2024 ANNUAL REPORT
FOR THE MUNICIPALITY OF CLYDE RIVER

YEAR BEING REPORTED: 2024

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. **3BM-CLY1924** issued to the **Municipality of Clyde River**.

i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

Attached are the quantities of water used as reported in the On Tap Water Delivery System and the estimated discharge of waste. The water consumption volume is considered equal to the sewage discharge volume because there is no meter at the end of the discharge pipe.

2024 ANNUAL REPORT
FOR THE MUNICIPALITY OF CLYDE RIVER

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (m^3)	Hazardous Waste Accepted (m^3)	Non-Hazardous Waste Accepted (m^3)
January	3,202.74	Same	1.21	1,096.55
February	3,925.72	Same	1.21	1,096.55
March	3,212.93	Same	1.21	1,096.55
April	3,149.16	Same	1.21	1,096.55
May	3,260.53	Same	1.21	1,096.55
June	3,298.21	Same	1.21	1,096.55
July	3,467.69	Same	1.21	1,096.55
August	3,404.58	Same	1.21	1,096.55
September	3,404.43	Same	1.21	1,096.55
October	3,347.71	Same	1.21	1,096.55
November	3,437.87	Same	1.21	1,096.55
December	3,337.54	Same	1.21	1,096.55
ANNUAL TOTAL	39,449.11	Same	14.56	13,158.62

2024 ANNUAL REPORT
FOR THE MUNICIPALITY OF CLYDE RIVER

IV. A summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities:

The south berm of the large sewage lagoon cell had to be repaired due to erosion during the sewage lagoon decanting process. The berm was immediately repaired by Pilitak June 2024. Photos of the repaired berm are provided in **Appendix C**.

A dam safety inspection will take place in 2025 to determine if further repair work is required. The full scope of work for the dam safety inspection is provided in the response to **Part X**.

V. A list of unauthorized discharges and summary of follow-up action taken:

There were no spills associated with licensed infrastructure in 2024.

VI. A summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year:

There was no abandonment and restoration work completed during 2024. There is no abandonment and restoration work anticipated for 2025.

VII. A summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned:

<u>Water</u>
A feasibility study for a new water supply facility is in progress, which includes a hydrology study to determine the viability of Emirtavik Lake (Water Source Lake) as a sufficient water source through to 2050. The expected completion of the feasibility study is March 2026. A summary will be provided along with the 2025 Annual Report.

<u>Solid Waste</u>
The initial planning study for a new solid waste facility was completed in 2020/21. The cost estimates have indicated that the current funding cannot support the construction of a new state-of-the-art 20-year landfill. The focus of the project has shifted to making improvements to the current site. A second planning contract to assess and prioritize the improvements to the current site is expected to be complete in 2025.

VIII. Any other details on water use or waste disposal requested by the Board by November 1st of the year being reported; and

No other details on water use or waste disposal requested by the Board by November 1st of

2024.

IX. Updates or revisions to the approved Operation and Maintenance Plans:

Updated Operation and Maintenance Plans for the Sewage Disposal Facility, Water Suppy Facility, and Solid Waste Disposal Facility, and updated Environmental Emergency Spill Contingency and Environmental Monitoring and QA/QC Plans were provided within the 2024 Application for Amendment and Renewal of the Water Licence for approval.

The changes to the Plans ensure that all information is up to date for the infrastructure, personnel, and procedures for handling regulatory requirements.

X. ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

An early decant of both cells of sewage facility was required in April 2024 to comply with the minimum 1.0 m freeboard requirement of Part D, Item of the Licence. Details regarding this event are provided in **Appendix D**. SIFEC North was contracted in April 2024 for the decant as there was no working sewage decanting pump available in the community. The sewage pump broke down in 2023, which led to the early decant event. Details of the scope of work for the SIFEC North contract are provided in **Appendix E**. A higher capacity sewage lagoon pump has been ordered as a replacement for the original pump that broke down in 2023. Details of the new pump are provided in **Appendix F**.

No modifications to the Monitoring Program.

No sludge has been removed from the Wastewater Treatment Facility

The Dillon Study for the recommended frequency of engineer inspections will be provided separately from this Annual Report by the Government of Nunavut – Community and Government Services by March 31, 2025

A dam safety inspection study for the wastewater treatment facility will be initiated with an engineering consultant starting in the upcoming spring. The study will involve the following scope:

- Complete a detailed visual berm inspection at the Clyde River sewage lagoon including all berms, lagoon liner, and decant equipment;
- Develop a photographic record of current berm and sewage lagoon conditions on site;
- Determine and report all locations of potential sewage lagoon leaks and or structural failure currently occurring or likely to occur in the future;
- Identify current and or future safety and environmental concerns including risk of structural failure or leaking of the sewage lagoon;

- Communicate with municipality employees and record local information and observations regarding the sewage lagoon;
- Indicate any recommended remedial measures of immediate and future concerns with a Class D Cost estimate

XI. FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

2024 Inspection Report has not been received.

APPENDICES:

Appendix A: Summary of Monitoring Data
Appendix B: Certificate of Analyses
Appendix C: South Cell South Berm Repair Photos
Appendix D: Lagoon Discharge Notification and Acknowledgement Appendix
Appendix E: Early Decent Scope of Work
Appendix F: New Sewage Lagoon Pump

Appendix A

Tabular Summary of Wastewater Monitoring Data

Parameter	**Maximum Concentration of any Grab Sample for CLY-*4* and *CLY-5***	**Units**	**Apr. 24, 2024 *CLY-5* Emergency Decant**	**July 27, 2024 *CLY-4* Mid-way Through Discharge**	**July 27, 2024 *CLY-5* Mid-way Through Discharge**	**July 27, 2024 CLY-6B Mid-way Through Discharge**
BOD_5	120	mg/L	106	11	83	13
Total Suspended Solids	180	mg/L	37	92	3640	16
Fecal Coliform	$1x10^6$	CFU/100 mL	6×10^5	<10	$6.2x10^4$	10
Oil and Grease	No visible sheen	N/A	-	1.8 mg/L	17.6 mg/L	1.2 mg/L
pH	Between 6 and 9	N/A	7.62	6.49	7.47	7.02

It is believed that the sample for CLY-4 had been diluted by freshet.

