2025 Water Conservation Plan Update

Town of Osoyoos

August 2026

Project No. 302-1103-002

ENGINEERING ■ PLANNING ■ URBAN DESIGN ■ LAND SURVEYING

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Table of Contents

1.0 Background 1
2.0 Description Of Water System 3
2.1 Planned Source Water Upgrades 4
3.0 Water Demand Analysis 5
3.1 Current Demand Statistics 5
3.2 Projected Population Growth 7
3.3 Water Conservation Targets 11
3.4 Summary & Recommended Conservation Scenario 14
4.0 Past Water Conservation Strategies 17
4.1 Water Conservation Results (2010–2017) 18
4.2 Summary 18
5.0 Water Conservation Options 19
5.1 Conservation-Oriented Rate Structures 19
5.2 Plumbing Fixture Rebate Programs 20
5.3 Further Water Conservation Bylaws and Enforcement 21
6.0 Conclusions and Recommendations 22

Appendices

Appendix A – Domestic Water System Composite Map

List of Tables

Table 3-1: Per-Capita ADD and MDD (2020–2024) 5
Table 3-2: Census Population Data 7
Table 3-3: OCP Growth Models 8
Table 3-4: British Columbia Regional District and Municipal Population Estimates 9
Table 3-5: Incremental Five-Year Water Conservation Targets (Average Day Demand) 12
Table 3-6: Summary of Targeted Long-Term Demand Levels. 16

List of Figures

Figure 3-1: Historic Water Consumption and Population 6
Figure 3-2: Population Projections 10
Figure 3-3: Per Capita ADD Projections 13
Figure 3-4: MDD Projections 15

List of Acronyms

ADD	Average Day Demand
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
B.C.	British Columbia
CAD	Canadian Dollars (2025)
CoP	City of Penticton
ICI	Industrial, Commercial & Institutional
MDD	Maximum Day Demand
NRW	Non-Revenue Water
OCP	Official Community Plan
RDOS	Regional District of Okanagan-Similkameen
Town	Town of Osoyoos
TRUE	TRUE Consulting
WCP	Water Conservation Plan
WTP	Water Treatment Plant

Units of Measure

cf	cubic feet
ft	feet
km	kilometre
L/s	Litres per second
lpcd	Litres per capita per day
Lpd	Litres per day
m	metre
mg/L	milligrams per Litre
ML	megalitre
MLD	Megalitres Per Day
mm	millimetre
psi	pounds per square inch
USgpm	US gallons per minute

Referenced Reports

TRUE	Osoyoos Water Conservation Plan (January 2010)
TRUE	Osoyoos Water Conservation Plan Implementation Update (August 2018)
TRUE	Osoyoos Water Conservation Plan Implementation Update (February 2022)
TRUE	Osoyoos Water System Infrastructure Plan (July 2023)
TRUE	Water Treatment Plant Pre-Design Report (August 2024)
Town of Osoyoos	Osoyoos Universal Water Metering Implementation Plan (July 2023)
Town of Osoyoos	Osoyoos Water Regulations and Rates Bylaw, No. 1388 (December 2023)

1.0 Background

The Town of Osoyoos (the Town) is a resort community located in the South Okanagan region of British Columbia. Its semi-arid climate and long, hot summers drive high water demand. The Town's water supply is sourced from a combination of groundwater wells and surface water intakes, serving residential, commercial, agricultural, and recreational users.

Recognizing the importance of sustainable water management, the Town developed its first Water Conservation Plan (WCP) in January 2010 with support from TRUE Consulting (TRUE). The plan outlined a five-year strategy (2010–2014) focused on reducing system demand, deferring the need for new supply infrastructure, and aligning with the Province of British Columbia's Living Water Smart objectives. Provincial targets included:

- Improving overall water use efficiency in B.C. by 33% by 2020.
- Meeting 50% of new water demands between 2020 and 2030 through conservation.

Beyond numeric goals, Living Water Smart emphasizes water stewardship across all levels of government, with key themes including efficiency, ecosystem protection, climate change adaptation, improved measurement, and building community resilience. The plan highlights the growing pressures of climate change, population growth, and competing demands, making conservation central to both environmental and economic sustainability.

Between 2010 and 2017, Osoyoos implemented several initiatives from the original WCP, including metering of major users, use of reclaimed water, public outreach, and exploration of non-potable irrigation sources. These efforts achieved a measurable reduction in per capita consumption, from 1,300 litres per person per day in 2009 to 1,120 litres in 2017, despite population growth. Notably, reductions in maximum day demand (MDD) allowed the Town to defer construction of Well No. 7, originally planned for 2010, in every year since 2011. While the town has deferred the construction of a new groundwater supply source, it is now in the position of having inadequate water supply to meet current maximum day demand under the n-1 pumping scenario (i.e. ability to provide MDD while the highest capacity groundwater supply well is out of service). As such, the town is exploring further water supply options and therefore, the provincial target of meeting 50% new water demands through conservation may not be possible.

In 2015, the Town retained Urban Systems Ltd. to update the WCP. The revised strategy emphasized four focus areas: landscape irrigation efficiency, fixture retrofits, education and outreach, and phased implementation of universal water metering. That year, the Town also established a dedicated water meter reserve fund, contributing $125,000 annually to support future infrastructure.

In late 2020, the Town formally advanced the Universal Water Metering Program, with the Implementation Plan delivered in July 2023. The plan outlined a full transition to metering through

phased installations and was structured around several core components. First, a comprehensive public communication and education program was developed to ensure residents were well informed of the program's goals, installation timelines, and their responsibilities before and after meter installation. The program included staged outreach materials, door-to-door communication, and an online booking system that allowed residents to schedule appointments 24/7, minimizing refusals and increasing compliance.

Second, the program required the development of a customer and meter database, integrated with the Town's Central Square Vadim iCity financial software to support billing, consumption tracking, and water-use reporting. This ensured that data from the new meters would flow directly into municipal billing and asset management systems.

Third, the plan emphasized training for Town staff, covering operation, maintenance, and troubleshooting of the new meters and the associated Neptune 360 cloud-based data management platform. This ensured internal capacity to manage the system over the long term.

On the technical side, the program involved supply and installation of ultrasonic and electromagnetic Advanced Metering Infrastructure (AMI) meters using a "one meter, one property" approach, supported by mobile and fixed network hardware for data collection. The system design provided flexibility to deploy both fixed and cellular endpoints, offering cost-effective coverage across Osoyoos's varied topography.

Finally, the contract established a ten-year operational support period, including software subscriptions, data management services, and warranty provisions for installed meters, ensuring continuity well beyond initial installation. This implementation built on the reserve fund established in 2015 and marked a major step toward aligning Osoyoos with regional best practices in demand management and conservation.

Given the South Okanagan's vulnerability to drought and increasingly variable summer precipitation, efficient water management is critical to long-term community resilience. This 2025 update builds on 15 years of progress, incorporating updated water use data, community priorities, and evolving provincial and federal policies. In alignment with Living Water Smart, the Plan reaffirms Osoyoos's commitment to proactive, adaptive, and community driven water stewardship.

