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FCNQ PETRO INC.

TANK FARM SALLUIT

Reference: File 3215-22-18

Answers to the third set of questions and comments

MARCH 13, 2023

Sacré-Davey

In order to continue the analysis of our file, we submit to you thr answers to the third series of questions and comments received by email on January 18th, 2023.

1 - SOCIAL ISSUES

SAFETY AND ACCIDENT RISKS

QC3-1 – As requested in QC2-1 of the June 25, 2021 document, the promoter must carry out and provide the individual risk assessment in order to determine whether the risk levels correspond to the uses of the territory, as defined by the individual risk acceptability criterion developed by the Major Industrial Accidents Council of Canada in 1995 and reviewed in 2008 by the Chemical Engineering Society of Canada.

ANSWER :

See Annex 1 – Quantitative Risk Assessment Report – Salluit tank farm

PUBLIC CONSULTATION

QC3-2 – The promoter must inform and consult the population of the northern village of Salluit and share the concerns raised by them with regard to the project, in particular concerning potential nuisances (e.g. odors, air quality, etc.) and the apprehended risks (e.g. worries, feeling of insecurity, etc.). The promoter must also explain how he considered these concerns in the design of his project and what he intends to do if some of them persist despite the measures that will be applied to mitigate the risks and nuisances for the population.

ANSWER :

A public consultation finally took place on January 18th, 2023. A full report on this consultation is presented in the Annex.

See Annex 2 – Public Consultation Report

2 – BIOPHYSICAL ISSUES

ATMOSPHERIC EMISSIONS AND AIR QUALITY

QC3-3 – The promoter must demonstrate that he will comply with Article 44 of the RAA, namely the use of submerged filling lines in the gas tank. As requested in QC2-3 of June 25, 2021 document, the promoter must demonstrate, with supporting evidence (e.g. plans and specifications, photographs) that the filling pipes will be submerged or that they are if this provision is not already in place. Provide the detail of the filling line, in order to confirm compliance with article 44 of the RAA the use of submerged filling lines.

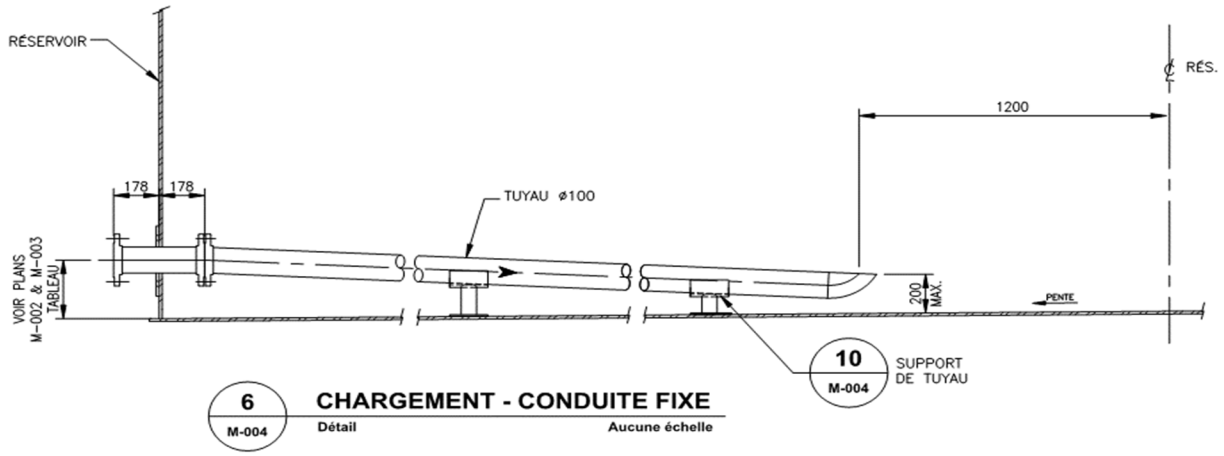
ANSWER :

Oil industry standards dictate that filling should be done from the bottom.

The petroleum product regulations (Chapter VIII of the Quebec Construction Code) read as follows:

8.129. A fill pipe installed on a tank that is to store motor fuel must extend to not more than 200 mm from the bottom of the tank and be fixed in such a way as to minimize vibration.
O.C. 220-2007, s. 1; O.C. 87-2018, s. 48.

The detail produced in the construction plans is such that:



Gasoline from the ship is introduced into the tank 200 mm from the floor.

The height of 200 mm roughly corresponds to the dead volume of the tank, that is, say the portion that cannot be drawn off. Thus, when filling the tank, the top of the bend will be just submerged when the tank has been emptied to the point of loss of suction (which is not desirable in the Nordic context since such a situation would correspond to a stock shortage).

In addition, the filling procedure requires a gradual increase in flow for a safe operation.

Section 8.129 is part of the inspection protocol leading to obtaining the operating permit from the RBQ. The existing tank farm is under permit.

QC3-4 – The promoter must confirm that he commits to carry out gasoline transfers in wind conditions that protect the population (2 m/s).

Considering the overruns of standards at sensitive receptors, in the event that unloading takes place when the wind speed is less than 2 m/s and in the direction of sensitive receptors, the promoter must also examine the possibility of planning a last resort alternative if unloading takes place under these conditions.

ANSWER :

Note that the speed has been revised to 2.5 m/s and in the direction of sensitive receptors following the update of the methodology for calculating emission rates according to maximum mass proportions.

If the derogation relating to the floating roof is accepted, FCNQ will add to the unloading procedures the conditions of wind speed and direction to allow the unloading of gasoline between the ship and the tank dedicated to this product. Weather equipment is available on the ships and weather conditions can be reconciled in the pre-unloading checklist. A windsock will be installed so that all participants can judge the unloading conditions.

The average annual wind speed is around 4 m/s. Thus, the minimum speed of 2.5 m/s is often exceeded and the problematic wind direction is rarely encountered.

Before the arrival of the ship, a follow-up of the weather forecast will therefore be carried out.

Note also that in the case of the scenario with an internal floating roof for gasoline, no particular measure is suggested given the low-modeled concentrations obtained.

QC3-5 – The promoter must justify why these contaminants have been excluded.

ANSWER :

The diesel fuel C9 18 -Alkane - branched and linear (CAS: 1159170-26-9) does not have a standard, criteria or threshold in the RAA. However, it has been added to the list of contaminants in the air dispersion modeling study and will be analyzed for all applicable time periods (1 hour, 8 hours, 24 hours and 1 year).

For Kerosene - Hydro desulfurized (CAS: 64742-81-0) as it is additive with Kerosene (CAS: 8008-20-6) in the Standards and Criteria table (Tab 2. Additivity) and both compounds can be present in the mixture at 100% the sum of both can never exceed the maximum of 100%.

Mélanges

Dénomination chimique	Nom commun et synonymes	Numéro d'enregistrement CAS	%
KÉROSÈNE (PÉTROLE)		8008-20-6	0 - 100
Kérosène (pétrole), hydrodésulfuré		64742-81-0	0 - 100

Thus, the maximum emission rate for Kerosene (Oil) considers all possibilities for these two compounds at their maximum. In order to avoid confusion, kerosene - hydrodesulfurized (CAS: 64742-81-0) has been modeled and has been added to the standards and criteria and results table.

QC3-6 – For the modeling scenario to reproduce the worst expected contaminant concentrations according to the period of application of the limit value in accordance with Appendix H of the RAA, the promoter must adjust the mass fractions for gasoline so that the molar fractions of the contaminants are maximal. The promoter must present an update of the atmospheric dispersion modeling that includes this adjustment.

ANSWER :

In order to take into account the highest concentrations of the substances in the different fuel types, we have revised the calculation of the emission rates. The maximum content of each substance is taken into account, and the sum of the mass fractions (theoretical maximums) exceeds 100%. The mass fractions are no longer adjusted to normalize the sum to 100%, resulting in an upward revision of the emission rates. For example, an increase in emission rates of 32% is noted for the gasoline ingredients. The new emission rates are considered conservative.

QC3-7 – The promoter must propose a project that complies with the regulations in force, planning to equip tank 2 with a floating roof. He must also produce and transmit an additional modeling scenario, which includes the gas tank with a floating roof. The promoter must also explain his intention in the event of obtaining the derogation from article 45 of the RAA.

ANSWER :

A new scenario with a floating roof on the fuel tank only has been added. The addition of a floating roof on this tank decreases the emission rates from this source by 93.41%. This percentage reduction is from the operator's study. By modeling these significantly lower emission rates, only isopentane exceeds its criteria at sensitive receptors during tank loading without considering attenuation for low winds. This exceedance is even lower than that found with a wind attenuation measure for a fixed roof. All the imposed limits are well respected considering the mitigation measure for winds below 2.5 m/s and a tank with internal floating roof. Based on these results, we do not recommend any specific mitigation measures for the scenario of unloading gasoline into an internal floating roof tank.

The updated results are presented in the attachment to this addendum.

We are of the opinion that the safe operation of a floating roof in an arctic climate has not been demonstrated and that Quebec regulations do not take into account this problem specific to Nunavik, but, in order not to delay the project further, we will plan the addition of the floating roof while pursuing our exemption request.

The risk of a disruption in the supply of all stored petroleum products appears to us to be greater in the event that the project is not carried out due to the refusal to authorize the project due to the absence of the floating roof. This is why, unless the derogation request is granted, the floating roof will be installed with the risk of a supply disruption for gasoline. These risks have already been exposed in the derogation request and the documents produced as part of this authorization request.

See Annex 3 – Table of final emission rates

QC3-8 – As this factor can have a significant impact on atmospheric dispersion, the promoter must present an update of the atmospheric dispersion modeling that includes this correction.

ANSWER :

The parameters used in the dispersion model were appropriate when modeling, i.e., σz = (building height) / 2.15. The values of σz listed in Table 6 of the report were incorrect and came from the first estimate of heights. These have been corrected, as shown below.

Modélisation ID	Réservoir correspondant	Description	Coordonnées centrales (UTM)		Élévation p/r mer	Hauteur[1] Source	Dmension[2] Latérale	σ_y [3]	σ_z [4]
			Est [m]	Nord [m]	[m]	[m]	[m]	[m]	[m]
R_1_EV_*	Réservoir #1 - Diesel	4 Évents col de cygne	466 179	6 897 334	12,0	9,88	0,09	0,021	4,60
R_9_EV_*	Réservoir #9 - Diesel	2 Évents col de cygne	466 164	6 897 243	13,1	9,98	0,18	0,041	4,64
R_10_EV_*	Réservoir #10 - Diesel	2 Évents col de cygne	466 159	6 897 219	14,0	9,98	0,18	0,041	4,64
R_11_EV_*	Réservoir #11 - Jet-A	2 Évents col de cygne	466 154	6 897 197	15,0	9,98	0,18	0,041	4,64

Note:
1. La hauteur de la source volumique correspond à la hauteur du bâtiment (réservoir), à laquelle on ajoute la moitié de la distance séparant la sortie du col de cygne du toit.
2 : La dimension latérale correspond à la dimension du col de cygne (côté d'un carré de même superficie que celle du col de cygne).
3 : Le σy est calculé comme la dimension latérale divisée par un facteur de 4,3 alors que le σz est calculé comme la hauteur du bâtiment divisé par un facteur de 2,15.
4 : Le σz est calculé comme la hauteur du bâtiment divisé par un facteur de 2,15.

QC3-9 – In order to position himself well with respect to the results of the atmospheric dispersion modeling, the promoter must specify what these factors are and which results of the tables were reduced by these factors, if certain results were corrected. The corrections made must also be justified. Only annual concentrations and exceedance frequencies can be corrected by a factor corresponding to the number of actual operating hours divided by the number of modeled hours.

ANSWER :

The correction factors multiplying the concentration results were removed. Instead, only emission rates on an annual basis have been calculated considering product loading and fugitive breath losses. The updated emission rates and results are presented as an attachment to this addendum. The new analysis of the results and conclusion result in a change in the minimum wind speed towards sensitive receptors from 2.0 m/s to 2.5 m/s due to the increase in the revised emission rates.

See Annex 4 – Table of combined results

QC3-10 – In order to verify compliance with article 197 of the RAA, it should be specified that if certain modeled concentrations exceed the standards or the criteria for the quality of the atmosphere in the next version of the modelling, the promoter must present a modeling scenario corresponding to the currently authorized activities in order to be able to compare with the concentrations resulting from the currently authorized situation.

ANSWER :

It should be noted that no authorization is currently issued for the site, due to the type of activity. However, the site is already discharging the various products into existing tanks. For gasoline, which shows higher modeled concentrations with its ingredients having higher vapor pressures, it is discharged by the ship at the same volume flow rate. This discharge actually occurs into two smaller and less voluminous tanks than the projected one that will replace them. Thus, since we

found in the dispersion model that sources with lower release heights had a greater impact on modeled concentrations, we can infer that the loading activity for the new gasoline tank will improve the situation.

In addition, adding tanks does not cause any problems with the annual standards or criteria, as the results with more tanks meet the limits.

SOIL, WATER ENVIRONMENTS AND WETLANDS

QC3-11 – As requested in QC2-10 of the June 25, 2021 document, the promoter must specify whether erosion zones are already visible and compare the flow that will be discharged during the emptying of the basin with the flow currently flowing in this watercourse. The promoter must also describe the protective works that he undertakes to put in place for the places where he deems it necessary.

ANSWER:

Inspections in 2019 and 2021 were carried out by the undersigned. In both cases, the inspection did not show any sign of erosion at the exit of the drainage pipe from the existing tank farm, nor further downstream from the outlet.

Photos 1 and 4 from 2019 and 2021 show the location of the downstream end of the drainage pipe, it can be seen that the vegetation is not affected in the discharge area as elsewhere along the slope. It can also be seen that at the location of the second planned outlet (see picture note 1), the ground conditions (slope, composition of the embankment, distance from the ditch) are similar. Thus, it is expected that the new discharge should produce flow conditions similar to the existing one since the surface to be drained is the same and the installation of the pipe is done according to the same installation detail.

The drain line is 4 inches in diameter. The flow that can be generated from this pipe is relatively low due to the small diameter of the pipe and the height of water that can be generated. In addition, the drainage of the basin is done after the precipitation does not add to the flow drained during the precipitation.

The immediate place where the water comes out of the pipe is made of stone to avoid the transport of sediment. Further, the existing backfill composed of sand and gravel containing few fines does not promote sediment transport. The low slope of the embankment allows low flow velocities limiting sediment transport.

Photo 2 shows the undisturbed area to the east of the deposit. There is well-established vegetation and traces of an ATV indicating a fairly compact and relatively well-drained soil allowing the passage of vehicles. The aerial picture (photo 3) also shows traces of vehicles.

Photo 3 shows an aerial picture of the location. The photo is undated. It indicates the drainage point of the basin and its position relative to the elements of the ground.

The drainage at the location shown has been in place since 2004. Inspections in recent years show that the drainage does not produce erosion. The new drainage will be installed under identical ground conditions to the existing drainage. As with any project of this type, a riprap at the discharge point will be installed (see detail 6 of plan Au-004 issued for Request for authorization Rev 1 dated 20.12.24).

The photos mentioned herein are included as an appendix to this addendum.

By Mr. Denis Thibodeau Ing. s

See Annex 5 – Pictures

ANNEX 1

QUANTITATIVE RISK ASSESSMENT REPORT – SALLUIT TANK FARM

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La Fédération des Coopératives du Nouveau-Québec

Quantitative Risk Assessment Report

Salluit (Nunavik) Tank Farm

March 10th, 2023
Revision: 00

Tt Doc. Nº: 46982-64-REP-002_00
Tt Project Nº: 711-46982

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DISCLAIMER

This report documents the Quantitative Risk Assessment (QRA), involving the assessment of the likelihood of worst-case and alternative accident scenarios assessed in the *Consequence Assessment Report* (#ref. 46982-64- REP-001_00, Tetra Tech, May 2022), associated with the operation of the tank farm of the Fédération des Coopératives du Nouveau-Québec (FCNQ) located in Salluit (Nunavik, Quebec).

This assessment is an industry standard and globally recognized study for the purposes of emergency planning or mitigating risks resulting from potential accident scenarios.

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GLOSSARY

	Definition
Pool Fire	The combustion of material evaporating from a layer of liquid at the base of the fire (AIChE-CCPS, 2023).
Jet Fire	A fire type resulting from the discharge of liquid, vapor, or gas into free space from an orifice, the momentum of which induces the surrounding atmosphere to mix with the discharged material (AIChE-CCPS, 2023).
Flash Fire	A fire that spreads by means of a flame front rapidly through a diffuse fuel, such as a dust, gas, or the vapors of an ignitable liquid, without the production of damaging pressure (AIChE-CCPS, 2023).
Vapour-Cloud Explosion (VCE)	The explosion resulting from the ignition of a cloud of flammable vapor, gas, or mist in which flame speeds accelerate to sufficiently high velocities to produce overpressure. (AIChE-CCPS 2023).
Pasquill Stability Class D	Neutral atmospheric condition that occurs most of the time during slight to moderate daytime solar intensity and thin nighttime overcast with the windspeed of around 5 m/s or slightly higher. This represents the average condition for dispersion of released materials (NOAA, 2023).
Pasquill Stability Class F	Stable atmospheric condition that occurs most of the time during nighttime overcast with the windspeed of less than 2 m/s, typically 1.5 m/s. This represents the worst-case condition for dispersion of released materials (NOAA, 2020).
Location Specific Individual Risk (LSIR)	Individual risk includes the nature of the injury to the individual, the likelihood of the injury occurring, and the time period over which the injury might occur. LSIR is sisk to a person staying at a specific location all the time (usually used for members of the public). (AIChE-CCPS, 2023).
Probit	A random variable with a mean of 5 and a variance of 1, which is used in various effect models. Probit-based models derived from experimental dose-response data, are often used to estimate the health effect that might result based upon the intensity and duration of an exposure to a harmful substance or condition (e.g., exposure to a toxic atmosphere, or a thermal radiation exposure). (AIChE-CCPS, 2023).
Qunatitatiev Risk Assessment (QRA)	The quantitative evaluation of expected risk from potential incident scenarios. It examines both consequences and frequencies, and how they combine into an overall measure of risk. The CPQRA process is always preceded by a qualitative systematic identification of process hazards. The CPQRA results may be used to make decisions, particularly when mitigation of risk is considered. (AIChE-CCPS, 2023).

