SPILL CONTINGENCY PLAN

Water Treatment Plant

Municipality of Kimmirut
Attn: John Mabberi - Mudonyi, CAO
P.O. Box 120
Kimmirut, NU X0A 0N0
T: 867-939-2247 / saokim@qiniq.com

By : Rhéa Fauteux, P.Eng.

June 15, 2021

Sifec North Inc.
P.O. Box 556
Rankin Inlet, NU X0C 0G0
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Sifec North Inc.
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SCHEDULE OF WORK

KIMMIRUT
New Genset Installation
SOA
SCHEDULE

Scheduled
15-06-2021

	April	May	2021-06-15	2021-06-16	2021-06-17	2021-06-18	2021-06-19	2021-06-20	2021-06-21	2021-06-22	2021-06-23	2021-06-24	2021-06-25	2021-06-26	2021-06-27	2021-06-28	2021-06-29	2021-06-30
Contract Signature																		
Kick-Off Meeting																		
Shop Drawing Submittal																		
Ordering																		
Packaging & Air Shipment																		
Electrical Permit																		
Building Permit																		
Schedule - Information to client																		
Nunavut Court of Justice (Extra Lodging Not Available)			N/A															
Mobilisation																		
Work Preparation																		
Prevention - Spill Kit Installation																		
Old Genset Emptying of Fluids																		
Spill Kit Install																		
Old Day Tank Emptying																		
Spill Kit Install																		
Old Exterior Fuel Line Emptying and Dismantlement																		
Old Genset Electrical Disconnect																		
Spill Kit Install																		
Inside Building Old Genset Fuel Line																		
Spill Kit Install																		
Inside Existing Day Tank Disconnect																		
New Genset Isolator																		
New Genset Installation																		
New Fuel Day Tank Installation																		
New Fuel Piping Installation																		
Electrical Connections																		
New Ventilation Duct for Genset																		
New Main Tank Gravel Pad																		
New Main Tank Spill Containment																		
New Main Tank Structure																		
New Main Tank Installation																		
New Piping Between Main Tank and Day Tank																		
Pipe Support																		
Vent																		
New Fuel Line Between Day Tank and Burner																		
New Fuel Pipe Cleaning																		
Mechanical Hydrostatic Testing 5 psi																		
Instrumentation (Level Switch)																		
Control/Electrical Wiring																		
Control Panel Installation																		
Filling Main Tank & Day Tank																		
Fuel Control Panel Testing																		
Spare Parts																		
System/Genset Commissioning																		
O&M (Operation & Maintenance Manual)																		
Training																		
De-Mobilisation																		

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1 TARGETED EQUIPMENT

For Diesel Fuel & Ethylene Glycol

a. Old Genset

b. 1 Old Storage Tanks 1200L

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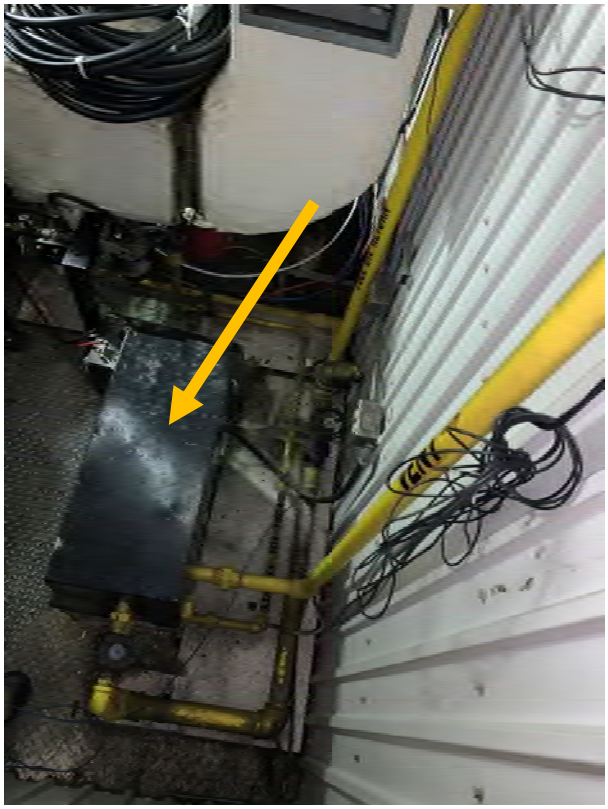
a. 1 Existing Auxiliary Day Tanks 60L



c. Existing Exterior Piping to be removed:

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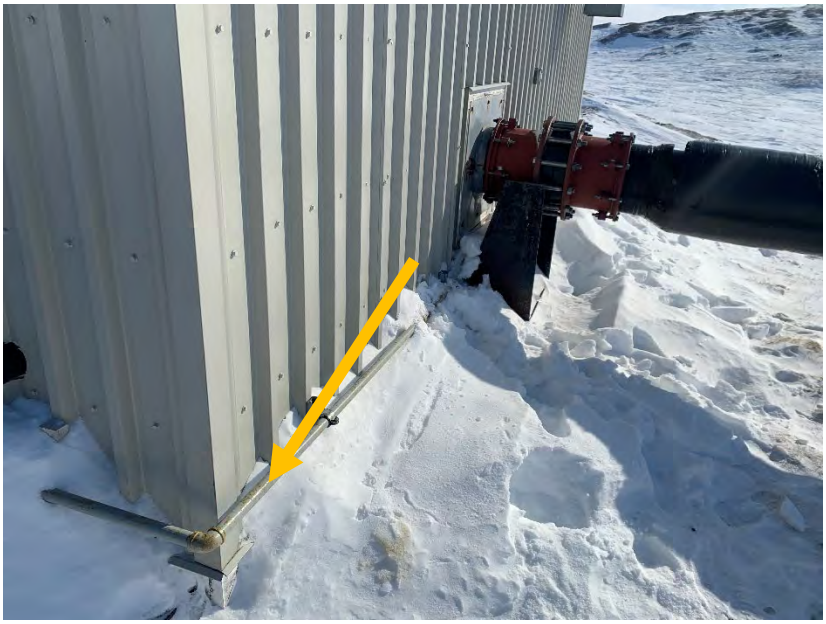

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d. Existing Interior Piping to be removed:

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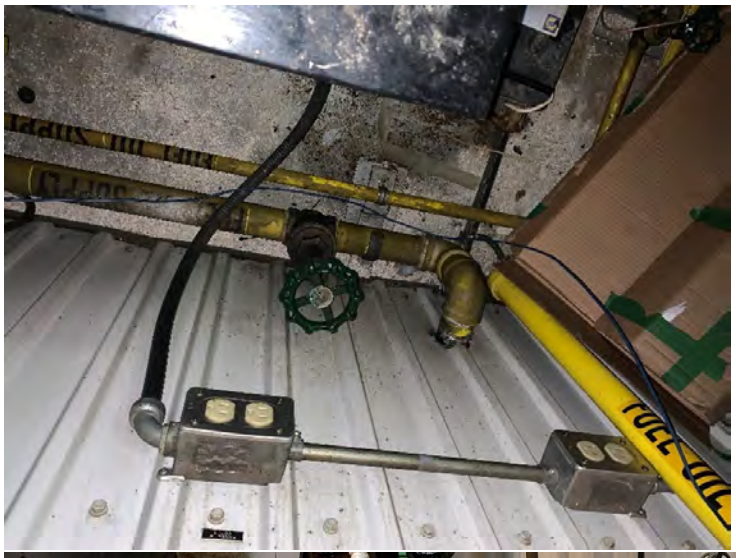

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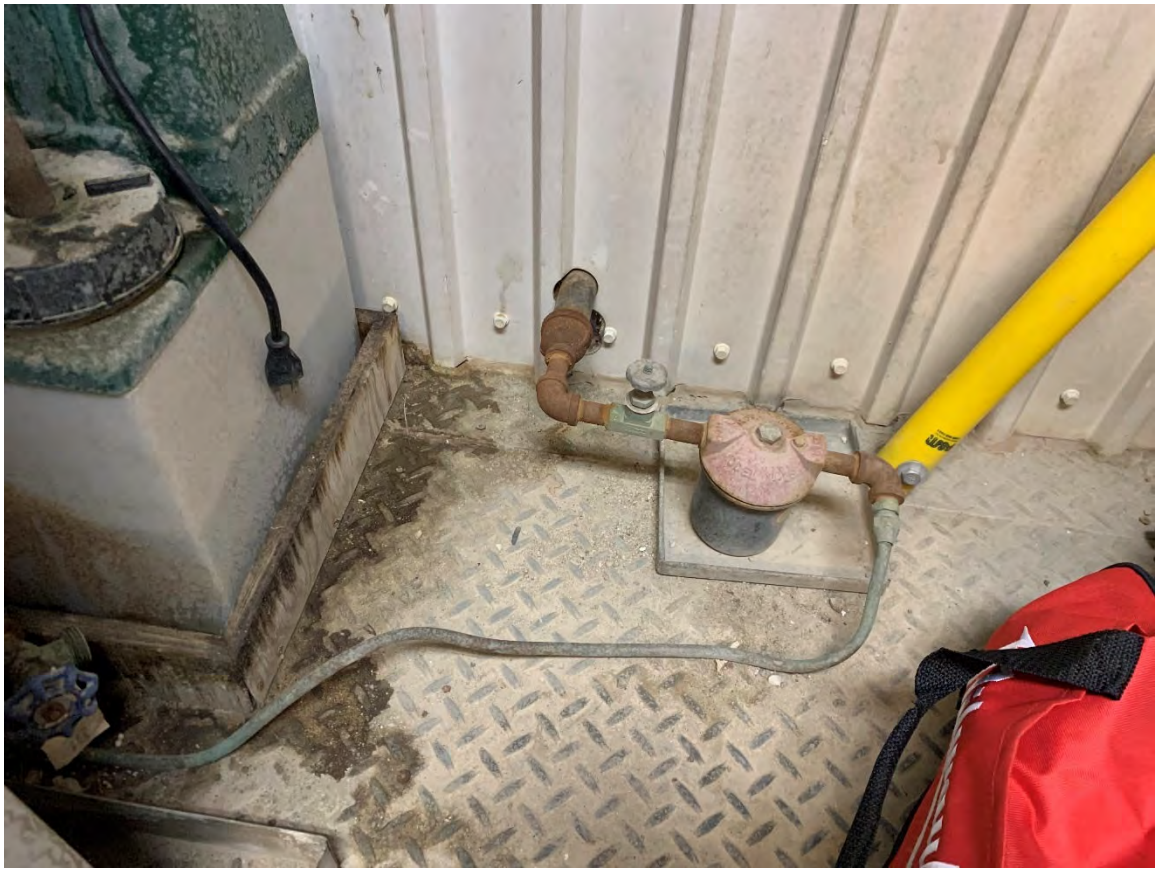