The following sections provide the foundation for updating the Town's domestic water conservation plan, including:

- Review of existing water source capacity.
- Population projections for the Town's service area.
- Assessment of existing and projected water demand.
- Overview of current water conservation initiatives.
- Recommended conservation goals for the domestic water system.
- Recommended initiatives to achieve these goals.

2.0 Description Of Water System

The Town owns and operates a groundwater based domestic water system that provides potable water to residential, commercial, institutional, and recreational users within both the municipal boundary and adjacent System 8 and 9 rural areas via a twinned water system. The domestic system is fully separated from the Town's agricultural irrigation networks, operated independently as Irrigation Systems 8 and 9. These rural extensions are hydraulically twinned with the Town's distribution system but operated independently for irrigation supply. A composite map of the water system is provided in Appendix A for reference.

As of 2024, the Town's domestic supply is sourced exclusively from six municipal production wells: Wells No. 1, 3, 4, 5, 6, and 8. Collectively, these wells have a rated capacity of approximately 266 L/s, equivalent to an effective daily supply of 17.2 ML/day based on 18 hours of pumping to allow for maintenance and aquifer recovery. Well No. 5 is the highest producing source at 76 L/s. To ensure resilience, the Town aims to employ an n-1 redundancy approach, planning system capacity on the basis that the largest well could be out of service at any given time.

Groundwater is conveyed through a pressurized distribution network of watermains ranging in diameter from 100 mm to 450 mm. The domestic system comprises more than 80 km of looped watermains, a configuration that helps maintain both pressure and reliability across the service area. At present, groundwater from the Town's production wells receives only sodium hypochlorite injection at each well pumpstation to maintain a chlorine residual for disinfection. No additional treatment processes, such as filtration or advanced oxidation, are currently in place. Seasonal operation of wells is managed to balance water quality, but elevated manganese, ammonia, and organic carbon remain challenges that require ongoing monitoring and system flushing.

In parallel with the domestic system, the Town uses Irrigation System 9 to provide non-potable water to select sites, including the Osoyoos Fire Hall and nearby commercial developments. This practice reduces pressure on the potable system during peak irrigation months. Opportunities to expand non-potable irrigation use, particularly for public landscaping, are actively being explored.

System demand is highly seasonal, with peak daily demand typically exceeding 18 ML/day in summer. Under current conditions, system planning identifies the need for two additional production wells (each designed for 50 L/s) to maintain supply reliability under the n-1 scenario. However, recent planning memos note that continued success in water conservation will directly influence the timing and necessity of new well development. The Town is also considering the development of a surface water source as an alternative to their existing groundwater supply configuration.

2.1 Planned Source Water Upgrades

At present, the Town's groundwater sources receive only sodium hypochlorite disinfection, with no manganese filtration or other advanced treatment. Pilot studies completed in 2023–2024 found that full groundwater treatment would be costly and complex. As a result, the Town has shifted its long-term supply strategy toward a surface water treatment system drawing from Osoyoos Lake. This approach offers improved reliability and cost-effectiveness, with estimated capital and operating costs of approximately $51.7 million and $1.15 million per year, respectively.

Raw Water Supply Main Alignment

The planned system includes a 600 mm dedicated supply main extending about 2.9 km from the existing System 8 lake intake to the proposed Water Treatment Plant (WTP) south of the 402 Reservoir. The alignment follows 87th Street and 108th Avenue, parallels existing Irrigation System 8 trunk mains, then continues along Highway 97 and 100th Avenue to Highway 3, terminating near Strawberry Creek Road. The route minimizes work in highway rights-of-way and coordinates with parallel irrigation main replacements for construction efficiency.

Planned Treatment Processes

The WTP will be designed to meet Interior Health's 4-3-2-1-0 drinking-water objectives using:

- Clarification (e.g., dissolved air flotation or equivalent).
- Filtration (dual-media or membrane).
- Activated carbon adsorption for organics and taste/odour control.
- Primary disinfection (ultraviolet light and/or chemical).
- Secondary disinfection (sodium hypochlorite).

These processes will control turbidity, algae, organic carbon, and taste-and-odour issues while ensuring regulatory compliance and resilience under variable lake conditions.

Implementation Timeline

Preliminary design and permitting are expected to require 12–18 months, with phased construction beginning in Fall 2026 and substantial completion anticipated by 2028 to align with current grant funding timelines.

3.0 Water Demand Analysis

3.1 Current Demand Statistics

The Town of Osoyoos has maintained recorded annual water consumption data since 2000, as documented in annual water reports and the 2023 Osoyoos Water System Infrastructure Plan.

Figure 3-1 illustrates trends from 2000 to 2024, including total annual consumption, serviced population, average day demand (ADD), a linear trendline for ADD, and key milestones such as the twinning of Irrigation Systems 8 and 9.

ADD was calculated using total annual water consumption and the total serviced population, which includes both the Town's census population and the additional rural population connected through Systems 8 and 9 (not captured in census counts). Population estimates for non-census years were interpolated or extrapolated from available census data.

Key observations from Figure 3-1 include:

- The twinning of rural systems resulted in a notable increase in serviced population (in 2020, rural residents accounted for 13% of the total serviced population).
- Per capita ADD has shown a consistent downward trend since 2000.
- It is reasonable to assume that per capita demand will continue to decline gradually or remain stable in the future, especially considering that universal metering of the domestic water system is soon to be completed.

For future demand projections, the five-year rolling average of ADD will be applied as the baseline, rather than relying solely on the 2024 value. Maximum Day Demand (MDD) is estimated using the historic multiplier of 2.44, and recent per-capita ADD and MDD values for 2020–2024 are summarized in Table 3-1.

TABLE 3-1: PER-CAPITA ADD AND MDD (2020–2024)

YEAR	ADD (L/C/D)	MDD (2.44 × ADD) (L/C/D)
2020	1,085	2,647
2021	1,075	2,623
2022	1,114	2,718
2023	1,013	2,472
2024	932	2,274
5 Year Average	1,044	2,547

