspection of WWTP and Pumps
	16:00 Fueled pumps and generator
	16:00 walked meliadine effluent piping to do inspection
	17:30 Started discharge into Meliadine Lake; 6 mg/L on TSS probe
	18:00 installation of a pump in the overflood part of the polymiser
Morning Cross-shift notes	
Night Cross-shift notes	Optimize treatment
	Fresh water pump for polymizer goes into fault a lot, be 2 when doing batches

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	04:15	11:50	no electricity	power generator in default	yes
	13:20	17:30	TSS effluent at 11	TSS	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 18, 2016
		Weather conditions (dayshift):	7'C, lot of Rain, windy
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	4'C, rain, wind
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	131
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3620	3596								NaOH Consumption	90,0
Average	150,00	146,00	7,64	7,25	65,44	7,95	1,16	2,96	4,24		
Minimum	126,00	48,00	7,42	3,82	18,00	7,40	0,63	2,00	3,40	Floc Consumption	25kg
Maximum	176,00	232,00	7,92	13,30	169,00	8,30	2,41	4,00	6,40		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		23		11		50,00%

Products inventory on site	**Fe2(SO4)3**	24	**Qty (L)**	2400
	NaOH	20	**Qty (L)**	2000
	FLOC	39	**Qte (kg)**	975
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	n	**Qte (L)**	
	NaOH	n	**Qte (L)**	
	FLOC	y	**Qte (kg)**	25

Daily Overview	2:30 Started H-6 pump
	4:30 stopped H-6 pump
	6:00 Health and safety meeting
	7:00 Daily inspection of WWTP and pumps
	9:00 Increased flowrate to 165 m3/h
	10:30 Started H6 pump
	12:30 Stopped H6 pump
	14:45 12'' left above the H17 suction
	15:00 Fueled pumps and generator
	15:50 Stopped effluent pump to try to move the pipeline to meliadine, pipeline kinked, don't move it
	16:05 Started effluent pump
	18-21 optimization of the treatment
	22:00 calibration of instruments
Morning Cross-shift notes	
Night Cross-shift notes	Weekly and monthly sampling in the morning, 2 bags, 5 buckets

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	15:50	16:05	Tried to move the effluent pipline	Request from Nuna and Larry	NO

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 19, 2016
		Weather conditions (dayshift):	7'C , Rain
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	4'C Rain
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	616
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4154	4168								NaOH Consumption	297,0
Average	172	171	7,61	3,91	15,36	7,93	0,57	1,72	3,40		
Minimum	150	121	7,48	2,30	8,00	7,71	0,31	1,00	2,20		
Maximum	191	198	7,79	6,80	25,00	8,10	1,01	3,00	7,40		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target		29 l/h		24 l/h		59,00%

Products inventory on site	**Fe2(SO4)3**	22	**Qty (L)**	22000
	NaOH	18	**Qty (L)**	18000
	FLOC	39	**Qte (kg)**	975
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	y	**Qte (L)**	1000
	NaOH	y	**Qte (L)**	1000
	FLOC	n	**Qte (kg)**	0

Daily Overview	1:00 pressurization of the Eye-WASH
	3:30 fuelling of the pump
	5:00 monthly + weekly sampling
	6:00 - 7:30 Optimization of treatment
	9:00 Removed turbidity net from H17 suction, godd tss results, much more less sediment
	10:15 Started H6 pump
	11:30 filled and pressurized emergency shower in treatment unit
	13:00 Daily inspection of WWTP and pumps
	13:45 Stopped H6 pump
	15:30 Fueled pumps and generator
	16:00 Fused a 120' line
	18:00:00 Washing of coverall that has been contaminted
	18:00 transfer of NaOH and H2SO4
	19:00 optimization of treatment
	19:30 started H6 pump
	21:30 stopped H6
Morning Cross-shift notes	Transfer some H2SO4
Night Cross-shift notes	Try to pump H6 before the sun sets
	blast at 7:00
	transfer naoh

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 20, 2016
		Weather conditions (dayshift):	5'C , Rain + Strong Winds
Dayshift Operator(s)	Jordan Manac'h	**Weather conditions (nightshift):**	2'C Rain + Strong winds
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	686
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4456	4602								NaOH Consumption	322,0
Average	185	199	7,59	7,68	57,36	7,79	1,16	2,58	4,75		
Minimum	154	151	7,01	2,77	9,00	7,64	0,51	1,00	2,20	Floc Consumption	
Maximum	197	254	7,77	14,20	129,00	7,96	4,16	5,00	6,40		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		30		13		48,00%

Products inventory on site	**Fe2(SO4)3**	21	**Qty (L)**	21000
	NaOH	18	**Qty (L)**	18000
	FLOC	39	**Qte (kg)**	975
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	y	**Qte (L)**	1000
	NaOH	n	**Qte (L)**	0
	FLOC	n	**Qte (kg)**	0

Daily Overview	4:00 Fuelling of the pump at h-17
	7:00 Daily inspection of WWTP and pumps
	7:15 Started H6 pump
	8:30 transferred naoh and ferric sulfate tote bottoms
	9:00 filled fuel tanks
	9:30 Brought turbidity net to seacans
	9:50 changed fresh water pump, shortened cable
	14:45 Stopped effluent pump to move the meliadine pipeline
	15:00 Fueled pumps and generators
	15:30 Stopped H6 pump
	16:20 Started effluent pump
	18:00 transfer of H2SO4
	20:45 Installation of a new tarp on fusion machine
	21:00-00:45 activation of Geotube, Geotube does'nt leak properly, doesn't go lower than 5'
Morning Cross-shift notes	Be carefull on the way to store the coverall, there were chemicals contamination in one of the jackets
Night Cross-shift notes	vacuum water with shop vac, when spill in caustic divison
	Place a new tarp over fusion machine, I think theres one in the equipment sea can

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 21, 2016
		Weather conditions (dayshift):	5'C , sunny + Strong winds
Dayshift Operator(s)	Jordan Manac'h / Michel Desy	**Weather conditions (nightshift):**	2'C Little windy
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	589
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3938	3357								NaOH	276,0
Average	165	157	7,64	6,27	42,71	7,63	2,03	4,32	11,27		
Minimum	33	5	7,41	3,57	12,00	7,33	0,42	2,00	9,60		
Maximum	205	213	7,85	11,01	96,00	7,93	7,21	12,00	13,00		