Appendix B

Please note:

- For analysis report no. 24-019563, the Client ID shows CLY-2, but the sample was in fact taken at CLY-5
- For analysis report no. 24-019556, the Client ID shows CLY-2 (new monitoring station); however, this is CLY-2 Runoff from the Solid Waste Disposal Facilities as per the water licence.
- The coordinates for the samples taken are as follows:
    - CLY-4: 70°28'06.9"N 68°37'45.5"W
    - CLY-5: 70°28'05.4"N 68°37'51.2"W
    - CLY-6B: 70°27'52.9"N 68°37'22.7"W

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: -

REPORT No: 24-011693 - Rev. 0

Report To:
Municipality of Clyde River
Box 89
Clyde River, NU X0A 0E0

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Ian Tigullaraq

DATE RECEIVED: 2024-Apr-29
DATE REPORTED: 2024-May-07
SAMPLE MATRIX: Waste Water

CUSTOMER PROJECT:
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	1	OTTAWA	LMACGREGOR	2024-Apr-30	A-IC-01	SM 4110B
BOD5 (Liquid)	1	KINGSTON	JWOLFE2	2024-May-02	BOD-001	SM 5210B
Cond/pH/Alk Auto (Liquid)	1	OTTAWA	SBOUDREAU	2024-Apr-29	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
Fecal Coliforms (Liquid)	1	OTTAWA	HALIPDA	2024-Apr-29	FC-001	SM 9222D
ICP/MS Total (Liquid)	1	OTTAWA	AOZKAYMAK	2024-May-02	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	1	OTTAWA	NHOGAN	2024-May-02	D-ICP-01	SM 3120B
Mercury (Liquid)	1	OTTAWA	TBENNETT	2024-May-02	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	1	KINGSTON	JYEARWOOD	2024-May-02	NH3-001	SM 4500NH3
PHC F1 (Liquid)	1	RICHMOND_HILL	FLENA	2024-May-02	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	1	KINGSTON	STHOMPSON	2024-May-02	PHC-W-001	MECP E3421
Phenols (Liquid)	1	KINGSTON	JMACINNES	2024-May-02	PHEN-01	MECP E3179
Total Organic Carbon (TOC)	1	OTTAWA	VKASYAN	2024-May-01	C-OC-01	EPA 415.2
TP & TKN (Liquid)	1	KINGSTON	KDIBBITS	2024-May-06	TPTKN-001	MECP E3516.2
TSS (Liquid)	1	KINGSTON	DCASSIDY	2024-May-01	TSS-001	SM 2540D
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2024-May-02	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

Michelle Dubien
Data Specialist

		Client I.D.	Leachate CLY-2
		Sample I.D.	24-011693-1
		Date Collected	2024-04-25
Parameter	**Units**	**R.L.**	-
Fecal Coliform	CFU/100mL	1	600000
Alkalinity(CaCO3) to pH4.5	mg/L	5	494
Conductivity @25°C	uS/cm	1	1480
pH @25°C	pH units	-	7.62
Chloride	mg/L	0.5	93.5
Nitrate (N)	mg/L	0.05	<0.05
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	<1
BOD5	mg/L	3	106
Total Suspended Solids	mg/L	3	37
Phosphorus (Total)	mg/L	0.01	15.2
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	152
Total Organic Carbon	mg/L	0.2	96.0
Phenolics	mg/L	0.001	<0.001
Hardness (as CaCO3)	mg/L	-	62.4
Aluminum (Total)	mg/L	0.01	0.22
Cadmium (Total)	mg/L	0.005	<0.005
Calcium (Total)	mg/L	0.02	10.8
Chromium (Total)	mg/L	0.002	0.002
Cobalt (Total)	mg/L	0.005	<0.005
Copper (Total)	mg/L	0.002	0.185

Michelle Dubien
Data Specialist

Parameter	Units	R.L.	Client I.D.: Leachate CLY-2 Sample I.D.: 24-011693-1 Date Collected: 2024-04-25 -
Iron (Total)	mg/L	0.005	2.44
Lead (Total)	mg/L	0.02	<0.02
Manganese (Total)	mg/L	0.001	0.213
Nickel (Total)	mg/L	0.01	<0.01
Potassium (Total)	mg/L	0.1	40.3
Zinc (Total)	mg/L	0.005	0.098
Arsenic (Total)	mg/L	0.0001	0.0011
Mercury	mg/L	0.00002	0.00005

Parameter	Units	R.L.	Client I.D.: Leachate CLY-2 Sample I.D.: 24-011693-1 Date Collected: 2024-04-25 -
Benzene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	131
Xylene, m,p-	µg/L	1	1
Xylene, m,p,o-	µg/L	1.1	1.6
Xylene, o-	µg/L	0.5	0.5
PHC F1 (C6-C10)	µg/L	25	168
PHC F2 (>C10-C16)	µg/L	50	331
PHC F3 (>C16-C34)	µg/L	400	2620
PHC F4 (>C34-C50)	µg/L	400	996

Michelle Dubien
Data Specialist

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 111254 **REPORT No: 24-019556 - Rev. 0**

Report To:
Municipality of Clyde River
Box 89
Clyde River, NU X0A 0E0

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Ian Tigullaraq

DATE RECEIVED: 2024-Jul-02
DATE REPORTED: 2024-Jul-10
SAMPLE MATRIX: Waste Water

CUSTOMER PROJECT:
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	1	OTTAWA	PCURIEL	2024-Jul-03	A-IC-01	SM 4110B
BOD5 (Liquid)	1	KINGSTON	JWOLFE2	2024-Jul-04	BOD-001	SM 5210B
Cond/pH/Alk Auto (Liquid)	1	OTTAWA	SBOUDREAU	2024-Jul-03	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
Fecal Coliforms (Liquid)	1	OTTAWA	HALIPDA	2024-Jul-02	FC-001	SM 9222D
ICP/MS Total (Liquid)	1	OTTAWA	TPRICE	2024-Jul-03	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	1	OTTAWA	JCASSIDY	2024-Jul-03	D-ICP-01	SM 3120B
Mercury (Liquid)	1	OTTAWA	TBENNETT	2024-Jul-04	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	1	KINGSTON	KDIBBITS	2024-Jul-04	NH3-001	SM 4500NH3
Oil & Grease (Liquid)	1	KINGSTON	TMCBRYDE	2024-Jul-05	O&G-001	SM 5520
PHC F1 (Liquid)	1	RICHMOND_HILL	FLENA	2024-Jul-05	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	1	KINGSTON	STHOMPSON	2024-Jul-09	PHC-W-001	MECP E3421
Phenols (Liquid)	1	KINGSTON	JMACINNES	2024-Jul-04	PHEN-01	MECP E3179
SVOC - Semi-Volatiles (Liquid)	1	KINGSTON	EASIEDU	2024-Jul-09	NAB-W-001	EPA 8270D
Total Organic Carbon (TOC)	1	OTTAWA	VKASYAN	2024-Jul-05	C-OC-01	EPA 415.2
TP & TKN (Liquid)	1	KINGSTON	KDIBBITS	2024-Jul-10	TPTKN-001	MECP E3516.2
TSS (Liquid)	1	KINGSTON	DCASSIDY	2024-Jul-04	TSS-001	SM 2540D
VOC-Volatiles Full (Water)	1	RICHMOND_HILL	FLENA	2024-Jul-05	C-VOC-02	EPA 8260

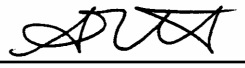
µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
F2 C10-C16 hydrocarbons in µg/g, (F2-napth if requested)
F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
F4 C34-C50 hydrocarbons in µg/g
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
Any deviations from the method are noted and reported for any particular sample.
nC6 and nC10 response factor is within 30% of response factor for toluene:
nC10,nC16 and nC34 response factors within 10% of each other:
C50 response factors within 70% of nC10+nC16+nC34 average:
Linearity is within 15%:
All results expressed on a dry weight basis.
Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
QC will be made available upon request.