1.0 INTRODUCTION

1.1 BACKGROUND

Tetra Tech QE Inc. was retained by the Fédération des Coopératives du Nouveau-Québec (FCNQ) to conduct a Quantitative Risk Assessment Report (QRA) of the petroleum storage and transfer systems at its Salluit facility. The existing facility has 5 storage tanks (Tanks #1, #2, #3, #4, and #5). Their plan is to add three additional storage tanks (Tanks #9, #10, and #11).

1.2 OBJECTIVES AND SCOPE

The objectives of the study was to understand the risk of the operations at the Salluit facility on the surrounding areas and ensuring that the risk is managed in accordance with recommendations in the Technical Guidelines of the Environmental Emergency Regulations (RUE, 2019), the Guide of the Council for the Reduction of Major Industrial Accidents (CRAIM), the Guidelines for Chemical Process Quantitative Risk Analysis prepared by Centre for Chemical Process Safety (CCPS), or other applicable methodologies.

The scope of the assessment included the entire facility including the existing and future planned tanks and associated piping system:

- Storage tanks
  - Reservoirs #1: Diesel
  - Reservoirs #2: Gasoline
  - Reservoirs #3: Diesel
  - Reservoirs #4: Diesel
  - Reservoirs #5: Diesel
  - Reservoirs #9: Diesel
  - Reservoirs #10: Diesel
  - Reservoirs #11: Jet Fuel A
- Transfer pipes, pumping system and loading system

The consequences considered for this assessment include:

- Pool Fire
- Jet Fire
- Flash Fire
- Vapour-Cloud Explosion (VCE)

1.3 STUDY METHODOLOGY

The Quantitative Risk Assessment (QRA) is an indispensable tool within the risk management program for determining the risk of using, handling, storage, and transport of dangerous substances. This study is used to demonstrate the risk associated with various activities and systems within a facility and to provide the facility authorities with relevant information which can be used in support of decision-making process for development of a site, operation of a facility, and transportation

route. The QRA is a systematic cumulative assessment of risk of all sources of hazards in a facility. When used in process plants, the QRA considers the contribution of every component of the process (even a small valve) in the risk of the development or operation of a facility to various receptors within the facility (workers) and outside the facility (members of the public). That is why process component count is an important step in QRA.

In the QRA context, risk is defined as the probability of the consequence of a hazard (fatality).

Internationally recognized methodologies to conduct the QRA are established by industry leading organizations such as Center for Chemical Process Safety (CCPS) of American Institute of Chemical Engineers or Health and Safety Executive (Regulatory Body for the UK) or Committee for the Prevention of Disasters, The Hague, Netherlands (TNO 1999). It should be noted that while the consequences of multiple hazard sources on a specific receptor are distinct[1], the risk from various hazard sources on the same receptor is cumulative[2]. Therefore, all the sources of hazards (including all the failure modes including those seem insignificant) must be considered in the QRA.

QRA results are presented as Location Specific Individual Risk (LSIR)[3], Individual Risk per Anum (IRPA)[4], and societal risk. The LSIR, IRPA are presented as iso-contours of probability of death while the societal risk is presented as F-N curves[5].

It should be noted that LSIR iso-contours are not specific to an individual accident scenario (e.g. a tank fire), but rather to all failures during operations across the facility.

1.3.1 End Effect Values

The reference threshold value of the QRA is the Location Specific Individual Risk (LSIR) of less than 10^{-6} deaths per year.

1.3.2 Location-Specific Individual Risk (LSIR) and Risk Benchmark

Individual risk to members of the public is typically represented by LSIR iso-contour that represent the geographical variation in risk for an individual who is at a specific location 24 hours a day, 365 days a year. The individual risk for workers moving from place to place during the time they are exposed to the risk is commonly expressed as IRPA. While the maximum tolerable risk for workers differs from the value for members of the public, the widely acceptable criterion for members of the public is 1×10^{-6} per year.

The United Kingdom's HSE PADHI (Health and Safety Executive Planning Advice for Developments near Hazardous Installations) recommends a zonal system linked to different levels of LSIR. These criteria are used to advise on the appropriate development of the territory around a major risk installation. The PADHI system uses three levels, the inner zone (IZ), the middle zone (MZ), and the outer zone (OZ). The area closest to the facility has more land use restrictions.

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[1] e.g., burns due to thermal radiation of a pool fire in a chemical plant and injuries due to the blast overpressure of a vessel explosion in the same facility are different outcomes and do not add.
[2] e.g., the probability of fatality is the sum of the probability of fatality of the thermal radiation and the probability of fatality of the blast overpressure and any other sources of hazard.
[3] Risk to a person staying at a specific location all the time (usually used for members of the public).
[4] Risk to a person moving around across several risk zones (usually used for workers).
[5] The F-N curve is a type of risk curve that displays the probability of having N or more deaths per year, as a function of N, on a double log scale.

The PADHI system further defines sensitivity levels for each area to allow for the progressive imposition of more severe restrictions as the sensitivity of the proposed development increases. There are four (4) levels of sensitivity:

- Level 1 – Based on normal working population
- Level 2 – Based on the general public – at home and involved in normal activities
- Level 3 – Based on vulnerable members of the public (children, those with mobility difficulties or those unable to recognize physical danger)
- Level 4 – Based on a denser level 3 and very large outdoor facilities

For the PADHI system, the following LSIR values are selected:

- LSIR > 1 x 10-5 for facilities for people at work, such as parking
- LSIR = 1 x 10-5 maximum risk for facilities for use by the public, such as residential

In Canada, LSIR = 3 x 10^{-6} is set as the maximum risk for low density residential developments and LSIR = 3 x 10^{-7} for high density residential and sensitive developments.

Since the objective of the study is to assess the individual risk of operations at the Salluit oil depot on members of the public, the LSIR iso-contours of 1x10^{-3},1x10^{-4},1x10^{-5}, 3x10 $^{-6}$ and 1x10^{-7} are shown on the site plan.

1.3.3 Probability Assessment

The QRA involves calculation of both the consequences and the probabilities of hazardous events. For a hazardous event to negatively affect workers, the public and the environment, certain conditions must be met (e.g. probability of the presence of human receptors near the site of a leak, probability of death in the event of a exposure to a certain concentration of hazardous substances). Therefore, calculating the probability of consequences involves calculating the probability (or frequency) of the initiating hazardous event and estimating or selecting conditional probabilities.

Frequency of the Consequences = Frequency of the initiating events x Conditional probabilities

Frequencies of the hazardous events (e.g., equipment failure or failure frequency values) and conditional probabilities are well documented by various organizations (e.g., UK HSE, CCPS, TNO, Oreda, OGP).

The following conditional probabilities are used:

- Probabilities of exposure to overpressure and thermal radiation: in this assessment, all probabilities of exposure have been considered at one, i.e. the assumption is that a person is at outside when there is a release and it is exposed.
- Probability of ignition of vapor cloud or released fuel.
- Probability of wind direction for each location (wind rose).
- Effect probabilities (thermal radiation and overpressure) were expressed as a probit function. In this study, the probit function provided by UK HSE (2013)6 was used.

[6] *UK Health and Safety Executive (HSE), Methods of Approximation and Determination of Human Vulnerability for Offshore Major Accident Hazard Assessment (SPC/Tech/OSD/30), 2013*

1.3.4 Consequence and Risk Modelling

DNV's SAFETI software was used for QRA calculations. SAFETI is a standard software, recognized for performing QRAs for chemical and petrochemical installations or risk analysis related to the transport of chemical products. SAFETI analyzes the complex consequences of accident scenarios, considering the local population and weather conditions, to quantify the risks associated with the release of hazardous chemicals. Table 1-1 shows the SAFETI steps of a QRA.

Table 1-1. SAFETI Stages of QRA (DNV 2013)

Stages	Activities	Group
1	Definition of scope / objectives	Scenario definition
2	Data collection	
3	Hazard identification	
4	Scenario definition	
5	Failure frequency estimation	Frequency analysis
6	Weather data input / definition	Background Data
7	Ignition source input / definition	
8	Population input / definition	
9	Consequence modelling: • Discharge • Dispersion • Fire and explosion • Toxic	Consequence Analysis (Models)
10	Event tree analysis	Impact Analysis
11	Risk summation	Risk Analysis (Run Rows)
12	Sensitivity analysis	
13	Results reporting	

The following input data was also used for calculations:

1. Temperature: 9°C (summer), -27 °C (winter)
2. Humidity: 50%
3. Soil roughness factor: 0.1 (rural environment)
4. The equipment failure frequencies and the conditional probabilities were obtained from UK HSE (2017)[7].
5. Ruptures of various sizes (small, large, and full rupture) were considered for leaks from various system components (equipment and piping).
6. The probit function for thermal radiation and overpressure is presented in UK HSE 2013.
7. Day and Night and Stability Class frequencies used were:
    a. Day: 60% Stability Class D
    b. Night: 35% Stability Class E
    c. Night: 5% Stability Class F

   Pasquill stability classes are defined in Appendix A
8. Wind speed and direction frequencies were obtained from Environment Canada historic weather data.[8]

[7] *UK Health and Safety Executive (HSE), Failure Rate and Event Data for use within Risk Assessments, 2017.*

[7] https://climate.weather.gc.ca/historical_data/search_historic_data_stations_e.html?searchType=stnProv&timeframe=1&lstProvince=QC&optLimit=yearRange&StartYear=1840&EndYear=2023&Year=2023&Month=3&Day=2&selRowPerPage=25&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&startRow=1

[8] https://climate.weather.gc.ca/historical_data/search_historic_data_stations_e.html?searchType=stnProv&timeframe=1&lstProvince=QC&optLimit=yearRange&StartYear=1840&EndYear=2023&Year=2023&Month=3&Day=2&selRowPerPage=25&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&startRow=1

2.0 DESCRIPTION OF THE FACILITY

The location of FCNQ Salluit facility is shown in Figure 2-1. Location of FCNQ Salluit Facility. The facilities are located on the west side of the village of Salluit in the Nunavik region of Quebec and on the south shore of the Hudson Strait.

The layout of the repository is shown in Figure 2-2. FCNQ Salluit Facility Layout.

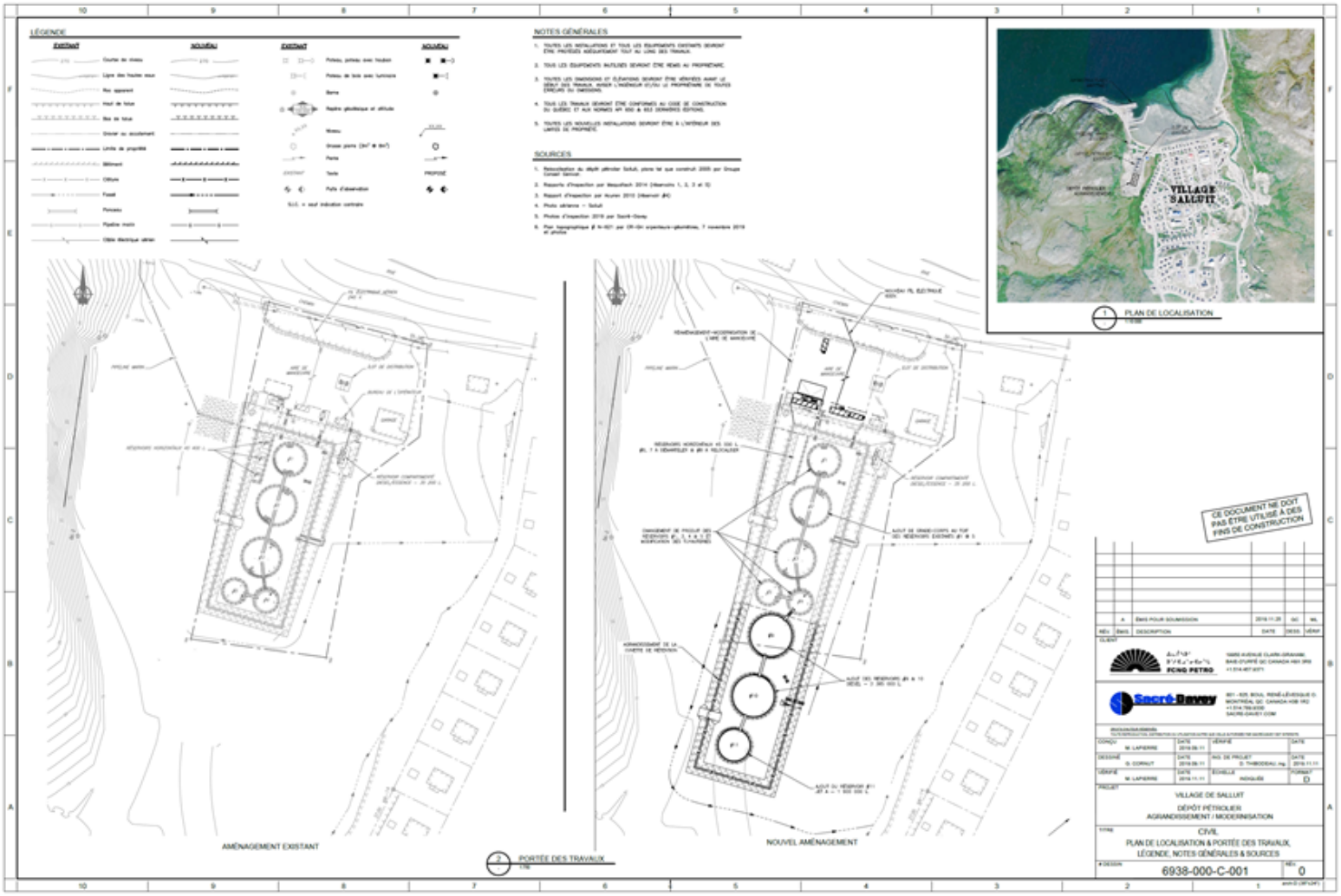
The facility is used for the storage and transfer of liquid petroleum products, such as gasoline, diesel and jet fuel (Jet Fuel A).

The Salluit oil depot consists of the following infrastructures:

- Pump station: (Container on concrete bloc)
- Garage
- Operator room (Trailor on concrete bloc)
- Electrical room (Trailor on concrete bloc)
- Mechanical room (Container on concrete bloc)
- Tank truck loading racks
- Environmental catch basin
- Petroleum product reservoirs
- Above ground or underground piping

Figure 2-1. Location of FCNQ Salluit Facility

Figure 2-2. FCNQ Salluit Facility Layout



2.1 STORAGE TANKS

Eight storage tanks (Tanks #1, #2, #3, #4, #5, #9, #10, and #11) were considered in this assessment. These eight reservoirs are installed in the same retention basin (dike). The location of the petroleum depot tanks is shown in Figure 2-3. Location of the Tanks Within the Facility. Table 2-1 specifies the dimensions and contents of the reservoirs under study as well as their containment basin.

Figure 2-3. Location of the Tanks Within the Facility

Table 2-1. Tanks Considered for the Assessment

Tank Number	Service	Diameter (m)	Height (m)	Tank Capacity Nominal (L)	Secondary Containment Total Avg. Area (m²)
#1	Diesel	14.63	9.65	1 590 000	4 028.75 *note 1
#2	Gasoline	17.91	9.65	2 384 000	4 028.75 *note 1
#3	Diesel	17.91	9.75	2 384 000	4 028.75 *note 1
#4	Diesel	10.67	7.32	636 000	4 028.75 *note 1
#5	Diesel	10.67	7.32	636 000	4 028.75 *note 1
#9	Diesel	20.70	9.75	3 385 000	4 028.75 *note 1
#10	Diesel	20.70	9.75	3 385 000	4 028.75 *note 1
#11	Jet-A	15.80	9.75	1 900 000	4 028.75 *note 1

*Note 1: See Figure 2-4

Area	Width (m)	Length (m)	Surface (m²)
Surface- top of containment	36.400	120	4 368
Surface- bottom of containment	31.400	117.5	3 689.5
Surface average: 4 028.75 m²			

2.2 CONGESTED AREA

No congested areas have been identified for the fire and explosion assessment.

3.0 SURROUNDING ENVIRONMENT

The Salluit tank farm is at the foot of a slope that can be subject to avalanches. The slope is located on the west side of the facility. The elevation of the reservoir containment basin varies between 9.5 and 15 m above sea level. The largest slope elevation is approximately 110 m above sea level located 420 m at west of the facility. To the east of the depot there is a ditch 75m from the edge of the containment basin and the nearest residence is located approximately 95m away.

4.0 SCENARIO DEVELOPMENT

4.1 FAILURE TYPES

The following types of failure were considered for this assessment:

- Tank ignition and tank fire
- Overflow of the tanks and bund fire
- Pipe rupture
- Valves and other piping system leaks
- Pump failure / leak

In addition to tank fire and tank overflow (which could potentially fill the secondary containment basin), three sizes of breach or rupture were analyzed for pipelines, regardless of cause:

1. The full-bore rupture of pipes and catastrophic failure of pumps, valves, and coupling
2. 70-mm hole which represents significant but more frequent leaks
3. 22-mm represent medium size failures
4. 7-mm hole which represents small failures

Note: 2-mm hole (pinhole) were not considered because the level of impact was judged to be negligible.