Active treatment sequence	**#1**	**Fe2(SO4)3**	**#2**	**NaOH**	**#3**	**Floc**
ph / volume target		25 l/h		10 l/h		44,00%

Products inventory on site	**Fe2(SO4)3**	21	**Qty (L)**	21000
	NaOH	18	**Qty (L)**	18000
	FLOC	39	**Qte (kg)**	975
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	N	**Qte (L)**	0
	NaOH	N	**Qte (L)**	0
	FLOC	N	**Qte (kg)**	0

Daily Overview	00:45 Stopped of H17 to get the geotube lower
	1:50 restart of H17
	4:30 Fuelling of H17 pump
	6:40 started H6 pump
	8:30 change flow in close circuit
	10:15 meliadine pump to 1000
	12:15 fuelled h17, trottle to 1800
	'12:40 change flow to meliadine
	13:00 fuelled everything
	17:00 stopped h6: 10h20
	19:00 transfer the products
	20:00 change of the NaOH transfer pump's drive shaft
Morning Cross-shift notes	The Geotube doesn't leeks good, it might be because of all the vegetation that we are pumping
	Inspection of fire instinguishers is due for this week
Night Cross-shift notes	weight the oven filter and explain to mich

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	00:45	01:50	Geotube too high	not leaking properly	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 22, 2016
		Weather conditions (dayshift):	sunny, 8 degree
Dayshift Operator(s)	michel desy/donny saumik	**Weather conditions (nightshift):**	moony, 1'c
Nightshift Operator(s)	simon moreau/joseph hamilton		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	573
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3983	3957								NaOH Consumption	268,0
Average	166	164	7,55	3,77	19,88	7,80	0,99	2,16	6,50		
Minimum	139	145	7,23	2,79	7,00	723,00	0,45	1,00	4,00	Floc Consumption	
Maximum	193	183	7,89	5,43	72,00	8,01	2,22	5,00	10,60		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		25 l/h		11 l/h		15,00%

Products inventory on site	**Fe2(SO4)3**	20	**Qty (L)**	20000
	NaOH	17	**Qty (L)**	17000
	FLOC	38	**Qte (kg)**	950
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	y	**Qte (L)**	1000
	NaOH	y	**Qte (L)**	1000
	FLOC	y	**Qte (kg)**	25

Daily Overview	3:00 fuelling of H17 pump
	3:30 Inspections
	4:00 pressurization of Eye-Wash
	7:00 tranfer naoh and fe2so4 tote and emptied tote bottom
	7:00-12h pump H6 worked 5h
	13:00 tss affluent at 7, watch it for an hour beefore stopping treatment
	13:50: water height at 14" over the pipe, measure make rise tss a lot in the raw water
	20:00 rise of the flow of the raw water to 180 m3/h
	20-22: optimisation
Morning Cross-shift notes	Transfer NaOH and Fe2SO4,
	Bring bags of polymer to the plant
	Try to find some boots for Donny so he could be able to work around chemicals
	Inspection of fire extinguishers is due for this week
Night Cross-shift notes	complete work card please
	have you tried to redo a curb of ntu vs tss and also check tss oven vs tss probe

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 23, 2016
		Weather conditions (dayshift):	sunny, 10 degree
Dayshift Operator(s)	michel desy/donny saumik	**Weather conditions (nightshift):**	Moony 3'C
Nightshift Operator(s)	simon moreau/joseph hamilton		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	595
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4375	4602								NaOH Consumption	294,0
Average	183	191	7,66	3,18	11,76	7,89	1,62	3,24	2,10		
Minimum	171	165	7,54	1,30	4,00	7,59	0,70	1,00	1,60		
Maximum	195	217	8,09	4,32	17,00	8,39	4,32	12,00	2,60		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		25 l/h		11 l/h		13,00%

Products inventory on site	**Fe2(SO4)3**	19	**Qty (L)**	19000
	NaOH	17	**Qty (L)**	17000
	FLOC	37	**Qte (kg)**	925
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	y	**Qte (L)**	1000
	NaOH	n	**Qte (L)**	
	FLOC	y	**Qte (kg)**	25

Daily Overview	3:00 fuel of H17
	6:30 H6 starting
	6:40 lake survey 63.038m
	12:00 H6 stopped
	18:30 tranfer of H2SO4
	19:30 inspections
	22:00 transfer of polymer
Morning Cross-shift notes	Inspection of fire extinguishers is due for this week
Night Cross-shift notes	

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	**Date**	September 24, 2016
		Weather conditions (dayshift):	10'C
Dayshift Operator(s)	michel desy/donny saumik	**Weather conditions (nightshift):**	5'c
Nightshift Operator(s)	simon moreau/joseph hamilton		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	229
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4351	4082								NaOH Consumption	130,7
Average	181	172	7,68	3,02	7,21	8,06	2,25	4,63	6,52		
Minimum	159	26	7,51	1,86	4,00	7,57	1,10	2,00	5,60		
Maximum	199	277	8,28	3,83	14,00	8,74	369,00	13,00	9,20		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target						

Products inventory on site	**Fe2(SO4)3**	19	**Qty (L)**	19000
	NaOH	16	**Qty (L)**	16000
	FLOC	37	**Qte (kg)**	925
Transfer of products in WWTP (Y/N)	**Fe2(SO4)3**	n	**Qte (L)**	
	NaOH	y	**Qte (L)**	1000
	FLOC		**Qte (kg)**	0

Daily Overview	3:00 fuel of h17 pump
	3:00 Rise of effluent's flow to get sump lower
	5:00 Recirculation h17 lower flow of pump to rise the sump's level to get cleaner water
	7h00 start h6
	10:00:00 stopped treatment after to 5h of low tss raw water
	11:00 emoty the sump
	13:30 stopped h6
	23:30 lower raw water flow, Flow non-constant goes from 160 to 220, probably beccause the pump is pumping air, now 127 m3/h more constant
Morning Cross-shift notes	Don't tight to much the plastic pieces of piping, we risk to break them and we should be able to untight them by hand
Night Cross-shift notes	why get sump lower?
	oil change? I'll email Marco
	startedweekly report
	chek remob plan

