

NUYENS SANITARY SYSTEM 2024 ANNUAL REPORT

DISTRICT OF LAKE COUNTRY



LAKE COUNTRY

Life. The Okanagan Way.



This annual report for the year 2024 is submitted according to the requirements of the Lake Country Operational Certificate – #10821. The Operational Certificate was first issued July 15, 1993, and last amended on December 5, 2022. This report will be made available to the public, but its intended audience is the governing agency with the Province of BC.

The municipal wastewater treatment facility, referred to as the Nuyens Sanitary System in the following report, is located at 14498 Carr’s Landing Road, British Columbia. The Environmental Operators Certification Program (EOCP) has classified the Nuyens Sanitary System as a Small Wastewater System and is owned, operated, and maintained by the District of Lake Country.

This document has been reviewed by the Wastewater Crew Leader and shared with wastewater operators and relevant District of Lake Country personnel. I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge.

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1 Introduction

The Nuyens Sanitary System is regulated by the Ministry of Environment and Parks and authorized under permit PE 10821. The Nuyens Sanitary System is located at 14498 Carr's Landing Road in Lake Country BC. There are 27 parcels capable of connecting to the Nuyens Sanitary System, and of these, 25 are actively connected and utilizing the system. Given that some parcels have multiple units, the total number of units being served is 28. Customers that are connected utilize a STEP (Septic Tank Effluent Pump) system in order to pump effluent from their property's septic tank, through a common 75mm force main, to the Nuyens disposal facility. The disposal facility, excluding the subsurface tile disposal fields, is contained within Nuyens Park, *cover image*. At the disposal facility, effluent passes through a 750-gallon concrete tank equipped with filters, into a fiberglass storage tank, followed by a 10m³ dosing tank. Subsequently, the flow is pumped to two subsurface tile disposal fields, which include 360m of tile and related appurtenances. The total volume pumped is metered, tracking both flow rate and total volume. *Figure 1* depicts the location of the Nuyens Sanitary System.



Figure 1: Nuyen Sanitary System Site Map

2 Annual Reporting

2.1 Exceedances

Section 1 of the permit indicates the effluent requirements. The maximum authorised discharge rate is 28.6 m³/d. There are no requirements for the effluent quality, however, Section 1.1.2 of the permit indicates that the characteristics of the discharge must not cause the groundwater quality at the edge of the initial dilution zone (IDZ) to exceed the applicable water quality guidelines, this is discussed in [Section 2.2.2](#) of this report.

In 2024, the Nuyens system did not exceed the permitted maximum flow limit. With the lack of down-gradient groundwater, the requirement to meet water quality guidelines at the edge of the initial dilution zone was not applicable in 2024.

2.2 Flow and Water Quality Analysis

2.2.1 Flow Analysis

Section 4.1 of the permit requires the effluent flow to be recorded once weekly. However, data are available from the SCADA system on a daily basis.

The annual flow at the Nuyens system is relatively consistent throughout the year with typical increases seen in the summer months due to seasonal use. The instances where no flow is recorded for an entire day can be attributed to the timing of the disposal pumps running. The 2024 flow rates are displayed in [Table 1](#) and *figure 2*. The data indicates that the flow is generally in the order of 6 m³/d, increasing to around 15 m³/d during the peak summer season.

Table 1: Nuyens Daily Flow

	Average Daily Flow (m ³ /day)	Maximum Daily Flow (m ³ /day)
January	4.04	7.67
February	2.81	5.29
March	4.16	8.03
April	5.14	7.71
May	9.09	13.32
June	8.66	13.23
July	9.61	13.16
August	9.70	15.92
September	6.30	12.31
October	5.17	9.61
November	3.06	6.57
December	3.50	5.50