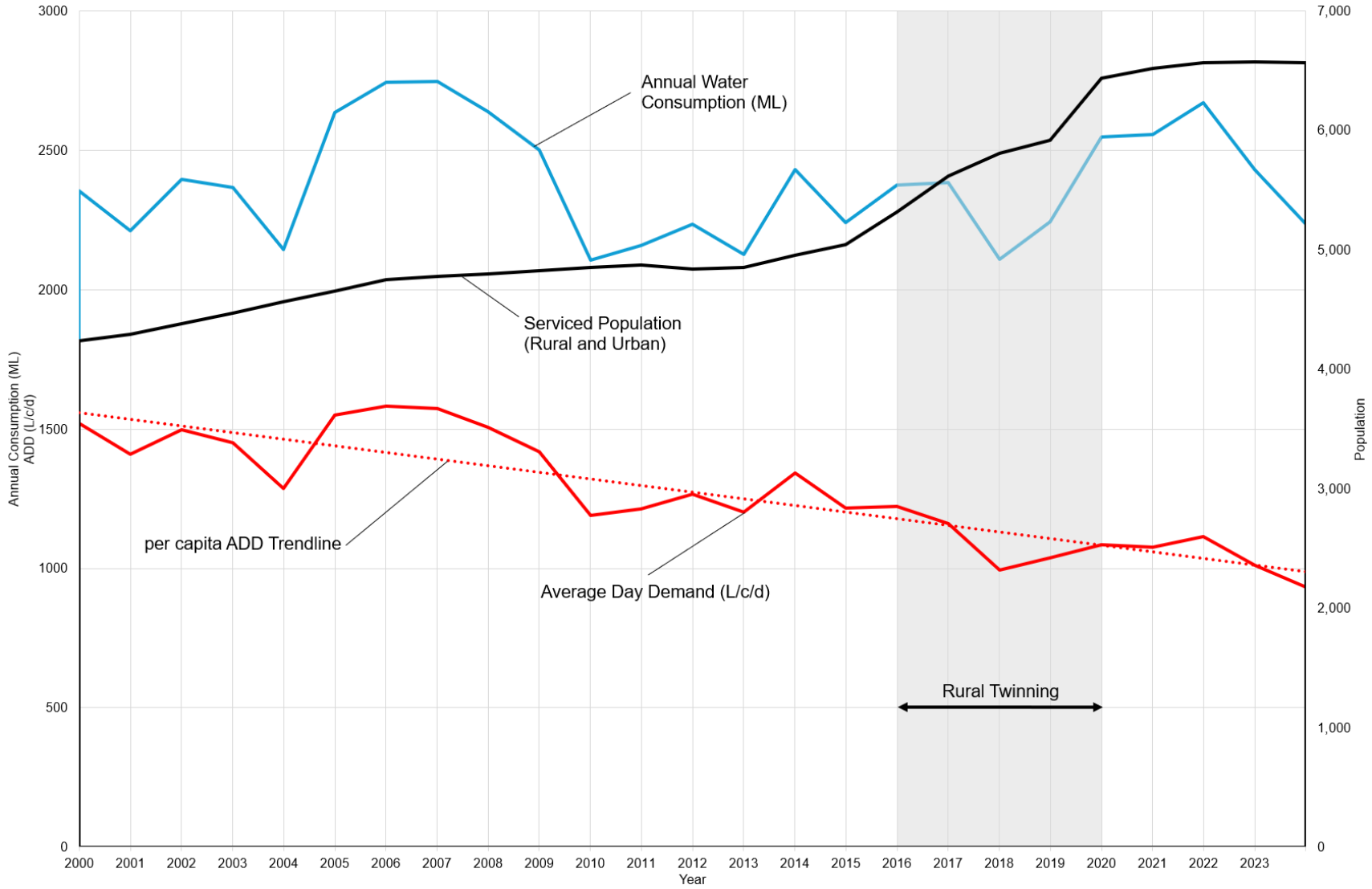


FIGURE 3-1: HISTORIC WATER CONSUMPTION AND POPULATION

3.2 Projected Population Growth

Population growth is one of the key variables guiding the selection of appropriate design capacity for the Town's water infrastructure. Several data sources and modeling approaches have been considered to establish a range of plausible growth scenarios.

The lowest growth scenario assumes minimal population change. Statistics Canada census data (Table 3-2) show that Osoyoos has generally experienced steady long-term growth since 1956.

TABLE 3-2: CENSUS POPULATION DATA

YEAR	CENSUS POPULATION	ANNUAL AVERAGE CHANGE
1951	899	-
1956	860	-0.88%
1961	1,022	3.51%
1966	1,166	2.67%
1971	1,285	1.96%
1976	2,100	10.32%
1981	2,738	5.45%
1986	2,956	1.54%
1991	3,403	2.86%
1996	4,021	3.39%
2001	4,295	1.33%
2006	4,752	2.04%
2011	4,845	0.39%
2016	5,085	0.97%
2021	5,556	1.79%

Some periods, highlighted in blue, are likely to reflect municipal boundary expansions that artificially inflated growth rates. These long-term growth trends are illustrated in Figure 3-2. While such expansions increase the serviced population, they are typically accompanied by targeted infrastructure investment and therefore do not represent organic growth. Excluding the population decline in 1956, the lowest recorded growth rate is 0.39% (2011). Rounded to 0.4%, this value is used as the lower-bound scenario, though it is likely too conservative for long-term planning.

The highest growth scenario would reflect historic peaks between 3% and 10.3% annually. However, these occurred more than 20 years ago, are not supported by recent census trends, and were often tied to boundary changes. As such, they are not considered realistic for projecting future organic growth.

The Town's Official Community Plan (OCP, 2022) identifies three modeled growth rates (Table 3-3).

TABLE 3-3: OCP GROWTH MODELS

MODEL	RATE OF POPULATION GROWTH
Low Growth	1%
Medium Growth	2%
High Growth	3%

The 3% model is considered overly aggressive. For example, applying a 3% rate to the 2024 urban population of 5,737 projects a 2050 population of 12,373, plus ~828 rural residents, well above historical trends. Over the past 20 years, the Town's growth has remained below 2%, making the 2% OCP scenario a reasonable upper-bound for water supply planning.

For a mid-range projection, census results from 2001–2024 indicate an average annual growth rate of 1.3%, consistent with BC Statistics data for the Okanagan-Similkameen region (1.4% between 2011–2023). Refer to Table 3-4 for further details.

Accordingly, three scenarios are carried forward for demand modeling:

- **Low Growth:** 0.4% annually
- **Medium Growth:** 1.3% annually
- **High Growth:** 2.0% annually

TABLE 3-4: BRITISH COLUMBIA REGIONAL DISTRICT AND MUNICIPAL POPULATION ESTIMATES

NAME	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Okanagan-Similkameen	-0.6%	0.4%	1.4%	1.4%	2.1%	1.8%	2.2%	1.6%	1.2%	1.4%	0.9%	0.3%	-0.2%
Keremeos	1.0%	2.1%	3.8%	3.3%	3.2%	-0.1%	3.4%	0.0%	1.4%	2.8%	1.8%	6.0%	-0.2%
Oliver	-1.2%	-0.1%	1.8%	1.3%	1.7%	4.2%	-0.6%	2.5%	-1.6%	-0.7%	0.9%	0.0%	-0.1%
Osoyoos	-0.8%	0.3%	2.2%	1.7%	2.8%	2.2%	2.2%	2.0%	1.6%	1.5%	0.9%	0.0%	-0.1%
Penticton	-0.8%	0.7%	1.1%	1.6%	2.2%	2.0%	3.0%	1.9%	0.8%	1.0%	1.1%	0.1%	0.2%
Princeton	3.5%	-1.9%	1.1%	0.8%	3.3%	-4.1%	0.2%	-0.4%	6.6%	0.2%	0.3%	1.3%	6.4%
Summerland	0.1%	0.7%	2.3%	1.8%	-0.3%	1.3%	0.3%	0.3%	0.8%	1.4%	1.4%	-0.9%	0.0%
Unincorporated Areas	-1.0%	0.3%	1.2%	1.0%	2.9%	2.0%	2.7%	1.8%	2.0%	2.5%	0.3%	0.8%	-1.7%