Steve Garrett
Director of Laboratory Services

Parameter	Units	R.L.	Client I.D.: CLY-2 (new monitoring station) Sample I.D.: 24-019556-1 Date Collected: 2024-06-27 -
Fecal Coliform	CFU/100mL	1	<100
Alkalinity(CaCO3) to pH4.5	mg/L	5	16
Conductivity @25°C	uS/cm	1	48
pH @25°C	pH units	-	6.84
Chloride	mg/L	0.5	4.2
Nitrate (N)	mg/L	0.05	0.10
Nitrite (N)	mg/L	0.05	<0.05
Sulphate	mg/L	1	<1
BOD5	mg/L	3	3
Total Suspended Solids	mg/L	3	11
Phosphorus (Total)	mg/L	0.01	0.06
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	<0.05
Total Organic Carbon	mg/L	0.2	5.8
Phenolics	mg/L	0.001	<0.001
Hardness (as CaCO3)	mg/L	0.02	12.9
Aluminum (Total)	mg/L	0.01	0.27
Cadmium (Total)	mg/L	0.005	<0.005
Calcium (Total)	mg/L	0.02	2.91
Chromium (Total)	mg/L	0.002	<0.002
Cobalt (Total)	mg/L	0.005	<0.005
Copper (Total)	mg/L	0.002	<0.002



Steve Garrett

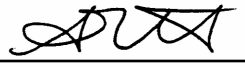
Director of Laboratory Services

		Client I.D.	CLY-2 (new monitoring station)
		Sample I.D.	24-019556-1
		Date Collected	2024-06-27
Parameter	**Units**	**R.L.**	-
Iron (Total)	mg/L	0.005	1.24
Lead (Total)	mg/L	0.02	<0.02
Manganese (Total)	mg/L	0.001	0.066
Nickel (Total)	mg/L	0.01	<0.01
Potassium (Total)	mg/L	0.1	3.0
Zinc (Total)	mg/L	0.005	0.029
Arsenic (Total)	mg/L	0.0001	0.0003
Mercury	mg/L	0.00002	<0.00002

Steve Garrett

Director of Laboratory Services

	Client I.D.		CLY-2 (new monitoring station)
	Sample I.D.		24-019556-1
	Date Collected		2024-06-27
Parameter	**Units**	**R.L.**	-
Benzene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	2.2
Xylene, m,p-	µg/L	1	<1
Xylene, m,p,o-	µg/L	1.1	<1.1
Xylene, o-	µg/L	0.5	<0.5
PHC F1 (C6-C10)	µg/L	25	<25
PHC F2 (>C10-C16)	µg/L	50	<50
PHC F3 (>C16-C34)	µg/L	400	<400
PHC F4 (>C34-C50)	µg/L	400	<400
Oil & Grease (Total)	mg/L	1.0	1.7



Steve Garrett

Director of Laboratory Services

		Client I.D.	CLY-2 (new monitoring station)
		Sample I.D.	24-019556-1
		Date Collected	2024-06-27
Parameter	**Units**	**R.L.**	-
Acenaphthene	µg/L	0.05	<0.05
Acenaphthylene	µg/L	0.05	<0.05
Anthracene	µg/L	0.05	<0.05
Benzo[a]anthracene	µg/L	0.05	<0.05
Benzo(a)pyrene	µg/L	0.01	<0.01
Benzo(b)fluoranthene	µg/L	0.05	<0.05
Benzo(b+k)fluoranthene	µg/L	0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.05	<0.05
Benzo(k)fluoranthene	µg/L	0.05	<0.05
Chrysene	µg/L	0.05	<0.05
Dibenzo(a,h)anthracene	µg/L	0.05	<0.05
Fluoranthene	µg/L	0.05	<0.05
Fluorene	µg/L	0.05	<0.05
Indeno(1,2,3,-cd)Pyrene	µg/L	0.05	<0.05
Methylnaphthalene,1-	µg/L	0.05	<0.05
Methylnaphthalene,2-(1-)	µg/L	1	<1
Methylnaphthalene,2-	µg/L	0.05	<0.05
Naphthalene	µg/L	0.05	<0.05
Phenanthrene	µg/L	0.05	<0.05
Pyrene	µg/L	0.05	<0.05
Total PAH	µg/L	0.1	0.2

Steve Garrett

Director of Laboratory Services

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G 111254

REPORT No: 24-019563 - Rev. 0

Report To:
Municipality of Clyde River
Box 89
Clyde River, NU X0A 0E0

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Ian Tigullaraq

DATE RECEIVED: 2024-Jul-02
DATE REPORTED: 2024-Jul-09
SAMPLE MATRIX: Waste Water

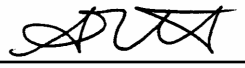
CUSTOMER PROJECT:
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	3	OTTAWA	PCURIEL	2024-Jul-03	A-IC-01	SM 4110B
BOD5 (Liquid)	3	KINGSTON	JWOLFE2	2024-Jul-04	BOD-001	SM 5210B
Cond/pH/Alk Auto (Liquid)	3	OTTAWA	SBOUDREAU	2024-Jul-03	COND-02/PH-02/ALK-02	SM 2510B/4500H/2320B
Fecal Coliforms (Liquid)	3	OTTAWA	HALIPDA	2024-Jul-02	FC-001	SM 9222D
ICP/MS Total (Liquid)	3	OTTAWA	TPRICE	2024-Jul-03	D-ICPMS-01	EPA 6020
ICP/OES Total (Liquid)	3	OTTAWA	AOZKAYMAK	2024-Jul-03	D-ICP-01	SM 3120B
Mercury (Liquid)	3	OTTAWA	TBENNETT	2024-Jul-04	D-HG-02	SM 3112B
Ammonia & o-Phosphate (Liquid)	3	KINGSTON	KDIBBITS	2024-Jul-04	NH3-001	SM 4500NH3
Oil & Grease (Liquid)	3	KINGSTON	TMCBRYDE	2024-Jul-05	O&G-001	SM 5520
Phenols (Liquid)	3	KINGSTON	JMACINNES	2024-Jul-04	PHEN-01	MECP E3179
Total Organic Carbon (TOC)	3	OTTAWA	VKASYAN	2024-Jul-05	C-OC-01	EPA 415.2
TSS (Liquid)	3	KINGSTON	DCASSIDY	2024-Jul-04	TSS-001	SM 2540D

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

Steve Garrett
Director of Laboratory Services

	Client I.D.		CLY-4	CLY-5	CLY-6B
	Sample I.D.		24-019563-1	24-019563-2	24-019563-3
	Date Collected		2024-06-27	2024-06-27	2024-06-27
Parameter	**Units**	**R.L.**	-	-	-
Fecal Coliform	CFU/100mL	1	<10	62000	10
Alkalinity(CaCO3) to pH4.5	mg/L	5	11	211	37
Conductivity @25°C	uS/cm	1	64	652	354
pH @25°C	pH units	-	6.49	7.47	7.02
Chloride	mg/L	0.5	6.2	42.3	50.1
Nitrate (N)	mg/L	0.05	0.46	0.06	6.01
Nitrite (N)	mg/L	0.05	<0.05	<0.05	0.38
Sulphate	mg/L	1	2	3	5
BOD5	mg/L	3	11	83	13
Total Suspended Solids	mg/L	3	92	3640	16
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05	0.33	70.1	12.6
Total Organic Carbon	mg/L	0.2	10.5	59.8	40.6
Phenolics	mg/L	0.001	<0.001	0.279	0.002
Hardness (as CaCO3)	mg/L	0.02	7.38	75.4	12.6
Aluminum (Total)	mg/L	0.01	0.29	14.4	0.13
Cadmium (Total)	mg/L	0.005	<0.005	<0.005	<0.005
Calcium (Total)	mg/L	0.02	1.50	10.7	2.36
Chromium (Total)	mg/L	0.002	<0.002	0.019	<0.002
Cobalt (Total)	mg/L	0.005	<0.005	0.010	<0.005
Copper (Total)	mg/L	0.002	0.003	0.114	0.027
Iron (Total)	mg/L	0.005	0.515	23.6	0.268



