103 – 859 Orono Avenue
Victoria, British Columbia
Canada V9B 2T9
T. 1.877.788.7277

August 13, 2024

Water Utilities Regulation Section
Ministry of Water, Land and Resource Stewardship
PO Box 9340 Stn Provincial Government
Victoria, BC V8W 9M1

Attention: Chris McMillan, Program Coordinator

Dear Mr. McMillan:

Subject: **Bluestem Multi-Utility Services ULC**
Canadian Lakeview Estates Water Utility
Application for Revision of Contribution in Aid of Future Construction Charge

Bluestem Multi-Utility Services ULC ("**BMUS**") submits this application requesting approval of a revised Contribution in Aid of Future Construction ("**CIAC**") charge for its Canadian Lakeview Estates water utility ("**CLE**" or "**Utility**"). When collected, the CIAC charge will be held in a Deferred Capacity Reserve Fund. CLE's CIAC charge has remained unchanged for over 10 years, with the last update in 2011. Per Schedule B of CLE's Water Tariff No. 5, the current CIAC charge is $6,000.

BMUS is requesting an upward revision of the CIAC charge to $38,590 to reflect the estimated replacement cost of the Utility's assets. BMUS also seeks approval of the proposed CIAC Charge on an interim, refundable basis – subject to final approval by the Office of the Comptroller of Water Rights – with an effective date of August 27, 2024.

Please contact the undersigned at Reg.Affairs@nexuswg.com if you have any questions.

Respectfully submitted,
Bluestem Multi-Utility Services ULC
Per 
Nonye Ogun
Manager, Regulatory Affairs

Attachments

cc: Elena Oliphant
Chief Financial Advisor
Water Utility Regulation Section
Ministry of Water, Land and Resource Stewardship

Bluestem Multi-Utility Services ULC
(Canadian Lakeview Estates)

Application For Revision Of Contribution In Aid Of Future Construction Charge

CONTENTS

EXECUTIVE SUMMARY

Bluestem Multi-Utility Services ULC (f/k/a Corix Multi-Utility Services Inc.) owns and operates a private water utility – Canadian Lakeview Estates Water Utility ("**CLE**" or the "**Utility**") – which provides services to 316 customers in the Adventure Bay community. Bluestem Multi-Utility Services ULC ("**BMUS**") is regulated by the Office of the Comptroller of Water Rights (the "**Comptroller**") in British Columbia.

CLE's Contribution in Aid of Future Construction ("**CIAC**") charge was first approved in May 1990 and last reviewed in March 2011. Based on information made available to BMUS by CLE's previous owners – Adventure Bay Waterworks, the Utility does not have a functional Deferred Capacity Reserve Fund ("**DCRF**") account.

BMUS submits this application to revise CLE's Contribution in Aid of Future Construction charge ("**Application**"). The Utility files this Application in accordance with the Water Utility Act and related financial guidelines issued by the Comptroller. The main body of the Application consists of the sections described below:

- **Section 1** introduces BMUS, provides relevant contact information, and outlines the regulatory approvals being sought as part of this Application.
- **Section 2** provides an overview of the relevant history of the Utility and key events that impacted the Utility since inception/acquisition by BMUS. It also provides the status of the Utility's current system capacity.
- **Section 3** provides details of required capital projects, a summary of CLE's depreciation study[1], and highlights of upcoming developer-funded projects.
- **Section 4** describes the methodology for the unit rate calculation and provides support for BMUS's request to increase the CIAC charge.

This Application also includes Financial Schedules which present relevant historical and forecast customer and financial information.

Additional supporting documents are included as appendices to this Application. These include, but are not limited to, system maps, water licenses, the updated tariff, and public notices.

[1] Per directives in the Comptroller's Order No 2516.

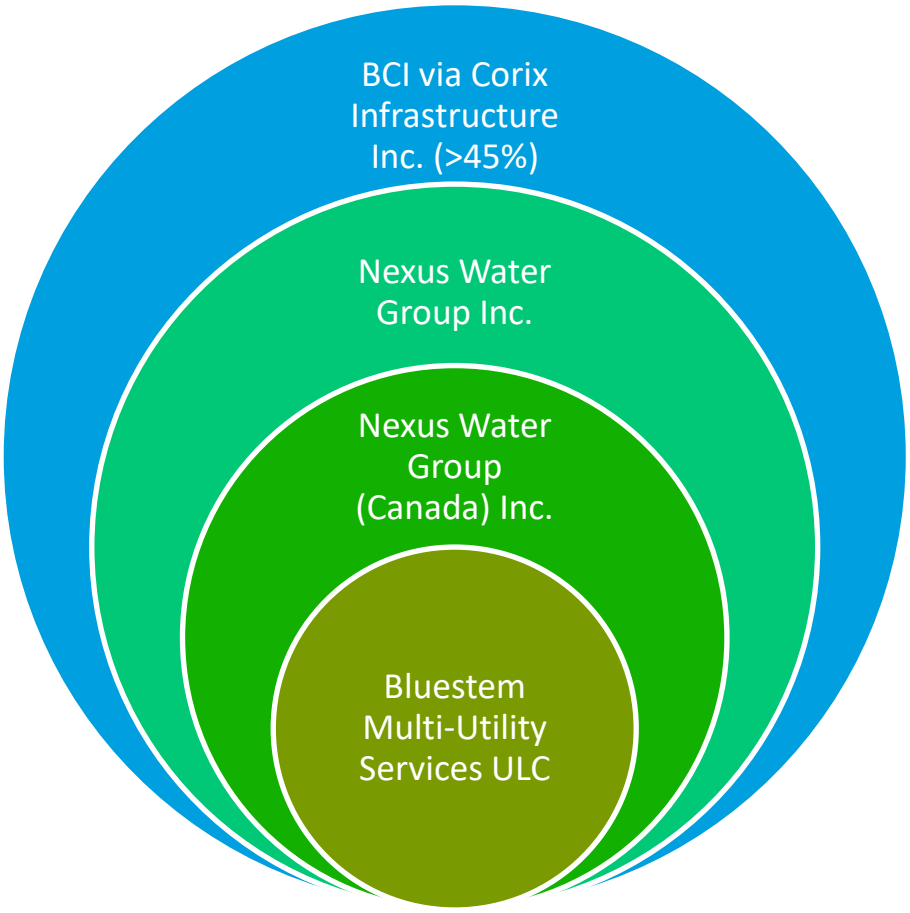
1. BLUESTEM MULTI-UTILITY SERVICES ULC

Bluestem Multi-Utility Services ULC (**BMUS**) owns and operates the water utility ("**CLE**" or "**Utility**") providing service to the community in Canadian Lakeview Estates, Vernon, BC. In addition to the water utility, BMUS also owns and operates the wastewater utility at CLE.

BMUS is regulated under the Water Utility Act, the Utilities Commission Act, and the Water Sustainability Act by the Comptroller of Water Rights. The Comptroller regulates all private water utilities in British Columbia to protect the public interest. The Comptroller ensures that these utilities provide safe and adequate water service at rates that are fair, reasonable, and sufficient to operate their water systems sustainably.

BMUS is a wholly owned subsidiary of Nexus Water Group (Canada) Inc. (**Nexus CA**), which is a wholly owned subsidiary of Nexus Water Group Inc. The British Columbia Investment Management Corporation (**BCI**) owns a significant stake in NWG; see Figure 1.

Figure 1: BMUS' Ownership Structure



1.1 Recent Merger Between Corix Infrastructure Inc. and SouthWest Water Co.

Corix Infrastructure (US) Inc. and SouthWest Water Company merged their water and wastewater businesses on April 1, 2024. Nexus Water Group Inc. (**NWG**) was created out of this merger. NWG is a regulated, private water and wastewater utility with local operations across 20 U.S. states and two Canadian provinces. NWG employs over 1,300 professionals who serve more than 1.3 million people across North America. Local operations deliver vital, safe, and reliable service through over 670 water systems and over 360 wastewater systems.

1.2 Approvals Sought

In this Application, BMUS requests approval of an increased CIAC charge of $38,590 effective August 27, 2024.

Contact Information

All communications with respect to this application should be addressed to BMUS's Regulatory Affairs team at this email address: Reg.Affairs@nexuswg.com.

2. BACKGROUND

CLE's water system was initially constructed in 1989 and has been privately owned since inception. The initial construction included lake intake infrastructure, a pump station, supply mains, a reservoir, and a distribution system. Phased development of the system occurred from 1990 through to 2010. Notable infrastructure upgrades within this period include a second reservoir installed in 1991, pressure reducing valve stations installed in 1998, and a third booster pump installed in 2002.

CLE received its first Certificate of Public Convenience & Necessity (**CPCN**) in January 1990 - under the name of C.L.U. Utilities Ltd. - for the construction and operation of the water system. Between 1991 and 2005, the Utility received amended CPCNs to expand the authorized service area and transfer the water system to Adventure Bay Waterworks Ltd.

Bluestem Multi-Utility Services ULC (formerly known as Corix Multi-Utility Services Inc.) purchased the Utility from Adventure Bay Waterworks in 2018. Thereafter, the Comptroller issued CPCN Certificate No. 1582 which approved a transfer of the Utility from its previous owners to Corix Multi-Utility Services Inc. (**Corix**); this CPCN included a list of 316 approved lots. Following the recent merger as explained in Section 1.1, CPCN 1582 has been replaced by CPCN 1652[2] which reflects the Utility's new corporate name[3].

Adventure Bay Waterworks provided some historical information on the Utility, and BMUS obtained copies of CPCN applications filed with the Comptroller to augment its understanding of the water system. BMUS has identified 130 lots that were added to the water system without adequate supporting documentation. Specifically, BMUS was unable to identify requisite capacity studies that would outline the water system's capacity pre- and post-connection of these lots. Therefore, BMUS has inferred that the Utility's capacity may not have been expanded to accommodate the 130 identified lots[4,5]. This capacity mismatch has resulted in system deficiencies described in Sections 2.1 to 2.5 below.

2.1 WATER SYSTEM DESIGN GUIDELINES & DEMANDS

CLE's design consultant, Stanley Associates Engineering Ltd completed a capacity study (**Stanley Study**) in March 1993. The Stanley Study did not specify the design guidelines used for CLE's water system; however, it outlined design parameters used in calculating the water demands that influenced the capacity of CLE's system intake, pumps, and reservoir. The Stanley Study incorporated guidelines from the Fire Underwriter's Survey in designing fire flow and reservoir requirements for the system.

The Stanley Study used US gallons as its primary metric for measurements in line with industry norms at the time. In this Application, BMUS has used "cubic meters" and "litres per second" measurements to reflect current nomenclature used in the Canadian utilities industry. Figure 2 below shows applicable conversion rates from US Gallons.

[2] Issued on July 3, 2024.

[3] Bluestem Multi-Utility Services ULC – Canadian Lakeview Estates Water

[4] 61 single family lots and 69 condominium units. The condominiums were later converted to single family lots.

[5] These lots equate 130 SFREs with an MDD of 1,066 cubic meters per day.

1 Cubic Meter = 264.17 US Liquid Gallons
1 Litre = 0.264 US Liquid Gallons

Figure 2: Conversion Rates from US Gallons

The water demand used for CLE's water system is based on a combination of unit types, the amount of irrigation area watered, and other miscellaneous uses. The Stanley Study specified water demands for each unit type using a uniform benchmark – the Single-Family Residential Equivalent (**SFRE**) - as presented in Table 1.

CLE's "Development Plan" (**CDP**) – comprising 475[6] units – was included in The Stanley Study and would require a Maximum Daily Demand (**MDD**) of 3,312 cubic meters per day, when completed. Per The Stanley Study, this plan was not viable because CLE's existing wastewater disposal system was not capable of processing related waste volumes. Thus, The Stanley Study recommended a reduced Development Plan (**RDP**) comprising 202 units with a MDD of 1,550 cubic meters per day. **This MDD of 1,550 cubic meters per day was the last "approved MDD" by the Comptroller for the development at CLE.**

Both plans included 101 single family lots (i.e. 101 SFREs) which were approved by the Comptroller prior to 1993[7]. The remainder of lots forecasted within the RDP comprised of 55 single family lots[8] and 46 condominium units. These lots amounted to 88.12 SFREs.

Table 1: Summary of the CDP, 1993 Capacity Study, and RDP

#	Unit Type	MDD per Unit	SFRE	CDP Units	CDP SFRE	RDP Units	RDP SFRE
1	Single Family Unit	8.2 cubic meters per day	1.00	268	268.00	156	156.00
2	Multi-Residential Service Unit (Condominium)	5.9 cubic meters per day	0.72	181	130.32	46	33.12
3	Apartment Unit						
	-Consumption per suite	1.15 cubic meters per day	0.14	26	5.59	0	0
	-Irrigation for building	16 cubic meters per day	1.95				
	TOTAL SFREs				**403.91**		**189.12**

[6] See Table 1

[7] CPCN's 717, 759, 799, 813 and 842.

[8] 25 lots in Phase 2, and 30 lots in Morning Glory.

CLE's development expanded to include the following units approved by CPCN 873 issued in 1993 and CPCN 901 issued in 1994:

i. 52 Single Family lots
ii. 1 Hobby Farm[9]
iii. 81 Condo units
iv. 22 Apartment suites
v. A lot with the Sewage Treatment Plant

This buildout differed from the RDP and added a total of 116.85 SFREs to the water system, leading to unplanned demand of 236 cubic meters per day (i.e. 28.73 SFREs). BMUS has not identified any updated capacity study that incorporates the demand arising from these units. Consequently, BMUS has inferred that The Stanley Study is the most recent detailed review of CLE's system capacity.

CPCN 1582 - issued to Corix in 2018 - includes a list of 316 approved lots as shown on Table 2. Using parameters outlined in The Stanley Study, **these units equate 307.5 SFREs with a MDD of 2,522 cubic meters.** Thus, there is a difference of 972 cubic meters per day between the existing buildout and the RDP.

