

NUYENS SANITARY SYSTEM 2023 ANNUAL REPORT

DISTRICT OF LAKE COUNTRY



LAKE COUNTRY

Life. The Okanagan Way.



This annual report for the year 2023 is submitted according to the requirements of the Lake Country Operational Certificate – #10821. The Operational Certificate was first issued July 15, 1998, 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 Climate Change Strategy 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 volumed pumped is metered, tracking both flow rate and total volume. *Figure 1* depicts the location of the Nuyens Sanitary System.

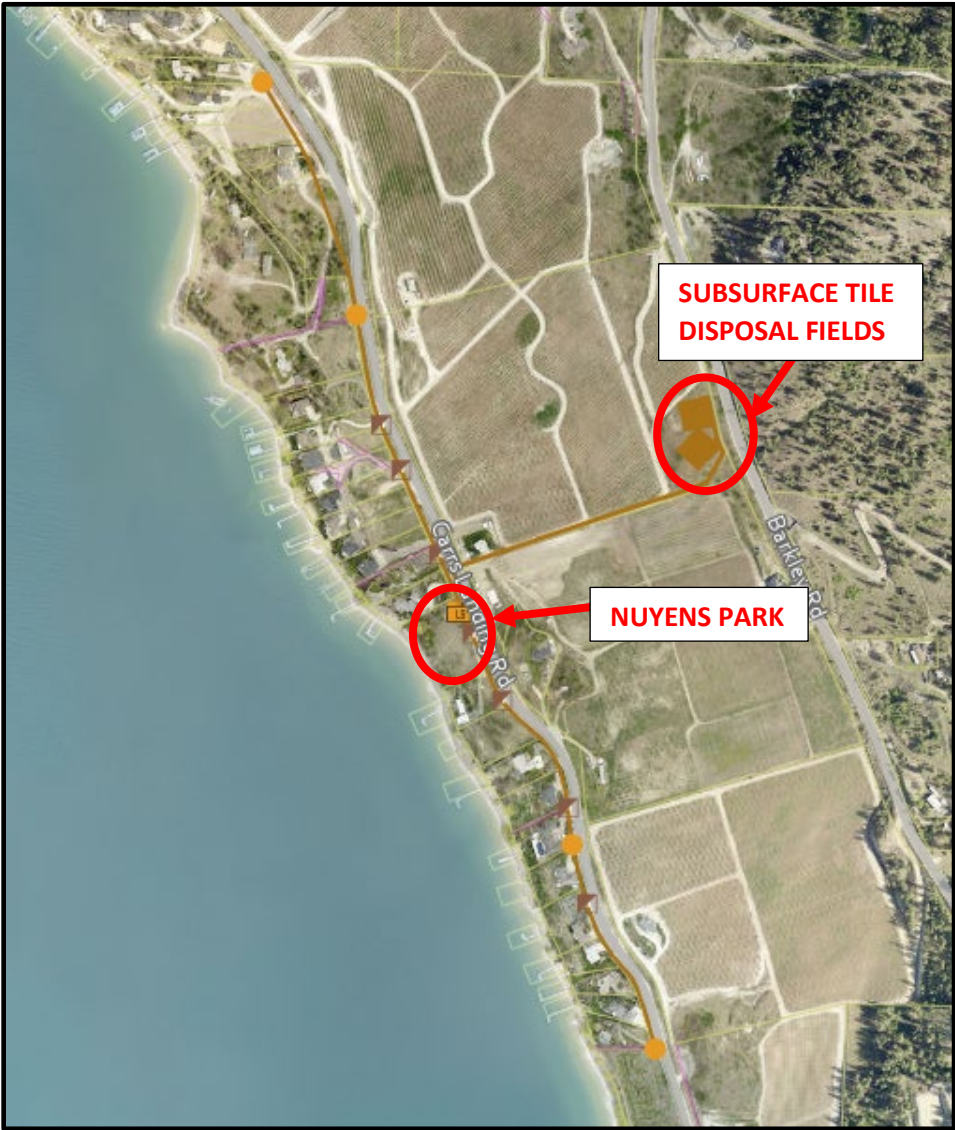


Figure 1: Nuyen Sanitary System Site Map

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.

In 2023, the Nuyens system did not exceed the permitted maximum flow limit of 28.3 m³/day. However, from August 19, 2023, to August 23, 2023, SCADA tracking at the Nuyens site experienced disruption due to the West Kelowna wildfire. As a result, records indicate that the flows on August 22nd and 23rd were both 32.79 m³/d. These values are known to be erroneous due to the SCADA disruption. The system was inspected and monitored frequently during this time, but accurate flow totals for those specific days could not be recorded. Nevertheless, based on observations by the operations team, it is believed that the flows consistently remained below the daily maximum of 28.3 m³/day, especially when considering that these residences are seasonal and the typical flows for peak usage is significantly less than the authorised daily maximum flow.

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 2023 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	4.56	10.08
February	4.43	5.50
March	4.32	5.27
April	5.08	7.44
May	5.82	7.6
June	6.41	9.63
July	10.52	14.82
August	8.49*	12.83
September	7.76	10.49
October	5.63	7.59
November	5.06	8.43
December	5.16	5.56

*Due to the West Kelowna Wildfire destroying the telecommunications tower, flow data is missing from August 19-23, 2023. These dates have been excluded from the average and maximum calculations but are assumed to have experience normal flows.