Source: https://www2.gov.bc.ca/assets/gov/data/statistics/people-population-community/population/pop_municipal_subprov_areas.xlsx

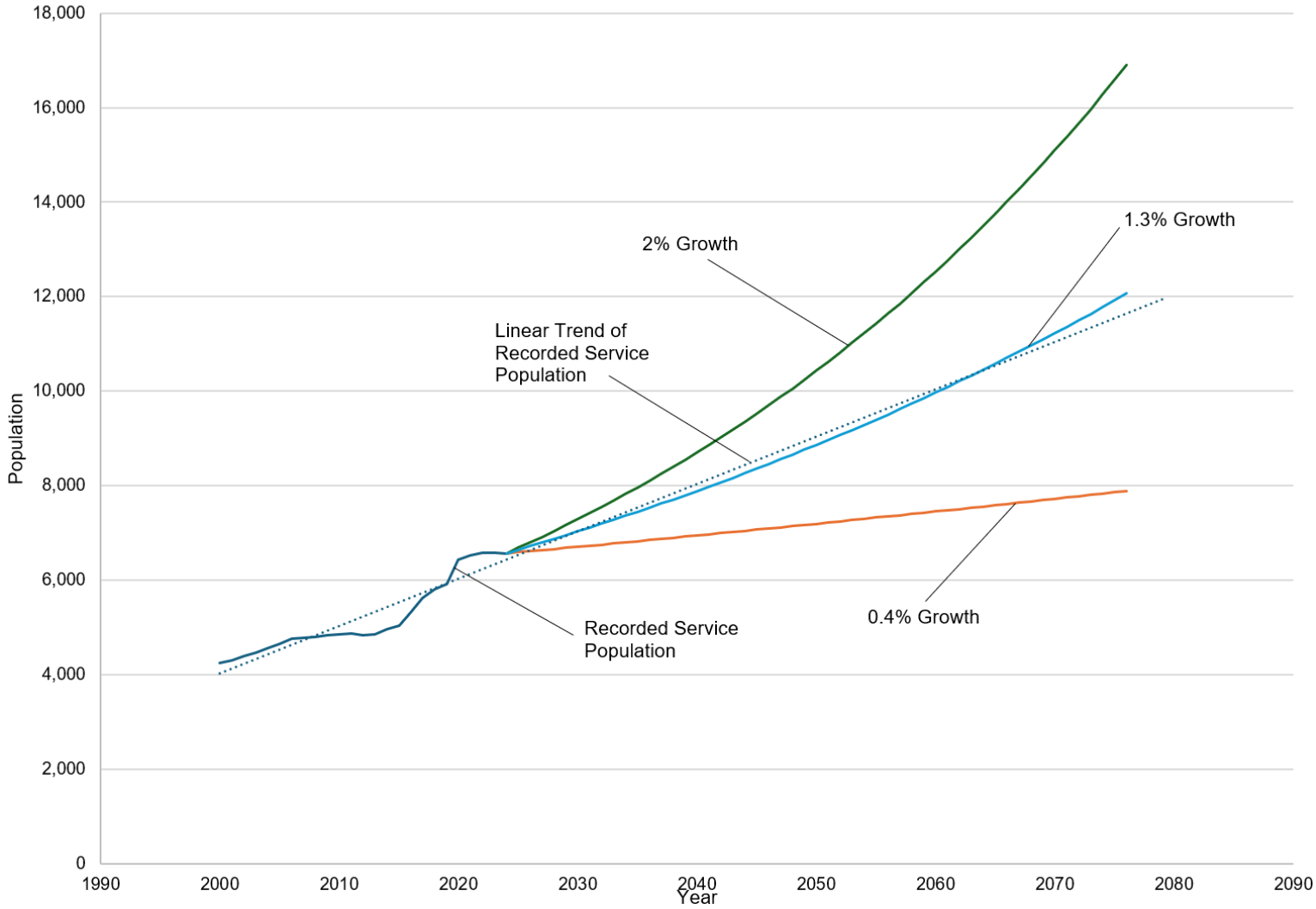


FIGURE 3-2: POPULATION PROJECTIONS

3.3 Water Conservation Targets

Water conservation has become a standard best practice in the water utility sector. This section evaluates achievable long-term water-use efficiency targets for the Town of Osoyoos and establishes performance benchmarks for monitoring progress toward sustainable per-capita demand levels. To establish realistic conservation benchmarks, it is useful to review past performance and peer community experience. The Town's first WCP, developed in 2010, aligned with the Province of British Columbia's Living Water Smart initiative. At that time, the Town set a target of improving water use efficiency by 33% by 2020. Achieving this goal would have required reducing the 2020 Average Day Demand (ADD) to 870 L/c/d. In practice, the 2020 ADD was 1,085 L/c/d, and the target was not met.

Nonetheless, since 2000, the Town has achieved a consistent downward trend in per capita water use, even without fully implementing all recommendations of the 2010 WCP. This indicates that further conservation gains remain attainable. The phased implementation of universal water metering for potable users is expected to accelerate reductions in the coming years.

The 2010 WCP benchmarked Osoyoos against other BC Interior communities. In 2010, the metered communities of Vernon and Penticton reported ADDs of 600 and 670 L/c/d, respectively. By 2023, Penticton had further reduced its ADD to 561 L/c/d, highlighting the effectiveness of metering. Similarly, the Town of Oliver's DCC Demand Management Pilot Project Update (2019) showed a 40–50% reduction in domestic consumption within one year of implementing water metering, more than double the 20% reduction over 20 years forecasted in the 2010 WCP.

These findings demonstrate that:

- The 2010 WCP underestimated the potential impact of water conservation.
- With universal metering and supporting initiatives, Osoyoos can reasonably expect substantial additional reductions in consumption.

For broader context, Canada's national average ADD is approximately 329 L/c/d. While not directly comparable due to Osoyoos's semi-arid climate and demographic characteristics, it highlights the potential for long-term efficiency gains.

To guide infrastructure planning, three ADD conservation models have been developed, with projected outcomes illustrated in Figure 3-3.

- **Worst-Case Model:** Assumes a 10% reduction in per capita ADD over 10 years. This represents half of the 2010 WCP projection and one-quarter of the reductions achieved in Oliver within a single year.
- **Best-Case Model:** Assumes a one-time 20% reduction in 2026, coinciding with the expected completion of universal metering. This aligns with the 2010 WCP and conservatively reflects Oliver's experience.

- **Targeted Model:** Assumes a continued 1.7% annual reduction in ADD, reflecting the Town's historic average since 2000, until a minimum threshold of 600 L/c/d is reached. This threshold is consistent with results achieved in Vernon, Penticton, and Oliver. Under this approach, Osoyoos would not reach 600 L/c/d until approximately 2052, lagging 50–60 years behind its peers. Importantly, this model does not account for any accelerated benefits from metering.