Table 2: Lots per CPCN 1582

No.		MDD per Unit	SFRE	Approved Lots[10]	Total SFRE
1	Single family dwelling unit, including townhouse and side-by-side duplex up to three bedrooms per unit (per Tariff)	8.2 cubic meters per day	1.00	280	**280.00**
2	Bed & breakfast unit, includes single family dwelling unit and suite for B&B	12.3 cubic meters per day	1.50	1	**1.50**
3	Multi-residential service (condominium) unit	5.9 cubic meters per day	0.72	34	**24.50**
4	Hobby farm	12.3 cubic meters per day	1.50	1	**1.50**
	TOTAL				**307.5**

[9] This was presented as "Item 4 – Remainder of Lot D" on the CPCN

[10] Per Schedule A of CPCN 1582

2.2 INTAKE CAPACITY

Per The Stanley Study, the capacity of the intake was 4,790 cubic meters per day[11] based on a 250 mm Ductile Iron intake pipe of approximately 140 metres length, with a Hazen-Williams Coefficient of 140, and head loss of 600 mm[12]. Based on the demand parameters outlined in The Stanley Study, CLE's intake capacity is equivalent to 584 SFREs.

BMUS recently extended the length of the intake pipe by 180 meters to improve raw water quality and protection of the source. Based on this new total length of approximately 320 metres and allowing for an equivalent head loss of 600 mm, the capacity of the intake may be reduced to approximately 3,024 cubic meters per day[13] equivalent to 369 SFREs.

Therefore, the intake capacity of 3,024 cubic meters per day or 35 Litres per second may be adequate for the current system MDD of 2,522 cubic meters per day or 29 Litres per second (equivalent to 307.5 SFREs), but it may be insufficient for the CDP MDD of 3,312 cubic meters per day or 38 Litres per second (equivalent to 404 SFREs).

2.3 PUMPING CAPACITY

The Stanley Study calculated a total required pump station capacity of 52 Litres per second for pumping the CDP's MDD in 18 hours and recommended the installation of two pumps for a total capacity of 34.6 Litres per second, with provisions to add a third pump when developments exceed this output level. However, the pump installations at CLE were not aligned to these recommendations.

The initial installation included two pumps, each with an approximate capacity of 3.8 Litres per second for a total capacity of approximately 7.6 Litres per second. A third booster pump was installed in 2002 with capacity matching The Stanley Study's recommendations (i.e. 17.3 Litres per second). While the combined operating capacity may be as high as 24.9 Litres per second, the flow meter[14] at the pumphouse measures flow of approximately 21 Litres per second only. This lower capacity is assumed to be the current pumping capacity of the pump station.

Therefore, the pump station capacity of approximately 21 Litres per second may be inadequate for the current MDD of 29 Litres per second (equivalent to 307.5 SFREs) and it may be insufficient for the CDP MDD of 38 Litres per second (equivalent to 404 SFREs).

2.4 RESERVOIR STORAGE

The Stanley Study specified a CDP storage requirement of 1,175 cubic meters based on a balancing storage of 25% of the CDP MDD (i.e. 835 cubic meters) and fire storage[15] of 340 cubic meters. The

[11] Equal to 55 Litres per second.

[12] This capacity was determined by the drawdown of water level in the pumphouse wet well rather than by the size or length of the intake pipe.

[13] 35 Litres per second.

[14] 600mm head loss is based on a maximum allowable drawdown of water level due to pump suction whilst maintaining a minimum submergence of the pumps. This reduced capacity may be inaccurate due to the meter's location which does not support a consistent laminar flow of water.

[15] Fire storage of 65 Liters per second over a 1.5-hour duration

existing storage capacity noted in The Stanley Study was 556 cubic meters and additional capacity required for the CDP was 620 cubic meters.

The Stanley Study stated the existing storage was capable of supplying either of the following options:

- 101 existing lots and fire flows at 65 Litres per second.
- 101 existing lots, 25 lots in Phase 2, 46 condominiums, and fire flows at 32 Litres per second.

Both options would provide adequate fire storage required by the Fire Protection Authority per a letter that confirmed minimum fire flow of 28 Litres per second at the hydrants[16].

The Stanley Study also recommended the addition of a third reservoir cell of 344 cubic meters in line with its recommendations on increased pumping capacity. This would have increased the total storage capacity to 900 cubic meters. However, CLE's storage capacity has remained unchanged since the Stanley Study was completed.

The total required storage capacity for 316 approved lots, with an estimated MDD of 2,522 cubic meters per day and a fire storage requirement of 340 cubic meters, would be 970 cubic meters. For the CPD MDD of 3,312 cubic meters per day, the total required storage capacity would be 1,168 cubic meters.

Revised Design Guidelines

The Government of British Columbia issued Design Guidelines for Rural Residential Community Water Systems (**Guidelines**) in March 2012. The Guidelines require utilities to have emergency storage infrastructure which will provide water during events such as natural disasters, pump power failure, source failure or watermain breaks. The emergency storage capacity should equal 25% of the Balancing Storage and 25% of the Fire Storage. Thus, CLE needs additional capacity of 242 cubic meters for the 316 approved lots, and 292 cubic meters for the CDP.

Total capacity requirements are 1,212 cubic meters for 316 lots, and 1,460 cubic meters for the CDP. **Therefore, the reservoir storage capacity of 556 cubic meters is <u>insufficient</u>**.

2.5 WATER LICENSES

The Ministry of Environment, Water Management Branch, has issued CLE eleven (11) conditional water licenses to extract water from Okanagan Lake. The first license was issued in February 1990 and the latest license was issued in February 2003. The total yearly diversion entitlement is approximately 280,000 cubic meters per year, and the maximum daily diversion is 2,306 cubic meters per day; see Table 3 below.

All except two applications to increase diversion entitlements were submitted to the Ministry of Environment within the same periods that CPCN Amendment applications were submitted to the Comptroller; the last two licenses (C106593 and C106785) were submitted for new subdivisions without any corresponding CPCN Amendment applications.

[16] The Regional District of North Okanagan issued a letter dated Feb 22, 1993, that confirmed fire protection requirements at CLE.

Table 3: Water Licenses for CLE Water System

License Number	Diversion Entitlement (m^3/Year)	Diversion Max per Day (m^3/Day)
C066482	20,742	170
C070400	19,912	164
C103384	15,764	130
C103537	830	7
C103768	16,593	136
C105600	72,176	595
C105642	8,297	68
C106336	830	7
C106592	24,890	205
C106593	18,253	150
C106785	81,989	674
TOTAL	**280,273**	**2,306**

Therefore, the entitlement licenses with a total maximum daily diversion of 2,306 cubic meters per day may be inadequate for the current MDD of 2,522 cubic meters per day (equivalent to 307.5 SFRE's) and it may be insufficient for the CDP MDD of 3,312 cubic meters per day (equivalent to 404 SFRE's).

3. CAPITAL PROJECTS

Historically, the Utility has witnessed high turbidity of raw water which resulted in Water Quality Advisories (WQA) for residents of the community; a recurring situation for more than five years. This led to BMUS's request for the Comptroller's approval of a capital project involving the Lake Intake infrastructure (the "**Project**") in November 2023. The Project is the first in a multi-stage process aimed at resolving water quality and treatment challenges at CLE.

CLE's Replacement Reserve Trust Fund ("**RRTF**") held a balance of $179,971 as of November 2, 2023, and this balance was insufficient for the Project's estimated costs of $241,859. Thus, BMUS provided a loan (capped at $100,000) as supplementary funding for the Project; a final loan value will be determined upon conclusion of the Project. Existing customers of CLE are to repay the loan through future contributions to the RRTF which has generated approximately $45,000 each year for the past three years.

There are additional capital projects that will be required to bring the Utility into compliance with regulatory requirements. Based on BMUS' understanding of the water system's history, all existing customers will bear the costs of these projects. Further details of anticipated projects are below:

3.1 System Capacity Upgrades

Further to Section 3 above, capital investments of $6.46 million (in 2024 dollars) may be required to bring the Utility into compliance with regulatory capacity requirements. This value includes estimated costs of the following improvements:

1. $0.33 M for water meters within each customer's home.
2. $0.50 M for existing pumphouse upgrades.
3. $3.50 M for new water treatment plant and related appurtenances.
4. $2.00 M for reservoir expansion.
5. $0.13 M for new water sample station on the distribution system.

These upgrades do not include costs attributable to new lots under development as described in Section 3.3.

3.2 Recommended Asset Replacement

BMUS engaged TRUE Consulting, an engineering consultant, to assess the existing water system assets comprising relevant supply, distribution, and storage infrastructure. TRUE has documented its assessment of the existing water system in a Depreciation Report (the "**Report**") accompanied by a Reserve Balance Model ("**RB Model**"). This report was prepared in anticipation of BMUS' upcoming Rate Application and in compliance with Decision and Order No. 2516 issued on April 16, 2018, to Adventure Bay Waterworks. An extract of the relevant determination is below:

> "**The Utility is to submit the engineering/depreciation study to determine an adequate level of funding for its replacement provision** and submit a Revenue Requirements and Rates Application prior to December 31, 2019." [**Emphasis added**]

Based on TRUE's Report, CLE needs to replace component valued at $1,612,400 in 2024. Therefore, the RRTF balance needs to be shored up significantly within the next few months.

Table 4: Recommended Replacements in 2024

System Component	Estimated Replacement Cost
Pressure Reducing Valves	1,350,000
Air Release Valves	30,000
Blow-off Valves	45,000
Pumping Plant	177,900
Water Plant	9,500
Replacements	**$1,612,400**

3.3 New Lot Developments

There has been no new development at CLE for over seven years, however there is a lot of interest currently to add new subdivisions and multi-family developments. The Utility's ability to accommodate new connections is hindered by current capacity limitations described in Section 2 above. Table 5 lists the current developments proposed at CLE.

Table 5: New Lot Developments at CLE

No.	Development Plans	New units Proposed	Approximate Schedule for First Connection	Total SFRE
1	32 single family lots, located east of Tronson Road at the end of Goldclaim Road.	32	5 years	**32**
2	8 single family lots, located south of Garmisch Road.	8	2 years	**8**
3	17 townhouses, located east of the WWTP and north of the existing condominium buildings.	17	1 year	**17**
4	3 single family lots, 2 fourplexes (8 units), 3 duplexes (6 units) and 4 unknown units, located east of ex. condominium bldgs.	21	2 years	**21**
5	9 single family strata lots, located west of Tronson Road / Peregrine Way.	9	5 years	**9**
6	27 townhouses, located on the west side of Tronson Road.	27	2 years	**27**
	TOTAL	**114**		**114**

These developments have the potential to add 114 SFREs to CLE's water system over the next 5 years, increasing the customer base to 421.5 SFREs with an estimated MDD of 3,456 cubic meters per day. **It**

is noteworthy that this 5-year horizon for the CLE development would exceed the CDP of 404 SFREs in The Stanley Study.

Future developments beyond the 5-year horizon have the potential for increased demand on the CLE water system. **Consequently, system deficiencies described in Sections 2.2 to 2.5 would be further exacerbated.** BMUS finds that it may be prudent to factor in additional capacity beyond the expansion needed for the proposed developments in Table 5.

4. CONTRIBUTION IN AID OF FUTURE CONSTRUCTION (CIAC) CHARGE

CIAC charges are one-time charges collected from developers or new customers to cover the costs incurred by the utility to provide water service to additional units which utilize or may utilize waterworks capacity in the future.

In 1990, CLU Utilities obtained the Comptroller's approval of a $4,000 CIAC Charge based on an expected addition of 78 lots to the water system: lots from Phase 1, Phase 3, and Morning Glory. After 20 years of maintaining the CIAC charge at $4,000, Adventure Bay Waterworks applied for an increase to "reflect actual cost expectations to expand the system at 2011 values/costs". The Comptroller approved the revised CIAC charge of $6,000[17] via Order No. 2260 dated March 28, 2011.

Corix did not receive a Deferred Capacity Trust Fund ("DCTF") account from Adventure Bay Waterworks when it purchased the Utility. Subsequently, neither BMUS nor Corix have received any connection requests or CIAC charges for new lots. Thus, the DCRF account has not been created. BMUS will create this account upon approval of the revised CIAC Charge.

4.1 METHODOLOGY

BMUS has used the "Buy-In Method" to calculate the proposed CIAC charge of $38,590. The Buy-in Method ("**BIM**") calculates a System Development Charge[18] based on the value of existing system assets. The BIM is typically used where there is sufficient capacity in the existing system to meet near-term and long-term capacity needs. It is a method of achieving capital equity between existing and new customers by collecting a charge representative of the average investment attributable to existing customers.

BMUS has valued CLE's existing system assets using their replacement cost i.e. at the current-day cost of replicating the existing assets. Based on the Report, CLE's assets are valued at **$11,866,300[19];** see Table 5.

The proposed CIAC charge assumes that CLE's system has sufficient capacity for its approved 307.5 SFREs; see Table 2.

[17] effective October 1, 2010.
[18] System Development Charge is the equivalent of a CIAC charge.
[19] Cost excludes contingency and engineering fees.

Table 5: Replacement Cost of CLE's Water System

No	System Component	Service Life	Estimated Replacement Cost (2024)
1	Pipe Network[1]	50 - 75	5,998,350
2	Hydrants	50	528,000
3	Valves	25	335,200
4	PRV	25	1,350,000
5	ARV	25	30,000
6	BOV	25	90,000
7	Services	50	1,415,000
8	Pump Station	15 - 30	372,750
9	Water Treatment	15	26,000
10	Reservoir	60	1,571,000
11	Source of Supply[2]	60	150,000
	TOTAL		**$11,866,300**

4.1.1 Tariff Applied For

Per Schedule B of CLE's Water Tariff No. 5 (effective June 1, 2017), the Utility currently collects CIAC charges of $6,000 from applicants seeking for an extension of CLE's services. The Utility is requesting for an increase of this amount to $38,590. An updated Tariff that incorporates the proposed charge is attached as an appendix to this Application.