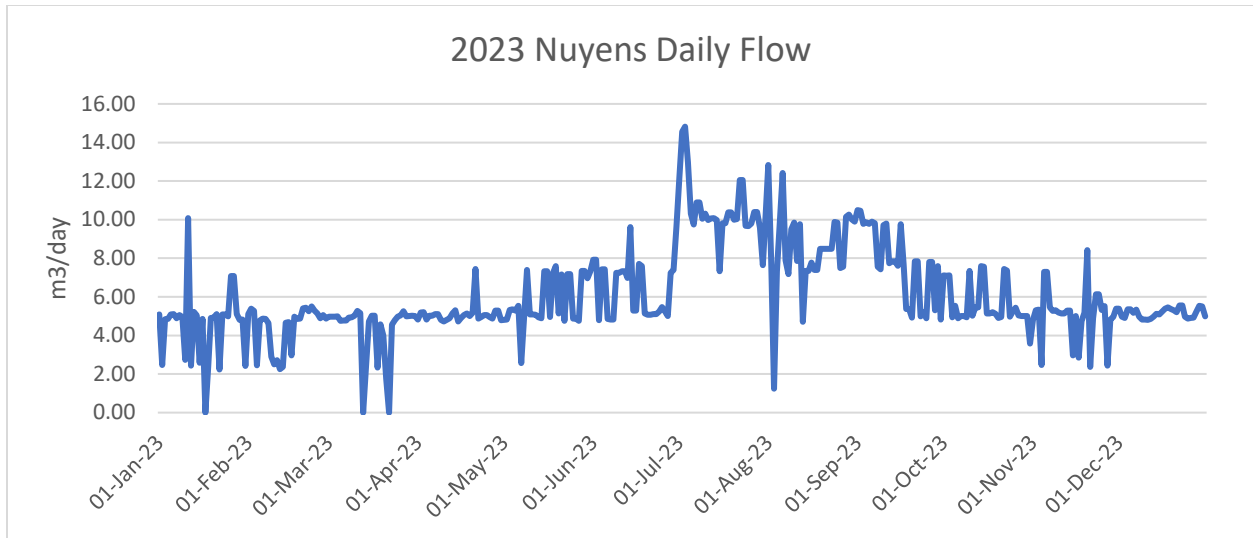


Figure 2: 2023 Nuyens Daily Flow

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 June and October. The volume of water in the wells proved inadequate for obtaining a grab sample. This was also confirmed by the Ministry of Environment and Climate Change staff during the 2023 inspection (Advisory Letter 216857). The wells dried up before the purging process was complete and therefore operators could not secure a sufficient sample volume. Consequently, no water quality results are available. However, 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
June 2023 Depth of Water (m)	2.15	0.85	0.83	0.00
October 2023 Depth of Water (m)	1.96	0.97	0.80	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 24, 2023 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 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 24, 2023 (Nuyens Park)	July 6, 2023 (Okanagan Pumphouse)	July 6, 2023 (Coral Beach)	July 6, 2023 (Lake Pine Pumphouse)
Chloride (mg/L of Cl)	6.08 mg/L	5.53 mg/L	6.10 mg/L	6.18 mg/L
Ammonia nitrogen (mg/L of N)	<0.050 mg/L	N/A	N/A	N/A

2.3 Sludge management

2.3.1 Facility Sludge Management

7.22m³ of sludge was removed from the facility on March 20, 2023, 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 2023, compliance

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

was achieved by all but four properties. Of these, two properties became noncompliant during the latter quarter of 2023 and are currently in the process of coming into compliance, another property under construction has been granted an extension, and the remaining property is actively engaged in communication with District Staff to address and rectify the non-compliance issue. Full compliance for all properties is anticipated to be achieved by the end of 2024, or corrective actions to ensure compliance will begin. 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.

The site was inspected by the Ministry of Environment and Climate Change Strategy on October 10th, with the inspection period being from December 5th, 2022 to December 5th, 2023. The reason for the inspection was due to a complaint that algal growth in Okanagan Lake was being caused by the release from the Nuyens facility, with the misunderstanding being that the facility released directly to the lake. The facility was issued an Advisory Letter (dated December 12th, 2023; report number 216857). The facility was found to be fully compliant, with the exception of the following:

- Flows elevated above the permit on August 22nd and 23rd.
- Notification and reporting of non-compliances (relating to the elevated flows).

The District responded to the Ministry regarding the elevated flow item on January 12th, 2024 and, as indicated above, provided information that these flows are expected to be erroneous due to the wildfire situation causing a telemetry failure. As such, the flows are expected to be fully compliant with the permit requirements.

APPENDIX A

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

Property	Date of Last Septic Tank Pumping
14225 CARRS LANDING RD	2020-11-09*
14228 CARRS LANDING RD	2021-06-25
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	*
14350 CARRS LANDING RD	2022-04-29
14370 CARRS LANDING RD	2018-10-02*
14390 CARRS LANDING RD	2021-04-16
14450 CARRS LANDING RD	2021-03-16
14524 CARRS LANDING RD	2021-09-27
14548 CARRS LANDING RD	2023-05-26
14560 CARRS LANDING RD	2023-05-26
14572 CARRS LANDING RD	2020-10-13*
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	2023-07-14
14670 CARRS LANDING RD	2021-09-28
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

*District of Lake Country records indicate that these properties are not in compliance with our operational and maintenance manual requirements. See section 2.3.2 of the main report for more information.