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	05:00	06:00	tss too high	activate the bag	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	Date	September 25, 2016
		Weather conditions (dayshift):	windy
Dayshift Operator(s)	Michel Désy	Weather conditions (nightshift):	Wind, rain
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	52
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4061	3890								NaOH Consumption	37,0
Average	169,00	183,00	7,80	3,47	5,93	8,03	3,26	7,20	4,40		
Minimum	121,00	86,00	7,20	2,18	4,00	7,70	2,12	4,00	2,40	Floc Consumption	
Maximum	202,00	272,00	8,26	5,75	10,00	8,62	4,85	11,00	5,60		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		15 l/h		11l/h		11,00%

Products inventory on site				
	Fe2(SO4)3	19	Qty (L)	19000
	NaOH	16	Qty (L)	16000
	FLOC	37	Qte (kg)	925

Transfer of products in WWTP (Y/N)			
	Fe2(SO4)3		Qte (L)
	NaOH		Qte (L)
	FLOC		Qte (kg)

Daily Overview	1:00 Stopped H-17, Geotube let pass too much TSS (13 mg/L), it flushes itself because chemistery inside get rinced off of it
	1:15 restart of H17 pump, bypass geotube
	2:00 TSS getting lower in the pad
	2:00 Fuel of H17 pump
	7:00 started h6
	12:00 stopped h6
	13:00 washed empty tote
	15:25, water getting debris cause of wind, turn off h17, replug thre bag, return water h17
	15:50, probe does not work properly, water clear, water to meliadine
	20:45 stopping of effluent, emptying the Sump, starting of treatment, TSS high
	21:00-0:00 Emptying the sump to H17, revoval of accumulation of sediment
Morning Cross-shift notes	
Night Cross-shift notes	weekly sampling!

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	01:00	01:15	TSS too high	Geotube let pass 13 mg/l, getting washed	yes
	15:25	15:50	replug the bag	windy, organic debris in the water	yes
	20:45	02:00	Recirculation, pumping out sediments	Too much sediments in the sump	yes

Daily Operational Report

Project:	TE-1640 - Méliadine	Date	September 26, 2016
		Weather conditions (dayshift):	rainy, 7 degree
Dayshift Operator(s)	Michel Désy	Weather conditions (nightshift):	2c
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	428
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4142	3752								NaOH Consumption	334,0
Average	172	163	7,67	2,62	-	8,60	1,25	-	5,95		
Minimum	141	16	7,20	1,37	-	8,34	0,40	-	0,80		
Maximum	191	217	8,18	3,77	-	8,86	2,31	-	8,60		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		29 l/h		24 l/h		59,00%

Products inventory on site	Fe2(SO4)3	19	Qty (L)	19000
	NaOH	16	Qty (L)	16000
	FLOC	37	Qte (kg)	925
Transfer of products in WWTP (Y/N)	Fe2(SO4)3	n	Qte (L)	
	NaOH	n	Qte (L)	
	FLOC	n	Qte (kg)	

Daily Overview	2:00 opening of effluent to meliadine lake
	3:00 fuel of H17 pump
	5:00 weekly sampling
	9:30 started h6
	15:00 meliadine line inspection
	17:00 stopped h6
Morning Cross-shift notes	
Night Cross-shift notes	more oven test

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	Date	September 27, 2016
		Weather conditions (dayshift):	sunny, cold
Dayshift Operator(s)	Michel Désy	Weather conditions (nightshift):	2'c
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	475
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	4508	4624								NaOH Consumption	363,0
Average	188	193	7,71	1,84	-	8,53	1,47	-			
Minimum	170	151	7,49	1,18	-	8,38	0,51	-			
Maximum	202	259	7,84	2,51	-	8,67	7,14	-			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		19 l/h		16 l/h		11,00%

Products inventory on site	Fe2(SO4)3	18	Qty (L)	18000
	NaOH	15	Qty (L)	15000
	FLOC	37	Qte (kg)	925
Transfer of products in WWTP (Y/N)	Fe2(SO4)3	yes	Qte (L)	1000
	NaOH	yes	Qte (L)	1000
	FLOC	no	Qte (kg)	

Daily Overview	3:00 fuel of h17 pump
	7:00 started h6 pump
	9:00 transfer caustic and ferric
	10:00 clean the tote
	11:00 fixed ferric probe
	14:00 stopped h6
Morning Cross-shift notes	try to find a 2" wide by 5' aluminun bar to hit the bag
Night Cross-shift notes	Mornig meeting messages: Make sure to always wear ppe, no more chance / always close the seacan back/ don't waste food (12$ a
	if any chemical spill, note it
	get oil and filter ready for pumps oil change
	look at schedule and remob file

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	Date	September 28, 2016
		Weather conditions (dayshift):	sunny
Dayshift Operator(s)	Alexandre Julien / Michel Desy	Weather conditions (nightshift):	Really strong winds, 90 km and more
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	327
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3828	3680								NaOH Consumption	256,0
Average	161	154	7,68	2,85	-	8,49	1,26	-	7,63		
Minimum	86	75	7,50	1,14	-	7,88	0,67	-	0,80		
Maximum	196	189	8,23	10,90	-	8,84	2,19	-	10,40		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		22 l/h		13 l/h		8,00%

Products inventory on site	Fe2(SO4)3	18	Qty (L)	18000
	NaOH	15	Qty (L)	15000
	FLOC	37	Qte (kg)	925
Transfer of products in WWTP (Y/N)	Fe2(SO4)3	n	Qte (L)	
	NaOH	n	Qte (L)	
	FLOC	n	Qte (kg)	

Daily Overview	3:00 fuel of h17
	8:00 started h6
	9:00 reduce h17 for cross shift: 185m³/h to 125m³/h, ferric, 21-14l/h, caustic 17-12l/h polymer 13-9%
	13:00 stopped h6 not enough water
	13:00: Laboratory tests on raw water treatment
	14:15: Stopped injections, the raw water is better than the treated one
	15:45: Raise the raw flowrate to 160 m³/h
	15:50: Fueling H17 pump
	20:00:00: Strong winds begins, raw water getting darker, start treatment
	22:00 Raw water darker,
Morning Cross-shift notes	Things for oil change are in the Fe2SO4 division
	Alex's note: oven test every 2 hours, start back h6, keep the sump high
Night Cross-shift notes	take some oven test on raw water