To provide clear milestones for tracking progress toward this long-term efficiency goal, a series of incremental five-year targets have been established under the Targeted Model scenario. These targets represent achievable reductions in ADD based on a 1.7% annual improvement rate and are summarized in Table 3-5. These benchmarks provide measurable milestones for evaluating conservation performance and aligning rate structures and operational strategies with long-term efficiency goals.

TABLE 3-5: INCREMENTAL FIVE-YEAR WATER CONSERVATION TARGETS (AVERAGE DAY DEMAND)

YEAR	TARGET USAGE (L/C/D)	% REDUCTION FROM 2024 BASELINE
2025	932	—
2030	870	6.7%
2035	798	14.4%
2040	732	21.5%
2045	672	27.9%
2050	617	33.8%
2052	600	35.6%

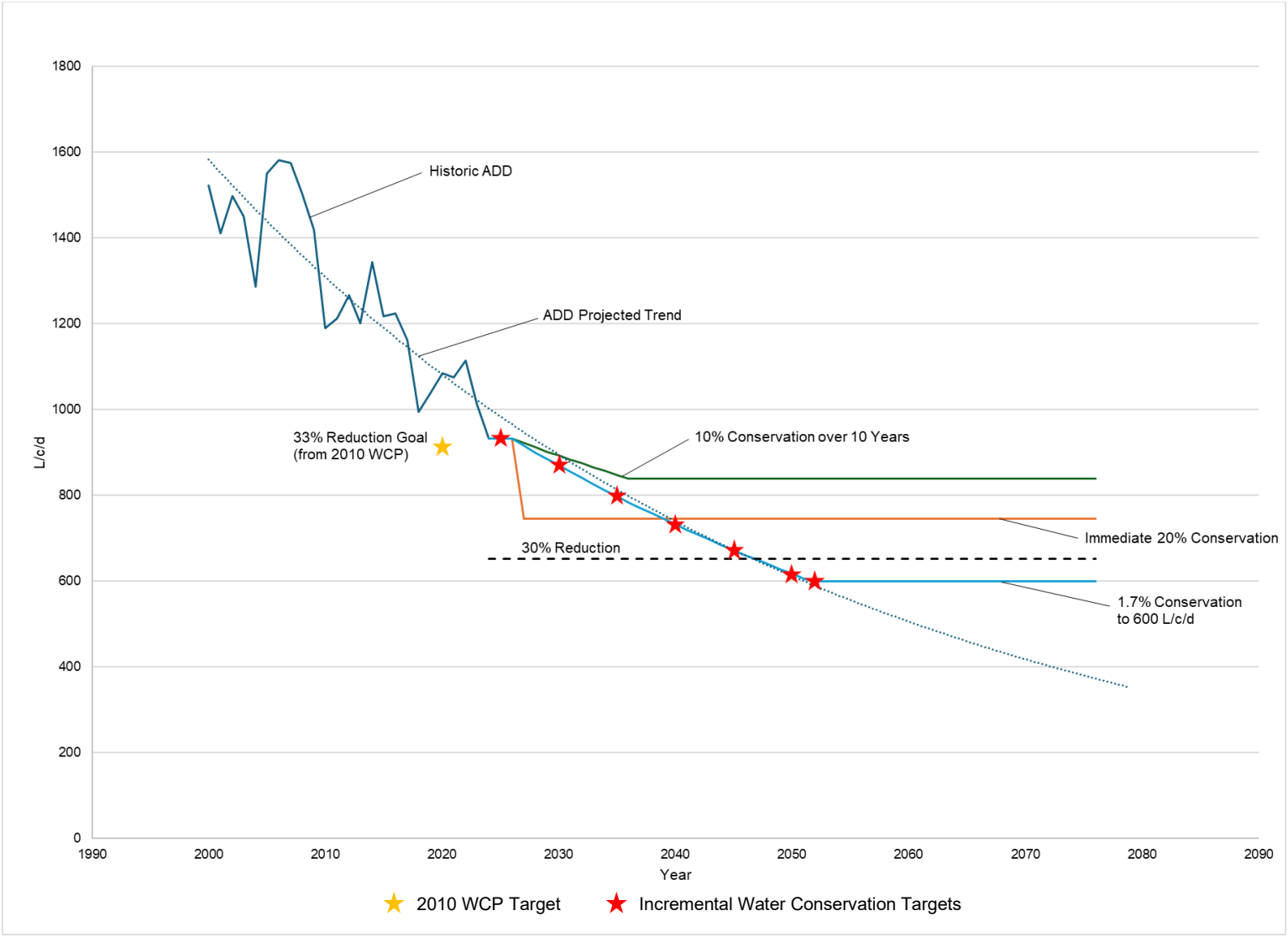


FIGURE 3-3: PER CAPITA ADD PROJECTIONS

3.4 Summary & Recommended Conservation Scenario

Building on the Targeted Model presented in Section 3.3, the resulting demand projections confirm that effective long-term demand management remains critical for reducing future capital expenditures on source and treatment infrastructure. The adopted strategy assumes 1.3% annual population growth (medium-range scenario consistent with census trends) and a 1.7% annual reduction in per-capita demand until a long-term efficiency level of 600 L/c/d is achieved. This approach reflects historic performance, local climatic conditions, and regional benchmarks and will require continued implementation of water conservation measures (refer to Section 5.0).

As shown in Table 3-5 and Figure 3-3 the Targeted Model projects a gradual decline in per-capita ADD from approximately 932 L/c/d in 2025 to 600 L/c/d by 2052 (~35.6% reduction). These benchmarks provide a measurable framework for evaluating the effectiveness of conservation initiatives and guiding future rate structure adjustments, while allowing the Town to accommodate growth and defer major capital upgrades beyond the current 20-year planning horizon.

Figure 3-4 illustrates the projected Maximum Day Demand (MDD) under the Targeted Model, together with the higher and lower-growth scenarios. Under the Targeted Model, system-wide MDD is projected to reach approximately 17.7 MLD at the 50-year horizon, consistent with the initial design capacity recommended in the TRUE Water Treatment Plant Predesign Report (2024) and appropriate for n-1 supply redundancy. Although the Town will size the future WTP footprint to accommodate a 2% annual growth scenario (consistent with OCP planning and scalable via Development Cost Charges), the 1.3% growth + conservation trajectory remains the most realistic operating condition for the coming decades. The MDD curve shows a gradual decline until the 600 L/c/d target is reached in 2052, after which MDD increases in line with population growth.

Each model was translated into MDD projections using the historic Average-to-Maximum multiplier of 2.44, allowing direct comparison with recent engineering design capacities. Table 3-6 summarizes the targeted long-term demand levels, while Figure 4 illustrates the projected MDD under each scenario. The TRUE Water Treatment Plant Predesign Report (2024) recommended an initial capacity of 17.4 MLD (200 L/s), expandable to 22.5 MLD (260 L/s), with provisions for an ultimate footprint of 25.9 MLD (300 L/s). Under the high-consumption scenario, system MDD is projected to reach approximately 24.7 MLD by 2076, slightly above the 22.5 MLD build-out capacity but still within the 25.9 MLD ultimate footprint envelope identified in the Predesign Report. As additional metering data become available, the Town should refine these projections annually to confirm that the Targeted Model remains both effective and financially prudent.