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e. New Genset

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Diesel Generator Set

MTU 3R0096 DS30

30 kWe/60 Hz/Standby/208 - 600V
Reference MTU 3R0096 DS30 (27 kWe) for Prime Rating Technical Data

System ratings

Voltage (L-L)	240V †	208V †	240V †	380V †	480V †	600V
Phase	1	3	3	3	3	3
PF	1	0.8	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
kW	30	30	30	30	30	30
kVA	30	37	37	37	37	37
Amps	125	104	90	57	45	36
skVA@30% voltage dip	65	142	142	187	187	142
Generator model	285PSL1700	285PSL1700	285PSL1700	285PSL1700	285PSL1700	284PSL5252
Temp rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD DOUBLE DELTA	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	12 LEAD WYE	4 LEAD WYE

† UL 2200 offered

Certifications and standards

- Emissions
  - EPA Tier 3 certified
- Generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004
- Seismic certification – optional
  - IBC certification
- UL 2200 – optional (refer to *System ratings* for availability)
- CSA – optional
  - CSA C22.2 No. 100
  - CSA C22.2 No. 14
- Performance Assurance Certification (PAC)
  - Generator set tested to ISO 8528-5 for transient response
  - Verified product design, quality and performance integrity
  - All engine systems are prototype and factory tested
- Power rating
  - Accepts rated load in one step per NFPA 110

A Rolls-Royce solution

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Standard features*

- MTU is a single source supplier
- Global product support
- 2 year standard warranty
- 3029TFG89 diesel engine
  - 2.9 liter displacement
  - 4-cycle
- Engine-generator resilient mounted
- Complete range of accessories
- Cooling system
  - Integral set-mounted
  - Engine-driven fan
- Generator
  - Brushless, rotating field generator
  - 2/3 pitch windings
  - 300% short circuit capability with optional Permanent Magnet Generator (PMG)
- Digital control panel(s)
  - UL recognized, CSA certified, NFPA 110
  - Complete system metering
  - LCD display

Standard equipment*

Engine

- Air cleaners
- Oil pump
- Oil drain extension and S/O valve
- Full flow oil filter
- Fuel filter with water seperator
- Jacket water pump
- Thermostat
- Blower fan and fan drive
- Radiator - unit mounted
- Electric starting motor - 12V
- Governor – mechanical droop
- Base - formed steel
- SAE flywheel and bell housing
- Charging alternator - 12V
- Battery box and cables
- Flexible fuel connectors
- Flexible exhaust connection
- EPA certified engine

Generator

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- Self-ventilated and drip-proof
- Superior voltage waveform
- Solid state, volts-per-hertz regulator
- ±1% voltage regulation no load to full load
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- 130 °C maximum standby temperature rise
- 1-bearing, sealed
- Flexible coupling
- Full amortisseur windings
- 125% rotor balancing
- 3-phase voltage sensing
- 100% of rated load - one step
- 5% maximum total harmonic distortion

Digital control panel(s)

- Digital metering
- Engine parameters
- Generator protection functions
- Engine protection
- Windows®-based software
- Multilingual capability
- Remote communications to RDP-110 remote annunciator
- Programmable input and output contacts
- UL recognized, CSA certified, CE approved
- Event recording
- IP 54 front panel rating with integrated gasket
- NFPA 110 compatible

* Represents standard product only. Consult the factory/MTU Distributor for additional configurations.