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved

Daily Operational Report

Project:	TE-1640 - Méliadine	Date	September 29, 2016
		Weather conditions (dayshift):	Very strongs winds and sunny
Dayshift Operator(s)	Alexandre Julien	Weather conditions (nightshift):	smooth winds, 1'C
Nightshift Operator(s)	Simon Moreau		

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S. (Oven)	Fe2(SO4)3 Consumption	586
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	3791	3182								NaOH Consumption	317,0
Average	158	142	7,57	8,62	-	8,31	1,16	-	5,47		
Minimum	148	27	7,49	3,63	-	8,07	0,17	-	1,60		
Maximum	165	252	7,63	13,00	-	8,63	2,44	-	11,80		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target		20 l/h		11 l/h		4,00%

Products inventory on site	Fe2(SO4)3	18	Qty (L)	18000
	NaOH	15	Qty (L)	15000
	FLOC	37	Qte (kg)	925
Transfer of products in WWTP (Y/N)	Fe2(SO4)3	n	Qte (L)	
	NaOH	n	Qte (L)	
	FLOC	n	Qte (kg)	

Daily Overview

01:40 Wind becomes really strong, waves in decantation pad, effluent becomes red
4:00 water of effluent a bit cleaner
5:00 restart of effluent
10:30: Meeting with S.Chartier to know what the plan for next days, don't know, no communications to outside of the camp
11:00 Started H6 pumping
11:15: Raise polymer concentration from 0,05 to 0,1
14:00: Talk with Dan (They'll have a meeting tomorrow morning, to know what to do with H13 and A54 pumping)
14:30: The treatment seem to be good, the particules drop and the geotube® get down easier
15:00: The raw water seem to be better, the strongs winds going down
16:05: Change fresh water filter (big blue before the fresh water tank)
23:00 inspection

Morning Cross-shift notes

Raw water was becoming darker and darker, no oven test
Try to find a new can of urethane to to fix a small hole in the bag

Night Cross-shift notes

Operation stops / unplanned events

Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
01:45	05:00	TSS to high	strong wind agitates the sump	yes

Weekly Operational Report

Project:	TE-1640 - Méliadine	Week of:
Dayshift Operator(s)	Simon Moreau	August 21, 2016 to August 27, 2016
Nightshift Operator(s)	Jordan Manac'h	

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent			Fe2(SO4)3 Consumption	NaOH Consumption	Floc Consumption
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)			
Units	m³	m³		NTU	mg/L		NTU	mg/L	kg	kg	kg
Total	28875	29302							0,0	0,0	0,0
Average	189	195	7,67	0,50	1,67	7,72	0,44	1,36			
Minimum	143	84	7,40	0,29	1,00	7,36	0,25	1,00			
Maximum	207	258	7,89	0,84	2,86	6,91	1,71	2,14			

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
Ph / volume target						

Prodcuct inventory on site				
Fe2(SO4)3	24	Qty (L)	2400
NaOH	20	Qty (L)	2000
FLOC	40	Qte (kg)	1000

Weekly Overview
Sunday
Straightening of Effluent discharge piping
Started pumping operations of H17 towards Meliadine
Effluent pump working on and off depending on level in sump
Monday
Monthy Sampling done
Tuesday
Installation of air vent on discharge pipe to get rid of the syphon effect that was causing the start and stop of the effluent pump
Effluent pump now working on a continuous basis; only planned stops are for inspections and maintaince
Wednesday
Mainatince on a couple of pipes showing a bit of wear and tear from being placed on rocks; pipes elevated off rocks to avoid future problems
Thursday
Changed the O ring on the outlet effluent pump, O ring was damaged during installation
Friday
Pump at H17 stopped to change a cracked piece leaking on Baffle in WWTP
Saturday
Visit from health and safety , recommnendations given to make WWTP site safer

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	03:30	04:10	Broken piece on baffle created leak	cracked piece	fixed
	15:30	15:35	Inspection of oil on pumps	inspection	-

Weekly Operational Report

Project:	TE-1640 - Méliadine	Week of:
Dayshift Operator(s)	Simon Moreau	August 28, 2016 to September 3, 2016
Nightshift Operator(s)	Jordan Manac'h, Alexandre Julien	

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S (oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	32430	32903								NaOH Consumption	
Average	197	198	7,69	0,36	1,45	7,62	0,25	1,19	0,80		
Minimum	15	8	7,37	0,06	1,00	7,11	0,03	1,00	0,40	Floc Consumption	
Maximum	247	254	7,90	2,09	3,00	7,84	1,62	3,00	1,20		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
pH / volume target						

Product inventory on site				
Fe2(SO4)3	24	Qty (L)	2400	
NaOH	20	Qty (L)	2000	
FLOC	40	Qte (kg)	1000	

Weekly Overview

Sunday

Injection point to the baffle (90' adaptor) broke, stopped all pumping for duration of the repairs

Monday

Visit from Dave Lodder of the Health and Safety department

Weekly Sampling

Tuesday

Visit from Sylvain Chartier and Martin

Monthly inspection of the fire extinguishers

Wednesday

Inspection of the depth of the suction for the H17 pump; suction to be straightened out when there is less water in H17

Thursday

Oil changes on the effluent and H17 pumps

Solidified retention pads for both generators and the tower light

JHA prepared and approved to move the suction of the H17 pump on Friday

Friday

Moving suction line is done, now 45 cm of water over it

Oil changes and maintenance on the electric generator

Saturday

Installation of a membrane under the H6 discharge pipe to limit the erosion

Operation stops / unplanned events

Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
11:40	13:05	Water spill in WWTP	Injection point adaptor broke	Fixed
14:20	15:35	oil change on H17 pump, effluent still pumping	250h maintenance	yes
15:40	16:15	Oil change on effluent pump, H17 still pumping	250h maintenance	yes
06:45	08:00	moving of H17 suction	not enough water over it	yes
14:02	15:50	no electricity	Oil change on generator	yes