CIAC Charge per unit	**=**	*Replacement Cost ÷ Total SFRE*
	=	$11,866,300 ÷ 307.5
	=	**$38,590**

APPENDIX I

CLE WATER SYSTEM MAP


Canadian Lakeview Estates
Water System
CORIX Utilities
N
W
E
S
Manhole
Vault
Intake Structure
Service Connections
Reservoir
Hydrant Valve
System Valve
Specialty Valve
Hydrant
Well
Water Main
Raw Water
Vancouver
Victoria
Seattle
1:4,009
5/24/2023
80
Meters

APPENDIX II

CLE WATER SYSTEM LICENCES

WATER MANAGEMENT BRANCH

MINISTRY OF ENVIRONMENT

THE PROVINCE OF BRITISH COLUMBIA—WATER ACT

CONDITIONAL WATER LICENCE

Manford Faeisch and Fredrick Hirschold Jr., P.O. Box 183, Vernon, British Columbia V1T 6M2

are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 6th December, 1988.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 4,562,500 gallons a year, provided that the maximum daily diversion may not exceed 37,500 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pipe, pump and sump, which shall be located approximately as shown on the attached plan.

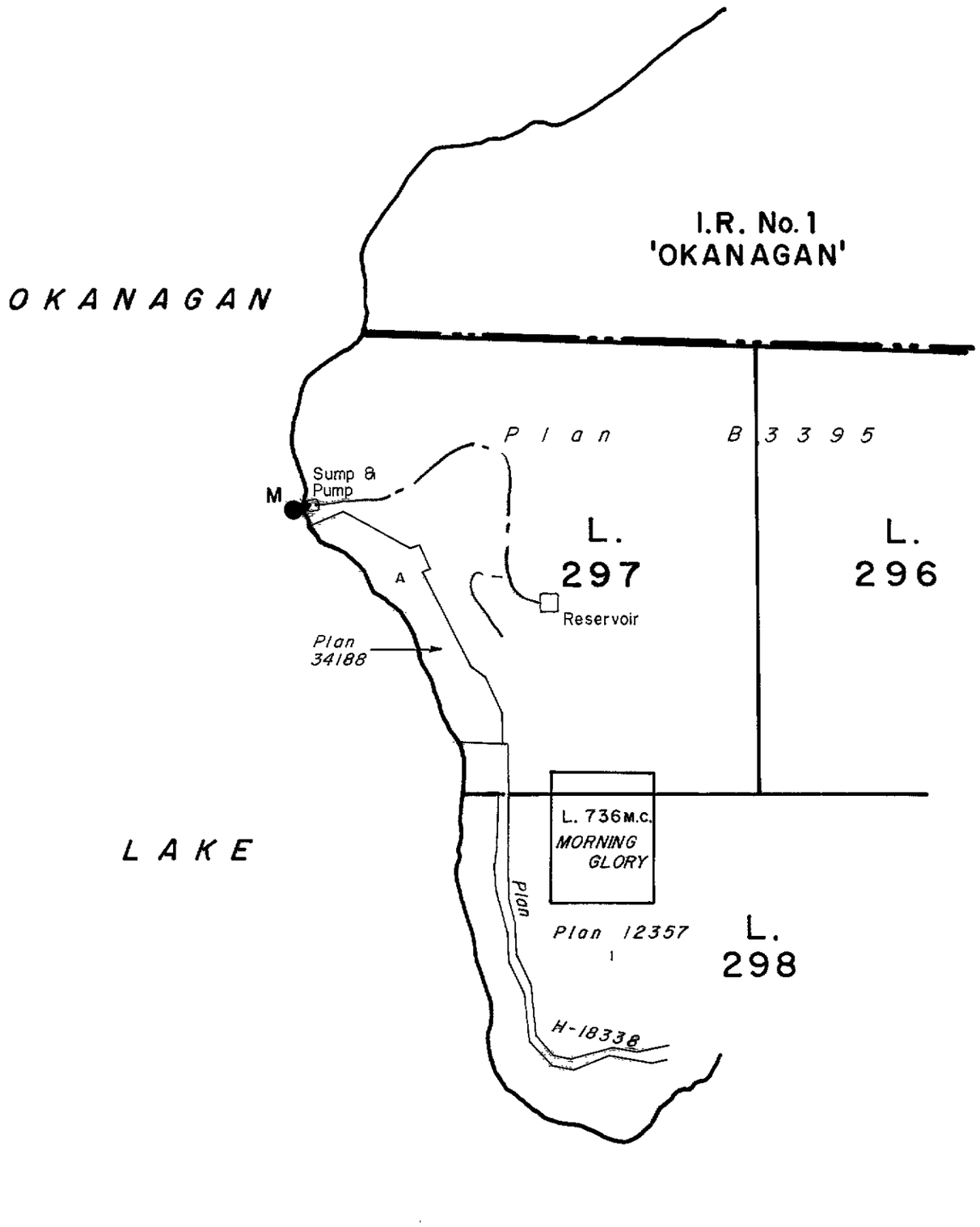
(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December, 1993.

(j) The works authorized under clause (h) hereof shall be constructed to operate within a lake elevation of 1116.8 to 1125.6 feet.

A. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

File No. 8001197 Date issued FEB 19 1990 Conditional Licence 66482

Province of British Columbia



WATER DISTRICT :VERNON
PRECINCT :VERNON
LAND DISTRICT :OSOYOOS DIVISION OF YALE

Signature .....
Date FEB 19 1990

LEGEND

Scale : 1:20000
Point of Diversion : ●
Map Number : WR 82·L·023·2·4
Pipe : — — —
Permit over Crown Land: [redacted]

C.L. 66482
File 8001197
P.C.L. 17325

WATER MANAGEMENT BRANCH

MINISTRY OF ENVIRONMENT

THE PROVINCE OF BRITISH COLUMBIA—WATER ACT

CONDITIONAL WATER LICENCE

C L U Utilities Ltd., c/o M. Bossers of Site 11A, Comp. 7, R.R. 4, Vernon British Columbia V1T 6L7, are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 23rd February, 1990.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted 4,380,000 gallons a year, provided that the maximum daily diversion may not exceed 36,000 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 759/1991 and any substitution thereof or amendment thereto.

(h) The works authorized constructed are diversion structure pipe, pump, and sump which are located approximately as shown on the attached plan.

(i) The construction of the said works has been completed and the water shall beneficially used on or before the 31st day of December 1994.

(j) The works authorized under clause (h) hereof shall be constructed to operate within a lake elevation of 1116.8 to 1125.6 feet.

M. G. Baucke

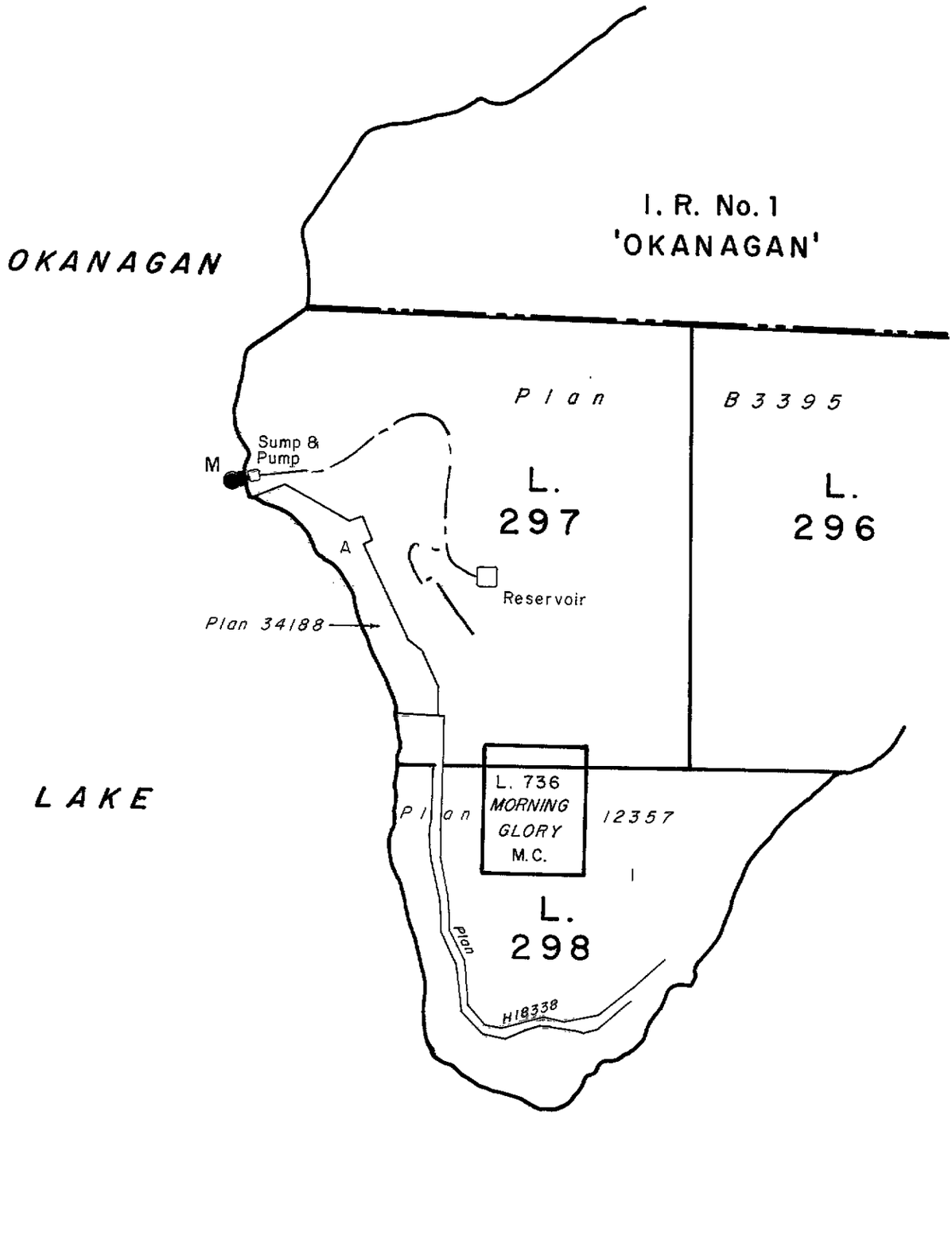
/ A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: MAY 25 1992

File No. 8001485

Conditional Licence 70400

Province of British Columbia



WATER DISTRICT :VERNON
PRECINCT :VERNON
LAND DISTRICT :OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20000
Point of Diversion : ●
Map Number : WR 82·L·023·2·4
Pipe : — — —
Permit over Crown Land: ▬▬

Signature M. A. Bawlf
Date MAY 25 1992

C.L. 70400
File 8001485
P.C.L. 17325

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA — WATER ACT

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 29th August, 1991.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 3,467,500 gallons a year, provided that the maximum daily diversion does not exceed 28,500 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 799/1992 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, and storage tanks which shall be located approximately as shown on the attached plan. The works shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

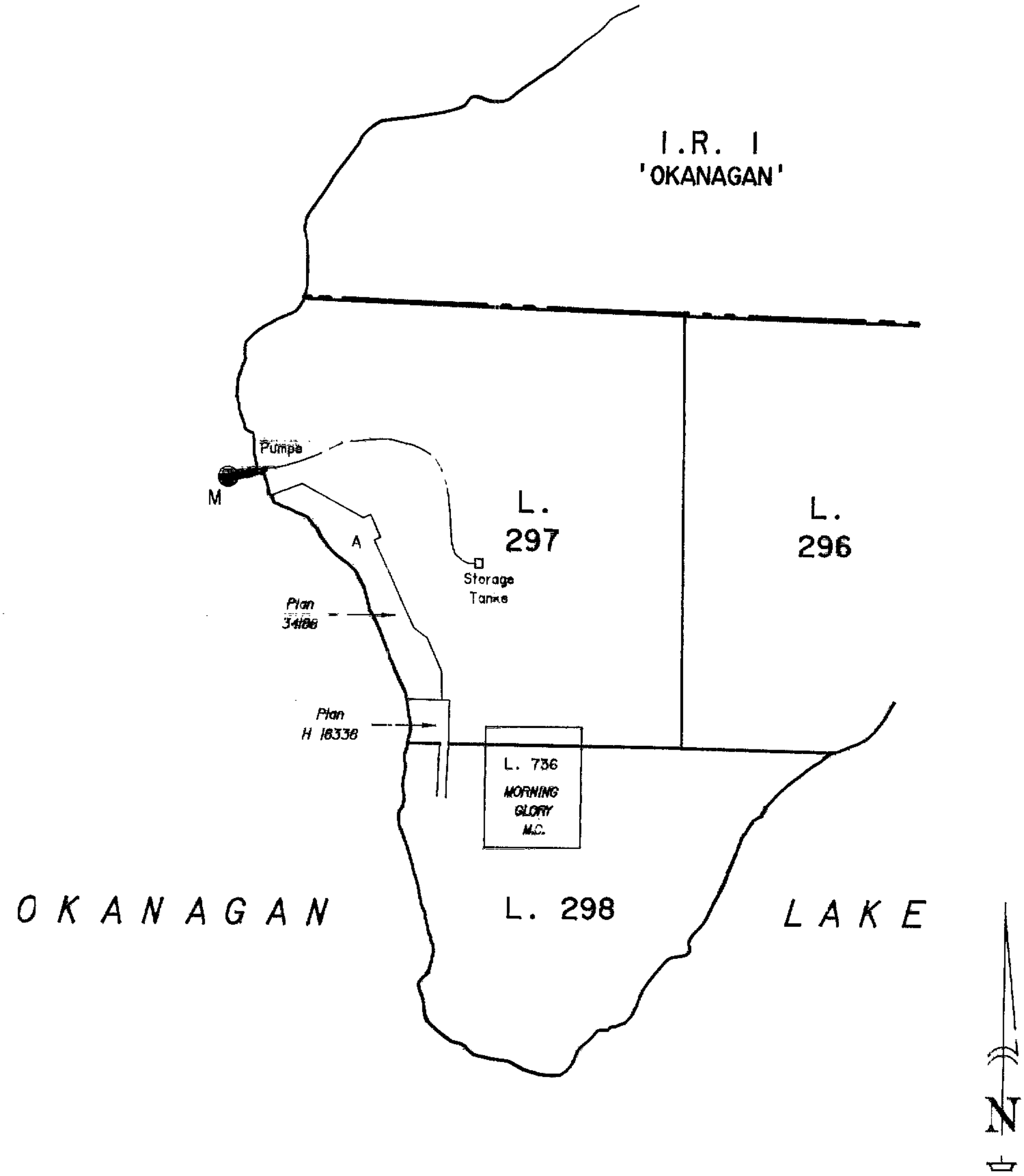
(i) The construction of the said works have been completed and the water shall be beneficially used on or before the 31st day of December, 1994.