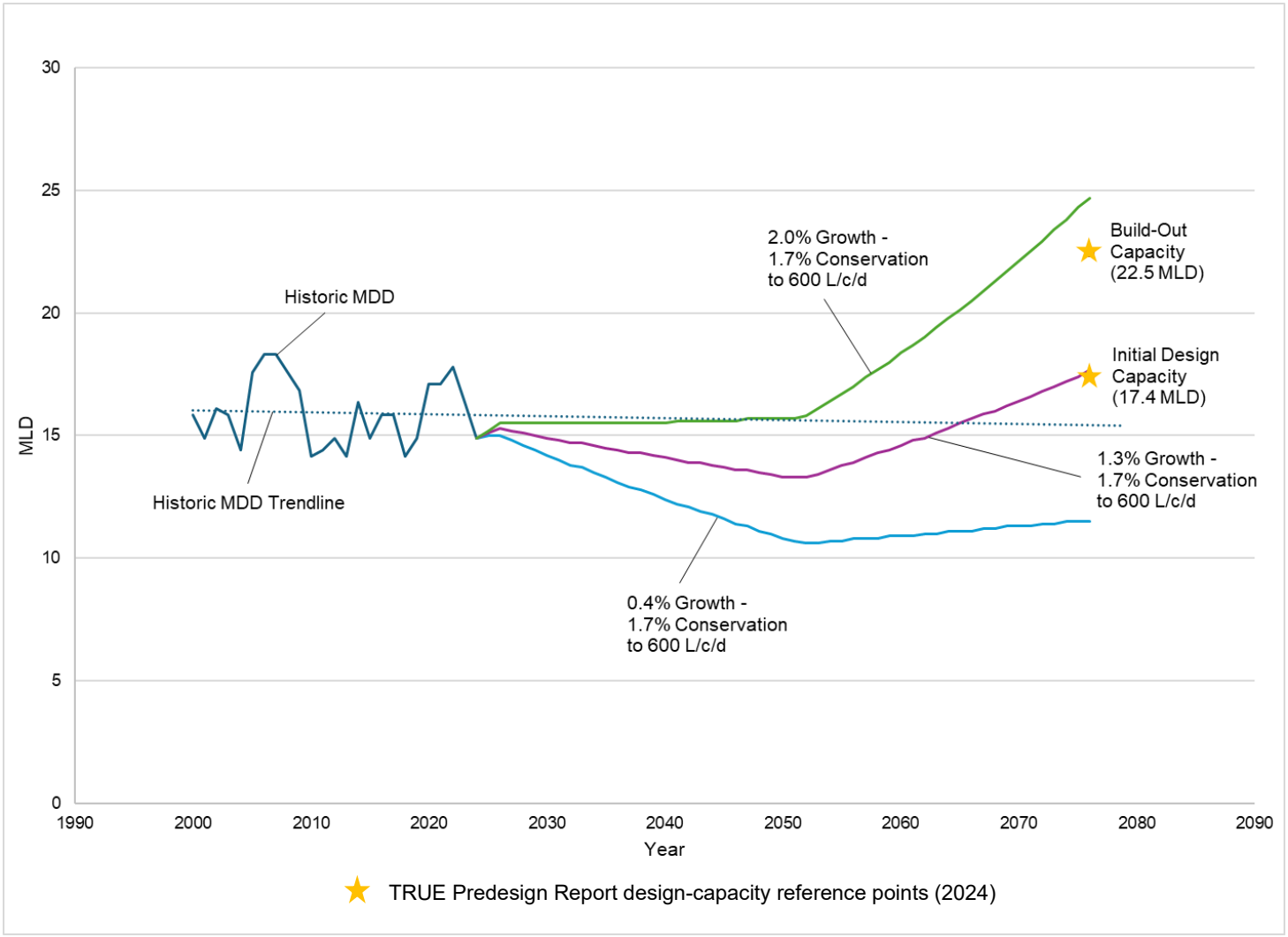


FIGURE 3-4: MDD PROJECTIONS

Note: MDD projections under the "Targeted Case" reflect an ADD goal of 600 L/c/d, equivalent to 13.3 MLD at the current serviced population and 17.7 MLD at the 50-year horizon.

Key findings from this comparison include:

- The TRUE 2043 build-out capacity of 22.5 MLD and initial build capacity of 17.4 MLD were appropriate based on the 2024 predesign assumptions. However, updated modelling in this Water Conservation Plan indicates that these capacities no longer align with projected long-term system demand.
- Under the updated Targeted Model, system-wide MDD is now projected to reach approximately 17.7 MLD at the 50-year horizon.
- Under the High-Growth (2%/yr) scenario, long-term MDD is projected to reach approximately 24.7 MLD, which exceeds the 22.5 MLD build-out point but remains within the 25.9 MLD ultimate footprint envelope identified in the Predesign Report.

Based on this updated assessment, it is recommended that the Town adopt the Targeted Model as the basis for long-term demand management. At the same time, any future water source upgrades should also consider the High-Growth scenario result of 24.7 MLD for components that must accommodate potential build-out conditions. Using the incremental conservation targets identified in Table 3-5 and the per-capita reductions illustrated in Figure 3-3 will be essential for achieving the updated long-term demand thresholds.

TABLE 3-6: SUMMARY OF TARGETED LONG-TERM DEMAND LEVELS.

PARAMETER	TARGET VALUE	BASIS/NOTES
Per capita ADD	600 L/c/d	Long-term efficiency benchmark, consistent with Okanagan peers
Per capita MDD	1,460 L/c/d	Based on ADD × 2.44 multiplier
System-wide MDD	17.7 MLD	50-year horizon target, aligns with TRUE Predesign (2024) initial capacity

The Town should review water usage annually as part of its water system reporting to verify progress toward the 600 L/c/d target. Ongoing monitoring will ensure that the Targeted Model remains effective, financially sustainable, and aligns with regional best practice.

4.0 Past Water Conservation Strategies

Since adopting its first WCP in 2010, the Town of Osoyoos has advanced a range of initiatives aimed at reducing Maximum Day Demand (MDD), deferring new source capacity (e.g., municipal wells), and contributing toward provincial objectives under Living Water Smart: British Columbia's Water Plan. While these efforts have achieved meaningful reductions in water consumption, the full provincial targets have not yet been met. Specifically, Living Water Smart set goals of improving water use efficiency by 33% by 2020 and meeting 50% of new demand growth through conservation between 2020 and 2030. Continued implementation of universal metering and additional conservation initiatives are expected to narrow this gap.

Between 2010 and 2025 the Town implemented the following strategies as part of a five-year action plan:

Metering of Major Water Users (2010–2011):

A metering program was introduced for major users, including multi-family properties and recreational vehicle parks. Data collected was used to identify excessive consumption. Targeted outreach by Town staff proved more effective than "mock billing" and encouraged reductions in water use.