Weekly Operational Report

Project:	TE-1640 - Méliadine	Week of:
Dayshift Operator(s)	Simon Moreau , Jordan Manac'h	September 4 to September 10
Nightshift Operator(s)	Alexandre Julien	

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S (oven)	Fe2(SO4)3 Consumption	
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	33118	33747								NaOH Consumption	
Average	197	201	7,63	0,67	1,68	7,54	0,58	1,56	1,17		
Minimum	157	182	7,47	0,27	1,00	7,46	0,23	1,00	0,94	Floc Consumption	
Maximum	207	228	7,77	1,29	2,86	7,63	0,99	2,86	1,93		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc	
ph / volume target							

Products inventory on site			
Fe2(SO4)3		Qty (L)	
NaOH		Qty (L)	
FLOC		Qte (kg)	

Weekly Overview
Sunday
Made a plan with Michel and Dan to prevent any absoption of particules by H6 suction while pumping from H6
Prepared all materials and the JHA for the intervention on H17 suction
Monday
Moved all equipment needed for the H17 suction intervention
Weekly sampling and extra 500 mL (x2) samples to env. Tech for shipping to El Haji Kane from ASDR
Tuesday
Health and Safety inspection by Floyd
Wednesday
Installation of the turbidity net on the H17 suction
Arrival of Dan Misiano
Thursday
Verification of turbidity net installation
Friday
Departure of Simon Moreau and Dan Misiano
Arrival of Jordan Manac'h
Saturday
Started pumping from H6 towards H17

Operation stops / unplanned events	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	08:40	09:40	Stoppage of H17 pump	Install turbidity net	yes
	09:15	09:45	Stoppage of H17	Stabilize the turidity net	yes

Weekly Operational Report

Project:	TE-1640 - Méliadine	Week of:		
Dayshift Operator(s)	Jordan Manac'h	September 11, 2016	to	September 17, 2016
Nightshift Operator(s)	Alexandre Julien / Simon Moreau			

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S (oven)	Fe2(SO4)3 Consumption	131
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	29073	26008								NaOH Consumption	90,0
Average	181	166	7,31	1,77	7,40	7,53	#REF!	2,88	2,70		
Minimum	139	137	6,53	1,11	5,43	7,59	#REF!	1,83	2,03	Floc Consumption	25 kg
Maximum	200	187	13,00	3,05	11,71	7,64	#REF!	4,83	3,40		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc	
ph / volume target							

Products inventory on site				
Fe2(SO4)3	24	Qty (L)	2400	
NaOH	20	Qty (L)	2000	
FLOC	40	Qte (kg)	1000	

Weekly Overview

Sunday
Pumped 2,5 hours from H6 to H17 lake
Schedule mechanical maintenance for pumps on Monday

Monday
Pumped 3 hours from H6 to H17 lake
Six inches of water left above the suction of the H17 pump
Maintenance pushed back to tomorrow due to time restrictions

Tuesday
Maintenance on pumps are done
Strong winds cause an higher turbidity
Pumped 4 hours from H6 to H17 lake

Wednesday
Pumped 2,5 hours from H6 to H17 lake
14:00 4'' of water left above the suction of the h17 pump

Thursday
14:00 Measured depth of H17 and A54 to the deepest spots
18:00 Drop raw and effluent flow at 135 m³/h to prevent from taking air
22:00 T.S.S portable does'nt work good

Friday
Extension of the suction in H17
Starting of the treatment

Saturday
Switch to the spair electric generator

Operation stops / unplanned events

Date	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
16-sept	11:00	12:45	No more water a suction	level to low	yes
16-sept	14:30	03:45	TSS too high	tss	yes
17-sept	04:15	11:50	no electricity	power generator in default	yes
18-sept	13:20	17:30	TSS effluent at 11	TSS	yes

Weekly Operational Report

Project:	TE-1640 - Méliadine	Week of:		
		September 18, 2016	to	September 24, 2016
Dayshift Operator(s)	jordan manach, michel desy			
Nightshift Operator(s)	simon moreau			

	Volume treated (WWTP)	Volume discharged (EFFLUENT)	Raw water			Effluent				Total Products Consumption (L)	
			pH	Turbidity	T.S.S. (probe)	pH	Turbidity	T.S.S. (probe)	T.S.S (oven)	Fe2(SO4)3 Consumption	3419
Units	m³	m³		NTU	mg/L		NTU	mg/L			
Total	28877	28364								NaOH Consumption	1677,7
Average	172	171	6,98	4,79	31,39	7,86	1,40	3,09	5,54		
Minimum	133	94	6,48	2,54	8,86	109,75	0,59	1,43	4,09	Floc Consumption	125kg
Maximum	194	225	7,40	8,41	74,57	8,20	55,76	7,71	7,94		

Active treatment sequence	#1	Fe2(SO4)3	#2	NaOH	#3	Floc
ph / volume target						

Products inventory on site				
Fe2(SO4)3	19	Qty (L)	1900	
NaOH	16	Qty (L)	1600	
FLOC	35	Qte (kg)	875	

Weekly Overview
Sunday
begin of lots of rain
4h h6
Monday
Removed turbidity net from H17 suction, good tss results, much less sediment
more rain
6h45 h6
Tuesday
moved effluent pipeline
still raining, with wind
8h15 h6
Wednesday
michel desy became an operator
10h20 h6
Thursday
rise of the lake in h17
5h h6
Friday
h17 pumping postone to Monday
5h h6 39:20 total
Saturday
stopped treatment, tss very low
broke the tss probe
6h h6 45:20 total
10:00 stop injections of products
22:00 Geotube starting to rince itself and let Tss pass through it

Operation stops / unplanned events	Date	Start (hour)	End (hour)	Problematic Description	Cause (s)	Fixed / Solved
	18/09/2016	15:50	16:05	Tried to move the effluent pipeline	Request from Nuna and Larry	NO
	20/09/2016	15:00	16:00	Tried to move the effluent pipeline	Request from Nuna and Larry	yes
	21/09/2016	00:45	01:50	not leaking properly	not leaking properly	yes
	21/09/2016	09:00	13:00	Tss too high	lack of floc	yes
	24/09/2016	05:00	06:00	Tss too high	activate the	yes

APPENDIX E
OPERATION PROCEDURES

ASDR	***Framework for Sustainable Development*** ***Work Procedure***	***TE-1640 –WTP-Meliadine Project*** Revision #0
	Dewatering Methodology and Critical path	***Elaboration :*** *Dan Misiano*
		Approval : */*

Objective

This procedure aims to clearly define the dewatering methodology (pumping / treatment) applicable to the Meliadine project in order to ensure effluent discharge compliancy in regards to MMER.