A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: JUN 21 1993

File No. 8001744 Conditional Licence 103384

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

Signature: ____________

Date: JUN 21 19[illegible]

C.L. 103384
File 8001744
P.C.L. 20735

LEGEND

Scale	:	1:20 000
Point of Diversion	:	●
Map Number	:	WR 82.L.023.2.4
Pipe	:	– – – –
Permit over Crown Land	:	

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA — WATER ACT

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 15th October, 1991.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 182,500 gallons a year, provided that the maximum daily diversion does not exceed 1,500 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 799/1992 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, and storage tanks which shall be located approximately as shown on the attached plan. The works shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

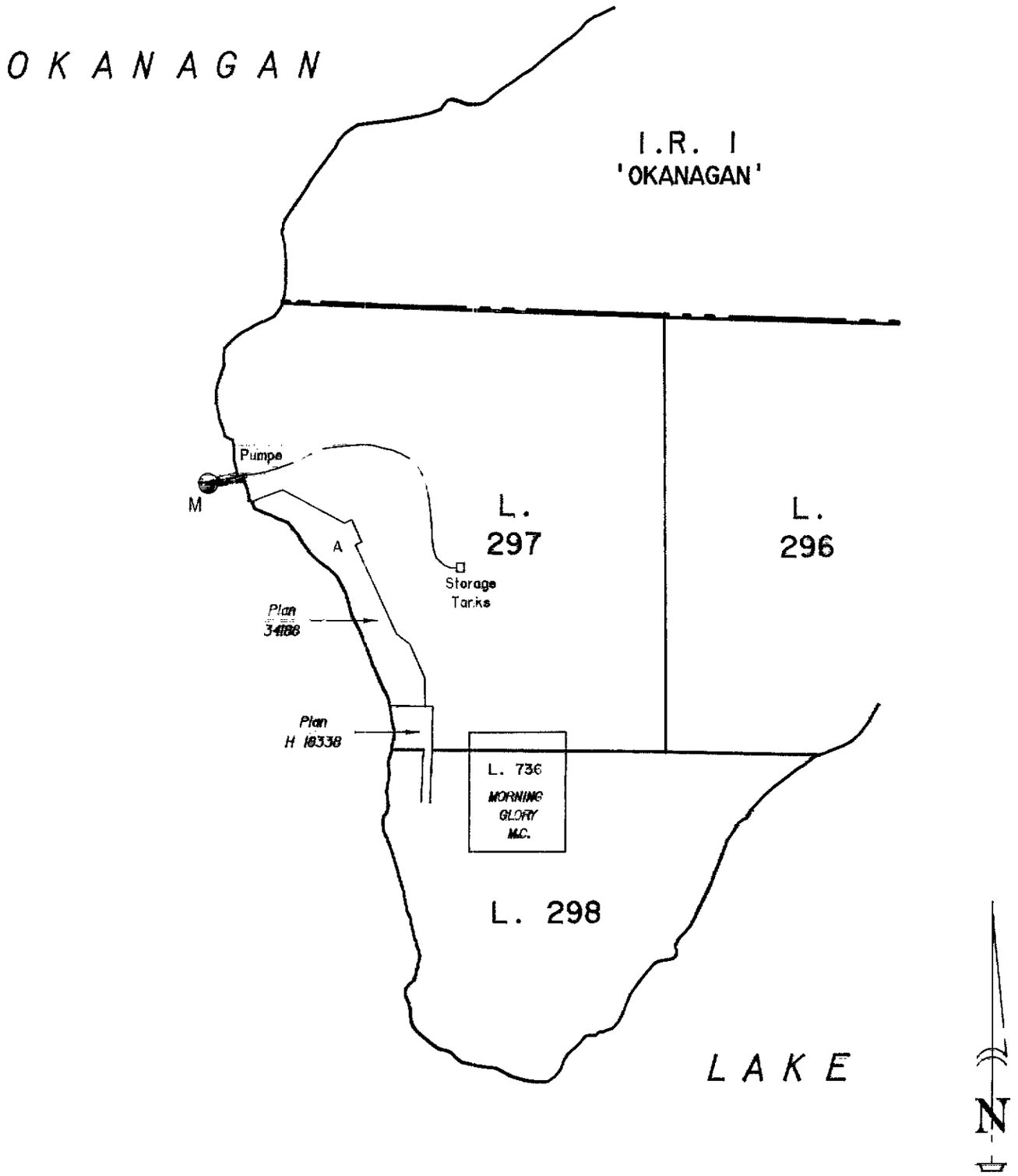
(i) The construction of the said works have been completed and the water shall be beneficially used on or before the 31st day of December, 1994.

A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: JUN 21 1993

File No. 8001757 Conditional Licence 103537

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

Signature : [signature]
Date : JUN 21 1990

C.L. 103537
File 8001757
P.C.L. 20735

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA — WATER ACT

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 25th November, 1991.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 3,650,000 gallons a year, provided that the maximum daily diversion does not exceed 30,000 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 813/1992 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, and storage tanks which shall be located approximately as shown on the attached plan. The works shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

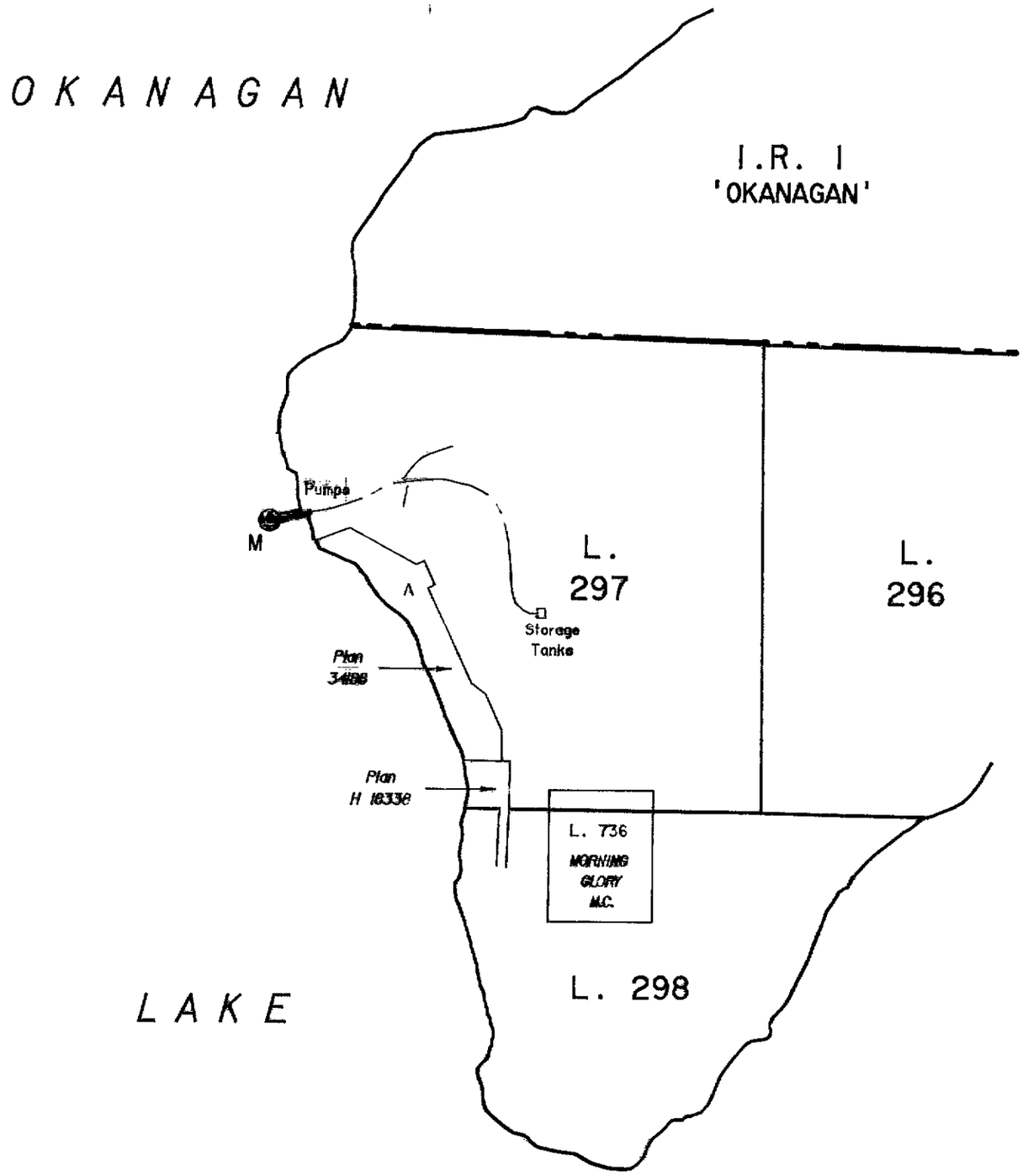
(i) The construction of the said works have been completed and the water shall be beneficially used on or before the 31st day of December, 1994.

A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: JUN 21 1993

File No. 8001763 Conditional Licence 103768

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

Signature : [signature]
Date : JUN 21 1993

C.L. 103768
File 8001763
P.C.L. 20735

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA - WATER ACT

CONDITIONAL WATER LICENCE

The Holder of a Certificate of Public Convenience and Necessity, as set out in Clause (g) hereof is herby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 16th May 1991.

(d) The purpose for which this licence is issued is industrial, (lawn watering).

(e) The maximum quantity of water which may be diverted is 0.5 acre feet per annum.

(f) The period of the year during which the water may be used is the 1st April to 30th September.

(g) This licence is appurtenant to the undertaking of the licensee, as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto of which .25 acres may be irrigated.

(h) The works authorized to be constructed are diversion structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan. The works authorized shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December, 1997. Thereafter, the licensee shall continue to make regular beneficial use of water in the manner authorized herein.

M. G. Baulka

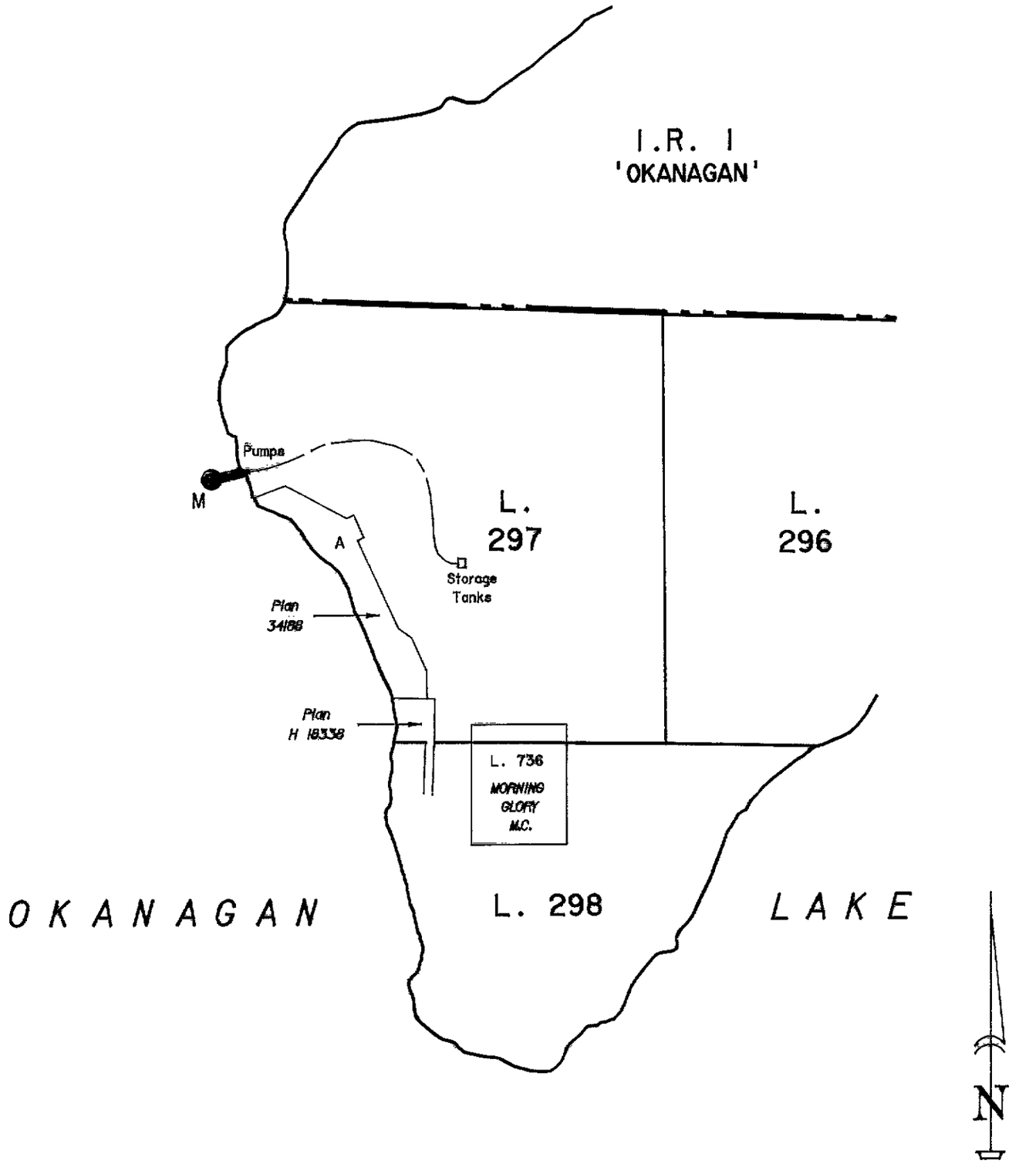
A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: JUN 03 1994

File No. 8001695

Conditional Licence 103895

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

Signature : M. G. Bauer
Date : JUN 03 1994

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

C.L. 103895
File 8001695
P.C.L. 20735

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA - WATER ACT

CONDITIONAL WATER LICENCE

The Holder of a Certificate of Public Convenience and Necessity, as set out in Clause (g) hereof is herby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 3rd November 1992.