Steve Garrett

Director of Laboratory Services

		Client I.D.	CLY-4	CLY-5	CLY-6B
		Sample I.D.	24-019563-1	24-019563-2	24-019563-3
		Date Collected	2024-06-27	2024-06-27	2024-06-27
Parameter	**Units**	**R.L.**	-	-	-
Lead (Total)	mg/L	0.02	<0.02	<0.02	<0.02
Magnesium (Total)	mg/L	0.02	0.88	11.8	1.62
Manganese (Total)	mg/L	0.001	0.252	0.426	0.012
Nickel (Total)	mg/L	0.01	<0.01	0.01	<0.01
Potassium (Total)	mg/L	0.1	5.6	23.4	17.3
Sodium (Total)	mg/L	0.2	4.2	39.0	33.4
Zinc (Total)	mg/L	0.005	0.011	0.113	0.016
Arsenic (Total)	mg/L	0.0005	<0.0005	0.0039	0.0005
Mercury	mg/L	0.00002	<0.00002	<0.00002	0.00003

		Client I.D.	CLY-4	CLY-5	CLY-6B
		Sample I.D.	24-019563-1	24-019563-2	24-019563-3
		Date Collected	2024-06-27	2024-06-27	2024-06-27
Parameter	**Units**	**R.L.**	-	-	-
Oil & Grease (Total)	mg/L	1.0	1.8	17.6	1.2

Steve Garrett

Director of Laboratory Services

Appendix C

Photos of the repaired berm (south cell, south berm):

Appendix D

Joseph Monteith
Water Resources Officer
Qikiqtani and High Arctic Region
Crown-Indigenous Relations and Northern Affairs Canada
P.O. Box 2200
Iqaluit, NU, X0A 0H0
Ph: 867-975-1787
Email: joseph.monteith@canada.ca

April 15, 2024

RE: Clyde River Sewage Lagoon Decant, Water Licence No. 3BM-CLY1924

Dear Joseph Montieth,

As per Part D, Item 3 of the Municipality of Clyde River Water Licence No. 3BM-CLY1924, this is notification of plans to discharge waste from the sewage lagoon beginning April 22, 2024. An urgent decant of the sewage lagoon is needed to comply with the minimum 1.0 m freeboard requirement of Part D, Item 4 of the Licence, and prevent potential damage to the sewage lagoon berms due to high effluent levels during thaw. As this is within the ten (10) day notice period of the Licence, approval is requested.

The sewage lagoon in Clyde River consists of 2 cells, a smaller rehabilitated cell and a larger cell commissioned in 2011. Three discharge chutes are available to sewage truck operators, with the choice of chute dependent on factors such as wind direction and snow build-up (Section 2.3.3, *Clyde River Waste Water Facility Operations and Maintenance Manual*, exp, July 2012).

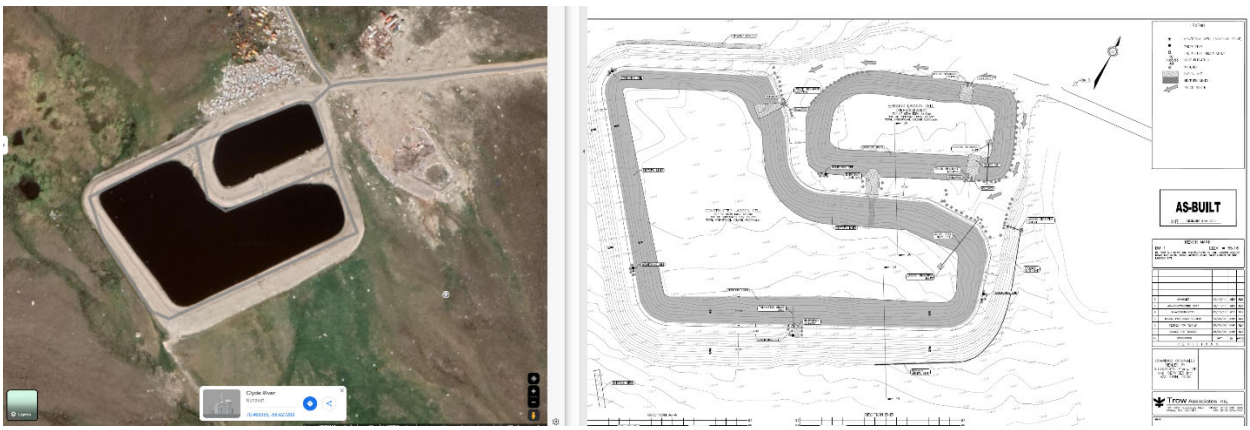


Figure 1: Clyde River Sewage Lagoon

Both sewage lagoon cells in Clyde River have filled to the top of the berms (see Figures 2 and 3). The sewage lagoon is designed for a pump-decant during the ice-free summer period to the filter strip wetlands area. In order to lower effluent volumes to 1.0 m freeboard, 3 to 4 days of effluent pumping is projected. Effluent will

be directed to the filter strip wetlands. As temperatures are still below freezing, it is anticipated that the effluent will freeze as it is dispersed, for gradual release later in the spring when the wetland thaws. Regular decanting operations will take place this summer (following notice to Inspector) to fully decant both cells.

Figure 2: Clyde River Sewage Lagoon – Small Cell, April 2024

Figure 3: Clyde River Sewage Lagoon – Large Cell, April 2024

Samples will be taken during the decant at CLY-5 for comparison to effluent criteria set out in Part D, Item 2 of Water Licence No. 3BM-CLY1924, along with daily decant volume. This will be reported to Crown-Indigenous Relations and Northern Affairs (CIRNAC) upon Certificate of Analysis receipt, and included in the 2024 Annual Report.

Your prompt response to this letter is appreciated. Should you have any questions, please contact me at 867-975-5478 or mlusty@gov.nu.ca.

Sincerely,

Megan Lusty
Manager, Municipal Works
Department of Community and Government Services
Government of Nunavut

cc: Daryl Dibblee, Chief Administrative Officer, Municipality of Clyde River
NWB Licensing Department

Lusty, Megan

From: Lusty, Megan
Sent: April 16, 2024 11:00 AM
To: Monteith, Joseph (he)
Subject: RE: 3BM-CLY1924 Clyde River Sewage Lagoon Decant

Hi Joseph,

Yes, samples will be taken during the decant. It will only be the decant from CLY-5, not throughout the wetland because that area will be frozen. It is a partial decant to lower levels to 1.0m freeboard, expected 3-4 days, not a full decant. The normal monitoring samples will be taken during the summer decant.