Dewatering Methodology – Meliadine Project

Water treatment plant:
The water treatment plant utilized at the Meliadine site is a modular design featuring two modules (sea containers of 40'). Both modules make up the treatment plant with an operational capacity of 75 to 350 m³ / hour. The plant is equipped with 8 " interior piping (baffle) and various injection points for the treatment of T.S.S., metals, as well as pH adjustment. At any time, the treatment plant can operate in "T.S.S. treatment" mode or in "T.S.S. and Metals treatment" (iron, zinc, lead, copper, etc.).

Dewatering Methodology – pumping and parameter monitoring:
With respect to the Meliadine project, the developed strategy is to perform sequential pumping of water bodies (H6 & H17) without applying treatment; insofar as the parameters of the raw water coming out of the ASDR WWTP (pH, turbidity, T.S.S. & metals) are in compliance with the MMER standards.

The sequential pumping sequence will be as follows:

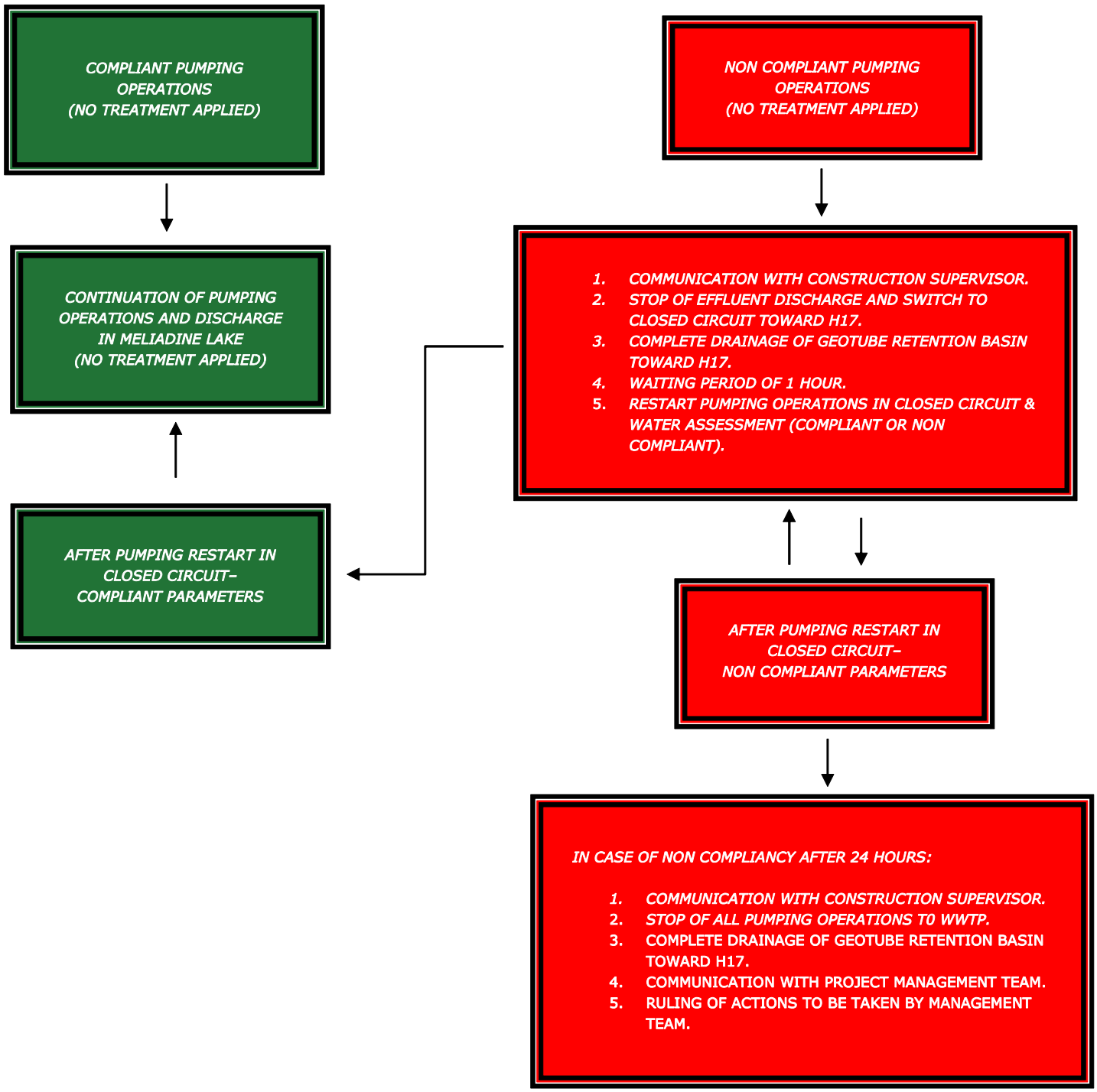
1. *Pumping of H17 to ASDR WWTP (no treatment) and effluent discharge in Meliadine Lake (all while monitoring T.S.S to ensure concentrations remain below 15 mg / L);*
2. *Pumping of H6 to H17;*
3. *Pumping of H17 (containing H6 water) to ASDR WWTP (implementing treatment) and effluent discharge in Meliadine Lake;*

Dewatering Methodology – proposed treatment process:
In case of non-compliance of raw water parameters, the proposed treatment process will be adapted according to the source of contamination (T.S.S. or metals);