(d) The purpose for which this licence is issued is waterworks and industrial.

(e) The maximum quantity of water which may be diverted is 15,876,514 gallons per year to a maximum of 130,500 gallons a day for waterworks and 300 gallons a day for industrial use.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee, as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan. The works authorized shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December, 1997. Thereafter, the licensee shall continue to make regular beneficial use of water in the manner authorized herein.

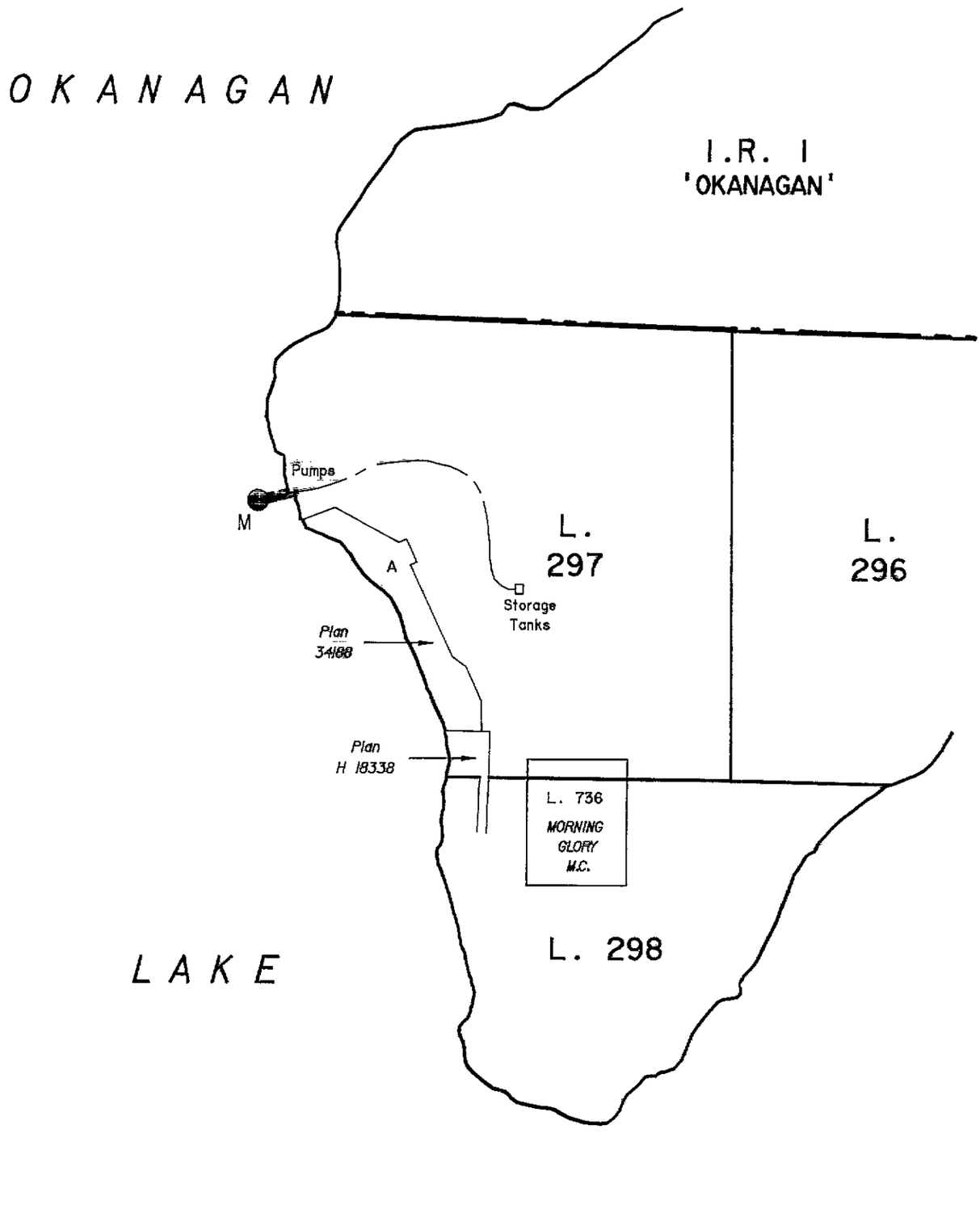
A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: MAY 24 1994

File No. 8001945

Conditional Licence 105600

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

Signature: [signature]
Date: MAY 14 1994

C.L. 105600
File 8001945
P.C.L. 20735

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA — WATER ACT

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 9th November, 1992.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 1,825,000 gallons a year, provided that the maximum daily diversion does not exceed 15,000 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 842/1993 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, and storage tanks which shall be located approximately as shown on the attached plan. The works shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

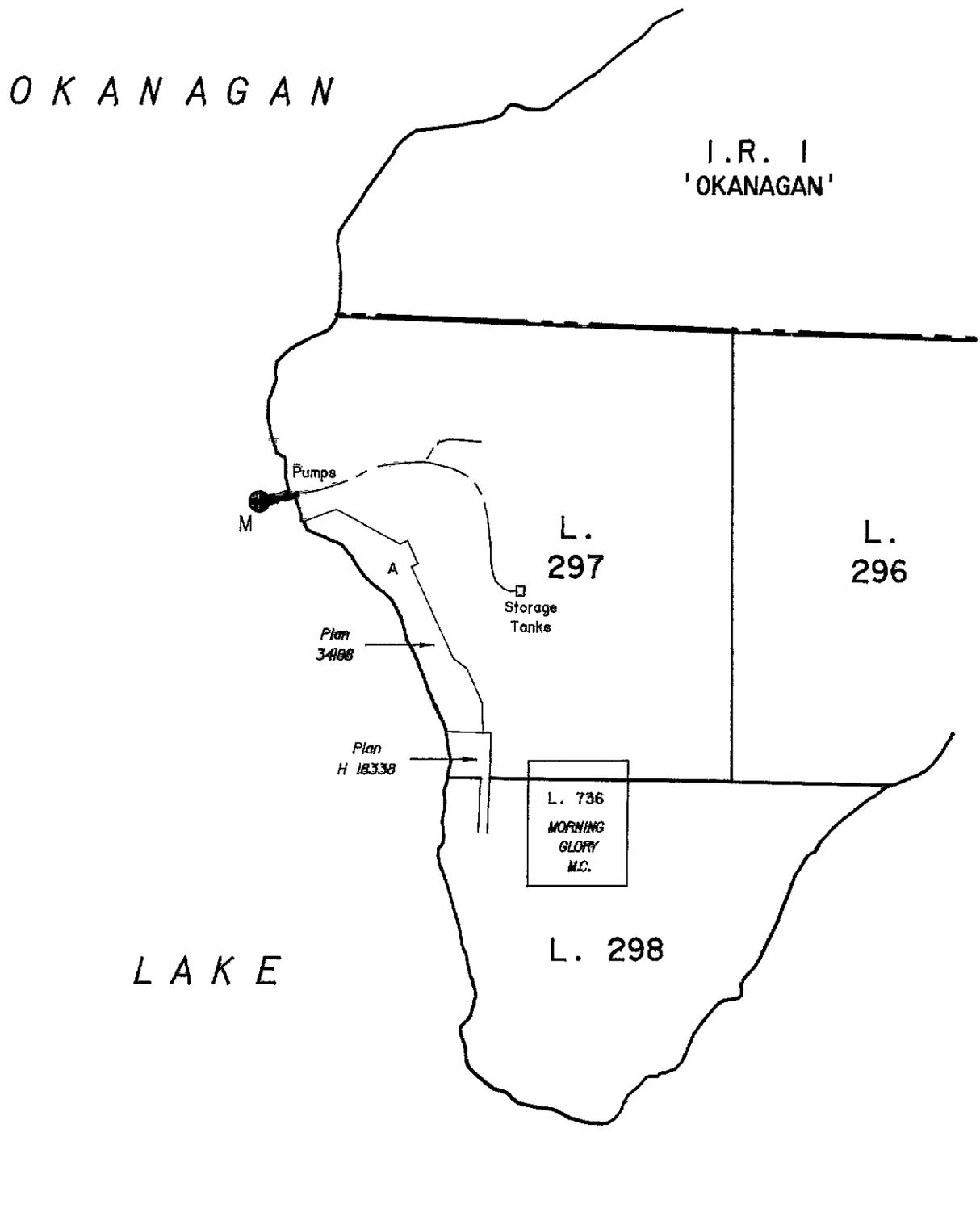
(i) The construction of the said works have been completed and the water shall be beneficially used on or before the 31st day of December, 1994.

A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: JUN 21 1993

File No. 8002001 Conditional Licence 105642

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

Signature _____

Date: JUN 21 [illegible]

C.L. 105642
File 8002001
P.C.L. 20735

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA - WATER ACT

CONDITIONAL WATER LICENCE

The Holder of a Certificate of Public Convenience and Necessity, as set out in Clause (g) hereof is herby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 22nd March 1993.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 182,500 gallons per year to a maximum of 1,500 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee, as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan. The works authorized shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December, 1997. Thereafter, the licensee shall continue to make regular beneficial use of water in the manner authorized herein.

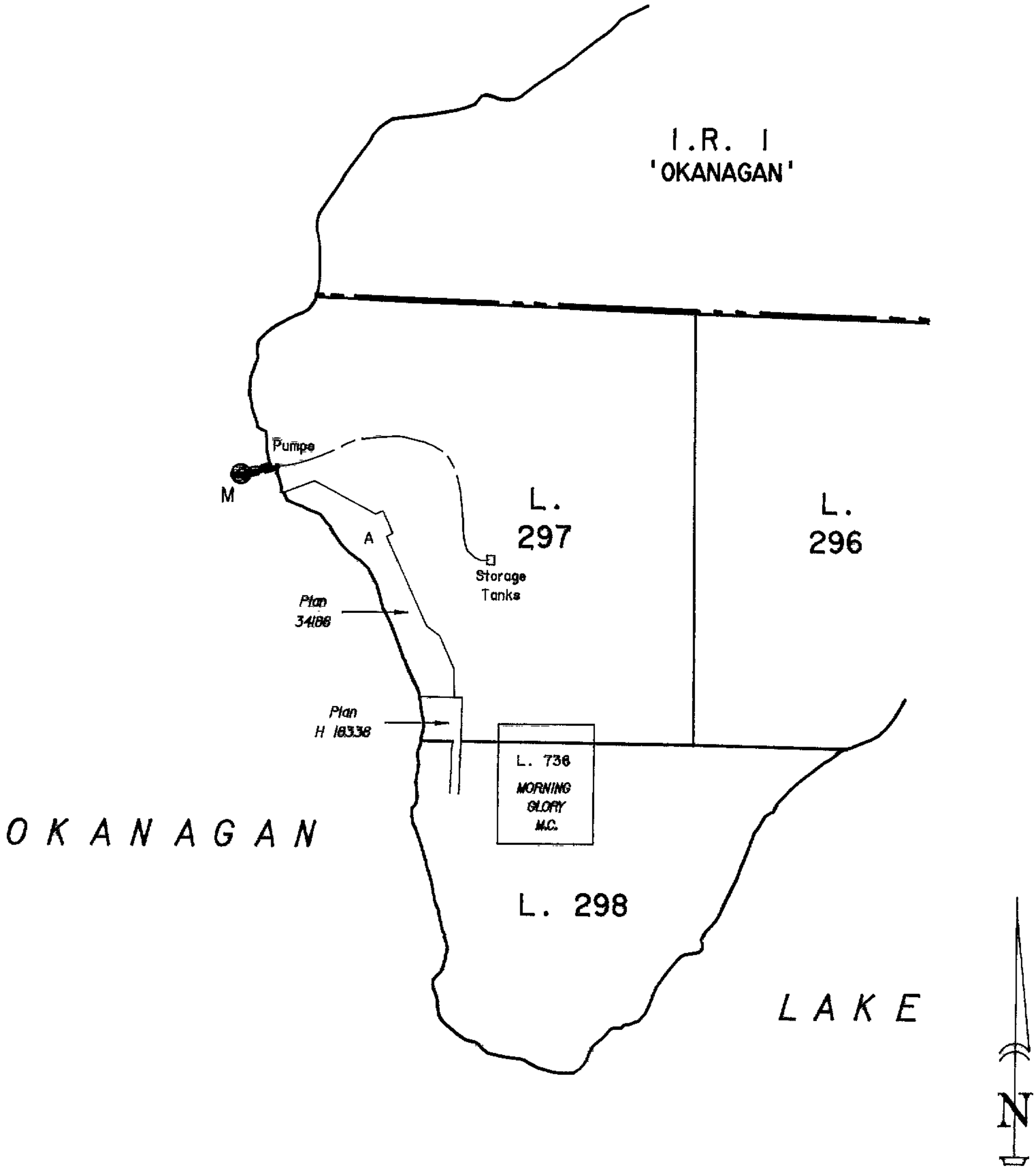
A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: MAY 24 1994

File No. 8002061

Conditional Licence 106336

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

Signature:

Date: MAY 2[illegible] 199[illegible]

C.L. 106336
File 8002061
P.C.L. 20735

LEGEND

Scale : 1:20 000
Point of Diversion : ●
Map Number : WR 82.L.023.2.4
Pipe : —— – ——
Permit over Crown Land :

Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA - WATER ACT

CONDITIONAL WATER LICENCE

The Holder of a Certificate of Public Convenience and Necessity, as set out in Clause (g) hereof is herby authorized to divert and use water as follows:

(a) The source of the water-supply is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 12th May 1993.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 5,475,000 gallons per year to a maximum of 45,000 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee, as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are diversion structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan. The works authorized shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet.