4.2 LEAK SCENARIO PROBABILITY CALCULATIONS

The first step in the probability calculations for each leak scenario is the number of pieces of equipment. The part count provides information about the number of pipe segments and components such as valves, as well as other pieces of equipment.

To facilitate the counting of pieces of equipment, the network of the oil depot has been divided into five segments (nodes). Figure 4-1 shows the nodes selected for evaluation. Figure 4-2 and Figure 4-3 show the locations of nodes on the repository layout plans.

Figure 4-1. Selected Nodes for the Assessment

Node #	Fuel	Location	Color Code	P and T
Node 1	Diesel	Pipes connecting pumps/loading to Tanks #1 and #3		Static Head, Ambient
Node 2	Diesel	Pipes connecting to Tanks #4 and #5		Static Head, Ambient
Node 3	Diesel	Pipes connecting to Tanks #9 and #10		Static Head, Ambient
Node 4	Gasoline	Pipes connecting pumps/loading to Tanks #2		Static Head, Ambient
Node 5	Jet Fuel A	Pipes connecting pumps to Tanks #11		Static Head, Ambient

Figure 4-2. Identified nodes on tanks 1-2-3

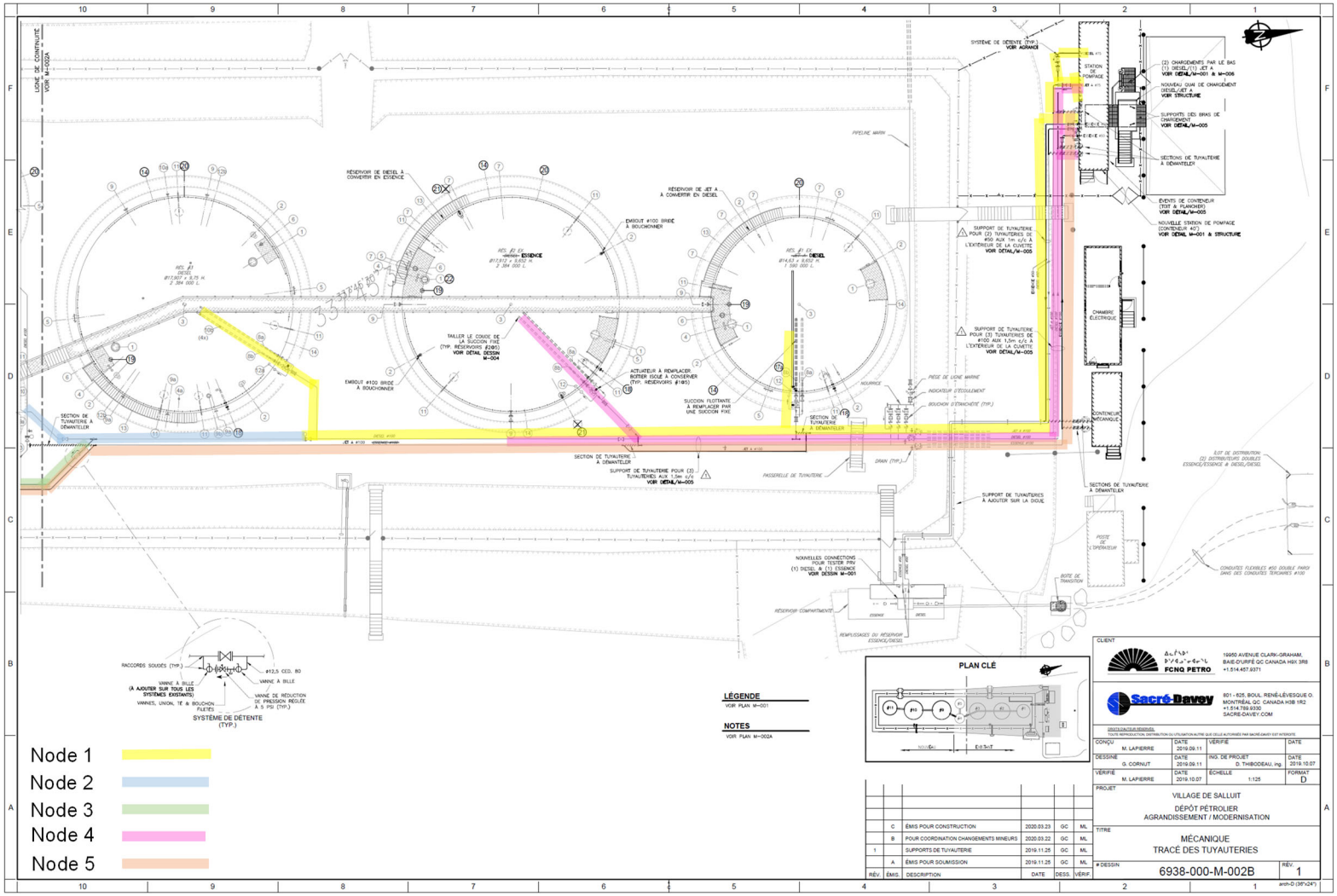
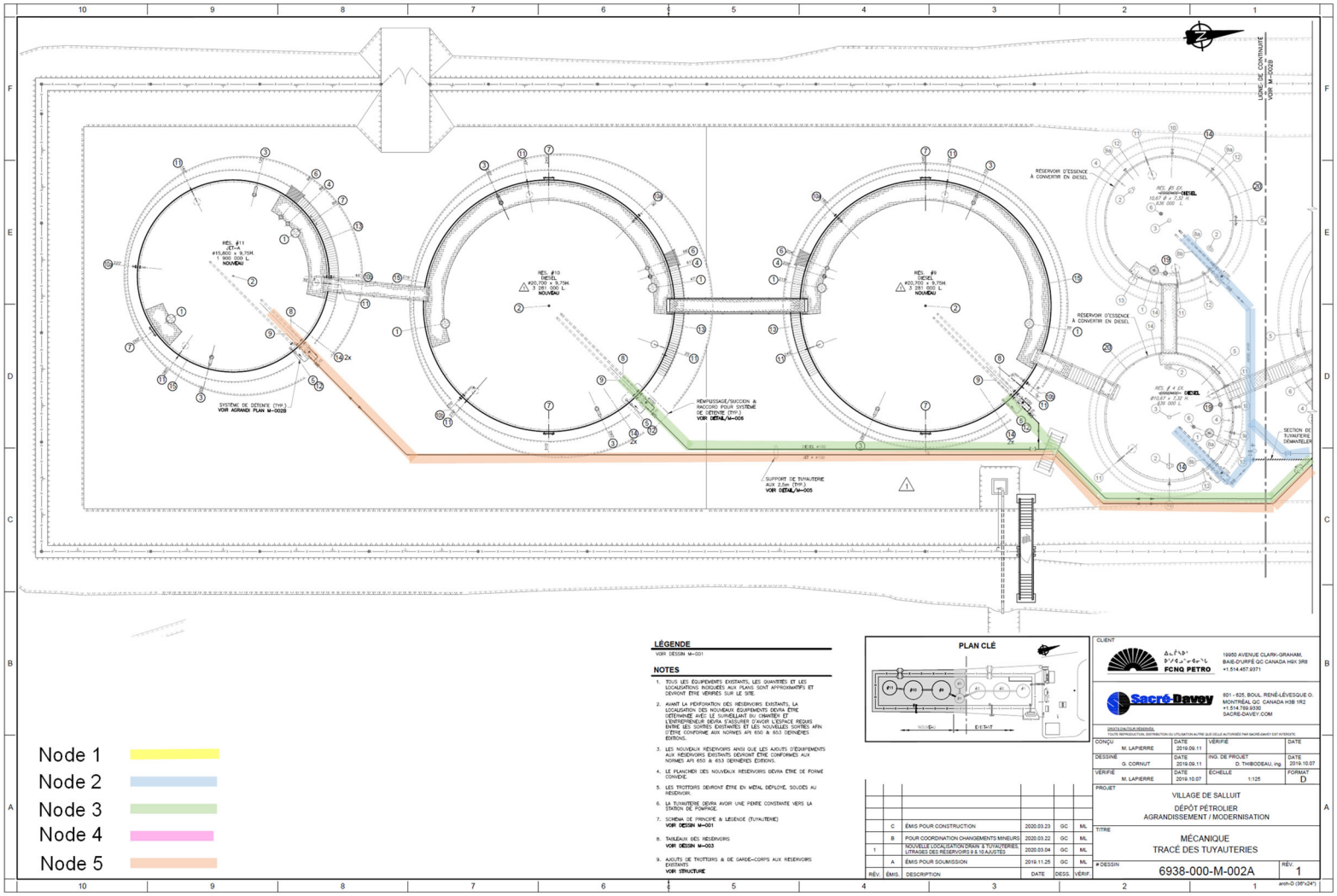


Figure 4-3. Nodes Identified on tanks 4-5-9-10-11



Leak frequencies of different breach sizes for individual components (piping, tanks, pumps) were obtained from UK HSE (2017).

The overall frequency of each accident scenario is calculated by multiplying the number of components involved in each scenario by their individual frequencies and then summing the results for all components for each leak size. Since each leak size has different consequences, they are assigned their own frequency when entered in the SAFETI software.

5.0 QRA RESULTS

Using all the input data and the leaked leak frequencies described in the previous sections, SAFETI produced the LSIR iso-contours for the individual risk levels of 1 x 10^{-3}, 1 x 10^{-4}, 1 x 10^{-5}, 1 x 10^{-6} and 1 x 10^{-7} per year.

The risk iso-contours for are shown in Figure 5-1.

The results indicate that the LSIR values do not exceed the reference threshold of 1x10^{-6} per year at ground level for residential developments located east of the Salluit oil depot.

Figure 5-1. LSIR Risk Contours for Salluit facility

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APPENDIX A– PASQUILL STABILITY CLASS

Pasquill Stability Classes

A: Extremely unstable conditions	D: Neutral conditions
B: Moderately unstable conditions	E: Slightly stable conditions
C: Slightly unstable conditions	F: Moderately stable conditions
G: Extremely Stable	

Meteorological Conditions Defining Pasquill Stability Classes

	Daytime insolation			**Night-time conditions**	
Surface wind speed (m/s)	**Strong**	**Moderate**	**Slight**	**Thin overcast or > 4/8 low cloud**	**<= 4/8 cloudiness**
< 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	C	D	E
5 - 6	C	C - D	D	D	D
> 6	C	D	D	D	D

ANNEX 2

PUBLIC CONSULTATION REPORT

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FCNQ
Petro Division

EXPANSION AND MODERNIZATION OF SALLUIT PETROLEUM TANK FARM

COMMUNITY CONSULTATION

FEBRUARY, 2023

TABLE OF CONTENTS

Glossary of Terms

FCNQ Petro	Fédération des Coopératives du Nouveau-Québec - Petro
JBNQA	James Bay and Northern Quebec Agreement
KEQC	Kativik Environmental Quality Commission
KRG	Kativik Regional Government
QLHC	Qaqqalik Landholding Corporation
Residents	Residents of Salluit
Village	Northern Village of Salluit

Introduction

FCNQ Petro supplies Arctic Diesel, Jet Fuel A-1 and Gasoline to the community of Salluit. The products supplied by FCNQ Petro are stored in a tank farm situated adjacent to the Salluit Marina which currently has a capacity to hold 7.7M litres of product. As a result of growing energy needs in Salluit and a related surge in demand, the current tank farm has insufficient capacity to hold quantities of the products required to meet current and future demand. Consequently, FCNQ Petro is currently required to make two deliveries of the products to Salluit to ensure adequate fuel supplies to meet community demand. This approach presents a potential risk in that FCNQ Petro must time the second delivery of the products to coincide with the onset of winter. If products are delivered too early the tank farm lacks the capacity to ensure fuel supplies last through the winter. If supplies reach too late, then they may never be delivered due to the formation of sea ice. The two deliveries of fuel also doubles the potential risk of spillage during the transfer of the products.

With a view to ensuring a secure supply of Diesel and Heating Oil for the community in the winter months, in April,, 2019, FCNQ Petro proposed the expansion and modernization of the Salluit tank farm. The proposed project would see the dismantling of two existing horizontal reservoirs and the addition of three new vertical reservoirs, which would increase the storage capacity by more than double to 16.1M litres. This increased storage capacity is projected to meet the community's energy needs for the next 15 years.

Between April, 2019 and January, 2023, FCNQ Petro engaged with all key stakeholders to obtain their feedback concerning its proposed project to expand and modernize the tank farm in Salluit. The key stakeholders include, but are not limited to, the following:

- Northern Village of Salluit
- Qaqqalik Landholding Corporation
- Kativik Environmental Quality Commission
- Salluit Cooperative
- The residents of Salluit

Since July, 2019, FCNQ Petro has conducted thirteen studies and/or reports that respond to various technical, environmental and social questions arising from its engagement with the various stakeholders. These studies were subsequently submitted to all required stakeholders.

As a final step in its consultation process, FCNQ Petro conducted a community consultation in January, 2023, to obtain feedback from the Residents in reference to its proposed project. The present report details the results of the said consultation.

Overall, all of the key stakeholders in Salluit recognize the need to expand and modernize the FCNQ Petro tank farm and are supportive of the proposed project to do so.

Key Stakeholders for the Community Consultation

Northern Village of Salluit

The Village is a legal entity created pursuant to the *Act respecting Northern villages and the Kativik Regional Government*. The mayor and council are elected officials who have a duty to represent their constituents, the community of Salluit and its residents.

Qaqqalik Landholding Corporation

The ***Qaqqalik Landholding corporation of Salluit*** Is a legal entity created as non-profit association under section 5 of the Land Régime Act, and governed by said Act, the ***JBNQA*** and the ***Quebec Companies Act.*** The membership of the ***Qaqqalik landholding corporation of Salluit*** is composed of the beneficiaries affiliated to their respective community. The board of directors are elected by the members.

Residents of Salluit

The community of Salluit comprises approximately 1,500 residents, the vast majority of whom are Inuit. The population of Salluit is growing at a rate of over 2% per year, compared to the Canadian national average population growth rate of under 1%. The expansion of the community creates growing demand for many goods and services including energy.

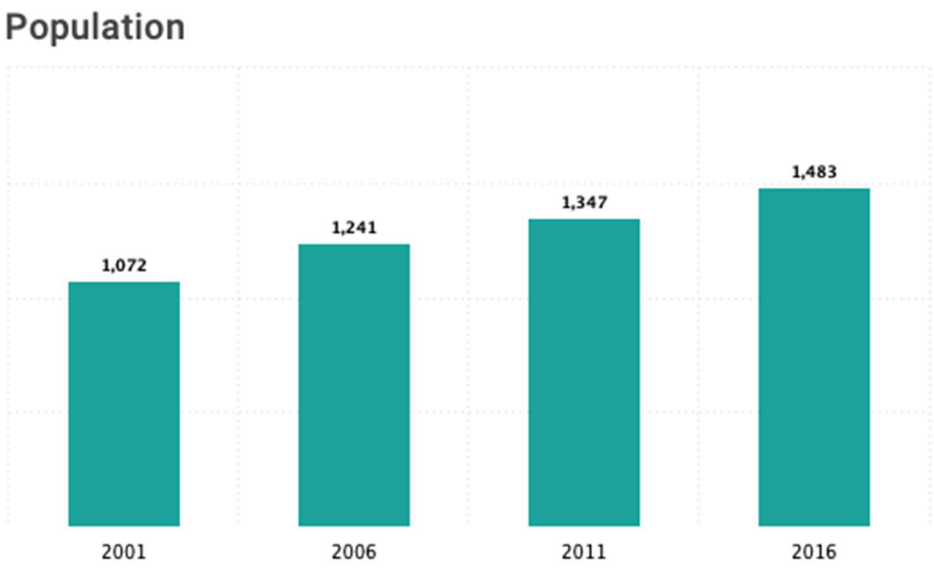


Fig. 1 - Salluit Population Growth[1]

[1] https://townfolio.co/qc/salluit/demographics

Community Consultation Methodology

FCNQ Petro commenced its community consultation process by initiating engagements with the Village and QLHC. The Village and QLHC have representatives who are elected by the Residents and are mandated to take decisions in the best interest of the community.

The engagements with the Village and QLHC commenced with in-person meetings in April, 2019, wherein FCNQ Petro summarized the proposed tank farm expansion and modernization project. Following the initial in-person meetings, FCNQ Petro submitted the primary plan and other related information to the Village and QLHC.

FCNQ subsequently applied for construction permits from the Village (April, 2019) and QLHC (May, 2019). The Village granted its development permit in May, 2019, and QLHC granted its construction permit in March, 2020. Following the receipt of the permits, FCNQ Petro kept the Village and QLHC informed of the project progress and changes in the project timeline arising from the review processes of KEQC.

Pursuant to in-person meetings held with the Village and QLHC on 18 January, 2023, both organizations re-affirmed their support for the proposed project and FCNQ Petro undertook to submit an application for the renewal of the permits referred to above.

Over the course of its engagement with the Village and QLHC since 2019, FCNQ Petro has provided the two organizations with all details related to the proposed project, including, but not limited to the:

- expansion design and site plans;
- fuel capacity details;
- gravel requirements.