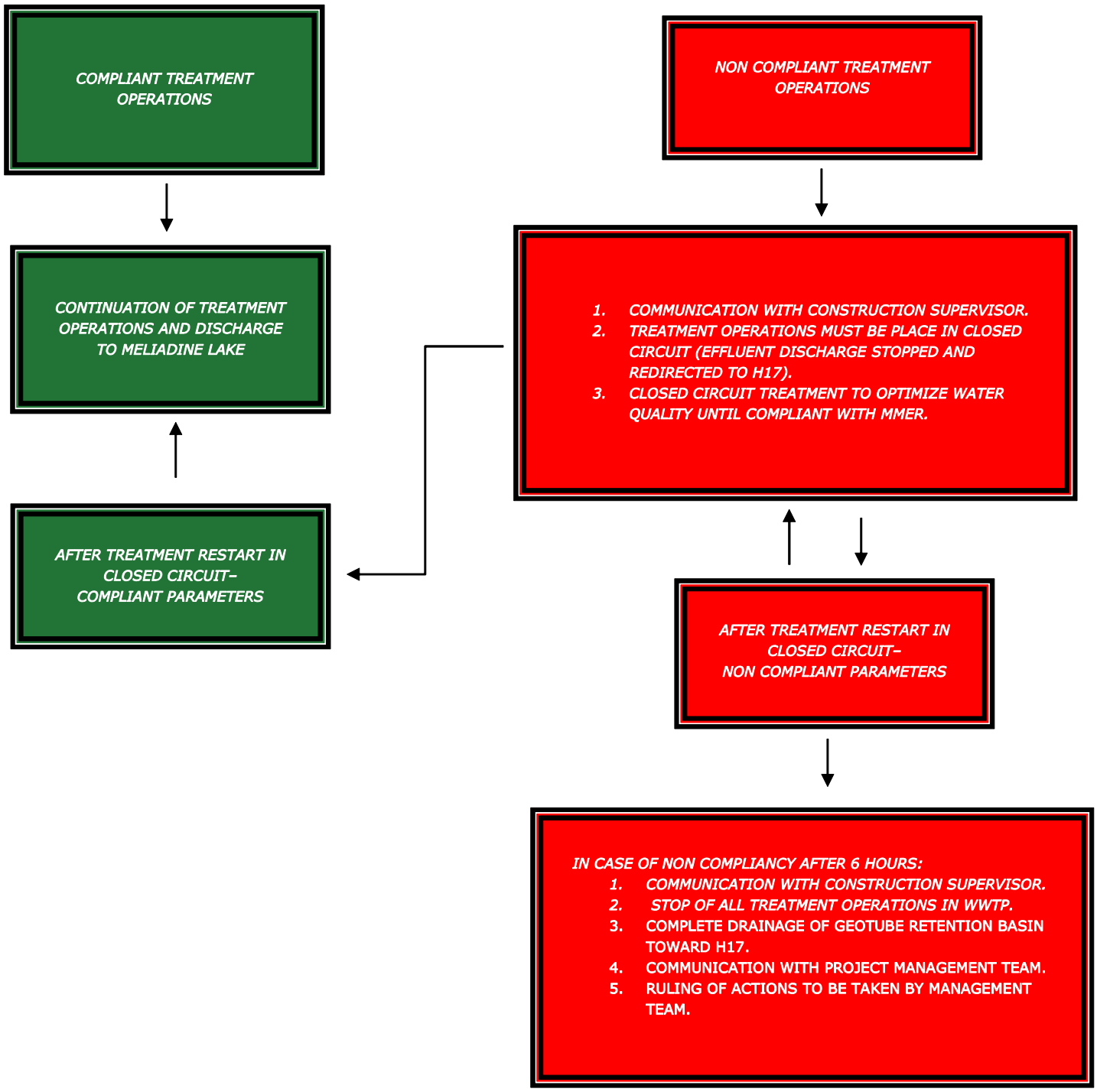
Validation of Compliance:
During operations, the compliance of water discharged to the Meliadine Lake (effluent) will be validated by:

1. *Hourly monitoring of water parameters (pH, turbidity, T.S.S. & metals) by the ASDR operation team.*
2. *The analytical results received from external laboratory assays as part of the weekly and monthly monitoring of the MMER.*

Critical Path (pumping operations)



Critical Path(treatment operations)



Transmission of information et commitment

Attestation of Training / Information and Engagement

I, the undersigned, claim to have read and understood the present document and am committed to respect the work procedure at all times.

Date	*Supervisor name*	*Supervisor signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
Date	*Name*	*Worker signature*
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Date	*Name*	*Worker signature*

ASDR	***Framework for Sustainable Development*** ***Work Procedure***	***TE-1640 –WTP-Meliadine Project*** Revision #0
	Sampling Schedule of Effluent (MMER)	***Elaboration :*** *Dan Misiano*
		Approval : */*

Objective

This procedure aims to define the sampling schedule of the effluent prescribed by the MMER during the pumping / treatment operations while on Meliadine mine site and to validate the proper method of sampling and identifying the samples in question.

General Considerations

- *Always wear nitrile gloves while sampling as there are corrosive products in certain bottles and to avoid contamination of the sample in question.*

References

- *Metal Mining Effluent Regulation (MMER) – June 2016.*

Procedure

Necessary Resources

Necessary Materials
• *Sampling bottles (differing depending on analysis required)* • *Nitrile gloves* • *Black permanent marker*

Protection Equipment	*Security*	*Training*
	N.D.	N.D.

Scope of the Procedure

Sampling Scheduled (MMER) planned by ASDR:

In the aim to respect the schedule prescribed by the MMER, the sampling will be comprised of the following studies:

1. ***Study 1A-Sampling of Deleterious Substances (at a frequency of 1 sample a week)***

The analysis includes of the following parameters:

a. *pH*
b. *see Schedule 4 :*

SCHEDULE 4

(Section 3, paragraph 4(1)(a), subsections 12(1) and (3), section 13, subsections 15(1), 19.1(1) and 20(1), paragraphs 21(2)(b) and (f), 24(1)(a) and 34(1)(b), subsection 34(3), paragraphs 34(4)(a) and (5)(a) and (b), 35(2)(b), 36(d) and 37(1)(a) and Schedules 5 and 7)

Authorized Limits of Deleterious Substances

	Column 1	Column 2	Column 3	Column 4
Item	Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
1	Arsenic	0.50 mg/L	0.75 mg/L	1.00 mg/L
2	Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
3	Cyanide	1.00 mg/L	1.50 mg/L	2.00 mg/L
4	Lead	0.20 mg/L	0.30 mg/L	0.40 mg/L
5	Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
6	Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
7	Total Suspended Solids	15.00 mg/L	22.50 mg/L	30.00 mg/L
8	Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L

NOTE: All concentrations are total values.