Thanks,

Megan

ᒪᐃᑦᓄᓐ ᓪᓚᑎ Megan Lusty
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Manager, Municipal Works
Community Infrastructure Division
Community and Government Services
Government of Nunavut

Atangujaq, Hamlatkunni Havauhiit
Nunallaani Napaqtirinirmun Havagvia
Nunalingni Kavamatkunilu Pivikhaqautikkut
Nunavut Kavamanga

Gestionnaire des Projets Municipaux
Division des Infrastructures Communautaires
Services Communautaires et Gouvernementaux
Gouvernement du Nunavut

867-975-5478
mlusty@gov.nu.ca

From: Monteith, Joseph (he) <joseph.monteith@rcaanc-cirnac.gc.ca>
Sent: Tuesday, April 16, 2024 10:44 AM
To: Lusty, Megan <MLusty@GOV.NU.CA>
Subject: RE: 3BM-CLY1924 Clyde River Sewage Lagoon Decant

Hello,

Thank you for the notification and update of the Sewage Lagoon in Clyde River. Notification is required, not permission. I imagine you will be taking samples? Typically samples are taken at the time of decant and at the monitoring stations. The route the sewage takes to the its final receiving environment is a form of treatment. I would sample to ensure compliance with the Water License. If not, a spill report should be submitted to the NT/NU Spills line.

Best Regards,

JM

Joseph Monteith
Resource Management Officer
Qikiqtani and High Arctic Region
Crown-Indigenous Relations
And Northern Affairs Canada
P.O. Box 2200
Iqaluit, NU
X0A 3H0
Ph: 867 975-4289
Cell: 867 975-1787
Fax: 867 979-6445
Email:joseph.monteith@canada.ca

Crown-Indigenous Relations and Northern Affairs Canada | Relations Couronne-Autochtones et Affaires du Nord Canada

---

From: Lusty, Megan <MLusty@GOV.NU.CA>
Sent: Monday, April 15, 2024 4:25 PM
To: Monteith, Joseph (he) <joseph.monteith@rcaanc-cirnac.gc.ca>
Cc: cao@clyderiver.ca; Licensing Department <licensing@nwb-oen.ca>
Subject: 3BM-CLY1924 Clyde River Sewage Lagoon Decant

Hi Joseph,

Please see the attached notice to decant the Clyde River Sewage Lagoon. Feel free to contact me if you would like to discuss further.

Thanks,

Megan

ᒪᐃᑦᓯ ᓪᓚᑎ Megan Lusty

ᐊᐅᓚᑦᑎᓕ ᐄᐊᒋᓚᑦᓂᓐᓄᑦ ᓴᓇᕈᕐᕋᑕᓂᓕᖅᓯᓄᑦ
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ᓄᓇᕗᑦ ᓴᖅᓯᒪᓕᖅᑐᑦ

Manager, Municipal Works
Community Infrastructure Division
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Government of Nunavut

Atangujaq, Hamlatkunni Havauhiit
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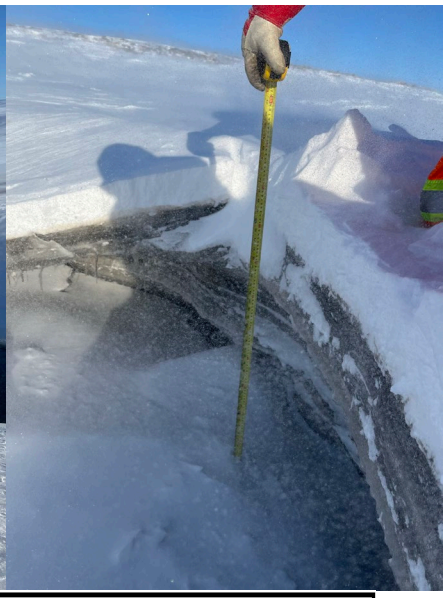
Nunalingni Kavamatkunilu Pivikhaqautikkut
Nunavut Kavamanga

Gestionnaire des Projets Municipaux
Division des Infrastructures Communautaires
Services Communautaires et Gouvernementaux
Gouvernement du Nunavut

867-975-5478
mlusty@gov.nu.ca

Appendix E

Freeboard of 1.0 m maintained through early decanting:



INVOICE

SIFEC NORTH

P.O. Box 556
323 Makpah, 83rd Street, Lot 11
Rankin Inlet, NU X0C 0G0
Tel: 855-437-4001
Email: info@sifec.ca

Date: 5/1/2024
GST # : 86615 4339 RT0001
Invoice # : 24032
Delivery: Clyde River, NU

To: Municipality of Clyde River
Attn: Mr. Daryl Dibblee, SAO
Clyde River, NU X0A 0E0
P: 867-924-6220
E: cao@clyderiver.ca

Project Name: Sewage Lagoon Emptying
PO #:9892
Sifec Purchase Order #: YCY06

ITEM	QTY	DESCRIPTION	LABOUR RATE PER HOUR	MATERIAL	TOTAL
1.1		**Scope of Work** **Pump out one meter of liquid from southern sewage lagoon before May 2024** **Mobilisation & Transportation of Material** **Supply of 3 New Gasoline Trash Pump 3" with hoses** **Supply of one gasoline spill kit** **Supply of one ice drill** **Install Pump and hoses to perform the work** **Provide sewage pump monitoring during process estimated 4 days** **Provide Training, show how to store pumps and hoses correctly once the job is completed** **Bring back to Ottawa possible BOD samples**			

Appendix F

Comparison of New Decanting Pump to Original (Existing) for Clyde River 2025 Annual Report Submission

	Original (Existing)	New
Pump		
Model	PA6C60	PA6C60
Year	2006	2023
Size	**6" x 6" Flanged**	**Same**
Casing	Ductile Iron No. 65-45-12. Maximum operating pressure 100 psi	Ductile Iron No. 65-45-12. Maximum operating pressure 98 psi
Impeller	**Open Type. Ductile Iron No. 65-45-12. Handles 3" diameter spherical solids.**	**Same**
Impeller shaft	Stainless Steel 17-4 PH	Same
Wear plate	Ductile Iron 80-60-03	Same
Priming Chamber	Non-heated	Heated
Seal	Same	Same
Seal Plate	Gray Iron No. 30	Carbon Steel 1015
Mobility	Skid or 2-wheel	Same
Performance	**See attached pump curves. The performance curves are very similar. The new pump has a marginally lower flow capacity.**	
Engine		
Model	John Deere 4045D Power Tech	Caterpillar C3.6Ta
Type	**Diesel, Four-Cylinder**	**Same**
Displacement	4.5 L	3.6 L
Oil	Forced lubrication from 7.6 L oil reservoir	Forced lubrication from 4.0 L oil reservoir
Full fuel load operating time	**26.1 Hrs**	**21.7 Hrs**

ACDEU

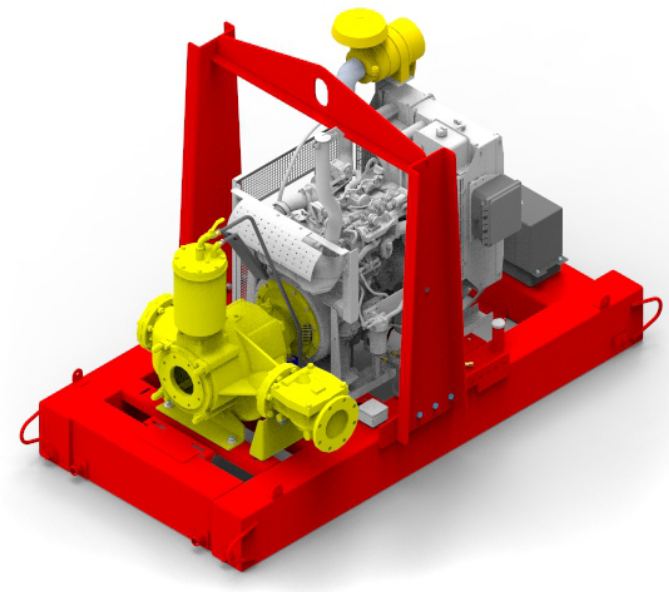
Priming Assisted Centrifugal Pump w/Autostart
Model PA6C60-C3.6TA S5 /S1
Size 6” x 6”