Additionally, FCNQ Petro held a community meeting at the Salluit Community Centre on the evening of 18 January, 2023, to enable Residents to provide their feedback on the proposed project. FCNQ Petro informed Residents of the community meeting by the following means:

- Advertisements in Nunatsiaq News (14 – 18 January, 2023);
- Announcements on the community Radio (16 – 18 January, 2023);
- Facebook and Instagram posts (16 – 18 January, 2023);
- Creation of a Facebook event.

Furthermore, on the date of the community meeting, FCNQ Petro changed the time of the said meeting to accommodate other community events taking place at the community church, and to maximize participation in the community meeting. The time change was announced on the community radio station and posted on Facebook.

At the aforementioned community meeting, FCNQ Petro detailed the proposed project to the Residents and explained all of the potential risks and mitigation measures related thereto.

Following the presentation, Residents were given an opportunity to ask questions to FCNQ representatives as detailed in the next section of this report.

Consultation Results

Northern Village of Salluit

The Village recognizes the need to expand and modernize the tank farm and it is very supportive of the proposed project.

During a meeting held on 18 January, 2023, FCNQ Petro confirmed to the Village that:

- The proposed project was delayed by approximately two years in order to complete environmental and social impact assessment studies requested by KEQC. The said studies were completed and submitted to KEQC between January, 2020 and September, 2022. As part of the information requested by KEQC, FCNQ Petro has engaged with the Residents and a consultative meeting is scheduled for the evening of 18 January, 2023, to obtain their feedback on the proposed project;
- The land used by the tank farm would increase by approximately 3,000m^2;
- Two smaller, horizontal tanks will be dismantled during the expansion and modernization;
- The expanded area would be fenced to ensure security and safety.

The Village advised FCNQ Petro:

- That the tank farm expansion would use some land currently used as a storage space by the community;
- Of the existence of a baseball diamond in the area to be used for the tank farm expansion, and asked whether FCNQ Petro would help in the relocation of the said baseball diamond.

M. Jean Luc Mallette, Senior Manager, FCNQ Petro, explained that:

- While a portion of the land used for storage would be used for the tank farm expansion, all of the remaining area would still be available for that purpose;
- FCNQ Petro would be open to exploring the possibility of collaborating with the Village on a new recreational area in the community.

The Village reaffirmed its support of the proposed project.

Qaqqalik Landholding Corporation

QLHC recognizes the need to expand and modernize the tank farm and it is very supportive of the proposed project.

During a meeting held on 18 January, 2023, FCNQ Petro confirmed to QLHC that:

- The proposed project was delayed by approximately two years in order to complete environmental and social impact assessment studies requested by KEQC. The said studies were completed and submitted to KEQC between January, 2020 and September, 2022. As

part of the information requested by KEQC, FCNQ Petro has engaged with the residents of Salluit and a consultative meeting is scheduled for the evening of 18 January, 2023, to obtain their feedback on the proposed project;
- The land used by the tank farm would increase by approximately 3,000m^2;
- Two smaller, horizontal tanks will be dismantled during the expansion and modernization;
- The expanded area would be fenced to ensure security and safety;
- The buffer zone of 100m between the wall of the closest tank and residential buildings would continue to be maintained.

QLHC requested from FCNQ Petro a copy of its emergency plan, which FCNQ Petro undertook to provide in due course.

QLHC reaffirmed its support of the proposed project and expressed the importance of completing the proposed project with minimal delay.

Residents of Salluit

FCNQ Petro held a community meeting on the evening of 18 January, 2023, to obtain feedback from the residents of Salluit on its proposed project. The community meeting was well-attended, with 65 residents participating. Appendix A details the meeting attendees, and Appendix B provides a copy of the presentation delivered to the Residents.

Overall, the residents are supportive of the proposed project and recognize the need to expand the tank farm to ensure their energy security. During the course of the community meeting, FCNQ responded to several questions from community residents as summarized below:

Question from a Resident:
What is the location of the expansion?
FCNQ Response:
The location of the expansion remains unchanged from the one presented to all stakeholders in December, 2019. The expansion will comprise three new tanks south of the current tanks, and the dismantling of two existing small horizontal tanks.
Question from a Resident:
Will the addition of three new tanks pose a safety risk?
FCNQ Response:
The proposed project was initiated four years ago, and it underwent a thorough impact assessment which answered many questions including this one, satisfactorily to the KEQC and the Québec Ministry of Environment. This consultation is also a part of the process to hopefully move forward with the project.
Question from a Resident:
Is there a concern for fire at the site, and what steps are in place to extinguish a fire?
FCNQ Response:

Industry-standard measures are in place to prevent fires at the site. In the remote event of a fire, FCNQ Petro will rely on the local Fire Service to extinguish it.
Question from a Resident:
What mitigation measures are in place in the event of a leak from the tanks?
FCNQ Response:
The tank dikes are designed to be leak proof, and to hold a volume greater than the volume of the largest tank plus 10%.
Question from a Resident:
There are a row of houses close to the tank farm. Will the expansion present a concern for these houses?
FCNQ Response:
Risk analyses were carried out concerning these houses, and the new tanks are within the 100m buffer zone. Additionally, the dominant winds blow away from the community and towards the water which further reduces risk factors.
Question from a Resident:
The tank farm is close to a residential area, and when the ship arrives to deliver the products, there is some disruption for other users of the waterway. As such, is it possible to move the tank farm to the next cove near the community?
FCNQ Response:
The possibility of moving the tank farm was explored and there are no current locations with the infrastructure and services required for such a relocation. Furthermore, the tanks are filled by a tanker boat which requires a certain elevation and anchorage abilities that may not be possible. Expanding the tank farm will also mean that tanker will only need to deliver the fuel products once per year as opposed to twice per year. It is important that the expansion project is safe for the community and as such, multiple studies have been conducted and submitted to the KEQC and the Québec Government in that regard.
Question from a Resident:
There are many discussions about renewable energy, but it looks like petroleum products will be needed for some time yet?
FCNQ Response:
Renewable Energy is being developed, but it is very unpredictable for now. The proposed project will meet the immediate energy needs of the community for 15 years, and by then there may be a reliable renewable energy solution in place.
Question from a Resident:
What mitigation will there be for the loss of the baseball field?
FCNQ Response:
This was raised by the Village, and FCNQ Petro agreed to discuss this further with the Village to come up with a plan. We don't know the details as of yet, but FCNQ Petro will work collaboratively with the Village.
Question from a Resident:

Will there be training opportunities for residents to be able to benefit from jobs during the expansion of the tank farm, such as welders?
FCNQ Response:
FCNQ Petro will be relying on a sub-contractor that specializes in the type of welding required for the tank farm expansion. This minimizes risk for the project and the community. As such, there will not be any welder training provided. There may be an opportunity to hire some operators for civil work and labour to install fencing. This is something that FCNQ Petro can explore further.
Question from a Resident:
There is concern about the loading pipe which is above-surface. Can it be struck by an avalanche? Is a design improvement for the pipe possible?
FCNQ Response:
Under a separate project than the expansion of the tank farm, FCNQ Petro is planning to rebuild the loading pipe, with a plan to have the manifold further away and partly underground. The impact of the revised loading pipe will be that the pipe will be empty after filling and as such significantly minimize any risk of a leak in case of physical damage to the pipe itself.
Question from a Resident:
Is it possible to have the entire pipe underground?
FCNQ Response:
The pipeline project is outside of the scope of the present consultation. That said, FCNQ Petro wants to improve the pipeline and looking at ways to minimize the pumping time, transfer and spill risks by installing a 6" pipe to the manifold and relocating the manifold such that the loading activities do not interfere with the marina. The pipe will be buried only in specific areas and will be above ground elsewhere.
Question from a Resident:
Is it possible to implement a self-serve, credit card payment system for the fuel at the gas station? There are times when residents want to go on the land, but are unable to get fuel because a worker is not present.
FCNQ Response:
This is an operational concern that is not linked to the expansion project. That said, supervision is obligatory, even if it is for a self-serve pump. FCNQ Petro is investigating a "pay-at-pump" option as a pilot project in Aupaluk.
Question from a Resident:
Will the manifold be in water or on land?
FCNQ Response:
The pipeline project is outside of the scope of the present consultation. That said, for safety the manifold will be on land and further away from the water.
Question from a Resident:
I support the notion of moving the tank farm to a new location in a different cove, this would alleviate the elders' concerns.

FCNQ Response:
FCNQ Petro understands this point, and it is working to find a solution to supply the community safely. To move the tank farm to a new location will lead to numerous delays which in turn would mean that current energy needs are not met. At this point in time, when energy security is critical, the current location for the expansion of the tank farm is the only viable option.
Question from a Resident:
Has the landholding corporation been involved in this process?
FCNQ Response:
Yes, QLHC has been consulted from the beginning of the project. FCNQ Petro also met with QLHC earlier in the day to provide an update on the project. QLHC has issued all permits required to build the new tanks.
Question from a Resident:
What is the benefit to the people and the community?
FCNQ Response:
The main benefit is energy security for the community for all of its energy needs. That is an essential service. FCNQ Petro will lease the land required for the expansion from QLHC and pay a fee associated with the rental. As a cooperative, the community benefits through the hiring of personnel and any profits also go to members who decide how to spend the profits.

Conclusion

The community of Salluit has been steadily growing at a rate of over 2% over the last decade and this growth is expected to continue in the foreseeable future. This growth has resulted in an increased demand for energy. With a view to meeting the increased demand and ensuring an adequate fuel supply over the winter months, FCNQ Petro currently makes two shipments of petroleum products to Salluit. This approach has several inherent risks which includes, but is not limited to: (a) the possibility of improperly timing the second delivery whereby the community runs out of fuel supplies prior to the end of winter; and, (b) doubling the potential risk of spillage during the transfer of products to the storage tanks.

FCNQ Petro's proposed project to expand and modernize the Salluit tank farm will ensure energy security for Salluit, and halve any potential environmental risks related to the transfer of products to storage tanks by halving the number of product deliveries in a given year.

Based on FCNQ's consultations with the Village, QLHC and the Residents, it is evident that there is a clear understanding amongst all stakeholders of the importance of having a safe and secure energy supply for Salluit, and the manner of achieving this by expanding and modernizing the Salluit tank farm. During the consultations, FCNQ Petro satisfactorily responded to all of the questions raised by the stakeholders and undertook to work collaboratively with the Village, QLHC and the Residents to address concerns and implement reasonable mitigative measure where appropriate to do so. Overall, there is broad support from all key stakeholders in the community to proceed with the proposed project for the benefit of all of Salluit's residents.

In light of the foregoing, and subject to receiving authorization from KEQC to do so, FCNQ Petro intends to proceed with the proposed project without further delays, and with the primary aim of ensuring energy security for Salluit.

Appendix A - Community Meeting Attendance Sheet

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

FIRST NAME	LAST NAME	E-MAIL
1. Mark	Okituk	
2. ᐃᓕᓴᐱ	ᑕᔭᕋ	
3. ᐃᓕᓴᐱ ᓂ.	ᒫᓂᐅᕆ	
4. Eva	Usuctoayuk	
5. Louisa Y	Yuliusie	gaunnaq@hotmail.q
6. Eva	Kumakuluk	
7. Annie	Usvituayuk	
8. Ida	Saviadjuk	
9. Mosusie	Padlayat Senior	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

FIRST NAME	LAST NAME	E-MAIL
10. Elaisa	Audlaluk	
11. Elaiya	Ilisituk	
12. Putulik	Papigatuk	
13. Kitty	Naluijuk	
14. Elysa	Ikey	
15. Annie	Naluijuk	
16. Katsuak	Saviadjuk	
17. Mark	Papigatuk	
18. Louisa	Pauyungiest	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

	FIRST NAME	LAST NAME	E-MAIL
19	Joanasie K.	Papigatuk	
20.	Sanaaq	ISaaC	
21.	MARY	PAPIGATUK	
22.	Amaamak	Saviakjuk	
23.	ᐱᑕᐃᒪᒪᑉ		
24.	Lucassie	Kadjulik	
25.	Kaudja	Tarkirk	
26.	LESLEY	TARKIRKIJ	
27.	EVA S	AUDLALUK	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

	FIRST NAME	LAST NAME	E-MAIL
28.	Talla	Kaitak	
29.	Susie	Sakiagak	
30.	Sarah	kaitak	
31.	Mika	Amamatuak	
32.	Katsaak	kaitak	
33.	Soral	saviajuk	
34.	Annie	Araky	
35.	INULUK	KNULUMK	
36.	Mosesie	uSuitaqjuk	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

	FIRST NAME	LAST NAME	E-MAIL
37.			
38.	Renee	Savalaqini	
39.	Uiyakil	Kaitak	
40.	ᐳᐊᒥ	ᑫᑕ	
41.	ᓗᐊ	ᓄᕕᐊᕐᕿᒃ	
42	ᐅᕐᓕᕆ	ᑫᑦᑕ	
43.	ᓛᐅᑭ	ᓴᑲᔅᓵᒃᑯᒃ	
44.	Christine	Keatainak	
45.	Mary	Keatainak	
46.	Annie	Kadjulik Jr	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

	FIRST NAME	LAST NAME	E-MAIL
47.			
48.	Alaku	Ning	
49.	Josepi	Yuliusie	
50.	Angie	Yuliusie	
51.	Lizzie	Paningajak	
52.	Eva	nayoua	
53.	DENISE	Keatainak	
54.	Qupanuak	THOMASSIAH	
55	ᓓᓗᑯᓗ	ᔪᒪᒃ	
56.	Kitty	Okituk	

ATTENDANCE
PUBLIC CONSULTATION FOR THE SALLUIT TANK FARM EXPANSION

	FIRST NAME	LAST NAME	E-MAIL
57.	Troy	Tukkiapik	
58.	Aksa	Padlayat	
59.	Unnaluk	Tayara	
60.	Johnny	Tayara	
61.	Tu Xar	Katjulik	
62.	Susie	Kakayuk	
63.	Rosie	Kabseup	
64.	[illegible]	[illegible]	
65.	[illegible]	[illegible]	

Appendix B – Community Presentation

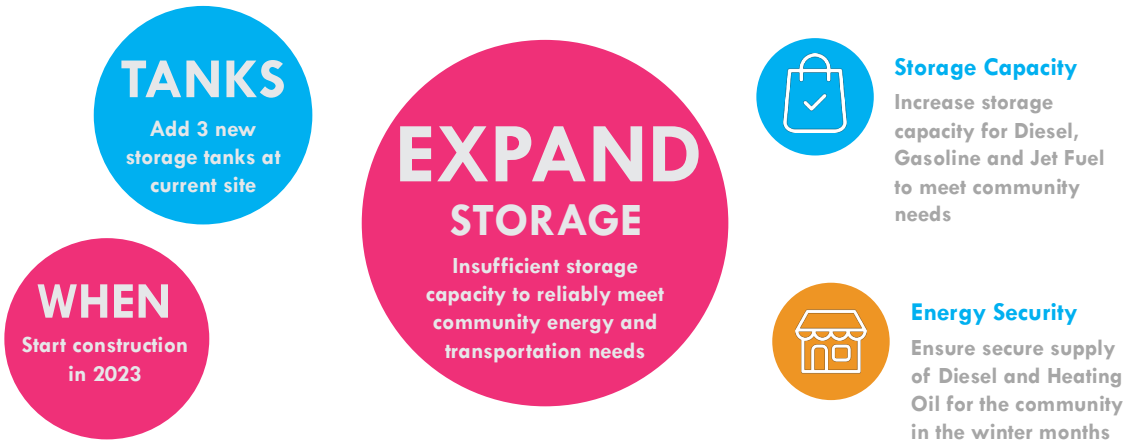
ILAGIISAQ - FCNQ

Expansion & Modernization of Tank Farm in Salluit

COMMUNITY CONSULTATION

JANUARY 2023

PROJECT SUMMARY



KEY STAKEHOLDERS

COMMUNITY

1

PEOPLE

All of the residents of Salluit who are impacted by the proposed project

LOCAL AUTHORITIES

2

GOVERNMENT

Mayor & Council and LHC, who represent Salluit as elected representatives

KEQC - KRG

3

ENVIRONMENT

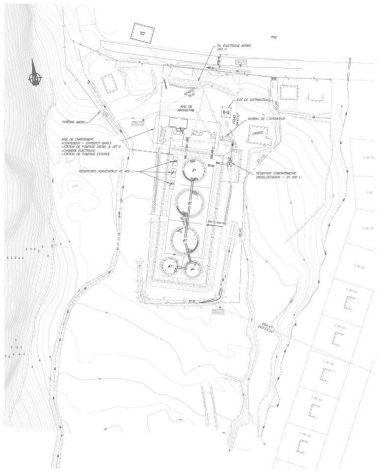
Environmental and social impact assessment

INSTALLATIONS

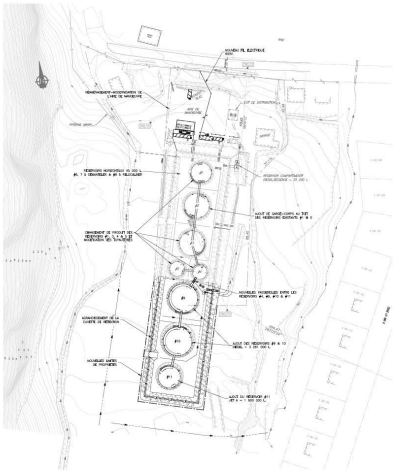
Current

- 5 vertical reservoirs
- 3 horizontal reservoirs
- Total capacity of 7.7M liters

No	Product	Volume
1	Jet - A	1 590 000
2	Diesel	2 384 000
3	Diesel	2 384 000
4	Gasoline	636 000
5	Gasoline	636 000
6	Waste	45 400
7	Empty	45 400
8	Empty	45 400