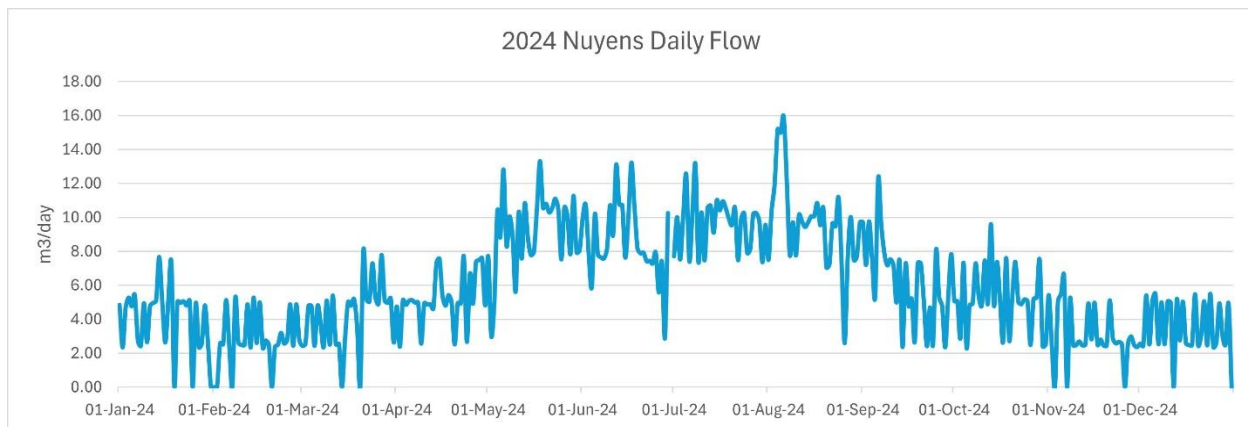


Figure 2: 2024 Nuyens Daily Flow

2.2.2 Water Quality Analysis

Monitoring of the effluent quality is not required for this site, with the focus being to evaluate the receiving environment through monitoring of groundwater wells and Okanagan Lake. The District of Lake Country contracted Urban Systems to assess and develop a groundwater monitoring program which was submitted to the Ministry in May 2022. The amended permit which included the scope of the groundwater monitoring program was issued in December 2022. Monitoring wells were installed in January of 2023.

In accordance with Section 4.2 of Permit PE 10821, the monitoring wells underwent semi-annual sampling in April and October. The volume of water in the wells proved inadequate for obtaining a grab sample. The wells dried up before the purging process was complete and therefore operators could not secure a sufficient sample volume. Since low water levels were also observed during spring sampling in June 2023, operations conducted sampling earlier in 2024 in hopes of encountering higher groundwater levels sufficient for a sample. However, water levels remained inadequate and consequently, no water quality results are available. Well water depths were obtained and are displayed in [Table 2](#). There is a decrease in water levels with increasing distance from the Nuyens site, regardless of the time of year. The highest water levels are associated with the background well (Well 1) in both the spring and the fall. There is little difference in the water levels for Wells 2 and 3, which are in similar locations. The decrease in the presence of water is clearly observed in Well 4, which is the furthest well away from the Nuyens site. The insufficient volume of water may suggest that effluent is not influencing the volumes of groundwater where these monitoring wells are located.

Table 2: Monitoring Well Depth of Water

	Well 1: Background, up gradient	Well 2: Near disposal field, down gradient	Well 3: Property boundary at Carr's Landing Road	Well 4: Near property by Nuyens Park
EMS ID	E330431	E330432	E330433	E330434
Well Bottom (m)	5.96	3.88	6.70	9.72
April 2024 Depth of Water (m)	2.37	1.02	0.87	0.00
October 2024 Depth of Water (m)	1.90	0.88	0.83	0.00