Prime Aire®

VARIOUS PATENTS APPLY

2-YEAR WARRANTY TWO PRIMING-ASSIST

Total Head		Capacity of Pump in U.S. Gallons per Minute (GPM) at Continuous Performance			
P.S.I.	Feet				
59.0	136	600	600	600	600
52.0	120	920	1020	1020	1020
43.4	100	1035	1420	1440	1480
34.7	80	1040	1440	1720	1840
26.0	60	1100	1440	1740	1990
17.3	40	1150	1445	1755	2000
8.7	20	1070	1450	1760	2000
Suction Lift		25’	20’	15’	10’



PUMP SPECIFICATIONS

Size: 6” x 6” (152 mm x 152 mm) Flanged.
Casing: Ductile Iron 65-45-12.
Maximum Operating Pressure 98 psi (676 kPa).*
Semi-Open, Two Vane Impeller: Ductile Iron 65-45-12.
Handles 3” (76,2 mm) Diameter Spherical Solids.
Impeller Shaft: Stainless Steel 17-4 PH.
Replaceable Wear Plate: Ductile Iron 80-60-03.
Bearing Housing: Gray Iron 30.
Seal Plate: Carbon Steel 1015.
Seal: Mechanical, Oil-Lubricated. Silicon Carbide Rotating and Stationary Faces. Stainless Steel 316 Stationary Seat. Fluorocarbon Elastomers (DuPont Viton or Equivalent). Stainless Steel 18-8 Cage and Spring. Maximum Temperature of Liquid Pumped, 160°F (71°C).*
Shaft Sleeve: Stainless Steel 17-4 PH.
Priming Chamber: Heated Priming Chamber, Gray Iron 30 Housing w/Stainless Steel Float and Linkage.
Discharge Check Valve: Ductile Iron Housing w/Buna-N Flapper.
Radial and Thrust Bearings: Open Double Ball.
Bearing and Seal Cavity Lubrication: SAE 30 Non-Detergent Oil.
O-Rings: Buna-N.
Gaskets: Resistant Synthetic Rubber, Cork, Buna-N, Vegetable Fiber and Compressed Synthetic Fibers.
Hardware: Standard Plated Steel.
Bearing and Seal Cavity Oil Level Sight Gauges.

Consult Factory for Applications Exceeding Maximum Pressure and/or Temperature Indicated.

Standard Equipment: Gear-Driven Air Compressor. Hoisting Bail. Combination Skid Base w/Fuel Tank. Strainer. Single Ball Type Float Switch.**

**50 Ft. (15 m) Standard Length; Dual Switches and Alternate Cable Lengths Available From the Factory.*

Optional Equipment: Suction and Discharge NPT Threaded Flange
High Speed (55 MPH/89 KM/H) Single Axle Pneumatic - Tired Wheel Kit w/ wo DOT - Approved Lights and Electric Brakes. Tandem Axle Over-the - Road Trailer (Meets DOT Requirements) Available w/Either Electric or Hydraulic Surge Brakes, Running Lights, Jack Stands and Safety Cables/ Chains. Submersible Transducer Liquid Level Sensor (50 Ft. [15M] Cable Standard, Alternate Lengths Available).

WARNING!
Do not use in explosive atmosphere or for pumping volatile flammable liquids.

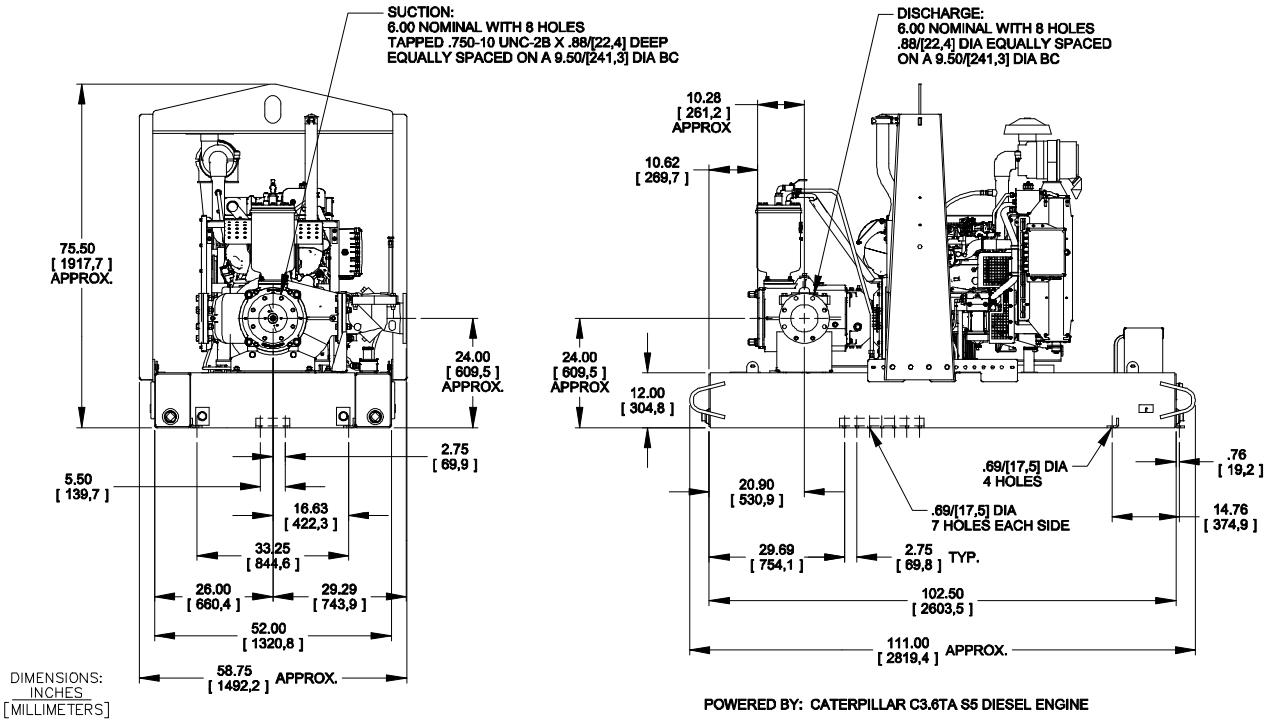
ENGINE SPECIFICATIONS

Model: Caterpillar C3.6TA
Type: Turbocharged, After-Cooled, Four cylinder, Diesel Engine. (Tier IV EPA/EU Stage 5 Compliant)
Displacement 221 Cu. In. (3,6 Liters).
Governor: Isochronous
Lubrication: Forced Lubrication
Air Cleaner: Dry Type.
Oil Reservoir: 4.2 U.S. Qts. (4,0 liters) Refill.
Fuel Tank: 88 U.S. Gals. (330 liters).
Full Load Operating Time: 21.7 Hrs Estimated.
Starter: 12V Electric.
Standard Features: Low Oil Pressure and High Coolant Temperature Safety Shut Down Switches. Autostart Instrument Panel Includes: Tachometer, Voltmeter, Hourmeter, Coolant Temperature Gauge, Oil Pressure Gauge, Manual/Stop/Auto Key Switch, 10 Amp Pushbutton Circuit Breaker, Startup Warning Delay. Muffler w/Weather Cap. Throttle Control.