(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December, 1997. Thereafter, the licensee shall continue to make regular beneficial use of water in the manner authorized herein.

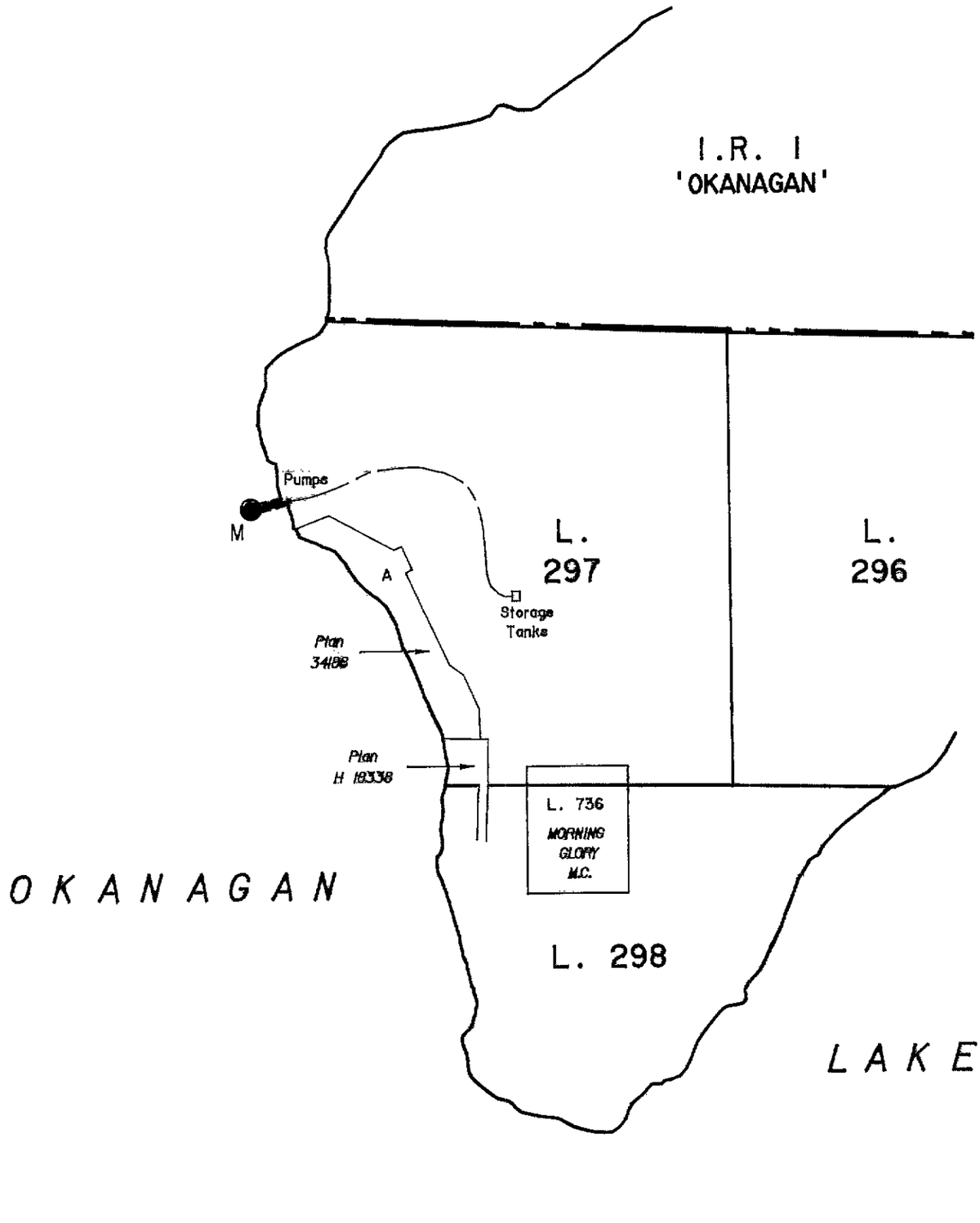
A.D. Zackodnik, P.Eng.
Regional Water Manager
Southern Interior Region

Date Issued: MAY 24 1994

File No. 8002087

Conditional Licence 106592

Province of British Columbia



WATER DISTRICT : VERNON
PRECINCT : VERNON
LAND DISTRICT : OSOYOOS DIVISION OF YALE

LEGEND

Scale : 1:20 000
Point of Diversion :
Map Number : WR 82.L.023.2.4
Pipe :
Permit over Crown Land :

Signature : A.J. Rachuk
Date : MAY 24 1994

C.L. 106592
File 8002087
P.C.L. 20735

BRITISH COLUMBIA

WATER ACT

CONDITIONAL WATER LICENCE

CLU Utilities Ltd., of Box 1192 Vernon BC V1T 6N4, is hereby authorized to divert and use water as follows:

(a) The source on which the rights are granted is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 12th May, 1993.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 4,015,000 gallons per year, at a maximum rate of 33,000 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) The land upon which the water is to be used and to which this licence is appurtenant is the waterworks undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto. (service within parts of District Lots 297 and 298, Osoyoos Division Yale District)

(h) The authorized works are an intake structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan.

(i) The construction of the said works shall be completed and the water shall be beneficially used prior to the 31st day of December 2006. Thereafter, the licensee shall continue to make regular beneficial use of the water in the manner authorized herein.

(j) This licence is issued pursuant to the provisions of the Water Act to ensure compliance with that statute, which makes it an offence to divert or use water from a stream in British Columbia without proper authorization. It is the responsibility of the licensee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

(k) The works authorized under clause (h) hereof shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet (340.41 to 343.09 meters) Geodetic Survey of Canada datum.

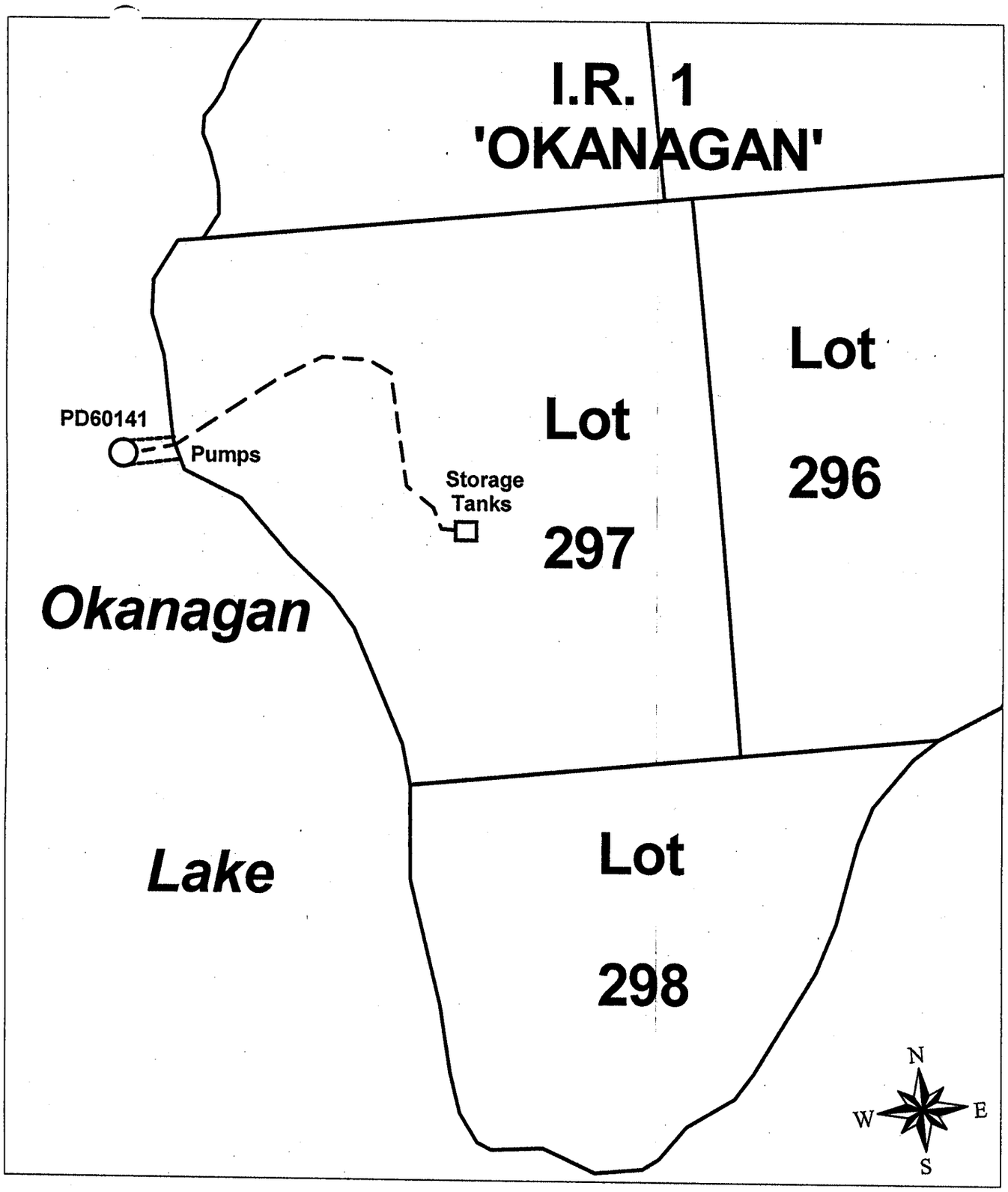
Don I. McKee, P.Eng.
Assistant Regional Water Manager
Southern Service Region – Kamloops Service Centre
Land & Water Management Division

Date Issued: February 27, 2003

File: 8002088

CONDITIONAL LICENCE: 106593

BRITISH COLUMBIA



WATER DISTRICT: Vernon
PRECINCT: Vernon
LAND DISTRICT: ODYD

Signature: _____

Date: February 27, 2003

LEGEND:

Scale: 1:15,000
Point of Diversion: O PD60141
Map Number: WR 82E.023.2.4
Pipe: - - - -
Permit over Crown Land: ----------

C.L. C106593
File 8002088
P.C.L 22448

This licence is appurtenant the waterworks undertaking of the holder of CPCN 717/1990, and any substitution thereof or amendment thereto.

BRITISH COLUMBIA

WATER ACT

CONDITIONAL WATER LICENCE

CLU Utilities Ltd., of Box 1192 Vernon BC V1T 6N4, is hereby authorized to divert and use water as follows:

(a) The source on which the rights are granted is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 29th June, 1993

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 18,035,000 gallons per year, at a maximum rate of 148,350 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) The land upon which the water is to be used and to which this licence is appurtenant is the waterworks undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 717/1990 and any substitution thereof or amendment thereto. (service within parts of District Lots 297 and 298, Osoyoos Division Yale District)

(h) The authorized works are an intake structure, pumps, pipe and storage tanks which shall be located approximately as shown on the attached plan.

(i) The construction of the said works shall be completed and the water shall be beneficially used prior to the 31st day of December 2006. Thereafter, the licensee shall continue to make regular beneficial use of the water in the manner authorized herein.

(j) This licence is issued pursuant to the provisions of the Water Act to ensure compliance with that statute, which makes it an offence to divert or use water from a stream in British Columbia without proper authorization. It is the responsibility of the licensee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

(k) The works authorized under clause (h) hereof shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet (340.41 to 343.09 meters) Geodetic Survey of Canada datum.

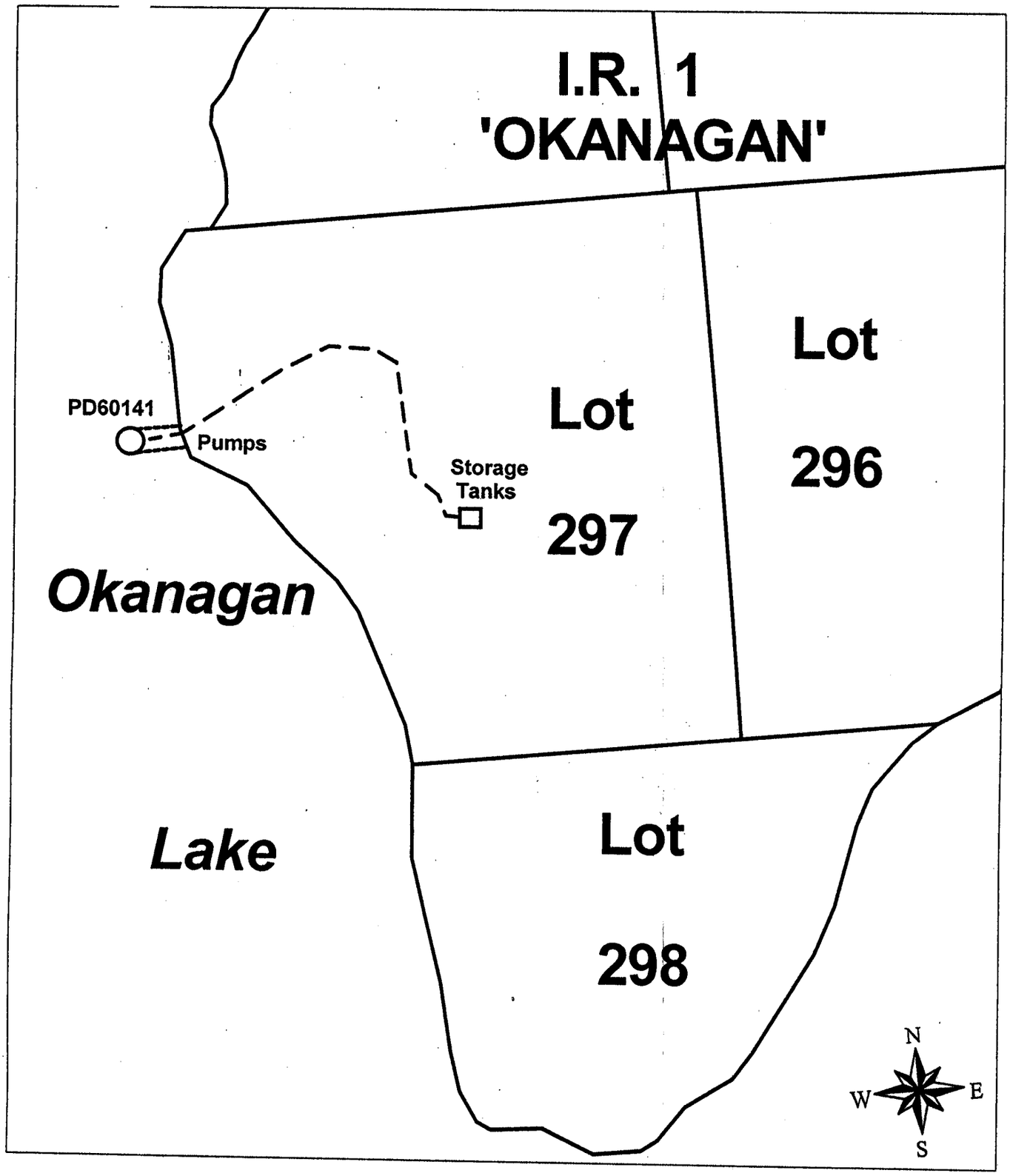
Don I. McKee, P.Eng.
Assistant Regional Water Manager
Southern Service Region – Kamloops Service Centre
Land & Water Management Division