Permit PE 10821 mandates the annual sampling (in the fall) of the surface waters of Okanagan Lake from Nuyens Park for chloride and ammonia only. These two parameters are considered to be suitable for tracing the movement of the Nuyens effluent and could be used as an indication of potential influence due to the presence of the effluent. The chloride results from the October 17, 2024 sample align with other samples collected from Okanagan Lake by the District of Lake Country. Furthermore, ammonia nitrogen results from the same sample were found to be below the detection limits. Detailed water quality results are provided in [Table 3](#). For comparison, the concentrations of ammonia nitrogen and chloride in the effluent from the Nuyens wastewater treatment system is expected to be in the order of 20 mg/L and 59 mg/L, respectively, based on a standard medium strength domestic wastewater¹. Therefore, from these data, there is no indication of influence of the Nuyens effluent on the lake in the vicinity of Nuyens Park.

Table 3: Okanagan Lake Sample Results

	October 17, 2023 (Nuyens Park)	July 29, 2023 (Okanagan Pump House)	July 6, 2023 (Coral Beach)
Chloride (mg/L of Cl)	5.91 mg/L	5.54 mg/L	6.04 mg/L
Ammonia nitrogen (mg/L of N)	<0.050 mg/L	N/A	N/A

2.3 Sludge management

2.3.1 Facility Sludge Management

3.4 m³ of sludge was removed from the facility on June 28th, 2024, and disposed of at the Lake Country WWTP Septage Receiving Facility. Solids accumulation at the facility has been minimal. Sludge volumes will continue to be monitored and frequencies will be increased if required.

2.3.2 Individual Septic Tank Management

The Nuyens Operational and Maintenance manual, established in 2022, mandates customers utilizing the Nuyens Sanitary System to pump their private septic tanks every three years. In 2024, compliance was achieved by all but one property. The one property that is not in compliance is under construction

¹ Metcalf and Eddy/AECOM (2014). Wastewater Engineering, Treatment and Resource Recovery. 5th Edition. McGraw-Hill Education.

and has their sewer disconnected and therefore has been granted an extension. The list of properties and their servicing dates can be found in [Appendix A](#).

2.4 Evaluation of Performance

Operation of the system since the completion of the upgrades in 2021 continues to yield positive results. Operators are able to monitor flows with greater accuracy and effluent quality is easier to maintain with filters in place. The system has had no mechanical issues, and a chemical addition has been set up at the head of the facility to mitigate odours and reduce H₂S corrosion. This is a standard system where small doses of nitrate are added to transition the incoming sewage from anaerobic to anoxic conditions.

APPENDIX A

Table 1: Nuyens Sanitary System Private Septic Tank's Pumping Records

Property	Date of Last Septic Tank Pumping
14225 CARRS LANDING RD	2024-04-24
14228 CARRS LANDING RD	2024-06-20
14232 CARRS LANDING RD	2023-07-26
14250 CARRS LANDING RD	2023-05-19
14264 CARRS LANDING RD	2022-04-29
14330 CARRS LANDING RD	2024-04-29
14350 CARRS LANDING RD	2022-04-29
14370 CARRS LANDING RD	2018-10-02*
14390 CARRS LANDING RD	2024-04-23
14450 CARRS LANDING RD	2024-03-06
14524 CARRS LANDING RD	2024-11-29
14548 CARRS LANDING RD	2023-05-26
14560 CARRS LANDING RD	2023-05-26
14572 CARRS LANDING RD	2024-06-01
14580 CARRS LANDING RD	2021-05-04
14602 CARRS LANDING RD	2023-05-31
14610 CARRS LANDING RD	2023-06-22
14630 CARRS LANDING RD	2022-09-22
14650 CARRS LANDING RD	2024-01-05
14670 CARRS LANDING RD	2024-06-04
14710 CARRS LANDING RD	2023-05-25
14808 CARRS LANDING RD	2022-08-12
14816 CARRS LANDING RD	2023-05-30
14838 CARRS LANDING RD	2022-01-09
14864 CARRS LANDING RD	2023-05-18

*Sewer is currently disconnected at 14370 Carrs Landing Rd. Upon reconnection the District will ensure pumping compliance.