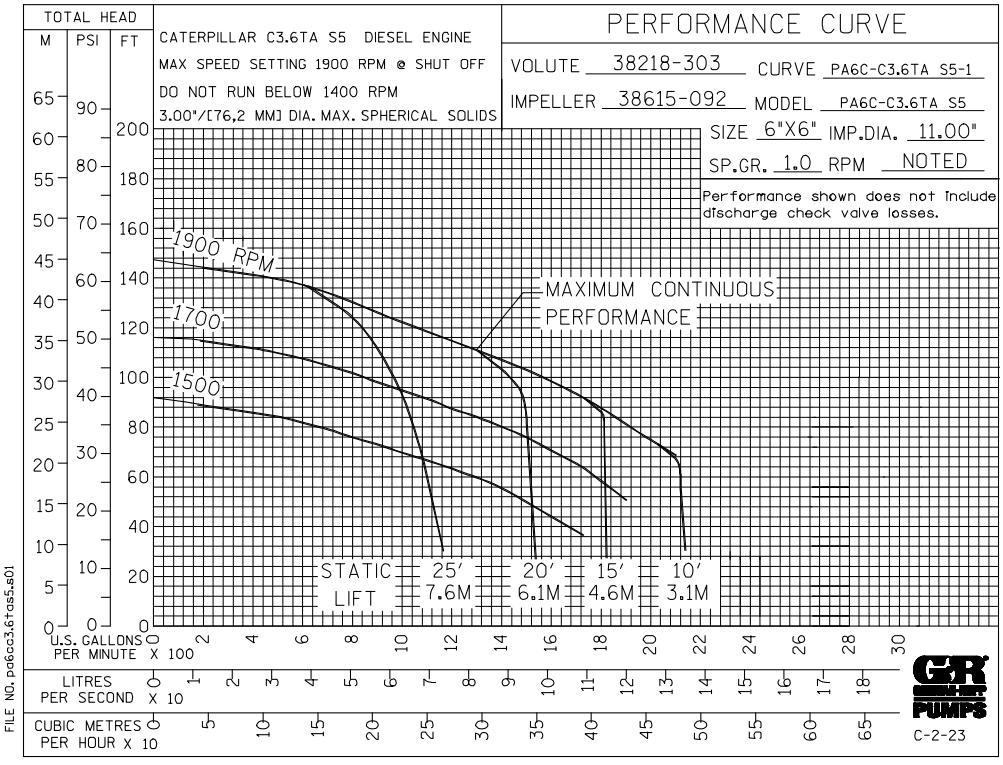
CATERPILLAR PUBLISHED PERFORMANCE:
Maximum Gross BHP (Intermittent) 74 (55 kW) @ 2400 RPM

Specification Data	APPROXIMATE DIMENSIONS and WEIGHTS		SKID BASE	2-WHEEL
SECTION 42, PAGE 1145C		NET WEIGHT:	3600LBS. (1633 KG.)	4150LBS. (1882 KG.)
		SHIPPING WEIGHT:	3800 LBS. (1724 KG.)	4350 LBS. (1973 KG.)

OUTLINE DRAWING



POWERED BY: CATERPILLAR C3.6TA S5 DIESEL ENGINE



THE GORMAN-RUPP COMPANY ● MANSFIELD, OHIO

GORMAN-RUPP OF CANADA LIMITED ● ST. THOMAS, ONTARIO, CANADA

Specifications Subject to Change Without Notice

Printed in U.S.A.

ACDEU

Prime Aire®

Diesel Engine Driven
Priming Assisted Centrifugal Pump w/Autostart
Model PA6C60–4045D
Size 6" x 6"

2 YEAR WARRANTY
TWO-YEAR PRIMING-ASSIST

Total Head		Capacity of Pump in U.S. Gallons per Minute (GPM) at Continuous Performance				
P.S.I.	Feet					
63.3	146	200	200	200	200	200
60.7	140	400	400	400	400	400
52.0	120	820	1000	1000	1000	1000
43.4	100	960	1380	1420	1420	1420
34.7	80	1040	1500	1770	1770	1770
26.0	60	1100	1510	1815	2050	2050
17.4	40	1140	1505	1820	2120	2250
8.7	20	1200	1550	1820	2150	2360
Suction Lift		25'	20'	15'	10'	5'

PUMP SPECIFICATIONS

Size: 6" x 6" (152 mm x 152 mm) Flanged.
Casing: Ductile Iron No. 65-45-12. Maximum Operating Pressure 100 psi (690 kPa).*
Open Type, Two Vane Impeller: Ductile Iron No. 65-45-12. Handles 3" (76,2 mm) Diameter Spherical Solids.
Impeller Shaft: Stainless Steel No. 17-4 PH.
Replaceable Wear Plate: Ductile Iron No. 80-60-03.
Removeable Cleanout Cover Plate: Gray Iron No. 30.
Intermediate Bracket: Gray Iron No. 30.
Seal Plate: Gray Iron No. 30.
Seal: Mechanical, Oil-Lubricated. Silicon Carbide Rotating and Stationary Faces. Stainless Steel No. 316 Stationary Seat. Fluorocarbon Elastomers (DuPont Viton® or Equivalent). Stainless Steel No. 18-8 Cage and Spring. Maximum Temperature of Liquid Pumped, 160°F (71°C).*
Shaft Sleeve: Stainless Steel No. 17-4 PH.
Priming Chamber: Gray Iron No. 30.
Discharge Check Valve: Gray Iron No. 30 Housing w/Buna-N Flapper.
Radial and Thrust Bearings: Open Double Ball.
Bearing and Seal Cavity Lubrication: SAE No. 30 Non-Detergent Oil.
Flanges: Gray Iron No. 30.
Gaskets: Resistant Synthetic Rubber, Cork, PTFE, Vegetable Fiber, and Compressed Synthetic Fibers.
Hardware: Standard Plated Steel.
Bearing and Seal Cavity Oil Level Sight Gauges.

Consult Factory for Applications Exceeding Maximum Pressure and/or Temperature Indicated.

Standard Equipment: Gear-Driven Air Compressor. Hoisting Bail. Combination Skid Base w/Fuel Tank. Strainer. Single Ball Type Float Switch.**

**50 Ft. (15 m) Standard Length; Dual Switches and Alternate Cable Lengths Available From the Factory.*

Optional Equipment: Battery. High Speed (55 MPH/89 KM/H) Wheel Kit with ST225/75R15 Pneumatic Tires. Over-the-Road Trailer (Meets D.O.T. and Transport Canada Requirements) Available w/Either Electric or Hydraulic Surge Brakes, Running Lights, Two Trailer Jack Stands and Safety Chains. EPS w/Submersible Transducer Liquid Level Sensor (50 Ft. [15 M] Cable Standard, Alternate Lengths Available).

SHOWN WITH OPTIONAL NPT SUCTION AND DISCHARGE FLANGES

WARNING!
Do not use in explosive atmosphere or for pumping volatile flammable liquids.