AMÉNAGEMENT EXISTANT



NOUVEL AMÉNAGEMENT

Proposed

- 3 new vertical reservoirs
- Dismantling of 2 existing reservoirs
- Total capacity increased to 16.1M liters

No	Status	Present Product	Projected Product	Volume
1	Existing	Jet - A	Diesel	1 590 000
2	Existing	Diesel	Gasoline	2 384 000
3	Existing	Diesel	Diesel	2 384 000
4	Existing	Gasoline	Diesel	636 000
5	Existing	Gasoline	Diesel	636 000
6	Existing	Waste	Dismantled	45 400
7	Existing	Empty	Dismantled	45 400
8	Existing	Empty	Various	45 400
9	New	N/A	Diesel	3 281 000
10	New	N/A	Diesel	3 281 000
11	New	N/A	Jet - A	1 900 000

RISK PROFILE

01 Weather
Lightening is very rare, and tank farm is protected by a grounding system

02 Vapors
Minimized by filling tanks when prevailing winds ensure dispersion

03 Filling Leakage
Negligible as tanks are filled from the bottom rather than the top

04 Tank Leakage
Membrane in dikes renders it mostly leakproof. Retention basin can hold volume of largest tank plus 10%

05 Dangerous Products
Self-ignition is impossible at outdoor temperatures & industry standards in place

06 System Failures
Pumps, valves and piping are inspected daily for possible issues

07 Breakage
No vehicles allowed inside tank farm. Pressure release valves for closed piping

08 Plane Crash
Tank farm is outside of aircraft approach cone.

09 Flood
Unlikely due to ground slope profile towards the sea

10 Earthquake
Highly unlikely as Salluit is in a low-risk zone

11 Fire
Minimized by following all standard safety precautions

12 Avalanche
Tank farm moved to current location in 2004 to minimize risk

CONSTRUCTION SAFETY

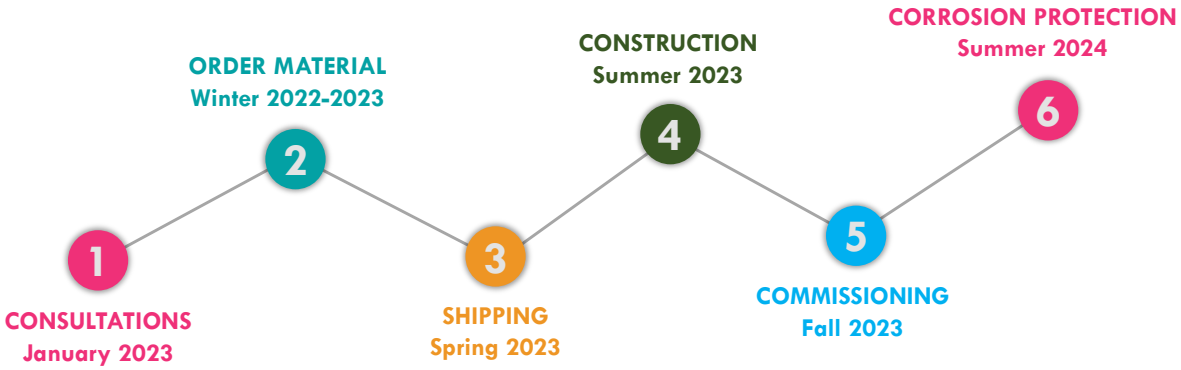
Safety Program
General safety program for entire project, as well as specific safety programs for each trade will be developed. Similar program was developed for expansion of tank farm in Kangiqsujuaq

Soil and Backfill
Contaminated soil is not anticipated during basin expansion work. If found, it will be treated according to current regulations.
Backfill will come from current borrow pits through purchases from the Salluit Landholding Corporation

Waste Management
Metallic waste will be shipped to Montreal for recycling. All residual petroleum products & soiled absorbent materials will be stored in containers and shipped to Montreal for safe disposal. Construction waste will be sent to municipal dump

Emergency Program
Environmental emergency plan, construction safety program, agreements, and emergency procedures are in place to minimize impacts and ensure health and safety of employees and citizens

TIMELINE



COMMUNITY MAP

QUESTIONS & COMMENTS

Expansion & Modernization of Tank Farm in Salluit

COMMUNITY CONSULTATION

JANUARY 2023

ANNEX 3

TABLE OF FINAL EMISSION RATES

Composition des produits pétroliers entreposés

Produit	CAS	Valeur limite	Fraction massique Maximum selon FDS		
			Essence	Diesel	Jet-A
Toluène	108-88-3	Norme	25,0%	1,0%	0,2%
Xylène	1330-20-7	Norme	20,0%	1,0%	1,0%
Butane	106-97-8		20,0%		
Octane	111-65-9	Critère	18,0%	2,0%	
2-méthylbutane	78-78-4	Critère	15,0%		
Éthanol	64-17-5	Norme	10,0%		
Heptane	142-82-5	Critère	5,0%		
n-Hexane	110-54-3	Norme	5,0%		
1,2,4-triméthylbenzène	95-63-6	Critère	5,0%		
Éthylbenzène	100-41-4	Norme	4,0%	1,0%	0,1%
Cyclohexane	110-82-7	Critère	3,0%		
Benzène	71-43-2	Norme	1,5%		
Carburants diesel	68334-30-5	SEPR		100,0%	
Carburant diesel C9-C18 alcanes ramifiés et linéaires	1159170-26-6			30,0%	
Nonane	111-84-2	Critère		3,0%	
Kérosène (pétrole)	8008-20-6	Critère			100,0%
Kérosène (pétrole), hydrodésulfuré	64742-81-0	Critère			100,0%
Naphtalène	91-20-3	Norme			0,3%
Total			131,5%	138,0%	201,6%

La somme des fractions massique dépasse 100% puisque les fiches signalétiques indiquent la concentration maximale possible dans le produit

Product Parameters

Parameter	Unit	Gasoline	Diesel	Jet-A	
Liquid category	-	Petroleum distillates			
Single or multiple contaminant	-	Multiple			
Speciation option	-	Partial			
Average surface temperature	°F	18,55			On-site metereological conditions
Maximum surface temperature	°F	12,27			
Minimum surface temperature	°F	24,84			
Average product temperature	°F	19,54			
Vapor pressure	psia	3,2	0,005	0,008	
Minimum vapor pressure	psia	2,8	0,004	0,006	
Maximum vapor pressure	psia	3,7	0,007	0,01	
Molar mass of liquid	g/mol	86,8	105,9	162,0	TANKS database (U.S. EPA)
Molar mass of vapors	g/mol	73,3	102,6	130,0	TANKS database (U.S. EPA)

Characteristics of vertical storage tanks for flammable products

Paramètre		Unité	Valeur							
Tank		-	**Tank #1**	**Tank #2**	**Tank #3**	**Tank #4**	**Tank #5**	**Tank #9**	**Tank #10**	**Tank #11**
Produit			**Diesel**	**Gasoline**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Jet-A**
Type		-	VFRT (Vertical fix ceiling)							
Dimensions (metric)	Height	m	9,652	9,652	9,75	7,32	7,32	9,75	9,75	9,75
	Diameter	m	14,63	17,912	17,907	10,67	10,67	20,7	20,7	15,8
	Capacity	l	1 590 000	2 265 732	2 384 000	636 000	636 000	3 385 000	3 385 000	1 900 000
	Annual fillings	-	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,7
	Annual flow	l/y	715 000	925 000	1 071 000	286 000	286 000	1 521 000	1 521 000	1 350 000
Dimensions	Shell height	ft	31,7	31,7	32,0	24,0	24,0	32,0	32,0	32,0
	Shell diam	ft	48,0	58,8	58,8	35,0	35,0	67,9	67,9	51,8
	Max liquid height	ft	31,0	31,0	31,3	23,5	23,5	31,3	31,3	31,3
	Avg liquid height	ft	15,5	15,5	15,7	11,8	11,8	15,7	15,7	15,7
	Working volume	gal	420 034	598 543	629 786	168 013	168 013	894 222	894 222	501 927
	Turnovers per year	-	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,7
	Net throughput	gal/yr	188 883	244 359	282 928	75 553	75 553	401 806	401 806	356 632
	Is tank heated?	No/Yes	No							
Shell Characteristics	Shell color/shade	-	Grey/Light							
	Shell condition	-	Good							
Roof Characteristics	Color/Shade	-	Grey/Light							
	Condition	-	Good							
	Type	-	Cone							
	Height	ft	3							
Breather Vent Settings	Vaccuum Setting	psig	-0,03							
	Pressure Setting	psig	0,03							

Results of the TANKS modeling: annual emissions due to the RESPIRATION of tanks ("Breathing Losses")

Parameter	CAS	Unit	Results							
			Tank #1	Tank #2	Tank #3	Tank #4	Tank #5	Tank #9	Tank #10	Tank #11
			Diesel	Gasoline	Diesel	Diesel	Diesel	Diesel	Diesel	Jet-A
Toluene	108-88-3	lb/an	8,07	134,56	12,19	3,21	3,21	16,56	16,56	3,21
Xylene	1330-20-7	lb/an	1,83	24,42	2,76	0,73	0,73	3,76	3,76	3,64
Butane	106-97-8	lb/an		17 598,42						
Octane	111-65-9	lb/an	18,75	106,73	28,30	7,47	7,47	38,46	38,46	
2-methylbutane	78-78-4	lb/an		6 011,41						
Ethanol	64-17-5	lb/an		93,80						
Heptane	142-82-5	lb/an		54,12						
n-Hexane	110-54-3	lb/an		197,90						
1,2,4-trimethylbenzene	95-63-6	lb/an		1,09						
Ethylbenzene	100-41-4	lb/an	2,23	5,87	3,37	0,89	0,89	4,58	4,58	0,44
Cyclohexane	110-82-7	lb/an		72,14						
Benzene	71-43-2	lb/an		32,25						
Diesel Fuels	68334-30-5	lb/an	11,35		17,12	4,52	4,52	23,27	23,27	
Diesel Fuel C9-C18 Alkane branched and linear	1159170-26-6	lb/an	3,41		5,14	1,36	1,36	6,98	6,98	
Nonane	111-84-2	lb/an	12,82		19,35	5,10	5,10	26,30	26,30	
Kerosene	8008-20-6	lb/an								123,19
Kerosene, hydrodesulfurized	64742-81-0	lb/an								123,19
Naphtalene	91-20-3	lb/an								0,02
Total		**lb/an**	**55,05**	**24 332,73**	**83,09**	**21,92**	**21,92**	**112,92**	**112,92**	**130,50**

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Taux d'émission annuels (sommation des émissions de respiration "Breathing Losses" de TANKS et des émissions dues au pompage)

Important : diviser par le nombre d'évents

Paramètre	CAS	Unité	Résultats							
Réservoir			Réservoir #1	Réservoir #2	Réservoir #3	Réservoir #4	Réservoir #5	Réservoir #9	Réservoir #10	Réservoir #11
Produit			Diesel	Essence	Diesel	Diesel	Diesel	Diesel	Diesel	Jet-A
Toluène	108-88-3	g/s	1,43E-04	2,37E-03	2,16E-04	5,71E-05	5,71E-05	2,96E-04	2,96E-04	6,60E-05
Xylène	1330-20-7	g/s	3,40E-05	4,49E-04	5,12E-05	1,36E-05	1,36E-05	7,04E-05	7,04E-05	8,01E-05
Butane	106-97-8	g/s	0	2,83E-01	0	0	0	0	0	0
Octane	111-65-9	g/s	2,96E-04	1,69E-03	4,46E-04	1,18E-04	1,18E-04	6,09E-04	6,09E-04	0
2-méthylbutane	78-78-4	g/s	0	9,50E-02	0	0	0	0	0	0
Éthanol	64-17-5	g/s	0	1,68E-03	0	0	0	0	0	0
Heptane	142-82-5	g/s	0	9,42E-04	0	0	0	0	0	0
n-Hexane	110-54-3	g/s	0	3,38E-03	0	0	0	0	0	0
1,2,4-triméthylbenzène	95-63-6	g/s	0	1,92E-05	0	0	0	0	0	0
Éthylbenzène	100-41-4	g/s	4,08E-05	1,07E-04	6,16E-05	1,63E-05	1,63E-05	8,45E-05	8,45E-05	9,50E-06
Cyclohexane	110-82-7	g/s	0	1,24E-03	0	0	0	0	0	0
Benzène	71-43-2	g/s	0	5,59E-04	0	0	0	0	0	0
Carburants diesel	68334-30-5	g/s	3,00E-04	0	4,51E-04	1,20E-04	1,20E-04	6,25E-04	6,25E-04	0
Carburant diesel C9-C18 alcanes ramifiés et linéaires	1159170-26-6	g/s	8,99E-05	0	1,35E-04	3,59E-05	3,59E-05	1,88E-04	1,88E-04	0
Nonane	111-84-2	g/s	2,01E-04	0	3,03E-04	7,99E-05	7,99E-05	4,13E-04	4,13E-04	0
Kérosène (pétrole)	8008-20-6	g/s	0	0	0	0	0	0	0	2,48E-03
Kérosène (pétrole), hydrodésulfuré	64742-81-0	g/s	0	0	0	0	0	0	0	2,48E-03
Naphtalène	91-20-3	g/s	0	0	0	0	0	0	0	4,07E-07
Total		g/s	1,10E-03	3,91E-01	1,66E-03	4,40E-04	4,40E-04	2,29E-03	2,29E-03	5,12E-03

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2023-02-02 Sacré Davey - Salluit

Annual emission rates (addition of "Breathing Losses" emissions from TANKS and emissions due to pumping)

Important: divide by the number of vents

Parameter	CAS	Unit	Results							
Tank			Tank #1	Tank #2	Tank #3	Tank #4	Tank #5	Tank #9	Tank #10	Tank #11
Produit			Diesel	Gasoline	Diesel	Diesel	Diesel	Diesel	Diesel	Jet-A
Toluene	108-88-3	g/s	1,43E-04	2,37E-03	2,16E-04	5,71E-05	5,71E-05	2,96E-04	2,96E-04	6,60E-05
Xylene	1330-20-7	g/s	3,40E-05	4,49E-04	5,12E-05	1,36E-05	1,36E-05	7,04E-05	7,04E-05	8,01E-05
Butane	106-97-8	g/s	0	2,83E-01	0	0	0	0	0	0
Octane	111-65-9	g/s	2,96E-04	1,69E-03	4,46E-04	1,18E-04	1,18E-04	6,09E-04	6,09E-04	0
2-methylbutane	78-78-4	g/s	0	9,50E-02	0	0	0	0	0	0
Ethanol	64-17-5	g/s	0	1,68E-03	0	0	0	0	0	0
Heptane	142-82-5	g/s	0	9,42E-04	0	0	0	0	0	0
n-Hexane	110-54-3	g/s	0	3,38E-03	0	0	0	0	0	0
1,2,4-trimethylbenzene	95-63-6	g/s	0	1,92E-05	0	0	0	0	0	0
Ethylbenzene	100-41-4	g/s	4,08E-05	1,07E-04	6,16E-05	1,63E-05	1,63E-05	8,45E-05	8,45E-05	9,50E-06
Cyclohexane	110-82-7	g/s	0	1,24E-03	0	0	0	0	0	0
Benzene	71-43-2	g/s	0	5,59E-04	0	0	0	0	0	0
Diesel Fuels	68334-30-5	g/s	3,00E-04	0	4,51E-04	1,20E-04	1,20E-04	6,25E-04	6,25E-04	0
Diesel Fuel C9-C18 Alkane branched and linear	1159170-26-6	g/s	8,99E-05	0	1,35E-04	3,59E-05	3,59E-05	1,88E-04	1,88E-04	0
Nonane	111-84-2	g/s	2,01E-04	0	3,03E-04	7,99E-05	7,99E-05	4,13E-04	4,13E-04	0
Kerosene	8008-20-6	g/s	0	0	0	0	0	0	0	2,48E-03
Kerosene, hydrodesulfurized	64742-81-0	g/s	0	0	0	0	0	0	0	2,48E-03
Naphtalene	91-20-3	g/s	0	0	0	0	0	0	0	4,07E-07
Total		g/s	1,10E-03	3,91E-01	1,66E-03	4,40E-04	4,40E-04	2,29E-03	2,29E-03	5,12E-03

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2023-02-02 Sacré Davey - Salluit

Paramètres pour calcul des taux d'émission

Paramètre	Unité	Valeur	Note
Constante des gaz parfaits R	J/mol.K	8,314	Max Réservoir
Température	°C	10	
	°F	50	
	°K	283,15	
Transfert d'essence			
Volume transféré [Réservoir #2]	m³	925	Max Projeté
Taux de transfert	m³/h	90	
Durée de transfert	h	10,3	
Transfert de diesel			
Volume transféré [Réservoir #9]	m³	5 400	Max Projeté
Taux de transfert	m³/h	135	
Durée de transfert	h	40,0	
Transfert de Jet-A			
Volume transféré [Réservoir #11]	m³	1 350	Max Projeté
Taux de transfert	m³/h	135	
Durée de transfert	h	10,0	

Loi des gaz parfaits

PV=nRT
où
P représente la pression (enkPa)
V représente le volume (enL)
n représente la quantité de gaz (enmol)
R représente la constante des gaz parfaits (enkPa-L/mol-K)
T représente la température absolue (enK)

Loi de Raoult

Dans une solution idéale, à température constante,
la pression partielle en phase vapeur d'un constituant est proportionnelle à sa fraction molaire en phase liquide.