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Application data

Engine	
Manufacturer	John Deere
Model	3029TFG89
Type	4-cycle
Arrangement	3-inline
Displacement: L (in^3)	2.9 (177)
Bore: cm (in)	10.6 (4.2)
Stroke: cm (in)	11 (4.3)
Compression ratio	17.2:1
Rated rpm	1,800
Engine governor	mechanical droop
Maximum power: kWm (bhp)	35 (47)
Speed regulation	± 1%
Air cleaner	dry

Liquid capacity (Lubrication)	
Total oil system: L (gal)	8 (2.1)
Engine jacket water capacity: L (gal)	5.7 (1.5)
System coolant capacity: L (gal)	11.4 (3)

Electrical	
Electric volts DC	12
Cold cranking amps under -17.8 °C (0 °F)	925

Fuel system	
Fuel supply connection size	5/16" ID/-6 JIC
Fuel return connection size	5/16" ID/-6 JIC
Maximum fuel lift: m (ft)	2 (6.6)
Recommended fuel	diesel #2
Total fuel flow: L/hr (gal/hr)	111.3 (29.4)

Fuel consumption	
At 100% of power rating: L/hr (gal/hr)	9.9 (2.6)
At 75% of power rating: L/hr (gal/hr)	7.5 (2)
At 50% of power rating: L/hr (gal/hr)	5.2 (1.4)

Cooling - radiator system	
Ambient capacity of radiator: °C (°F)	50 (122)*
Maximum restriction of cooling air: intake and discharge side of radiator: kPa (in. H_2O)	0.12 (0.5)
Water pump capacity: L/min (gpm)	110 (29)
Heat rejection to coolant: kW (BTUM)	20.1 (1,144)
Heat radiated to ambient: kW (BTUM)	4.3 (245)
Fan power: kW (hp)	0.7 (0.94)

* Installation of a gravity exhaust louver in a Level 3 enclosure will reduce the ambient capacity of the cooling system by 5 °C (9 °F).

Air requirements	
Aspirating: *m^3/min (SCFM)	3.6 (127)
Air flow required for radiator cooled unit: *m^3/min (SCFM)	46.7 (1,636)
Remote cooled applications; air flow required for dissipation of radiated generator set heat for a maximum of 25 °F rise: *m^3/min (SCFM)	15.8 (553)

* Air density = 1.184 kg/m^3 (0.0739 lbm/ft^3)

Exhaust system	
Gas temp. (stack): °C (°F)	580 (1,076)
Gas volume at stack temp: m^3/min (CFM)	8.3 (293)
Maximum allowable back pressure at outlet of engine, before piping: kPa (in. H_2O)	7.5 (30)

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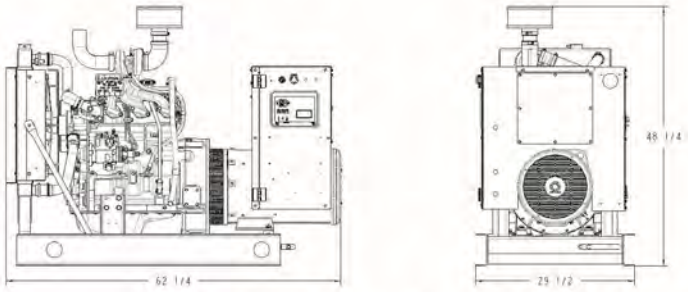
Weights and dimensions



Drawing above for illustration purposes only, based on standard open power 480 volt generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (L x W x H)	Weight (dry/less tank)
Open power unit (OPU)	1,581 x 749 x 1,226 mm (62.3 x 29.5 x 48.3 in)	736-995 kg (1,623-2,194 lb)

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific generator set.

Sound data

Unit type	Standby full load
Level 0: Open power unit: dB(A)	72.2

Sound data is provided at 7 m (23 ft). Generator set tested in accordance with ISO 8528-10 and with infinite exhaust.

Emissions data

NO_x + NMHC	CO	PM
4.41	0.44	0.11

All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, measuring instrumentation, etc. The data was obtained in compliance with US EPA regulations. The weighted cycle value (not shown) from each engine is guaranteed to be within the US EPA standards. 5-mode emission data per 40 CFR 89 or 40 CFR 1039 (as applicable) is available upon request.

Rating definitions and conditions

- Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 3046-1, BS 5514, and AS 2789. Average loadfactor: ≤ 85%.
- Consult your local MTU Distributor for derating information.