ENGINE SPECIFICATIONS

Model: John Deere 4045D "Power Tech".
Type: Four Cylinder, Four Cycle, Liquid Cooled Diesel Engine.
Displacement: 276 Cu. In. (4,5 liters).
Governor: Mechanical.
Lubrication: Forced Circulation.
Air Cleaner: Dry Type.
Oil Reservoir: 9 U.S. Qts. (8,5 liters) Dry; 8 U.S. Qts. (7,6 liters) Refill.
Fuel Tank: 88 U.S. Gals. (330 liters).
Full Load Operating Time: 26.1 Hrs.
Starter: 12V Electric.

Standard Features: Low Oil Pressure, High Coolant Temperature and Start Failure Safety Shut Down Switches/Indicators. Throttle Control. Autostart Instrument Panel Includes: Tachometer, Voltmeter, Hourmeter, Coolant Temperature and Oil Pressure Indicators, Manual/Stop/Auto Key Switch, 10 Amp Fuse, Audible Startup Warning Delay. Muffler w/Guard and Weather Cap.

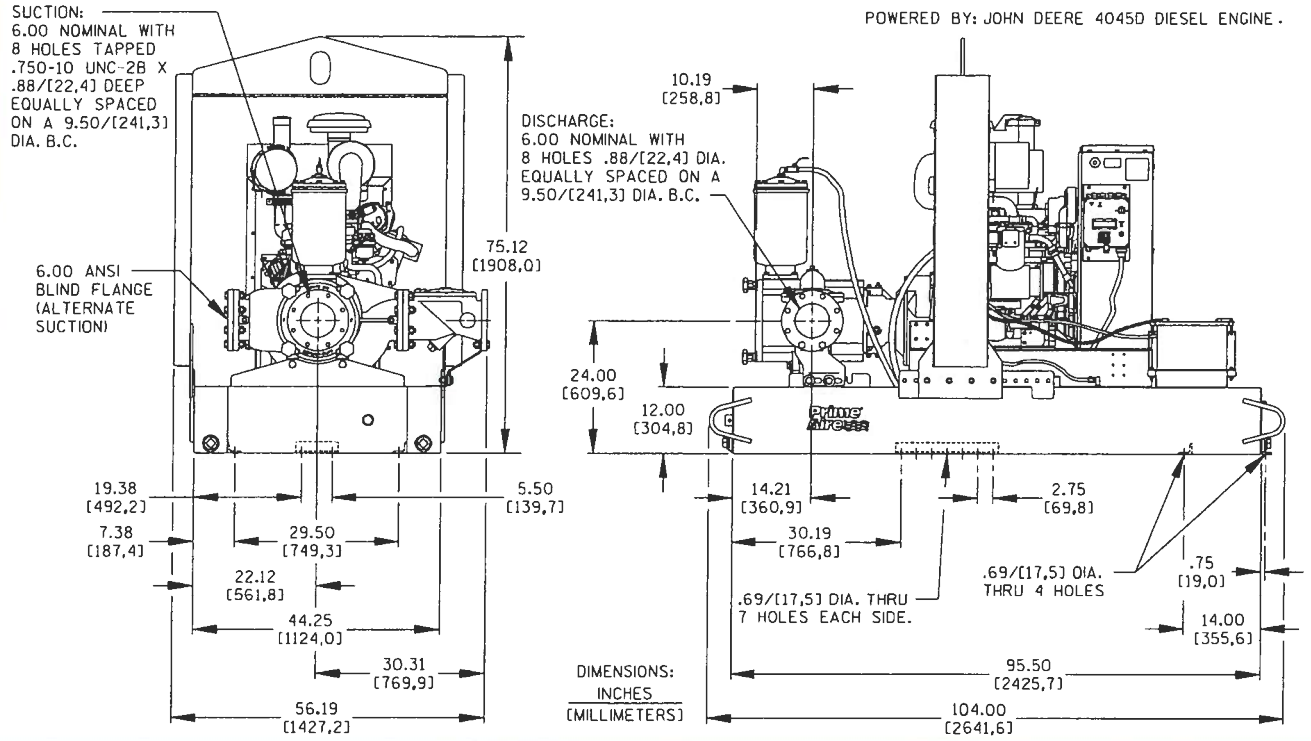
JOHN DEERE PUBLISHED PERFORMANCE:
Maximum Continuous BHP 76 (57 kW) @ 2500 RPM
Maximum Dynamic BHP 80 (60 kW) @ 2500 RPM

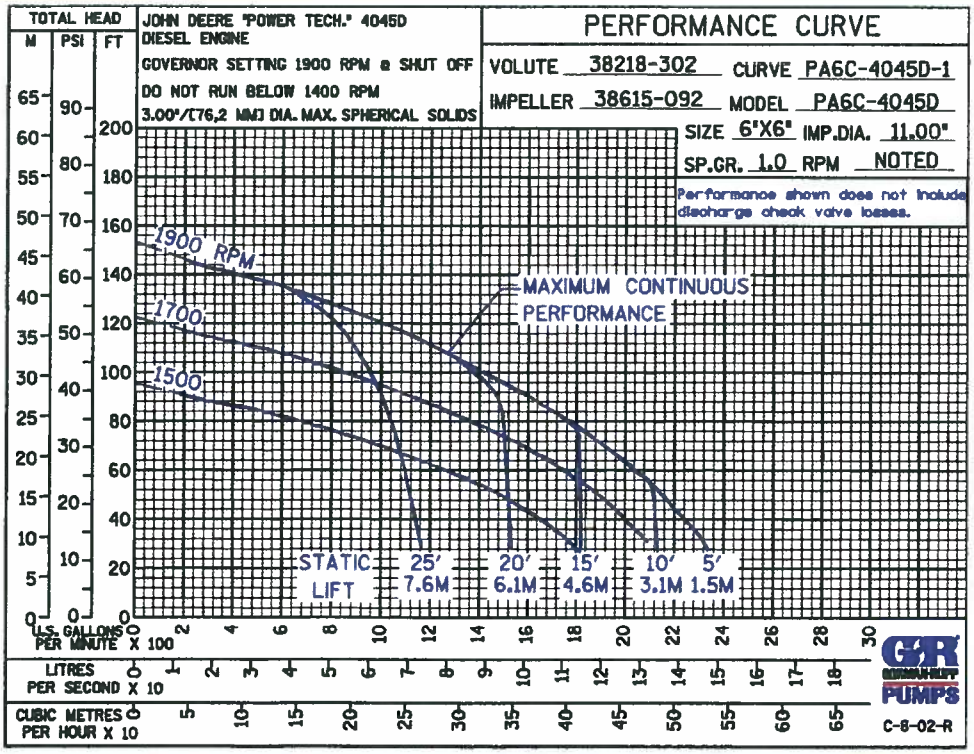
Specification Data

SECTION 42, PAGE 1100

APPROXIMATE DIMENSIONS and WEIGHTS

	SKID BASE	2-WHEEL
NET WEIGHT:	3310 LBS. (1501 KG.)	3600 LBS. (1633 KG.)
SHIPPING WEIGHT:	3460 LBS. (1569 KG.)	3600 LBS. (1633 KG.)
EXPORT CRATE SIZE:	247 CU. FT. (7 CU. M.)	





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