Date Issued: February 27, 2003

File: 8002112

CONDITIONAL LICENCE: 106785

BRITISH COLUMBIA



WATER DISTRICT: Vernon
PRECINCT: Vernon
LAND DISTRICT: ODYD

Signature: _____

Date: February 27, 2003

LEGEND:

Scale: 1:15,000
Point of Diversion: O PD60141
Map Number: WR 82L.023.2.4
Pipe: - - - -
Permit over Crown Land: ----------

C.L. C106785
File 8002112
P.C.L 22448

This licence is appurtenant the waterworks undertaking of the holder of CPCN 717/1990, and any substitution thereof or amendment thereto.

APPENDIX III

CLE TARIFF – SCHEDULE B (BLACKLINE)

Schedule B

Contribution in Aid of Future Construction

Where as a result of premises becoming qualified as authorized premises a greater number of units require or may require service from the utility, thus utilizing waterworks capacity presently or in the future, then, upon application for an extension of service, in addition to the connection charge and any main extension costs, the charge shown below shall be paid.

For each residential service premises qualifying as authorized premises	~~$6,000~~$38,590

Notes:

1. For other than a residential service premises, the charge shall be calculated on a single family residential equivalent basis.

2. Monies collected are to be deposited to the Utility's Deferred Capacity Reserve Fund and may only be released with the written authorization of the Comptroller of Water Rights.

APPENDIX IV

CLE TARIFF – SCHEDULE B (CLEAN)

Schedule B

Contribution in Aid of Future Construction

Where as a result of premises becoming qualified as authorized premises a greater number of units require or may require service from the utility, thus utilizing waterworks capacity presently or in the future, then, upon application for an extension of service, in addition to the connection charge and any main extension costs, the charge shown below shall be paid.

For each residential service premises qualifying as authorized premises	$38,590

Notes:

1. For other than a residential service premises, the charge shall be calculated on a single family residential equivalent basis.

2. Monies collected are to be deposited to the Utility's Deferred Capacity Reserve Fund and may only be released with the written authorization of the Comptroller of Water Rights.

APPENDIX V

PUBLIC NOTICE ISSUED TO CUSTOMERS

103 – 859 Orono Avenue
Victoria, British Columbia
Canada V9B 2T9
T. 1.877.788.7277

Date of mailing: August 13, 2024

NOTICE OF INCREASE TO CONTRIBUTION IN AID OF CONSTRUCTION CHARGE EFFECTIVE AUGUST 27, 2024

Notice is hereby given that BMUS – Canadian Lakeview Estates Water ("CLE Water") is seeking approval from the Comptroller of Water Rights ("the Comptroller") for an increase to its Contribution in Aid of Construction Charge.

On August 13, 2024, CLE Water applied to the Comptroller for an increase to its Contribution in Aid of Construction Charge (Schedule B, Water Tariff No. 5) from $6,000 to $38,590 for each unit qualifying as authorized premises.

The Contribution in Aid of Construction Charge is applicable to new customers (developers) applying to become part of the authorized service area of the utility and to the subdivision of lots within the existing service area. Monies collected are to be deposited to the utility's Deferred Capacity Reserve Fund and may only be released with the written authorization of the Comptroller.

A copy of this application is available for public inspection at: 69 Kestrel Pl, Vernon BC V1H 1E9 or online at https://bluestemutilities.com/canadian-lakeview-estates/resources/regulatory-affairs.

Any person wishing further information in connection with the proposed rates or reasons for the proposed changes should write to:

> Bluestem Multi-Utility Services ULC – Canadian Lakeview Estates Water
> 69 Kestrel Pl, Vernon BC V1H 1E9
> Reg.Affairs@nexuswg.com

By direction of the Comptroller of Water Rights, comments and concerns on the application are to be forwarded to Chris McMillan, Program Coordinator, Water Management Branch, Ministry of Water, Land and Resource Stewardship, PO Box 9340 Stn Prov Govt, Victoria BC V8W 9M1, or by email Chris.McMillan@gov.bc.ca on or before **September 12, 2024** with a copy to CLE Water.

As all submissions may be included as evidence, please ensure that a copy is provided to the Utility.

103 – 859 Orono Avenue
Victoria, British Columbia
Canada V9B 2T9
T. 1.877.788.7277

NOTICE OF APPLICATION

NOTICE OF APPLICATION TO THE COMPTROLLER OF WATER RIGHTS UNDER THE WATER UTILITY ACT AND THE UTILITIES COMMISSION ACT

Name of Utility: Bluestem Multi-Utility Services ULC – Canadian Lakeview Estate Water ("CLE Water")

Notice is hereby given by CLE Water that an application has been made to the Comptroller of Water Rights to increase the Contribution in Aid of Construction Charge (Schedule B of Water Tariff No. 5) from $6,000.00 to $38,590.00 for each unit qualifying as authorized premises.

The Contribution in Aid of Construction Charge is applicable to new customers (developers) applying to become part of the authorized service area of the utility and to the subdivision of lots within the existing service area. Monies collected are to be deposited to the utility's Deferred Capacity Reserve Fund and may only be released with the written authorization of the Comptroller.

Any person wishing further information in connection with this application should apply directly to Bluestem Multi-Utility Services ULC – Canadian Lakeview Estates Water at 69 Kestrel Pl, Vernon BC V1H 1E9 and Reg.Affairs@nexuswg.com.

Any objections to this application are to be forwarded to the Program Coordinator, Water Management Branch, Ministry of Water, Land and Resource Stewardship, PO Box 9340 Stn Prov Govt, Victoria BC V8W 9M1 or chris.mcmillan@gov.bc.ca and should be received on or before **September 12, 2024**

APPENDIX VI

CLE WATER SYSTEM STUDY – STANLEY ASSOCIATES (MARCH 1993)

CANADIAN LAKEVIEW DEVELOPMENT

WATER SYSTEM STUDY

MARCH 1993

Prepared by:
Stanley Associates Engineering Ltd.

Stanley Associates Engineering Ltd.
Suite 201 - 595 K.L.O. Road
Kelowna, B.C. V1Y 8E7
Telephone (604) 860-3225
Fax (604) 860-3367

March 1, 1993
File: 91-998-CLD

CLD Developments Ltd.
Site 11A, Comp. 7, R.R.#4
Vernon, B.C.
V1T 6L7

Attention: **Mr. A. Bossers**

Dear Sir:

Reference: **Water System Study**
Revised Draft

Enclosed is a revised draft of the December 92 Water Study Report. This study has been revised to suit comments provided by the Water Management Branch of the Ministry of Environment by letter dated February 3, 1993.

The modifications made in our recommendations will increase the capital cost of portions of the water system. However, in the long run, there will be a reduction in the operating costs and a more efficient use of pumping horsepower.

This report also provides recommendations for staged upgrading of the water system which must be discussed with Water Management. Please review the enclosed and provide your comments. We will then forward a copy of the report to Mr. W. Worobets for his approval.

Yours very truly,

STANLEY ASSOCIATES ENGINEERING LTD.

Charlie W. Higgins, P.Eng.
Branch Manager

CWH/lc

cc: Mr. Brad Chapman

TABLE OF CONTENTS

CANADIAN LAKEVIEW DEVELOPMENT
WATER SYSTEM STUDY

MARCH 1993

In response to a letter from Water Management dated November 20th, Stanley Associates Engineering Ltd. undertook the following water study which outlines proposed developments/improvements to the existing CLU water system to meet future demands. This report will provide a guideline to follow over the next 2 to 5 years, depending upon the rate of development.

It should be noted the original size of development anticipated for this area was 160 single family homes and 100 condominium units. This number of units now proposed has increased dramatically and as such will have a significant impact on the design of the water system.

1.0 DESIGN CRITERIA

The review of the adequacy of the existing supply system, reservoir and distribution system and recommendations for future system modifications have been based on the following criteria.

1.1 Supply

The source must be capable of supplying the total demands. As the source is Okanagan Lake, there is more than adequate source water to meet foreseeable demands.

The supply pumps must be capable of pumping the maximum day demand in 18 hours. Theoretically the pumps need only meet the maximum day demand in 24 hours, increased pump capacity to meet the demand in 18 hours allows a factor of safety for on-off pump operation, maintenance, emergency demand conditions, etc. Generally during peak hours of a maximum day when demand exceeds the pumping rate, supplementary supply would come from the balancing reservoir which in turn would be refilled during off peak hours (night time).

The lake intake must be capable of conveying water from the lake to the pump well and still maintain sufficient water over the pump inlets for efficient operation.

1.2 Balancing Storage

That there be sufficient reservoir capacity to store the total peak hour demands plus the total fire flow requirements. The total peak hour volume in communities generally varies between 15 and 30 percent of the total domestic maximum day demand. For this study a storage volume of 25 percent ot the total domestic maximum day demand has been used.

1.3 Fire Demand

In addition to meeting normal system demands, reservoir storage facilities and distribution mains must be capable of meeting possible fire demands. There is a wide variation in standards set by various agencies and municipalities for duration and volume of fire flows. The Fire Underwriter's Survey sets a high standard for fire flows and is based on size of buildings, separation, type of construction. Some typical examples of fire flows are as follows:

- Modern Residential subdivision, one and two storey single family homes detached 3 to 6 meters — 4000 to 5000 l/min (960 to 1200 US gpm).

- Modern Row or Town House groups — 6000 to 9000 l/min (1680 to 2400 US gpm).

- Apartment buildings — 3 storey frame, 300 m^2 7000 l/min (1920 US gpm).

These flows can be reduced by 25 to 50% for buildings having full approved automatic sprinkler systems.

The capacity of the local fire protection authorities equipment must also be considered in sizing for fire flows. Our discussions with the Fire Chief at the Regional District of North

Okanagan indicate that their minimum flow requirements were 450 US gpm at any hydrant. Their equipment can draw a maximum of 850 US gpm with one truck in the area capable of 1000 US gpm. A letter from the Fire Chief is attached in Appendix A of this report.

For the purpose of this study we will use fire flows of 500 US gpm for residential areas (minimum) and 1000 US gpm for the condominium developments with sprinkler systems.

1.4 Pressures

The service pressures should normally be maintained between 40 and 100 psi although they may drop as low as 20 psi at a fire site during a maximum day. Due to the nature of the topography of the development and the isolated sections of development, localized pressures up to a maximum of 150 psi could be used.

1.5 Distribution System

The distribution system must be capable of conveying the maximum day demand plus fire flow or peak hour demand, whichever is greater and still maintain the system pressures above the minimum. Velocities of the water in pipelines should be kept less than 6 feet per second except near a fire. Mains should be looped wherever possible.

1.6 Disinfection

The disinfection system is to be capable of providing a minimum of 20 minutes of chlorine contact time prior to the first consumer. This time is made up from the time in the intake and wet well (depending upon point of injection) and in the distribution mains.

1.7 Demands

The water demands in this development will vary depending upon the type of dwelling, amount of area (lawns) watered and other miscellaneous uses. Although some of the lots are in excess of 1/2 area, the amount of lawn area irrigated will be small due to the steepness of the topography, type of development and "natural" condition most lots are left in.

There is presently insufficient data available to determine actual water consumption in the area. As such we will utilize water demands originally developed in the preliminary work with a revised amount for the apartment proposed in the Condominium Site A on Lot 1. These are as follows:

A) Maximum Day Demand

Single Family Unit	8200 l/day	(1.5 US gpm)
Condominium Unit	5900 l/day	(1.1 US gpm)
Apartment Unit	1150 l/day	(0.2 per suite)
		(plus 16000 l/day irrigation at apartment)

B) Peak Hour Demand

Maximum Day x 1.7	=	Peak Hour
Single Family Unit		2.5 US gpm
Condominium Unit		1.9 US gpm
Apartment Unit		0.3 US gpm (plus irrigation)

2.0 WATER SYSTEM

The present water system consists of a 250 mm lake intake at a depth of 12.2 meters below low lake level, wet well and submersible pump station (2 pumps at 65 US gpm @ 600 ft/head), 150 mm and 200 mm supply main, 150 mm distribution mains, and 2 reservoirs at elevation 520 totalling 556 m^3 (147,000 US gallons).

There is presently only one pressure zone with all development in this zone. Maximum pressure experienced within this zone is 880 Kpa (128 psi) static. With the present pressure zoning, there are approximately 18 lots with pressures between 760 Kpa and 900 Kpa (110 and 130 psi). A discussion of future pressure zones is contained in a later section of this report.