Taux d'émission instantanés de contaminants lors du remplissage d'essence

	Produit	CAS	Fraction massique	Fraction molaire	Masse molaire	Quantité de matière	Tension de vapeur	Pression partielle	Émissions annuelles	Taux d'émission instantanés (évaluation des valeurs limites sur 1h)	Taux d'émission par source (Réservoir #2 Essence)		Taux d'émission journaliers (évaluation des valeurs limites sur 24h) 10,3 heures sur 24	Taux d'émission par source (Réservoir #2 Essence)		Taux d'émission annuels (évaluation des valeurs limites annuelles) 10,3 heures sur 8760	Taux d'émission par source (Réservoir #2 Essence)	
											R_2_EV_1	R_2_EV_2		R_2_EV_1	R_2_EV_2	incluant respiration	R_2_EV_1	R_2_EV_2
			g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Toluene	Toluène	108-88-3	25,0%	24,1%	84,07	0,00297	0,25	0,060	13 728	0,371	0,186	0,186	0,159	0,079	0,079	0,0024	0,0012	0,0012
Xylene	Xylène	1330-20-7	20,0%	15,3%	106,16	0,00188	0,07	0,011	3 075	0,083	0,042	0,042	0,036	0,018	0,018	0,0004	0,0002	0,0002
Butane	Butane	106-97-8	20,0%	27,9%	58,12	0,00344	21,60	6,026	948 852	25,645	12,822	12,822	10,982	5,491	5,491	0,2832	0,1416	0,1416
Octane	Octane	111-65-9	18,0%	12,8%	114,23	0,00158	0,12	0,015	4 744	0,128	0,064	0,064	0,055	0,027	0,027	0,0017	0,0008	0,0008
2methylbutane	2-méthylbutane	78-78-4	15,0%	16,9%	72,15	0,00208	8,16	1,38	268 841	7,266	3,633	3,633	3,112	1,556	1,556	0,0950	0,0475	0,0475
Ethanol	Éthanol	64-17-5	10,0%	17,6%	46,06	0,00217	0,48	0,084	10 543	0,285	0,142	0,142	0,122	0,061	0,061	0,0017	0,0008	0,0008
Heptane	Heptane	142-82-5	5,0%	4,0%	100,20	0,00050	0,47	0,019	5 162	0,140	0,070	0,070	0,060	0,030	0,030	0,0009	0,0005	0,0005
nHexane	n-Hexane	110-54-3	5,0%	2,1%	196,21	0,00025	1,52	0,031	16 693	0,451	0,226	0,226	0,193	0,097	0,097	0,0034	0,0017	0,0017
123trimethylbenzene	1,2,4-triméthylbenzène	95-63-6	5,0%	3,4%	120,19	0,00042	0,01	0,0003	110	0,003	0,001	0,001	0,001	0,001	0,001	0,0000	0,0000	0,0000
Ethylbenzene	Éthylbenzène	100-41-4	4,0%	3,1%	106,17	0,00038	0,08	0,002	703	0,019	0,009	0,009	0,008	0,004	0,004	0,0001	0,0001	0,0001
Cyclohexane	Cyclohexane	110-82-7	3,0%	2,9%	84,16	0,00036	0,95	0,027	6 260	0,169	0,085	0,085	0,072	0,036	0,036	0,0012	0,0006	0,0006
Benzene	Benzène	71-43-2	1,5%	1,6%	78,12	0,00019	0,91	0,014	2 998	0,081	0,041	0,041	0,035	0,017	0,017	0,0006	0,0003	0,0003
	Essence		132%	132%	106,61	0,01622		**7,67**	**1 281 708**	**34,64**	**17,32**	**17,32**	**14,83**	**7,42**	**7,42**	**0,39**	**0,1953**	**0,1953**

Taux d'émission instantanés de contaminants lors du remplissage de diesel

	Produit	CAS	Fraction massique	Fraction molaire	Masse molaire	Quantité de matière	Tension de vapeur	Pression partielle	Émissions annuelles	Taux d'émission instantanés (évaluation des valeurs limites sur 1h)	Taux d'émission par source (Réservoir #9 Diesel)		Taux d'émission journaliers (évaluation des valeurs limites sur 24h) 24,0 heures sur 24	Taux d'émission par source (Réservoir #9 Diesel)		Taux d'émission annuels (évaluation des valeurs limites annuelles) 40,0 heures sur 2880	Taux d'émission par source	
											R_9_EV_1	R_9_EV_2		R_9_EV_1	R_9_EV_2	incluant respiration	Appliqué à chaque évent de réservoir de diesel (15 évents)	
			g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	
Toluene	Toluène	108-88-3	1,0%	2,0%	84,07	0,00012	0,25	0,005	6 524	0,045	0,023	0,023	0,045	0,023	0,023	0,001	0,00007	
Xylene	Xylène	1330-20-7	1,0%	1,6%	106,16	0,00009	0,07	0,001	1 827	0,013	0,006	0,006	0,013	0,006	0,006	0,000	0,00002	
Octane	Octane	111-65-9	2,0%	2,9%	114,23	0,00018	0,12	0,003	6 263	0,043	0,022	0,022	0,043	0,022	0,022	0,002	0,00015	
Ethylbenzene	Éthylbenzène	100-41-4	1,0%	1,6%	106,17	0,00009	0,08	0,001	2 088	0,014	0,007	0,007	0,014	0,007	0,007	0,000	0,00002	
Carburants_diesel	Carburants diesel	68334-30-5	100,0%	97,1%	170,00	0,00588	0,012	0,012	32 516	0,226	0,113	0,113	0,226	0,113	0,113	0,002	0,00015	
Carburants_diesel_C9C18	Carburant diesel C9-C18 alcanes ramifiés et linéaires	1159170-26-6	30,0%	29,1%	170,00	0,00176	0,012	0,004	9 755	0,068	0,034	0,034	0,068	0,034	0,034	0,001	0,00004	
Nonane	Nonane	111-84-2	3,0%	3,9%	128,25	0,00023	0,05	0,002	3 914	0,027	0,014	0,014	0,027	0,014	0,014	0,001	0,00010	
	Diesel		138%	138%	227,71	0,00836		**0,03**	**62 887**	**0,44**	**0,22**	**0,22**	**0,44**	**0,22**	**0,22**	**0,008**	**0,0005**	

Taux d'émission instantanés de contaminants lors du remplissage de Jet-A

	Produit	CAS	Fraction massique	Fraction molaire	Masse molaire	Quantité de matière	Tension de vapeur	Pression partielle	Émissions annuelles	Taux d'émission instantanés (évaluation des valeurs limites sur 1h)	Taux d'émission par source (Réservoir #11 Jet-A)		Taux d'émission journaliers (évaluation des valeurs limites sur 24h) 10,0 heures sur 24	Taux d'émission par source (Réservoir #11 Jet-A)		Taux d'émission annuels (évaluation des valeurs limites annuelles) 10,0 heures sur 2880	Taux d'émission par source (Réservoir #11 Jet-A)	
											R_11_EV_1	R_11_EV_2		R_11_EV_1	R_11_EV_2	incluant respiration	R_11_EV_1	R_11_EV_2
			g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Toluene	Toluène	108-88-3	0,2%	0,8%	84,07	0,00002	0,25	0,002	626	0,017	0,009	0,009	0,007	0,004	0,004	0,0001	0,0000	0,0000
Xylene	Xylène	1330-20-7	1,0%	3,0%	106,16	0,00009	0,07	0,002	876	0,024	0,012	0,012	0,010	0,005	0,005	0,0001	0,0000	0,0000
Ethylbenzene	Éthylbenzène	100-41-4	0,1%	0,3%	106,17	0,00001	0,08	0,000	100	0,003	0,001	0,001	0,001	0,001	0,001	0,0000	0,0000	0,0000
Kerosene	Kérosène (pétrole)	8008-20-6	100,0%	98,4%	321,50	0,00311	0,018	0,018	22 378	0,622	0,311	0,311	0,259	0,130	0,130	0,0025	0,0012	0,0012
Kerosene_hydrodesulfure	Kérosène (pétrole), hydrodésulfuré	64742-81-0	100,0%	98,4%	321,50	0,00311	0,018	0,018	22 378	0,622	0,311	0,311	0,259	0,130	0,130	0,0025	0,0012	0,0012
Naphtalene	Naphtalène	91-20-3	0,3%	0,7%	128,06	0,00002	0,001	0,000	4	0,000	0,000	0,000	0,000	0,000	0,000	0,0000	0,0000	0,0000
	Jet-A		202%	202%	637,86	0,00637		**0,04**	**46 361**	**1,29**	**0,64**	**0,64**	**0,54**	**0,27**	**0,27**	**0,005**	**0,0026**	**0,0026**

Tetra Tech QI inc. 715-46960TT

2023-02-02 Sacré Davey - Salluit

Parameters for calculation of emission rates

Parameters	Unit	Value	Note
Ideal gas constant R	J/mol.K	8,314	Maximum Tank
Temperature	°C	10	
	°F	50	
	°K	283,15	
Gasoline Transfer			
Transferred Volume [Tank 2]	m³	925	Projected Maximum
Transfer Rate	m³/h	90	
Transfer Duration	h	10,3	
Diesel Transfer			
Transferred Volume [Tank 9]	m³	5 400	Projected Maximum
Transfer Rate	m³/h	135	
Transfer Duration	h	40,0	
Jet-A fuel Transfer			
Transferred Volume [Tank 11]	m³	1 350	Projected Maximum
Transfer Rate	m³/h	135	
Transfer Duration	h	10,0	

Ideal gas law

PV=nRT

Where:

P equals pressure (in kPa)

V equals volume (in L)

n equals the gas quantity (en mol)

R represents the ideal gas constant (en kPa·L/mol·K)

T equals absolute temperature (en K)

Raoult's Law

In an ideal solution, at constant temperature,
the vapor phase partial pressure of a constituent is proportional to its liquid phase mole fraction.

Instantaneous emission rate of contaminants when filling gasoline

Produit	CAS	Mass Fraction	Molar Fraction	Molar Mass	Quantity of product	Vapor Pressure	Partial Pressure	Annual Emissions	Emission Rate	Emission rate by source (Tank #2 Gasoline)	
										R_2_EV_1	R_2_EV_2
		g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s
Toluene	108-88-3	25,0%	24,1%	84,07	0,00297	0,25	0,060	13 728	0,371	0,186	0,186
Xylene	1330-20-7	20,0%	15,3%	106,16	0,00188	0,07	0,011	3 075	0,083	0,042	0,042
Butane	106-97-8	20,0%	27,9%	58,12	0,00344	21,60	6,026	948 852	25,645	12,822	12,822
Octane	111-65-9	18,0%	12,8%	114,23	0,00158	0,12	0,015	4 744	0,128	0,064	0,064
2-methylbutane	78-78-4	15,0%	16,9%	72,15	0,00208	8,16	1,38	268 841	7,266	3,633	3,633
Ethanol	64-17-5	10,0%	17,6%	46,06	0,00217	0,48	0,084	10 543	0,285	0,142	0,142
Heptane	142-82-5	5,0%	4,0%	100,20	0,00050	0,47	0,019	5 162	0,140	0,070	0,070
n-Hexane	110-54-3	5,0%	2,1%	196,21	0,00025	1,52	0,031	16 693	0,451	0,226	0,226
1,2,4-trimethylbenzene	95-63-6	5,0%	3,4%	120,19	0,00042	0,01	0,0003	110	0,003	0,001	0,001
Ethylbenzene	100-41-4	4,0%	3,1%	106,17	0,00038	0,08	0,002	703	0,019	0,009	0,009
Cyclohexane	110-82-7	3,0%	2,9%	84,16	0,00036	0,95	0,027	6 260	0,169	0,085	0,085
Benzene	71-43-2	1,5%	1,6%	78,12	0,00019	0,91	0,014	2 998	0,081	0,041	0,041
Gasoline		132%	132%	106,61	0,01622		**7,67**	**1 281 708**	**34,64**	**17,32**	**17,32**

Instantaneous emission rate of contaminants when filling diesel

Produit	CAS	Mass Fraction	Molar Fraction	Molar Mass	Quantity of product	Vapor Pressure	Partial Pressure	Annual Emissions	Emission Rate	Emission Rate by Source (Reservoir #9 Diesel)	
										R_9_EV_1	R_9_EV_2
		g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s
Toluene	108-88-3	1,0%	2,0%	84,07	0,00012	0,25	0,005	6 524	0,045	0,023	0,023
Xylene	1330-20-7	1,0%	1,6%	106,16	0,00009	0,07	0,001	1 827	0,013	0,006	0,006
Octane	111-65-9	2,0%	2,9%	114,23	0,00018	0,12	0,003	6 263	0,043	0,022	0,022
Ethylbenzene	100-41-4	1,0%	1,6%	106,17	0,00009	0,08	0,001	2 088	0,014	0,007	0,007
Diesel Fuels	68334-30-5	100,0%	97,1%	170,00	0,00588	0,012	0,012	32 516	0,226	0,113	0,113
Diesel Fuel C9-C18 Alkane branched and linear	1159170-26-6	30,0%	29,1%	170,00	0,00176	0,012	0,004	9 755	0,068	0,034	0,034
Nonane	111-84-2	3,0%	3,9%	128,25	0,00023	0,05	0,002	3 914	0,027	0,014	0,014
Diesel		138%	138%	227,71	0,00836		**0,03**	**62 887**	**0,44**	**0,22**	**0,22**

Instantaneous contaminant emission rates when filling Jet-A

Produit	CAS	Mass Fraction	Molar Fraction	Molar Mass	Quantity of product	Vapor Pressure	Partial Pressure	Annual Emissions	Emission Rate	Emission rate by source (Reservoir #11 Jet-A)	
										R_11_EV_1	R_11_EV_2
		g/g	mol/mol	g/mol	mol/g	psi	psi	g	g/s	g/s	g/s
Toluene	108-88-3	0,2%	0,8%	84,07	0,00002	0,25	0,002	626	0,017	0,009	0,009
Xylene	1330-20-7	1,0%	3,0%	106,16	0,00009	0,07	0,002	876	0,024	0,012	0,012
Ethylbenzene	100-41-4	0,1%	0,3%	106,17	0,00001	0,08	0,000	100	0,003	0,001	0,001
Kerosene	8008-20-6	100,0%	98,4%	321,50	0,00311	0,018	0,018	22 378	0,622	0,311	0,311
Kerosene, hydrodesulfurized	64742-81-0	100,0%	98,4%	321,50	0,00311	0,018	0,018	22 378	0,622	0,311	0,311
Naphtalene	91-20-3	0,3%	0,7%	128,06	0,00002	0,001	0,000	4	0,000	0,000	0,000
Jet-A		202%	202%	637,86	0,00637		**0,04**	**46 361**	**1,29**	**0,64**	**0,64**

ANNEX 4

TABLE OF COMBINED RESULTS

Valeurs limites et concentrations initiales des contaminants

Product	CAS	Norme ou Critère	Valeurs limites [µg/m³]				Concentration initiale [µg/m³]				Notes
			4min	1h	24h	1 an	4min	1h	24h	1 an	
Toluène	108-88-3	Norme	600				260				
Xylène (o,m,p)	1330-20-7	Norme (voir note)	350			20	150			8	Voir le tableau 2.
Octane	111-65-9	Critère (voir note)		3 500		350		0		0	Voir le tableau 2.
Isopentane	78-78-4	Critère (voir note)	3 800			240	210			9	Voir le tableau 2 (additif critère sur 1 an seulement).
Éthanol	64-17-5	Norme	340				0				
n-Heptane	142-82-5	Critère	2 740				60				
n-Hexane	110-54-3	Norme	5 300			140	140			3	
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	590			15	140			3	Voir le tableau 2.
Éthylbenzène	100-41-4	Norme	740			200	140			3	
Cyclohexane	110-82-7	Critère	1 435				40				
Benzène	71-43-2	Norme			10				3		
Carburants diesel	68334-30-5	SEPR		9,57		0,1					
Carburant diesel C9-C18 Alcanes ramifiés et linéaires	1159170-26-6	Non	*0*	*0*	*0*	*0*					
Nonane	111-84-2	Critère	11 500			442	45			0	
Kérosène	8008-20-6	Critère (voir note)		210				0			Voir le tableau 2.
Kérosène - hydrodésulfuré	64742-81-0	Critère (voir note)		210				0			Voir le tableau 2.
Naphtalène	91-20-3	Norme (voir note)	200			3	5			0	Voir le tableau 3.