Public Education and Awareness (2010–2014; Ongoing):

The Town has consistently promoted water conservation through its website, public notices, and tax mailings. These campaigns raised awareness of conservation objectives and provided practical tools for residents to reduce household consumption.

Reclaimed Water for Irrigation (2013–2015):

Infrastructure to deliver reclaimed water to the secondary school playing fields was constructed between 2013 and 2014. With School District approval, reclaimed water use for irrigation began in 2015, offsetting demand on the potable system during peak irrigation months.

Alternative Irrigation Water Sources (2015–Present):

In 2015, a test well was drilled at Kinsmen Park to assess non-potable irrigation potential, though yields proved insufficient. The Town has since focused on upgrading irrigation wells for Gyro Park and is exploring similar opportunities for Pioneer Walkway and Jack Shaw Gardens.

Universal Water Metering Program (Planned; Reserve Fund Established in 2015):

Although the 2010 WCP recommended universal water metering by 2013, public concerns delayed implementation. In 2015, the Town established a dedicated reserve fund, contributing $125,000 annually toward future metering infrastructure, supported by a public engagement strategy prepared by Urban Systems.

After several years of preparation, the Town formally advanced the Universal Water Metering Program in 2020, with Neptune Technology Group Canada Co. officially awarded the installation contract on July 2, 2024. The program covers approximately 1,990 domestic connections, with the final number fluctuating slightly (±2–3%) due to vacant and abandoned properties.

Additional Efforts:

Beyond the initial five initiatives, the Town leveraged Irrigation System 9 to provide non-potable water to the Osoyoos Fire Hall (2016) and a new Highway 3 commercial development, eliminating the use of potable water for irrigation at these sites.

4.1 Water Conservation Results (2010–2017)

- **Annual Water Use:** Total annual consumption decreased from 2,567 ML in 2009 to 2,384 ML in 2017 (~7% reduction).
- **Per Capita Consumption:** Despite population growth, average daily per capita consumption declined from 1,300 L/c/d (2009) to 1,120 L/c/d (2017), a ~14% reduction.
- **Deferred Capital Works:** Reductions in MDD allowed the Town to defer construction of Well No. 7, originally scheduled for 2010, each year since 2011.

4.2 Summary

Through targeted metering, reclaimed water use, public education, and exploration of alternative irrigation sources, the Town has made steady progress toward its conservation objectives. Establishing a metering reserve fund and maintaining public engagement strategies positioned the Town well for the implementation of universal water metering as the primary goal for continued advancement of water conservation practices.

5.0 Water Conservation Options

The *Water Conservation Plan Guidebook for BC* identifies a range of conservation measures that municipalities should consider. While not all options are universally applicable, the following subsections evaluate selected measures for their relevance to the Town of Osoyoos.

5.1 Conservation-Oriented Rate Structures

The Town of Osoyoos currently employs a conservation-oriented rate structure through volumetric pricing, which combines a fixed base fee with a variable consumption charge. Although the Town does not use an inclining block (tiered) rate structure, the existing design still links charges directly to metered consumption, thereby encouraging conservation. The effectiveness of this existing rate structure will be realized once the Town has completed the universal metering program for domestic users (expected in 2025).

As established in *Water Regulations and Rates Bylaw No. 1388 (2023)*:

- **Base Rate (¾" residential meter**): $599.49 per year
- **Volumetric Charge:** $1.08 per cubic metre consumed

This structure ensures that households with higher consumption incur proportionally greater costs, creating a financial incentive to reduce discretionary water uses such as outdoor irrigation and vehicle washing during peak demand periods. Following two full years of complete metering data, the Town should conduct a financial and revenue stability analysis to evaluate the feasibility of transitioning to a tiered rate structure.

At this stage, however, sufficient seasonal data is not yet available to confidently design an Osoyoos-specific tiered rate system. Without at least two years of complete metering data, there is a risk that a tiered structure could reduce utility revenues or shift costs unfairly between households. For this reason, the Town should maintain its current rate structure until individual water-use patterns are better understood.

A review of regional practices shows that most Okanagan municipalities (Kamloops, Peachland, Summerland, Penticton, Kelowna, West Kelowna, and Vernon/RDNO) have implemented three-block tiered structures. These typically provide:

- A base allowance for essential indoor use (Block 1),
- A moderate allowance for discretionary outdoor use (Block 2), and
- A higher charge for excessive or non-essential consumption (Block 3).

As a regional reference point, the City of Penticton (CoP) uses a three-block inclining structure. As shown above and in the CoP rate bylaw, the volumetric rate in Block 2 is set ~25% higher than

Block 1, and Block 3 is ~50% higher than Block 1. Once Osoyoos has collected sufficient consumption history under universal metering, thresholds for a Town specific tiered rate system should be developed using actual quarterly usage data for a typical single-family residence (essential indoor demand plus moderate irrigation). This will ensure that block sizes reflect local conditions, rather than relying on generalized estimates.

5.2 Plumbing Fixture Rebate Programs

A wide range of water saving technologies, such as low-flow toilets, showerheads, touch-activated faucets, and high efficiency appliances, represent potential opportunities for reducing water consumption. Historically, many local governments have offered rebate programs to encourage homeowners to replace older, less efficient fixtures, with toilet replacement programs being the most common.

Over the past two decades, however, the number of municipalities offering toilet rebate programs has declined. Contributing factors include:

- The discontinuation of provincial, federal, and agency-led programs (e.g., Okanagan Basin Water Board).
- The BC Plumbing Code requirement that all new toilets use ≤ 6 L/flush, eliminating the market for older 13–20 L/flush models.
- Increased availability and reduced purchase cost of ultra-low flush toilets.
- Fixture and appliance upgrades reduce average day demand (ADD) but have little effect on maximum day demand (MDD) or peak hour demand, which drive infrastructure sizing.
- In municipalities with metered billing, water savings already translate into lower utility bills, providing a built-in financial incentive.
- Other conservation initiatives (e.g., outdoor water use reduction) typically offer greater system-wide benefit and have been prioritized.

Where toilet rebate programs still exist, primarily in the Lower Mainland and Vancouver Island, rebates typically range from $50–$100 per fixture.

For Osoyoos, a toilet rebate program could be considered as part of a broader conservation strategy, but it should not be viewed as a high-priority initiative. At minimum, the Town should continue to promote the benefits of low-flush toilets through its public education and engagement channels. Additional data on the number of homes with outdated fixtures and expected participation rates would be required to evaluate cost-effectiveness.

Rebate programs could also be expanded to address high water use activities beyond plumbing fixtures. Examples from other municipalities include:

- Rebates to replace turf grass with drought-tolerant landscaping (xeriscaping).
- Rebates for commercial, multi-family, or institutional property turf replacement.

- Rebates for high-efficiency irrigation controllers.
- Rebates for pool covers to reduce evaporation losses.
- Rebates for replacing high-use fixtures and appliances.

If pursued, the Town could consider a first-come, first-served program format with a defined annual budget cap to control costs while providing residents with equitable access to the program.