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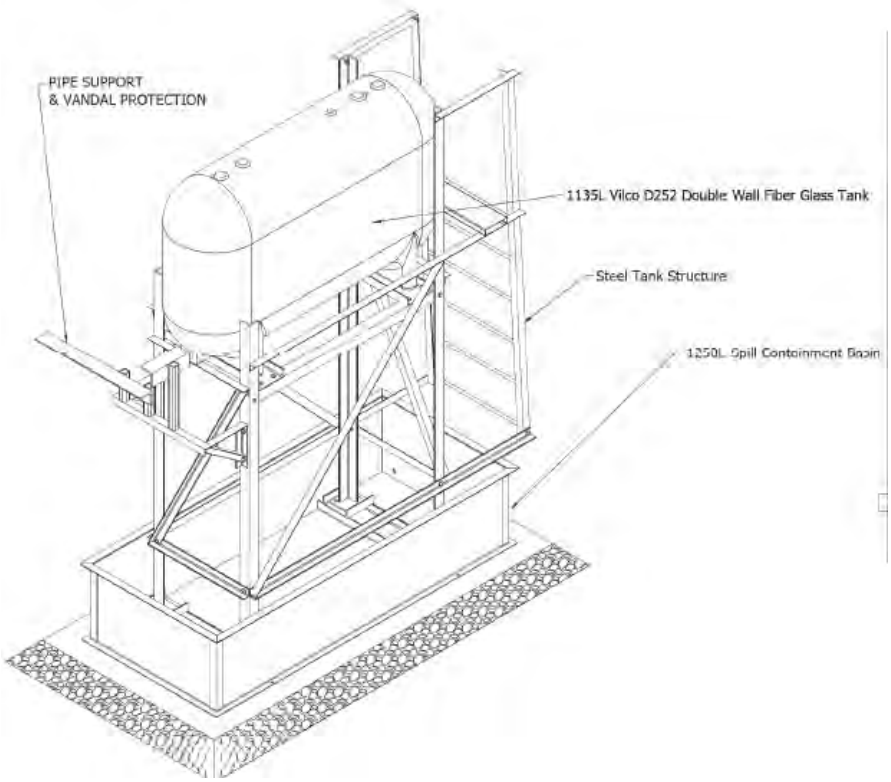
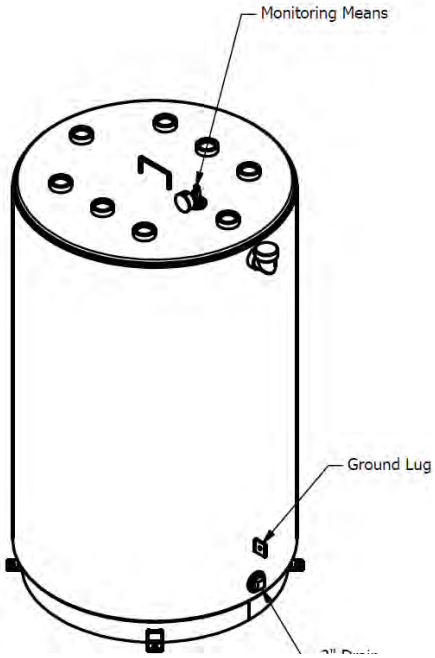
f. 1 New Main Storage Tank 1135L



g. 1 New Auxiliary Tank 200L:



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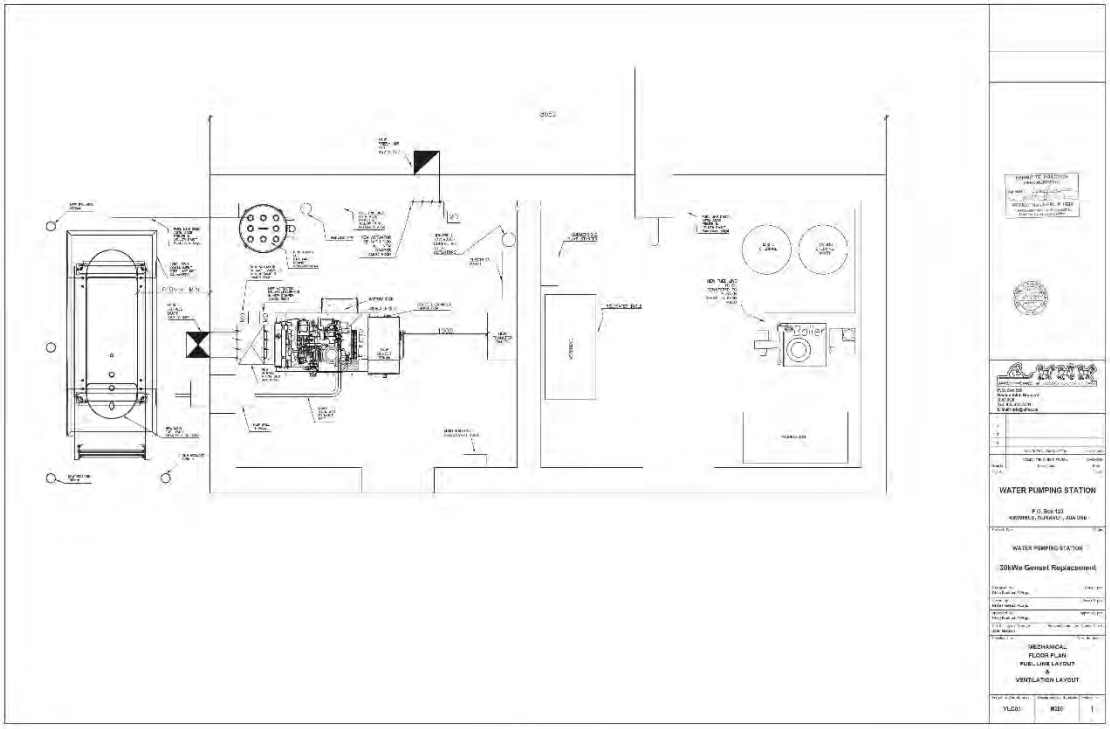
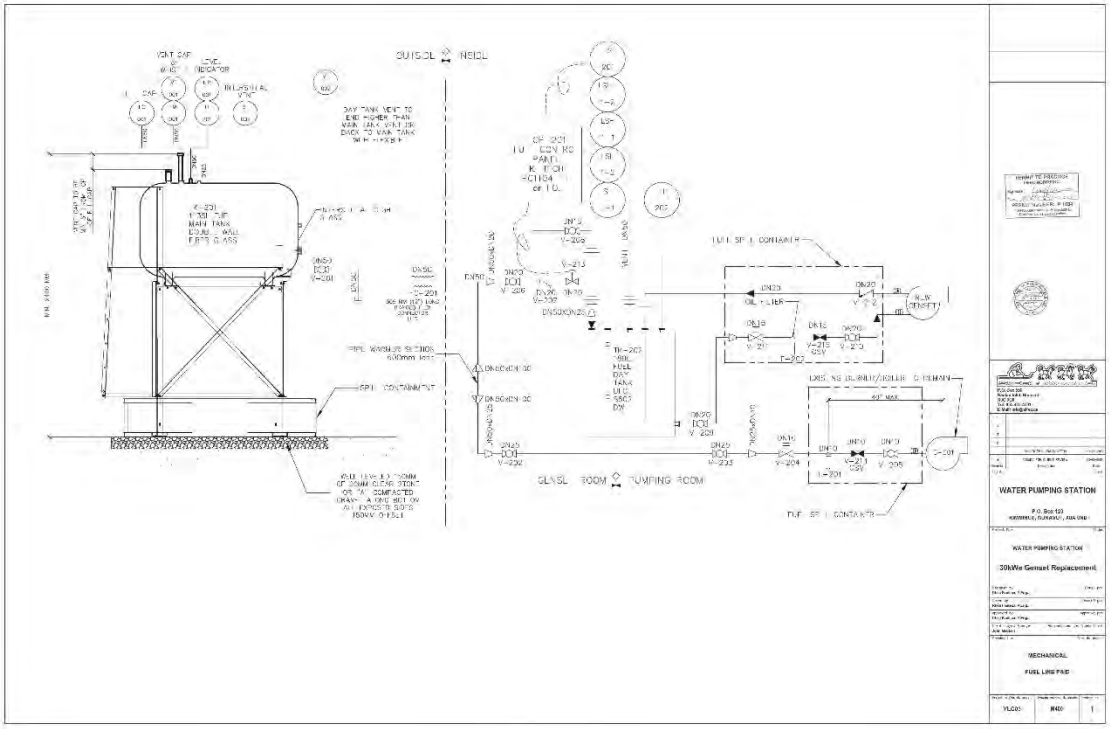
2 PLANS





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3 METHODOLOGY

Spill Kit to be in proximity for all steps:

- Inform client of equipment to be dismantled and duration of shut down.
- The Water pumping station is located near the community potable water reservoir. It is extremely important and mandatory to prevent any fuel or glycol spills.
- Validate if Emergency Electrical Unit Heaters are functioning.
- Permanently disconnect old genset (Lock Out Tagout)
- Permanently disconnect old fuel pumps.
- Disconnect oil burning equipment.
- Close necessary valves to empty the system.
- Completely empty the fuel system, Existing Main Tank and Existing Day Tank.
- Empty all fuel pipes from the section to be dismantled.
- Clean old piping and old fuel tank.
- Supply and Installation of new fuel system (day tank, main tank, new conduits, new valves as per plans).
- Cleaning, Flushing of new sections.
- Inspect the tank vent before starting operations.
- Verification that all pipe connections are correctly installed and inspected to prevent any spills.
- Hydrostatic Testing of new piping sections 5 psig as per CSA B139.
- Diesel-Fuel is delivered directly to new clean day tank.
- Start the filling operation.
- Testing of direct fill to Day Tanks with control panel.
- During the filling operation, ensure there are no leaks.
- Perform complete testing & partial commissioning.
- Complete the fuel transfer from old main tank to new main tank using temporary pump kit.
- Make sure every connection is securely tightened.
- Flush and clean old pipe sections as per regulations.
- Provide training to the operator.
- Provide O&M manual to client.
- Provide Spare Parts (Genset and Fuel System).

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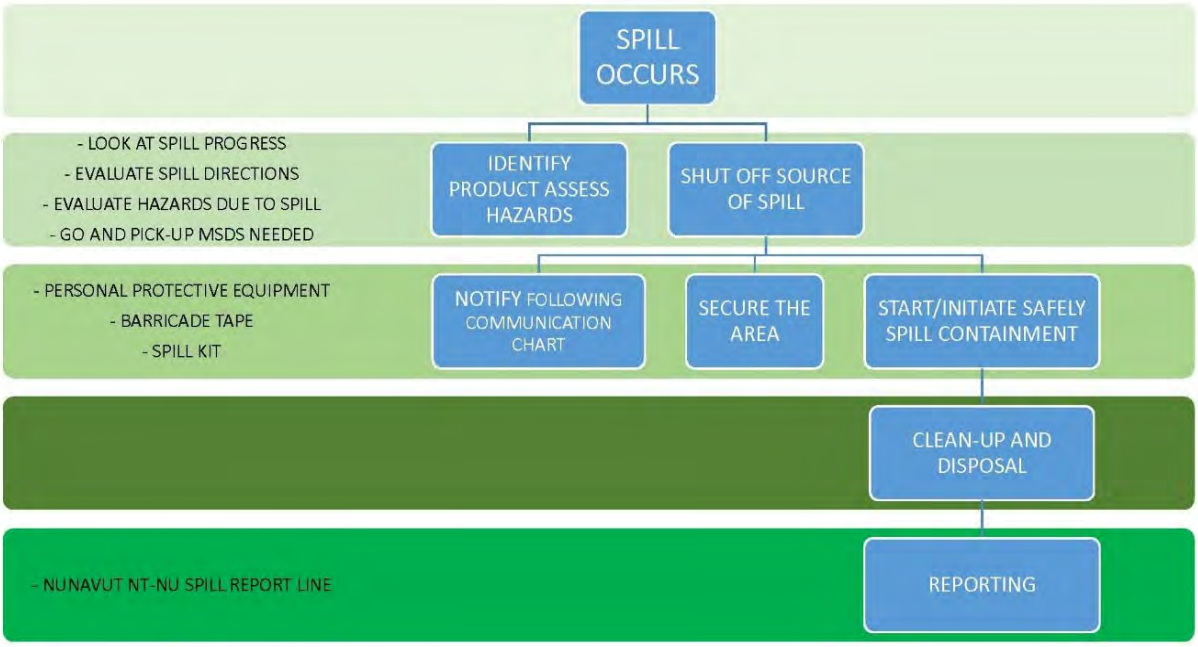
4 PROCEDURE IN THE EVENT OF A SPILL



No matter the size of the spill, minor or major, all spills must be reported

4.1 Communication:

- SIFEC PROJECT MANAGER
  Rhéa Fauteux
  Cell: 514-207-7012

- SIFEC SITE PIPE FITTER
  Robert Ménard
  Cell: 613-673-1078

- SIFEC SITE ELECTRICIAN
  Sylvain Lavoie
  Cell: 418-456-8703

- KIMMIRUT SAO
  John Stephen Mabberi
  Cell: 867-939-2247

- GOVERNMENT OF NUNAVUT OFFICER
  Gord Marinic
  Cell: 867-975-5495

- NUNAVUT ENVIRONMENT
  SPILL REPORT LINE
  867-920-8130

4.2 Spill Containment Material:

An emergency spill kit (45 gallon drums pre-identified) are available on site.