Limit values and initial concentrations of contaminants

Contaminant	CAS	Norm ou Criteria	Limit Value [µg/m³]				Initial Concentration [µg/m³]				Notes
			4min	1h	24h	1 y	4min	1h	24h	1 y	
Toluene	108-88-3	Norm	600				260				
Xylene (o,m,p)	1330-20-7	Norm (see note)	350			20	150			8	Additivity
Octane	111-65-9	Criteria (see note)		3 500		350		0		0	Additivity
Isopentane	78-78-4	Criteria (see note)	3 800			240	210			9	See Table 2 (additional criterion over 1 year only).
Ethanol	64-17-5	Norm	340				0				
n-Heptane	142-82-5	Criteria	2 740				60				
n-Hexane	110-54-3	Norm	5 300			140	140			3	
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	590			15	140			3	Additivity
Ethylbenzene	100-41-4	Norm	740			200	140			3	
Cyclohexane	110-82-7	Criteria	1 435				40				
Benzene	71-43-2	Norm			10				3		
Diesel Fuels	68334-30-5	SEPR		9,57		0,1					
Diesel Fuel C9-C18 Alkane - branched and linear	1159170-26-6	No	*0*	*0*	*0*	*0*					
Nonane	111-84-2	Criteria	11 500			442	45			0	
Kerosene	8008-20-6	Criteria (see note)		210				0			Additivity
Kerosene - hydrodesulfurized	64742-81-0	Criteria (see note)		210				0			Additivity
Naphtalene	91-20-3	Norm (see note)	200			3	5			0	PAHs

Résultats Essence - Réservoir à toit fixe

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	8436,9	4419,7	-	-	1449,5%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	1889,9	990,0	-	0,0	582,8%	-	-	40,2%
Octane	111-65-9	Critère (voir note)	-	1527,4	-	0,2	-	43,6%	-	0,1%
Isopentane	78-78-4	Critère (voir note)	165228,4	86554,6	-	10,0	4353,6%	-	-	7,9%
Éthanol	64-17-5	Norme	6479,5	3394,3	-	-	1905,7%	-	-	-
n-Heptane	142-82-5	Critère	3172,3	1661,8	-	-	118,0%	-	-	-
n-Hexane	110-54-3	Norme	10259,3	5374,3	-	0,4	196,2%	-	-	2,4%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	67,5	35,4	-	0,0	35,2%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	432,0	226,3	-	0,0	77,3%	-	-	1,5%
Cyclohexane	110-82-7	Critère	3847,2	2015,4	-	-	270,9%	-	-	-
Benzène	71-43-2	Norme	-	-	38,0	-	-	-	409,7%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	1125,8	589,8	-	-	231,0%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	252,2	132,1	-	0,0	114,9%	-	-	40,2%
Isopentane	78-78-4	Critère (voir note)	22048,6	11550,1	-	10,0	585,8%	-	-	7,9%
Éthanol	64-17-5	Norme	864,6	452,9	-	-	254,3%	-	-	-
n-Hexane	110-54-3	Norme	1369,0	717,2	-	0,4	28,5%	-	-	2,4%
Cyclohexane	110-82-7	Critère	513,4	268,9	-	-	38,6%	-	-	-
Benzène	71-43-2	Norme	-	-	21,5	-	-	-	244,9%	-

2,36E-01

Concentrations maximales observées aux récepteurs sensibles 0,020031

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	4021,4	2106,6	-	-	713,6%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	900,8	471,9	-	0,0	300,2%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	728,0	-	0,0	-	20,8%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	78755,2	41255,8	-	1,4	2078,0%	-	-	4,4%
Éthanol	64-17-5	Norme	3088,4	1617,9	-	-	908,4%	-	-	-
n-Heptane	142-82-5	Critère	1512,0	792,1	-	-	57,4%	-	-	-
n-Hexane	110-54-3	Norme	4890,0	2561,6	-	0,1	94,9%	-	-	2,2%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	32,2	16,9	-	0,0	29,2%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	205,9	107,9	-	0,0	46,7%	-	-	1,5%
Cyclohexane	110-82-7	Critère	1833,8	960,6	-	-	130,6%	-	-	-
Benzène	71-43-2	Norme	-	-	9,2	-	-	-	122,2%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	176,3	92,4	-	-	72,7%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	39,5	20,7	-	0,0	54,1%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	3452,7	1808,7	-	1,4	96,4%	-	-	4,4%
Éthanol	64-17-5	Norme	135,4	70,9	-	-	39,8%	-	-	-
n-Hexane	110-54-3	Norme	214,4	112,3	-	0,1	6,7%	-	-	2,2%
Cyclohexane	110-82-7	Critère	80,4	42,1	-	-	8,4%	-	-	-
Benzène	71-43-2	Norme	-	-	4,8	-	-	-	77,6%	-

Gasoline Results - Fix roof tank

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	8436,9	4419,7	-	-	1449,5%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	1889,9	990,0	-	0,0	582,8%	-	-	40,2%
Octane	111-65-9	Criteria (see note)	-	1527,4	-	0,2	-	43,6%	-	0,1%
Isopentane	78-78-4	Criteria (see note)	165228,4	86554,6	-	10,0	4353,6%	-	-	7,9%
Ethanol	64-17-5	Norm	6479,5	3394,3	-	-	1905,7%	-	-	-
n-Heptane	142-82-5	Criteria	3172,3	1661,8	-	-	118,0%	-	-	-
n-Hexane	110-54-3	Norm	10259,3	5374,3	-	0,4	196,2%	-	-	2,4%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	67,5	35,4	-	0,0	35,2%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	432,0	226,3	-	0,0	77,3%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	3847,2	2015,4	-	-	270,9%	-	-	-
Benzene	71-43-2	Norm	-	-	38,0	-	-	-	409,7%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	1125,8	589,8	-	-	231,0%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	252,2	132,1	-	0,0	114,9%	-	-	40,2%
Isopentane	78-78-4	Criteria (see note)	22048,6	11550,1	-	10,0	585,8%	-	-	7,9%
Ethanol	64-17-5	Norm	864,6	452,9	-	-	254,3%	-	-	-
n-Hexane	110-54-3	Norm	1369,0	717,2	-	0,4	28,5%	-	-	2,4%
Cyclohexane	110-82-7	Criteria	513,4	268,9	-	-	38,6%	-	-	-
Benzene	71-43-2	Norm	-	-	21,5	-	-	-	244,9%	-

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	4021,4	2106,6	-	-	713,6%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	900,8	471,9	-	0,0	300,2%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	728,0	-	0,0	-	20,8%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	78755,2	41255,8	-	1,4	2078,0%	-	-	4,4%
Ethanol	64-17-5	Norm	3088,4	1617,9	-	-	908,4%	-	-	-
n-Heptane	142-82-5	Criteria	1512,0	792,1	-	-	57,4%	-	-	-
n-Hexane	110-54-3	Norm	4890,0	2561,6	-	0,1	94,9%	-	-	2,2%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	32,2	16,9	-	0,0	29,2%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	205,9	107,9	-	0,0	46,7%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	1833,8	960,6	-	-	130,6%	-	-	-
Benzene	71-43-2	Norm	-	-	9,2	-	-	-	122,2%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	176,3	92,4	-	-	72,7%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	39,5	20,7	-	0,0	54,1%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	3452,7	1808,7	-	1,4	96,4%	-	-	4,4%
Ethanol	64-17-5	Norm	135,4	70,9	-	-	39,8%	-	-	-
n-Hexane	110-54-3	Norm	214,4	112,3	-	0,1	6,7%	-	-	2,2%
Cyclohexane	110-82-7	Criteria	80,4	42,1	-	-	8,4%	-	-	-
Benzene	71-43-2	Norm	-	-	4,8	-	-	-	77,6%	-

Résultats Essence - Réservoir à toit fixe avec vitesse du vent > 2.5 m/s

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	844,6	442,5	-	-	184,1%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	189,2	99,1	-	0,0	96,9%	-	-	40,2%
Octane	111-65-9	Critère (voir note)	-	152,9	-	0,2	-	4,4%	-	0,1%
Isopentane	78-78-4	Critère (voir note)	16541,1	8665,0	-	10,0	440,8%	-	-	7,9%
Éthanol	64-17-5	Norme	648,7	339,8	-	-	190,8%	-	-	-
n-Heptane	142-82-5	Critère	317,6	166,4	-	-	13,8%	-	-	-
n-Hexane	110-54-3	Norme	1027,1	538,0	-	0,4	22,0%	-	-	2,4%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	6,8	3,5	-	0,0	24,9%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	43,2	22,7	-	0,0	24,8%	-	-	1,5%
Cyclohexane	110-82-7	Critère	385,1	201,8	-	-	29,6%	-	-	-
Benzène	71-43-2	Norme	-	-	18,4	-	-	-	213,7%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	433,8	227,2	-	-	115,6%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	97,2	50,9	-	0,0	70,6%	-	-	40,2%
Isopentane	78-78-4	Critère (voir note)	8495,2	4450,2	-	10,0	229,1%	-	-	7,9%
Éthanol	64-17-5	Norme	333,1	174,5	-	-	98,0%	-	-	-
n-Hexane	110-54-3	Norme	527,5	276,3	-	0,4	12,6%	-	-	2,4%
Cyclohexane	110-82-7	Critère	197,8	103,6	-	-	16,6%	-	-	-
Benzène	71-43-2	Norme	-	-	11,3	-	-	-	142,7%	-

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	355,6	186,3	-	-	102,6%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	79,7	41,7	-	0,0	65,6%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	64,4	-	0,0	-	1,8%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	6963,8	3648,0	-	1,4	188,8%	-	-	4,4%
Éthanol	64-17-5	Norme	273,1	143,1	-	-	80,3%	-	-	-
n-Heptane	142-82-5	Critère	133,7	70,0	-	-	7,1%	-	-	-
n-Hexane	110-54-3	Norme	432,4	226,5	-	0,1	10,8%	-	-	2,2%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	2,8	1,5	-	0,0	24,2%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	18,2	9,5	-	0,0	21,4%	-	-	1,5%
Cyclohexane	110-82-7	Critère	162,1	84,9	-	-	14,1%	-	-	-
Benzène	71-43-2	Norme	-	-	4,2	-	-	-	71,9%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	78,9	41,3	-	-	56,5%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	17,7	9,3	-	0,0	47,9%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	1544,4	809,0	-	1,4	46,2%	-	-	4,4%
Éthanol	64-17-5	Norme	60,6	31,7	-	-	17,8%	-	-	-
n-Hexane	110-54-3	Norme	95,9	50,2	-	0,1	4,5%	-	-	2,2%
Cyclohexane	110-82-7	Critère	36,0	18,8	-	-	5,3%	-	-	-
Benzène	71-43-2	Norme	-	-	1,6	-	-	-	46,0%	-

Gasoline Results - Fix roof tank with wind speed > 2.5 m/s

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	844,6	442,5	-	-	184,1%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	189,2	99,1	-	0,0	96,9%	-	-	40,2%
Octane	111-65-9	Criteria (see note)	-	152,9	-	0,2	-	4,4%	-	0,1%
Isopentane	78-78-4	Criteria (see note)	16541,1	8665,0	-	10,0	440,8%	-	-	7,9%
Ethanol	64-17-5	Norm	648,7	339,8	-	-	190,8%	-	-	-
n-Heptane	142-82-5	Criteria	317,6	166,4	-	-	13,8%	-	-	-
n-Hexane	110-54-3	Norm	1027,1	538,0	-	0,4	22,0%	-	-	2,4%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	6,8	3,5	-	0,0	24,9%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	43,2	22,7	-	0,0	24,8%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	385,1	201,8	-	-	29,6%	-	-	-
Benzene	71-43-2	Norm	-	-	18,4	-	-	-	213,7%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	433,8	227,2	-	-	115,6%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	97,2	50,9	-	0,0	70,6%	-	-	40,2%
Isopentane	78-78-4	Criteria (see note)	8495,2	4450,2	-	10,0	229,1%	-	-	7,9%
Ethanol	64-17-5	Norm	333,1	174,5	-	-	98,0%	-	-	-
n-Hexane	110-54-3	Norm	527,5	276,3	-	0,4	12,6%	-	-	2,4%
Cyclohexane	110-82-7	Criteria	197,8	103,6	-	-	16,6%	-	-	-
Benzene	71-43-2	Norm	-	-	11,3	-	-	-	142,7%	-

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	355,6	186,3	-	-	102,6%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	79,7	41,7	-	0,0	65,6%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	64,4	-	0,0	-	1,8%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	6963,8	3648,0	-	1,4	188,8%	-	-	4,4%
Ethanol	64-17-5	Norm	273,1	143,1	-	-	80,3%	-	-	-
n-Heptane	142-82-5	Criteria	133,7	70,0	-	-	7,1%	-	-	-
n-Hexane	110-54-3	Norm	432,4	226,5	-	0,1	10,8%	-	-	2,2%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	2,8	1,5	-	0,0	24,2%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	18,2	9,5	-	0,0	21,4%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	162,1	84,9	-	-	14,1%	-	-	-
Benzene	71-43-2	Norm	-	-	4,2	-	-	-	71,9%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	78,9	41,3	-	-	56,5%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	17,7	9,3	-	0,0	47,9%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	1544,4	809,0	-	1,4	46,2%	-	-	4,4%
Ethanol	64-17-5	Norm	60,6	31,7	-	-	17,8%	-	-	-
n-Hexane	110-54-3	Norm	95,9	50,2	-	0,1	4,5%	-	-	2,2%
Cyclohexane	110-82-7	Criteria	36,0	18,8	-	-	5,3%	-	-	-
Benzene	71-43-2	Norm	-	-	1,6	-	-	-	46,0%	-

Improvement Over Closed FRT (%)

Résultats Essence - Réservoir à toit flottant interne 93,41%

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	556,0	291,3	-	-	136,0%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	124,5	65,2	-	0,0	78,4%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	100,7	-	0,0	-	2,9%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	10888,6	5703,9	-	0,7	292,1%	-	-	4,0%
Éthanol	64-17-5	Norme	427,0	223,7	-	-	125,6%	-	-	-
n-Heptane	142-82-5	Critère	209,1	109,5	-	-	9,8%	-	-	-
n-Hexane	110-54-3	Norme	676,1	354,2	-	0,0	15,4%	-	-	2,2%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	4,4	2,3	-	0,0	24,5%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	28,5	14,9	-	0,0	22,8%	-	-	1,5%
Cyclohexane	110-82-7	Critère	253,5	132,8	-	-	20,5%	-	-	-
Benzène	71-43-2	Norme	-	-	2,5	-	-	-	55,0%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	74,2	38,9	-	-	55,7%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	16,6	8,7	-	0,0	47,6%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	1453,0	761,2	-	0,7	43,8%	-	-	4,0%
Éthanol	64-17-5	Norme	57,0	29,8	-	-	16,8%	-	-	-
n-Hexane	110-54-3	Norme	90,2	47,3	-	0,0	4,3%	-	-	2,2%
Cyclohexane	110-82-7	Critère	33,8	17,7	-	-	5,1%	-	-	-
Benzène	71-43-2	Norme	-	-	1,4	-	-	-	44,2%	-

2,36E-01

Concentrations maximales observées aux récepteurs sensibles 0,020031125

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	265,0	138,8	-	-	87,5%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	59,4	31,1	-	0,0	59,8%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	48,0	-	0,0	-	1,4%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	5190,0	2718,8	-	0,1	142,1%	-	-	3,8%
Éthanol	64-17-5	Norme	203,5	106,6	-	-	59,9%	-	-	-
n-Heptane	142-82-5	Critère	99,6	52,2	-	-	5,8%	-	-	-
n-Hexane	110-54-3	Norme	322,3	168,8	-	0,0	8,7%	-	-	2,1%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	2,1	1,1	-	0,0	24,1%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	13,6	7,1	-	0,0	20,8%	-	-	1,5%
Cyclohexane	110-82-7	Critère	120,8	63,3	-	-	11,2%	-	-	-
Benzène	71-43-2	Norme	-	-	0,6	-	-	-	36,1%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	11,6	6,1	-	-	45,3%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	2,6	1,4	-	0,0	43,6%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	227,5	119,2	-	0,1	11,5%	-	-	3,8%
Éthanol	64-17-5	Norme	8,9	4,7	-	-	2,6%	-	-	-
n-Hexane	110-54-3	Norme	14,1	7,4	-	0,0	2,9%	-	-	2,1%
Cyclohexane	110-82-7	Critère	5,3	2,8	-	-	3,2%	-	-	-
Benzène	71-43-2	Norme	-	-	0,3	-	-	-	33,1%	-

Tetra Tech QI inc. 715-46960TT

2023-02-03 Air Dispersion Modeling

Improvement Over Closed FRT (%)

Gasoline Results - Internal floating roof tank 93,41%

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	556,0	291,3	-	-	136,0%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	124,5	65,2	-	0,0	78,4%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	100,7	-	0,0	-	2,9%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	10888,6	5703,9	-	0,7	292,1%	-	-	4,0%
Ethanol	64-17-5	Norm	427,0	223,7	-	-	125,6%	-	-	-
n-Heptane	142-82-5	Criteria	209,1	109,5	-	-	9,8%	-	-	-
n-Hexane	110-54-3	Norm	676,1	354,2	-	0,0	15,4%	-	-	2,2%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	4,4	2,3	-	0,0	24,5%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	28,5	14,9	-	0,0	22,8%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	253,5	132,8	-	-	20,5%	-	-	-
Benzene	71-43-2	Norm	-	-	2,5	-	-	-	55,0%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	74,2	38,9	-	-	55,7%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	16,6	8,7	-	0,0	47,6%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	1453,0	761,2	-	0,7	43,8%	-	-	4,0%
Ethanol	64-17-5	Norm	57,0	29,8	-	-	16,8%	-	-	-
n-Hexane	110-54-3	Norm	90,2	47,3	-	0,0	4,3%	-	-	2,2%
Cyclohexane	110-82-7	Criteria	33,8	17,7	-	-	5,1%	-	-	-
Benzene	71-43-2	Norm	-	-	1,4	-	-	-	44,2%	-

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	265,0	138,8	-	-	87,5%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	59,4	31,1	-	0,0	59,8%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	48,0	-	0,0	-	1,4%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	5190,0	2718,8	-	0,1	142,1%	-	-	3,8%
Ethanol	64-17-5	Norm	203,5	106,6	-	-	59,9%	-	-	-
n-Heptane	142-82-5	Criteria	99,6	52,2	-	-	5,8%	-	-	-
n-Hexane	110-54-3	Norm	322,3	168,8	-	0,0	8,7%	-	-	2,1%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	2,1	1,1	-	0,0	24,1%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	13,6	7,1	-	0,0	20,8%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	120,8	63,3	-	-	11,2%	-	-	-
Benzene	71-43-2	Norm	-	-	0,6	-	-	-	36,1%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	11,6	6,1	-	-	45,3%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	2,6	1,4	-	0,0	43,6%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	227,5	119,2	-	0,1	11,5%	-	-	3,8%
Ethanol	64-17-5	Norm	8,9	4,7	-	-	2,6%	-	-	-
n-Hexane	110-54-3	Norm	14,1	7,4	-	0,0	2,9%	-	-	2,1%
Cyclohexane	110-82-7	Criteria	5,3	2,8	-	-	3,2%	-	-	-
Benzene	71-43-2	Norm	-	-	0,3	-	-	-	33,1%	-