5.3 Further Water Conservation Bylaws and Enforcement

Some municipalities have strengthened water conservation through dedicated bylaws to manage discretionary demand. For example, the Town of Oliver regulates outdoor water use and requires meters on all new developments. Other communities have implemented additional measures, including:

- Prohibiting new turf grass installations or requiring drought tolerant landscaping.
- Limiting the size of residential swimming pools.
- Prohibiting the use of potable water for non-essential cleaning (e.g., driveways, patios, sidewalks).

While such bylaws can reduce discretionary consumption and promote long-term efficiency, their effectiveness depends heavily on enforcement. According to the Province of British Columbia, effective bylaw enforcement requires:

- Public education on regulatory rules.
- Routine inspections to confirm compliance.
- Mediation between members of the public when disputes arise.
- Emphasis on voluntary compliance wherever possible.
- Application of penalties where contraventions occur or harm is caused to the community.

Given current staffing, the Town's bylaw enforcement capacity is limited. Expanding water conservation bylaws without a corresponding increase in enforcement resources would place significant strain on existing officers and reduce program effectiveness. Moreover, consistent and fair application of penalties is essential to achieve compliance and maintain public trust.

Accordingly, while water conservation bylaws may have merit in principle, they should not be considered a realistic or high-priority initiative for Osoyoos unless the Town expands its bylaw enforcement department and dedicates sufficient resources to compliance monitoring, education, and enforcement.

6.0 Conclusions and Recommendations

Since adopting its first Water Conservation Plan, the Town of Osoyoos has made significant progress in managing demand. Per capita consumption has declined steadily, and reductions in Maximum Day Demand (MDD) have allowed the Town to defer new groundwater supply development for more than a decade. However, the Province's Living Water Smart targets (33% efficiency improvement by 2020, and meeting 50% of new demand growth through conservation by 2030) have not yet been fully achieved. The primary objective of this updated Plan is therefore to continue reducing MDD to defer or minimize the scale of new water source and treatment infrastructure, reducing long-term costs for the community.

The Town's current supply strategy is to transition toward a surface water treatment system drawing from Osoyoos Lake, with the planned water treatment plant south of the 402 Reservoir supported by a dedicated raw water supply main. Preliminary design and permitting are underway, with phased construction targeted to begin in Fall 2026 and substantial completion anticipated by 2028. Groundwater wells will continue to play an important role, both to supplement supply in the long term and to provide redundancy during surface water outages or maintenance periods.

Additional goals of the updated Water Conservation Plan include:

- **Reducing stress on the existing groundwater wells** to extend their service life while planning for a new surface water supply. This will reduce the number of costly treatment modules required to meet future MDD using groundwater alone.
- **Demonstrating ongoing conservation leadership** to strengthen eligibility for future grant funding.
- **Providing capacity for growth** by reducing demand, thereby supporting new development within the Town's service area.

At present, the Town's groundwater system can reliably meet Average Day Demand (ADD), but the central challenge is managing MDD so that the system continues to operate within its n-1 redundancy threshold until the new surface water treatment plant is in place.

Based on the analysis in previous sections, the following strategies are recommended:

- **Adopt a conservation-oriented rate structure** designed to ensure MDD remains within existing n-1 supply capacity over the 20-year horizon.
- **Conduct major user audits** through desktop analysis enabled by the AMI system. This will allow the Town to identify leakage and/or high-usage accounts without requiring additional field reads.
- **Introduce rebate programs focused on reducing irrigation demand,** such as incentives for irrigation controllers and xeriscaping (lawn replacement). Plumbing fixture rebates may be considered but should remain a lower priority initiative.

- **Carry out annual non-revenue water (NRW) audits** in accordance with AWWA M36 methodology, using available AWWA software. These audits should ideally be integrated with preparation of the Town's annual water system report.
- **Encourage residential infill development** within municipal boundaries in alignment with Provincial Bills 44, 46, and 47, and the Town's OCP. From a conservation perspective, higher-density development typically reduces outdoor irrigation demand, lowering per capita MDD.

In summary, conservation is not just about efficiency, it directly shapes the scale and cost of future infrastructure. By managing growth and consumption to achieve the targeted long-term levels (600 L/c/d ADD and 17.7 MLD MDD), the Town can ensure that the 2027 surface water treatment plant, and future supply infrastructure, are built at the smallest practical scale, minimizing capital and operating costs while maintaining resilience.

APPENDIX A

Domestic Water System Composite Map

For Continuation See Sheet 3

RESERVOIR
1000 cu.m. (240M. Imp. Gal.)
TWL 400m. (1312')

RESERVOIR
2550 cu.m. (676,000 IGAL)
TWL 340m. (1120')

RESERVOIR
1360 cu.m. (300000 IGAL)
TWL 340m. (1120')

SYSTEM 8/9 RESERVOIR
482cu. m. (106oo IGAL)
TWL 360.85m. (1184')

402 PR
PRESSURE
REDUCING
STATION

WELL 1

WELL 3

WELL 4

WELL 5

WYE
WELL

IRRIGATION
PUMPHOUSE #9

FAIRWAY HILLS
BOOSTER
STATION

HWY 97 & 100th AVE

HWY 97 & 92nd AVE

JUBILEE DR & 92nd AVE

87th ST & 92nd AVE

QUINCE LN & GALA CRES

VALIANT LANE

HWY 3 & MEADOWLARK DR

WESTRIDGE PUB

HWY 97 & EAGLE CT

HWY 97 & 74th AVE

EAGLE COURT &
MAIN ST

COTTONWOOD PARK

NORTH TAMARACK DR

MEADOWLARK DR
& 74th AVE

HWY 97 & 62nd AVE

HWY 97 & 62nd AVE

KINGFISHER DR & 83rd ST

NIGHTHAWK DR & 74th AVE

89th ST & PRIMROSE LN

LAKESHORE DR
& BAYVIEW CRES

LAKESIDE CELLARS

107 ST & 58 AVE

HWY 97 & CACTUS CRES

HWY 97 & 89th ST

WASTEWATER TREATMENT

PEBBLE BEACH DR

GOLF COURSE DR
& PEBBLE BEACH DR

LOBELIA DR & 32nd AVE

FAIRWINDS DR

CYPRESS HILLS DR

MAIN RESERVOIRS

For Continuation See Sheet 2

0 200 400 600 800 1,000 m

Legend

- Fire Hydrant Assembly
- Gate Valve
- Blowoff / Standpipe
- Municipal Watermain
- Municipal Watermain - 402 Pressure Reduced
- Irrigation Main
- Irrigation Main - System 9A
- Water Utility Structure
- Municipal Boundary
- First Nation Reserve Boundary

Sheet 3
Sheet 1
Sheet 2

TRUE CONSULTING

Osoyoos
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WATER SYSTEM COMPOSITE

MUNICIPAL SYSTEM AND SYSTEM 8/9

SCALE	1:5,000
DESIGN BY	
DRAWN BY	ET
DATE	5/8/2023
PROJECT REF No.	302-2061

DRAWING No.
302-2061-01

SHEET
1 OF 3

REVISION
01

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