This kit is made of the following items:

- 50 sorbent pads
- 3 sorbent booms (5'' x 10')
- 5 sorbent socks (3'' x 4')
- 1 bag granular sorbent
- 1 neoprene drain cover
- 5 disposal bags
- 1 retractable shovel
- 2 pairs gloves
- 2 pairs safety goggles
- 2 Tyvek suits

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4.3 Spill Report Form:

https://www.gov.nu.ca/environment/documents/nt-nu-spill-report-form-pdf

Northwest Territories | Nunavut | Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT; OR	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM / TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION / ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION: STATION OPERATOR	EMPLOYER	LOCATION CALLED: YELLOWKNIFE, NT	REPORT LINE NUMBER: (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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SIFEC NORTH INC. PROJECT RISK SAFETY ANALYSIS		
Form HS 101	Revision 0	Date: 15-06-2021

Project Number:		Date
Analysis By:	Rhéa Fauteux, P.Eng.	15-06-2021
Reviewed by HSE:		

Description of work:

- **Supply & Installation of Fuel Piping**
- **Main Fuel Tank Small Foundation.**
- **Installation of electrical and mechanical equipment.**

Step 1: Identify the Hazards

☐ Working at heights	☐ Environmental impact
☒ Mobile equipment	☐ Overhead powerlines
☒ Fire/explosion hazard	☐ Public access
☐ Trenching	☒ Lighting
☐ Energized Equipment	☐ Communication
☐ Traffic	☒ Tools/equipment
☐ Cranes and rigging	☒ Mechanical
☐ Dangerous chemicals/WHMIS products	☐ Extreme weather conditions
☒ Ground disturbance	☐ Other:

Step 2: Assess the Level of Risk (See definitions on page 2)

Risk Probability	Risk Severity				
	Catastrophic A	Critical B	Moderate C	Minor D	Negligible E
5 - Frequent	5A	5B	5C	5D	5E
4 – Likely	4A	4B	4C	4D	4E
3 - Occasional	3A	3B	3C	3D	3E
2 - Seldom	2A	2B	2C	2D	2E
1 - Improbable	1A	1B	1C	1D	1E

Step 3: Control the Risk

Hazard	Risk Level	Control Measure
Grinding, Cutting	1B	Welding must be done away from fueling zone. An extinguisher ABC minimum 10L must be in reach within a 5s period. Fire watch for. 30 minutes after completion of work. Make sure there are no combustible materials nearby (i.e. oil, rags, gasoline, paper,

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		dry grass, etc.). Work in a ventilated space.
Electrical Hazards – LOCKOUT AND TAGGING	1A	Identifying all energy sources that may affect the work and work area; redirecting or stopping the energy from doing what it is normally intended to do; physically preventing the accidental reenergizing of the system and verifying for zero energy. Individual involved in the work is accountable for his/herself when ensuring that before work begins, the required energy isolating devices are: In place to isolate and control hazardous energy; locked in place with their own personal locks; and then tagged.
Grinding Dust	3C	An eyewash bottle must be available on site. Employees using a grinder must were a face shield to prevent dust from entering the eyes.
Environmental Spill	2C	Before emptying any diesel fuel pipe or tank, make sure to have all the necessary mitigation items such as plugs, rags, Spill Kits and absorbents. Emptying, flushing, and cleaning all required pipes before any disposal.
MSDS Fuel	3C	Find Diesel Fuel MSDS.

PROBABILITY OF OCCURRENCE

Qualitative Definition	Meaning	Value
Frequent	• Likely to occur many times (occurred frequently) • Will be continuously experienced unless action is taken to change events	5
Likely	• Likely to occur sometimes (occurred infrequently) • The activity or event expected to occur 50-99% of the time. • Regulator likely to identify issue with minimal audit activity	4
Occasional	• Unlikely, but possible to occur (occurred rarely) 25-50% of the time • Potential for infrequent occurrence. Events are sporadic in nature	3

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	• Regulator have potential of issue discovery during focused or specialized review.	
Seldom	• Very unlikely to occur (not known it has occurred) • An activity or event that occurs intermittently, or 1-25% of time Not likely to happen (but could) • Regulator have low likelihood of issue identification during any general or focused review	2
Improbable	• Will only occur in exceptional circumstances	1

SEVERITY OF OCCURRENCE		
Term	**Meaning**	**Value**
Catastrophic	• Death, major environmental impact • Community state of emergency • System shutdown • Regulatory non-compliance resulting in legal action (fines/criminal charges)	A
Critical	• Serious injury, multiple injuries, large environmental impact • Serious impact to the community • Major property damage • Potential for serious regulatory non-compliance resulting in maximum fines	B
Moderate	• Lost time injury, environmental impact • Some impact to the community • Property Damage • Regulatory non-compliance resulting in directives or fines	C
Minor	• No anticipated injuries, environmental impact • Minimal impact to the community • Minor repair, maintenance issues • Regulatory non-compliance resulting in directives	D
Negligible	• No regulatory violation • No injuries, illnesses, property damage or environmental impact • No operational impact/community impact	E