Improvement Over Closed FRT (%)
93,41%

Résultats Essence - Réservoir à toit flottant interne avec vitesse du vent > 2.5 m/s

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	55,7	29,2	-	-	52,6%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	12,5	6,5	-	0,0	46,4%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	10,1	-	0,0	-	0,3%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	1090,1	571,0	-	0,7	34,2%	-	-	4,0%
Éthanol	64-17-5	Norme	42,7	22,4	-	-	12,6%	-	-	-
n-Heptane	142-82-5	Critère	20,9	11,0	-	-	3,0%	-	-	-
n-Hexane	110-54-3	Norme	67,7	35,5	-	0,0	3,9%	-	-	2,2%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	0,4	0,2	-	0,0	23,8%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	2,8	1,5	-	0,0	19,3%	-	-	1,5%
Cyclohexane	110-82-7	Critère	25,4	13,3	-	-	4,6%	-	-	-
Benzène	71-43-2	Norme	-	-	1,2	-	-	-	42,1%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	28,6	15,0	-	-	48,1%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	6,4	3,4	-	0,0	44,7%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	559,8	293,3	-	0,7	20,3%	-	-	4,0%
Éthanol	64-17-5	Norme	22,0	11,5	-	-	6,5%	-	-	-
n-Hexane	110-54-3	Norme	34,8	18,2	-	0,0	3,3%	-	-	2,2%
Cyclohexane	110-82-7	Critère	13,0	6,8	-	-	3,7%	-	-	-
Benzène	71-43-2	Norme	-	-	0,7	-	-	-	37,4%	-

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	23,4	12,3	-	-	47,2%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	5,2	2,7	-	0,0	44,4%	-	-	40,0%
Octane	111-65-9	Critère (voir note)	-	4,2	-	0,0	-	0,1%	-	0,0%
Isopentane	78-78-4	Critère (voir note)	458,9	240,4	-	0,1	17,6%	-	-	3,8%
Éthanol	64-17-5	Norme	18,0	9,4	-	-	5,3%	-	-	-
n-Heptane	142-82-5	Critère	8,8	4,6	-	-	2,5%	-	-	-
n-Hexane	110-54-3	Norme	28,5	14,9	-	0,0	3,2%	-	-	2,1%
1,2,4-Triméthylbenzène	95-63-6	Critère (voir note)	0,2	0,1	-	0,0	23,8%	-	-	20,0%
Éthylbenzène	100-41-4	Norme	1,2	0,6	-	0,0	19,1%	-	-	1,5%
Cyclohexane	110-82-7	Critère	10,7	5,6	-	-	3,5%	-	-	-
Benzène	71-43-2	Norme	-	-	0,3	-	-	-	32,8%	-
Résultats au 99e centile des concentrations ambiantes										
Toluène	108-88-3	Norme	5,2	2,7	-	-	44,2%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	1,2	0,6	-	0,0	43,2%	-	-	40,0%
Isopentane	78-78-4	Critère (voir note)	101,8	53,3	-	0,1	8,2%	-	-	3,8%
Éthanol	64-17-5	Norme	4,0	2,1	-	-	1,2%	-	-	-
n-Hexane	110-54-3	Norme	6,3	3,3	-	0,0	2,8%	-	-	2,1%
Cyclohexane	110-82-7	Critère	2,4	1,2	-	-	3,0%	-	-	-
Benzène	71-43-2	Norme	-	-	0,1	-	-	-	31,1%	-

Tetra Tech QI inc. 715-46960TT

2023-02-03 Air Dispersion Modeling

Improvement Over Closed FRT (%)

Gasoline Results - Internal floating roof tank with wind speed > 2.5 m/s 93,41%

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	55,7	29,2	-	-	52,6%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	12,5	6,5	-	0,0	46,4%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	10,1	-	0,0	-	0,3%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	1090,1	571,0	-	0,7	34,2%	-	-	4,0%
Ethanol	64-17-5	Norm	42,7	22,4	-	-	12,6%	-	-	-
n-Heptane	142-82-5	Criteria	20,9	11,0	-	-	3,0%	-	-	-
n-Hexane	110-54-3	Norm	67,7	35,5	-	0,0	3,9%	-	-	2,2%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	0,4	0,2	-	0,0	23,8%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	2,8	1,5	-	0,0	19,3%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	25,4	13,3	-	-	4,6%	-	-	-
Benzene	71-43-2	Norm	-	-	1,2	-	-	-	42,1%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	28,6	15,0	-	-	48,1%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	6,4	3,4	-	0,0	44,7%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	559,8	293,3	-	0,7	20,3%	-	-	4,0%
Ethanol	64-17-5	Norm	22,0	11,5	-	-	6,5%	-	-	-
n-Hexane	110-54-3	Norm	34,8	18,2	-	0,0	3,3%	-	-	2,2%
Cyclohexane	110-82-7	Criteria	13,0	6,8	-	-	3,7%	-	-	-
Benzene	71-43-2	Norm	-	-	0,7	-	-	-	37,4%	-

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	23,4	12,3	-	-	47,2%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	5,2	2,7	-	0,0	44,4%	-	-	40,0%
Octane	111-65-9	Criteria (see note)	-	4,2	-	0,0	-	0,1%	-	0,0%
Isopentane	78-78-4	Criteria (see note)	458,9	240,4	-	0,1	17,6%	-	-	3,8%
Ethanol	64-17-5	Norm	18,0	9,4	-	-	5,3%	-	-	-
n-Heptane	142-82-5	Criteria	8,8	4,6	-	-	2,5%	-	-	-
n-Hexane	110-54-3	Norm	28,5	14,9	-	0,0	3,2%	-	-	2,1%
1,2,4-TrimEthylbenzene	95-63-6	Criteria (see note)	0,2	0,1	-	0,0	23,8%	-	-	20,0%
Ethylbenzene	100-41-4	Norm	1,2	0,6	-	0,0	19,1%	-	-	1,5%
Cyclohexane	110-82-7	Criteria	10,7	5,6	-	-	3,5%	-	-	-
Benzene	71-43-2	Norm	-	-	0,3	-	-	-	32,8%	-
Results at the 99th percentile of ambient concentrations										
Toluene	108-88-3	Norm	5,2	2,7	-	-	44,2%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	1,2	0,6	-	0,0	43,2%	-	-	40,0%
Isopentane	78-78-4	Criteria (see note)	101,8	53,3	-	0,1	8,2%	-	-	3,8%
Ethanol	64-17-5	Norm	4,0	2,1	-	-	1,2%	-	-	-
n-Hexane	110-54-3	Norm	6,3	3,3	-	0,0	2,8%	-	-	2,1%
Cyclohexane	110-82-7	Criteria	2,4	1,2	-	-	3,0%	-	-	-
Benzene	71-43-2	Norm	-	-	0,1	-	-	-	31,1%	-

Résultats Diesel

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	221,2	115,9	-	-	80,2%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	61,9	32,4	-	0,0	60,6%	-	-	40,1%
Octane	111-65-9	Critère (voir note)	-	111,2	-	0,2	-	3,2%	-	0,05%
Éthylbenzène	100-41-4	Norme	70,8	37,1	-	0,0	28,5%	-	-	1,5%
Carburants diesel	68334-30-5	SEPR	-	577,6	-	0,2	-	6035,0%	-	161,8%
Carburant diesel C9-C18 Alcanes ramifiés et linéaires	1159170-26-6	Non	330,8	173,3	48,1	0,0	-	-	-	-
Nonane	111-84-2	Critère	132,7	69,5	-	0,1	1,5%	-	-	0,02%

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Carburants diesel	68334-30-5	SEPR	-	225,1	-	0,03	-	2352,3%	-	34,2%
Carburant diesel C9-C18 Alcanes ramifiés et linéaires	1159170-26-6	Non	128,9	67,5	12,5	0,01	-	-	-	-

Diesel Results

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	221,2	115,9	-	-	80,2%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	61,9	32,4	-	0,0	60,6%	-	-	40,1%
Octane	111-65-9	Criteria (see note)	-	111,2	-	0,2	-	3,2%	-	0,05%
Ethylbenzene	100-41-4	Norm	70,8	37,1	-	0,0	28,5%	-	-	1,5%
Diesel Fuels	68334-30-5	SEPR	-	577,6	-	0,2	-	6035,0%	-	161,8%
Diesel Fuel C9-C18 Alkane - branched and linear	1159170-26-6	No	330,8	173,3	48,1	0,0	-	-	-	-
Nonane	111-84-2	Criteria	132,7	69,5	-	0,1	1,5%	-	-	0,02%

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Diesel Fuels	68334-30-5	SEPR	-	225,1	-	0,03	-	2352,3%	-	34,2%
Diesel Fuel C9-C18 Alkane - branched and linear	1159170-26-6	No	128,9	67,5	12,5	0,01	-	-	-	-

Résultats Diesel : vitesse du vent > 2.5 m/s

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	103,1	54,0	-	-	60,5%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	28,9	15,1	-	0,0	51,1%	-	-	40,1%
Octane	111-65-9	Critère (voir note)	-	51,9	-	0,2	-	1,5%	-	0,05%
Éthylbenzène	100-41-4	Norme	33,0	17,3	-	0,0	23,4%	-	-	1,5%
Carburants diesel	68334-30-5	SEPR	-	269,2	-	0,2	-	2813,5%	-	161,8%
Carburant diesel C9-C18 Alcanes ramifiés et linéaires	1159170-26-6	Non	154,2	80,8	26,1	0,0	-	-	-	-
Nonane	111-84-2	Critère	61,9	32,4	-	0,1	0,9%	-	-	0,02%

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Carburants diesel	68334-30-5	SEPR	-	102,9	-	0,03	-	1075,7%	-	34,2%
Carburant diesel C9-C18 Alcanes ramifiés et linéaires	1159170-26-6	Non	59,0	30,9	7,6	0,01	-	-	-	-

Diesel Results : wind speed > 2.5 m/s

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	103,1	54,0	-	-	60,5%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	28,9	15,1	-	0,0	51,1%	-	-	40,1%
Octane	111-65-9	Criteria (see note)	-	51,9	-	0,2	-	1,5%	-	0,05%
Ethylbenzene	100-41-4	Norm	33,0	17,3	-	0,0	23,4%	-	-	1,5%
Diesel Fuels	68334-30-5	SEPR	-	269,2	-	0,2	-	2813,5%	-	161,8%
Diesel Fuel C9-C18 Alkane - branched and linear	1159170-26-6	No	154,2	80,8	26,1	0,0	-	-	-	-
Nonane	111-84-2	Criteria	61,9	32,4	-	0,1	0,9%	-	-	0,02%

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Diesel Fuels	68334-30-5	SEPR	-	102,9		0,03	-	1075,7%	-	34,2%
Diesel Fuel C9-C18 Alkane - branched and linear	1159170-26-6	No	59,0	30,9	7,6	0,01	-	-	-	-

Résultats Jet-A

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	121,8	63,8	-	-	63,6%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	170,5	89,3	-	0,0	91,6%	-	-	40,1%
Éthylbenzène	100-41-4	Norme	19,5	10,2	-	0,0	21,6%	-	-	1,5%
Kérosène	8008-20-6	Critère (voir note)	-	2281,7	-	-	-	1086,5%	-	-
Kérosène - hydrodésulfuré	64742-81-0	Critère (voir note)	-	2281,7	-	-	-	1086,5%	-	-
Naphtalène	91-20-3	Norme (voir note)	0,7	0,4	-	0,0	2,9%	-	-	0,0%

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	34,0	17,8	-	-	49,0%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	47,7	25,0	-	0,0	56,5%	-	-	40,0%
Éthylbenzène	100-41-4	Norme	5,4	2,9	-	0,0	19,7%	-	-	1,5%
Kérosène	8008-20-6	Critère (voir note)	-	638,0	-	-	-	303,8%	-	-
Kérosène - hydrodésulfuré	64742-81-0	Critère (voir note)	-	638,0	-	-	-	303,8%	-	-
Naphtalène	91-20-3	Norme (voir note)	0,2	0,1	-	0,0	2,6%	-	-	0,0%

Jet-A Results

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	121,8	63,8	-	-	63,6%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	170,5	89,3	-	0,0	91,6%	-	-	40,1%
Ethylbenzene	100-41-4	Norm	19,5	10,2	-	0,0	21,6%	-	-	1,5%
Kerosene	8008-20-6	Criteria (see note)	-	2281,7	-	-	-	1086,5%	-	-
Kerosene - hydrodesulfurized	64742-81-0	Criteria (see note)	-	2281,7	-	-	-	1086,5%	-	-
Naphtalene	91-20-3	Norm (see note)	0,7	0,4	-	0,0	2,9%	-	-	0,0%

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	34,0	17,8	-	-	49,0%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	47,7	25,0	-	0,0	56,5%	-	-	40,0%
Ethylbenzene	100-41-4	Norm	5,4	2,9	-	0,0	19,7%	-	-	1,5%
Kerosene	8008-20-6	Criteria (see note)	-	638,0	-	-	-	303,8%	-	-
Kerosene - hydrodesulfurized	64742-81-0	Criteria (see note)	-	638,0	-	-	-	303,8%	-	-
Naphtalene	91-20-3	Norm (see note)	0,2	0,1	-	0,0	2,6%	-	-	0,0%

Résultats Jet-A : vitesse du vent > 2.5 m/s

Concentrations maximales dans l'air ambiant et comparaison aux valeurs limites applicables

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	52,4	27,5	-	-	52,1%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	73,4	38,5	-	0,0	63,8%	-	-	40,1%
Éthylbenzène	100-41-4	Norme	8,4	4,4	-	0,0	20,1%	-	-	1,5%
Kérosène	8008-20-6	Critère (voir note)	-	982,7	-	-	-	468,0%	-	-
Kérosène - hydrodésulfuré	64742-81-0	Critère (voir note)	-	982,7	-	-	-	468,0%	-	-
Naphtalène	91-20-3	Norme (voir note)	0,3	0,2	-	0,0	2,7%	-	-	0,0%

Concentrations maximales observées aux récepteurs sensibles

Contaminant	CAS	Norme ou critère	Résultats [µg/m³]				Résultats : Pourcentage de la valeur limite (incluant concentration initiale)			
			4min	1h	24h	1 an	4min	1h	24h	1 an
Toluène	108-88-3	Norme	15,9	8,4	-	-	46,0%	-	-	-
Xylène (o,m,p)	1330-20-7	Norme (voir note)	22,3	11,7	-	0,0	49,2%	-	-	40,0%
Éthylbenzène	100-41-4	Norme	2,6	1,3	-	0,0	19,3%	-	-	1,5%
Kérosène	8008-20-6	Critère (voir note)	-	298,7	-	-	-	142,3%	-	-
Kérosène - hydrodésulfuré	64742-81-0	Critère (voir note)	-	298,7	-	-	-	142,3%	-	-
Naphtalène	91-20-3	Norme (voir note)	0,1	0,1	-	0,0	2,5%	-	-	0,0%

Jet-A Results : wind speed > 2.5 m/s

Maximum concentrations in ambient air and comparison with applicable limit values

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	52,4	27,5	-	-	52,1%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	73,4	38,5	-	0,0	63,8%	-	-	40,1%
Ethylbenzene	100-41-4	Norm	8,4	4,4	-	0,0	20,1%	-	-	1,5%
Kerosene	8008-20-6	Criteria (see note)	-	982,7	-	-	-	468,0%	-	-
Kerosene - hydrodesulfurized	64742-81-0	Criteria (see note)	-	982,7	-	-	-	468,0%	-	-
Naphtalene	91-20-3	Norm (see note)	0,3	0,2	-	0,0	2,7%	-	-	0,0%

Maximum concentrations observed at sensitive receptors

Product	CAS	Norm ou criteria	Results [µg/m³]				Results: Percentage of limit value (including initial concentration)			
			4min	1h	24h	1 y	4min	1h	24h	1 y
Toluene	108-88-3	Norm	15,9	8,4	-	-	46,0%	-	-	-
Xylene (o,m,p)	1330-20-7	Norm (see note)	22,3	11,7	-	0,0	49,2%	-	-	40,0%
Ethylbenzene	100-41-4	Norm	2,6	1,3	-	0,0	19,3%	-	-	1,5%
Kerosene	8008-20-6	Criteria (see note)	-	298,7	-	-	-	142,3%	-	-
Kerosene - hydrodesulfurized	64742-81-0	Criteria (see note)	-	298,7	-	-	-	142,3%	-	-
Naphtalene	91-20-3	Norm (see note)	0,1	0,1	-	0,0	2,5%	-	-	0,0%

ANNEX 5

PHOTOS


Photo #1
Localisation du second exutoire projeté
Exutoire du dépot existant, aucun signe d'érosion observé
remblai entre le dépôt et la zone naturelle
photo 2
07/30/2019


photo #2
Dépot pétrolier
photo#1
08/24/2021 20:04


photo #3
localisation exutoire existant
localisation future du second exutoire


Photo #4
zone exutoire , pas
de signe d'érosion
08/24/2021 20:15