SOR/2006-239, s. 25.

**With the exception of Cyanide (see paragraph (3) of section 2 of Metal Mining Effluent Regulation).*

*(**Reference** – Schedule 4: Metal Mining Effluent Regulation (MMER) – June 2016)*

2. ***Study 1B-Sampling for acute toxicity tests (at a frequency of 1 sample a month)***

The analysis includes the following parameters:

a. *determination of acute lethality tests on rainbow trout;*
b. *determination of acute lethality tests on daphnia magna;*

*(**Reference** – Section 2, point 14: Metal Mining Effluent Regulation (MMER) – June 2016)*

3. ***Study 2A-Sampling for characterisation of Effluent (at a frequency of 1 to 4 samples a year / period of effluent discharge)***

The analysis is compromised of the following parameters:

a. *Hardness*
b. *Alkalinity*
c. *Conductivity*
d. *Temperature*
e. *The following deleterious Substances (in total values) :*
    1. *Aluminium*
    2. *Cadmium*
    3. *Iron*
    4. *Mercury (* does not need to be taken following 12 straight sample analysis with a concentration lower than 0,10 µg/L)*
    5. *Molybdenum*
    6. *Selenium*
    7. *Ammonia*
    8. *Nitrate*

**This sampling is planned for two samplings sessions, which will coincide with the sampling dates of the acute toxicity tests.*

*(**Reference** – Schedule 5, part 1 paragraph 4 (1): Metal Mining Effluent Regulation (MMER) – June 2016)*

4. ***Study 2B-Sampling for sublethal toxicity testing (at a frequency of 1 or 2 samples a year / period of discharge of the effluent)***

The analysis includes the following parameters:

a. *Test for Measuring the Inhibition Growth Using Freshwater Alga Selenastrum capricornutum (Report EPS 1/RM/25),*
b. *Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, Lemna minor (Reference Method EPS 1/RM/37),,*
c. *Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia (Report EPS 1/RM/21),*
d. *Test of Larval Growth and Survival Using Fathead Minnows (Report EPS 1/RM/ 22),*

** This sampling is planned for two samplings sessions, which will coincide with the sampling dates for the sampling of acute toxicity and characterisation of the effluent.*

*(**Reference –** Schedule 5, part 1 paragraph 5 (1): Metal Mining Effluent Regulation (MMER) – June 2016)*

Sampling Calendar

Study :	**Sampling Location:**	**Parameter :**	**Number of Samples Planned :**	**Sampling Calendar :**					
				August 17-23	**August 24-30**	**August 31-September 6**	**September 7-13**	**September 14-20**	**September 21-27**
1A	***Final Effluent (Meliadine)***	***Deleterious substances & site measures***	***6***	***X***	***X***	***X***	***X***	***X***	***X***
1B	***Final Effluent (Meliadine)***	***Acute Toxicity***	***2***	***X***				***X***	
2A	***Final Effluent (Meliadine)***	***Effluent Characterisation & deleterious substances***	***2***	***X***				***X***	
2B	***Final Effluent (Meliadine)***	***Sublethal Toxicity***	***1***	***X***				***X***	

Sampling

#	Step	Description	Risk Management or advice
1	*Preparation of sampling bottles*	• *Prepare the bottles needed based on the sampling and analysis to be done beforehand.*	
2	*Preparing SST*	• *It is important to always wear nitrile gloves before any handling of the sampling bottles to avoid any potential chemical burns (preservatives that are found inside certain bottles) and to avoid contaminating the sample.*	
3	*Sampling*	• *The sampling of the effluent is ALWAYS done at the site validated by the C.A. (effluent) of the site.* • *Fill the sampling bottles with the aid of a second uncontaminated bottle that has been set aside for this purpose(2nd T.S.S. / pH bottle is acceptable)*	*Never sample effluent directly from Geotube® or take water directly on the pad*
4	*Identifying Samples*	• *Identify the sample with a black permanent marker to avoid fading or loss of writing.* * *Data to indicate on bottles:* 1. *Parameters to be analyzed :* 2. *Date & time of sampling;* 3. *Name of sample;* 4. *Name of person who took the sample;* 5. *Client;* 6. *Project number;*	
5.	*Registering sampling data in the ASDR report*	• *The data must be registered in the Excel file prepared for this activity.*	
6.	*Storing Samples*	• *Once the sample has been collected and identified, it must be stored at a predetermined location by the client.*	
7.	*Notifying Environmental services*	• *Once the sample stored at the predetermined location the foreman must be contacted (ideally both written and verbal) as to transfer the responsibility and the charge of the items.*	

Transmission of information and engagement

Attestation of Training / Information and Engagement		
I, the undersigned, claim to have read and understood the present document and am committed to respect the work procedure at all times.		
Date	Supervisor name	Supervisor signature
Date	Name	Worker signature
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APPENDIX F
GENERAL CONDITIONS

GENERAL CONDITIONS

GEOTECHNICAL REPORT

This report incorporates and is subject to these “General Conditions”.

1.1 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of TETRA TECH’s Client. TETRA TECH does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than TETRA TECH’s Client unless otherwise authorized in writing by TETRA TECH. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the report, if required, may be obtained upon request.

1.2 ALTERNATE REPORT FORMAT

Where TETRA TECH submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed TETRA TECH’s instruments of professional service); only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by TETRA TECH shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of TETRA TECH’s instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except TETRA TECH. TETRA TECH’s instruments of professional service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

1.3 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.4 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.5 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.6 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of testholes and/or soil/rock exposures. Stratigraphy is known only at the locations of the testhole or exposure. Actual geology and stratigraphy between testholes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

1.7 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.8 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.9 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

1.10 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.11 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.12 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

1.13 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.14 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of the report, TETRA TECH may rely on information provided by persons other than the Client. While TETRA TECH endeavours to verify the accuracy of such information when instructed to do so by the Client, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information which may affect the report.