2.1 Development Plan

Drawing #1 attached indicates the proposed development plan showing existing and proposed subdivisions. The development consists of the following lots/units.

A) Existing Phases (All single family units)

Phase 1	-	25
Phase 3	-	23
Phase 7	-	20
Phase 8	-	23
Phase 9	-	10 (approval pending)
Total	-	101 lots

B) Future Development

	Single Family	Condo Unit	Apartment
Morning Glory	40 lots		
Lot 1 - Condo Site A		59	26
Lot 4 - Condo Site B		100	
Lot 2 & 3 - (Condo Site)		22	
Phase 2	50 lots		
Phase 4	25 lots		
Phase 5	30 lots		
Reservoir Area	7 lots		
Disposal Area	15 lots		
Misc. (Tronson Rd)	10 lots		
Total Future	167 lots	181 units	26 suites

C) Total Development

	Single Family	Condo Units	Apartment
Existing Phases	101		
Future Phases	167	181	26
Total Development	268	181	26

Utilizing the above potential development numbers, the following maximum day and peak hour demands are anticipated.

A) Maximum Day Demand

268 x 1.5 US gpm	=	402 US gpm
181 x 1.1 US gpm	=	199 Us gpm
(26 x 0.2) + 3.0	=	16 US gpm
Total	=	617 US gpm

B) Peak Hour Demands

268 x 2.5	=	670 US gpm
181 x 1.9	=	344 US gpm
(26 x 0.3) + 3.0	=	11 US gpm
Total	=	1025 US gpm

The ultimate water demands are therefore:

Maximum Day	=	620 US gpm
Peak Hour	=	1025 US gpm

It is important to note that development of the Canadian Lakeview Development lands is presently limited by the capacity of the wastewater disposal system. The existing Waste Management Permit (WMP) allows a maximum of 30,000 Igpd to be disposed of in the designated area. Until such time as alternate methods of disposal can be determined, the number of units on the sewer system is limited to existing lots plus 46 condominiums and 25 lots in Phase 2. As on-site disposal systems may not be possible, staged upgrading of the water system must consider possibility that the number of lots may not exceed the wastewater disposal capacity. As such the water demands for the ultimate development controlled by waste management permits is as follows.

Total Development (WMP Control)

	Single Family	Condo Units	Apartments
Existing	101		
Phase 2	25		
Condo #3 - Site A		46	----
Morning Glory	30		
Total	156	46	0

Demands for this number of units are as follows.

A) Maximum Day Demand

156 x 1.5	=	234
46 x 1.1	=	51
Total		285 US gpm

B) Peak Hour Demand

156 x 2.5	=	390
46 x 1.9	=	88
Total		478 US gpm

The ultimate water demands should development be limited by existing waste management permits are therefore:

Maximum Day — 285 US gpm
Peak Hour — 480 US gpm

2.2 Supply System

In order to meet ultimate demands of the water system each of the components of the supply system are reviewed below.

2.2.1 Intake

The head loss of the ultimate flow through the intake must not be greater than the minimum submergence of the pump intakes at low water level in Okanagan Lake. The minimum low water stated by the Ministry of Environment is 340.40. The base of the pump station is 338.95.

Allowing for 150 mm space between the pump suction and the floor and 700 mm of submergence, the minimum level in the wet well can be 339.8 (equal to top of intake pipe). This would allow approximately 600 mm of head loss through the intake pipe (340.4 - 339.8) at the lowest lake level.

The length of the intake is approximately 140 m, at a C = 140 the capacity of the intake with 600 mm (2 feet) head loss is 880 US gpm. This exceeds the ultimate capacity of the pump station and is therefore acceptable.

2.2.2 Pumping Capacity

Using the design criteria for pumping maximum day demand in 18 hours, the total pump station capacity should be as follows.

620 US gpm x 24/18 = 827 US gpm

or

285 US gpm x 24/18 = 380 US gpm (WPM Control)

As power to the site is only single phase, the size of motors that can be run is somewhat limited. Single phase power must be "converted" to three phase through variable frequency drives. As such the size of the pumps must be selected to suite these power requirements. The other limiting factor in the number and size of the pumps is the size of the existing wet well. It is very expensive to install a larger wet well and as such the pumps/piping layout must be sized to suit the existing structure. It is our recommendation to install 3 pumps, each at 275 US gpm. For the initial upgrade planned this year we would propose installing 2 pumps at 275 US gpm which would provide capacity for 225 single family homes, 60 condo units and 26 apartments. The third pump could be added when development exceeds this amount.

It should be noted that if development does not exceed the number allowable under existing waste management permits, the pumping capacity of this upgrade will be in excess of requirements (550 total versus 380 required). However, the marginal increase in capital cost to supply the larger pumps is recommended as increased pumping capacity provides additional factors of safety for emergency conditions. In addition the use of variable frequency drives for pump control will allow reduction in horsepower draw and subsequent power costs.

We have attached a preliminary drawing showing the proposed layout of the pump station for your information. Final drawings will be forwarded when they are available.

2.2.3 Chlorine Contact Time

The minimum chlorine contact time to the first user according to Ministry of Health requirements is 20 minutes. In order to achieve this, the time in the intake, wet well and supply main must be calculated for the ultimate pumping capacity. The first user on the

system, based on the present layout of the distribution system is in Phase 7, at the end of the cul-de-sac. Using ultimate pumping capacity the time to reach this point is as follows.

Intake (assumes injection at the end of the intake)

- 140 m 250 mm pipe
- velocity of 825 US gpm equals 3.37 ft/sec
- time in intake is 2.3 minutes

Wet Well

- volume (water level 342 average)
- equals 1.22 x 1.83 x 3.0 = 6.7 m^3
- time in wet well 236 ft m^3/1.83 ft^3 sec = 2.1 min.

Supply Line

- 565 m of 150 mm pipe to first user in Phase 7
- velocity of 825 US gpm equals 9.3 ft/sec.
- time in supply line is 3.3 minutes.

Therefore, the chlorine contact time to the first user utilizing the existing intake, piping and wet well in only 7.7 minutes, 12.3 minutes less than required. In order to increase the contact time, there are a number of options consisting of a new parallel supply main from the pumphouse to Peregrine Way, parallel the existing supply main for a portion of the distance from Peregrine Way to the pumphouse, or provide a dedicated supply main from Peregrine Way to the reservoir.

In evaluating the various options the velocity in the existing supply main and subsequent head loss must be considered. With the ultimate flows the head loss in the 150 mm main between the pumphouse and Peregrine Way is 45 feet (20 psi $\pm$) with the velocity at 9.3 ft. per second. Both these values are excessive, and alternatives should be considered to lower

them. The installation of a new parallel main from the pumphouse to Peregrine Way (in Condo Site) will be expensive however will provide a reduction in pumping heads and ongoing power costs when ultimate flows are reached. As previously discussed the ultimate flows depend on waste management permits and as such we recommend a staged upgrading of the supply main.

The first section to be constructed is from the approximate location of the sewage treatment plant (Node 102) to the condo site tie-in, Node 108 (248 meters in length). The parallel line should be a 500 mm (20 inch) ductile iron or C905 SDR18 PVC pipe. The contact time shall then calculate as follows for the first pumphouse upgrade (550 US gpm).

Intake	3.4
Wetwell	3.1
Supply Main To Treatment Plant (150 m)	1.3
Parallel Mains (250 m - 500 & 150 mm)	23.9 min
Total	**31.7 min.**

If the pump station is upgraded to its ultimate capacity (825 US gpm) and the supply main is paralleled from the pumphouse to the sewage treatment plant with a 200 mm ductile iron pipe line, the chlorine contact time calculates as follows.

Intake	2.3
Wetwell	2.1
Supply Main (200 mm)	1.6
Supply Main (500 mm)	15.6
Total	**21.6 minutes**

The maximum allowable flow from the pumpstation to the first user on the existing distribution system (Phase 7) is approximately 225 US gpm to obtain 20 minutes contract time. If the flow from the pump station is controlled to this value, then immediate upgrading of supply lines is not required.

2.3 Reservoir Storage

The storage requirements to balance flows within the development are as follows.

A)	Maximum day domestic demand		614 US gpm
	Maximum day use		884,160 US gpm
	Total Reservoir Storage (25%)		221,040 US gallons (835 m^3)
B)	Fire Storage - Fire Flow 65 l/s (1000 US gpm)		
	FUS guidelines for 1000 US gpm flow is 1.5 hours duration		
	Total required 1000 x 1.5 hrs. =		90,000 US gallons (340 m^3)
C)	Total Ultimate Storage		
	A + B	=	311,000 US gallons (1175 m^3)
D)	Existing Storage	=	147,000 US gallons (556 m^3)
E)	Addition Capacity Required For Ultimate Development		
		=	164,000 US gallons (620 m^3)

The construction of additional reservoir capacity should coincide with additional development. The present storage is capable of supplying the 101 existing lots and fire flows at 65 l/s (1000 US gpm) or 101 existing lots, 25 lots in Phase 2, 46 Condo/apartments and fire flows at 32 l/s (500 US gpm) as required by the Fire Protection Authority. As the number of homes constructed at this time is approximately 20 of the 101 lots, the existing storage is adequate to supply the homes as well as higher fire flows to the Condominium Site. As the number of homes constructed increases or the future phases of development commence, the storage capacity should be increased. We recommend a third cell of 91,000 US gallons (344 m^3) $\pm$ which would then provide storage equal to the capacity of the pump station (225 single

family, 60 Condo units, 26 apartments, 65 l/s fire flows for 1.5 hours). Total storage at that time would be 238,000 US gallons (900 m^3)

It should be noted that this combined capacity of the three cells exceeds the requirements of the total number of lots available under the Waste Management Permit (WMP control requires 192,000 US gallons). Prior to proceeding with the third cell, the total number of lots to be serviced should be determined.

2.4 Distribution System

The existing and proposed distribution system is shown on attached drawing A. In order to meet the Ministry of Environment guidelines of maximum pressures within a zone of approximately 100 psi the development has been divided into 4 pressure zones, Upper Zone A (above elevation 490), Intermediate Zone B (from elevation 490 to 450), Intermediate Zone C (elevation 450 to 400), Lower Zone D (elevation 400 to lake elevation 340). The lots on Peregrine Way (Phase 8) presently within the Intermediate Zone B will now be serviced within the intermediate Zone C. This will be accomplished by constructing a PRV station at the intersection of Road A and Peregrine Way and by closing the valve on the supply line tie-in at Peregrine Way (between Node 4 and 5). The new supply line from the pumphouse (200 and 500 mm) will connect to Lower Zone C at the Condo Site A through a PRV station. The 200 mm line will be extended through Phase 2 to tie to Tronson Road. The proposed upper units within Condominium Site A will be on Zone B.

A computer model has been prepared to model maximum day demands and fire flows at various points through out the development. The nodal diagram and computer print outs are attached. Based on the analysis the following comments/recommendation are outlined below for each zone. All fire flows provided are given without pumps running (supply from reservoir only).

Upper Zone A - A booster station consisting of a below ground concrete tank and pumps to supply maximum day demand will be constructed adjacent the reservoir site. Distribution

from the booster station will be by 150 mm mains along right of ways. Fire flows, if required, could be supplied by an engine driven fire pump (or electric pump with standby power) or by a high level reservoir.

Intermediate Zone B - Any future development within this zone is in Phase 2 - all other areas are basically developed. In order to increase supply to the upper developments and provide increased fire flow to lower zones a 200 mm main has been indicated from the condominium site through Phase 2 to Tronson Road. This pipeline will also provide service to the upper Condo units on Site A (at approximately elevation 450).

Fire flows of 45 l/s (700 US gpm) are available at all points within this zone with the existing piping layout. When Phase 2 connection is established fire flows will increase to 65 l/s minimum at all points.

Intermediate Zone C - This zone is serviced through two PRV's from Zone B. It consists of Phase 8 Condo Site A, Future Phase 5 and Condo Site B. The present development in Condo Site A will be serviced through a PRV between Node 108 and 106, and Peregrine Way. With Phase 2 piping installed fire flows of 85 l/s - 1350 US gpm (1000 US gpm at hydrant and 350 US gpm to sprinklers) are available with only two areas of low pressure in Phase 2 (Node 107 and Node 15). These areas can be rectified by increasing the size of pipe 19 to 200 mm or by tieing pipe 29 in Phase 2 close to Node 17 on Tronson Road rather than Node 16. Existing piping will supply 45 l/s fire flow to Condo Site A.

Phase 5 & 8 and Condo site B will be serviced through the PRV at Road A and Peregrine Way intersection. Condo Site A and B may be looped together in the future. Main sizes, looping and connections must be determined when type of units are known and fire flows established.

Lower Zone D - This zone will supply Condos on Lot 2 and 3 and possibly some on Site B (Lot 4). It will be fed from PRV's from Zone C. The size of mains, looping and PRV location will be determined when development scenarios are established.

3.0 SUMMARY

The intensive development of the Canadian Lakeview Development lands will require upgrading of the existing water system. Various components must be completed immediately with other items being undertaken as development proceeds. The priority items are outlined below with the year the work should be undertaken.

1) Upgrade pumpstation to 2 - 275 US gpm pumps — 1993.

2) Install 500 mm supply main from STP Site to Condo Site tie-in complete with a PRV Station — 1993. This construction could be delayed as long as discharge from the pumps is controlled to ensure 20 minutes chlorine contact time.

3) Install a PRV station at Road A and Peregrine Way intersection — 1993.

4) Install a 200 mm supply main from Node 108 through Phase 2 to tie to Tronson Road at a location close to Node 17 — with Phase 2 development, 1993 possibly.

5) Upgrade reservoir size — 1994 or when number of homes and condo units constructed equals 100.

6) Install 200 mm parallel supply main from pumphouse to STP. This would be delayed until additional Waste Management Permits are established to allow more development.

Other improvements/expansions should proceed as development requires them.

APPENDIX A

FIRE PREVENTION LETTER

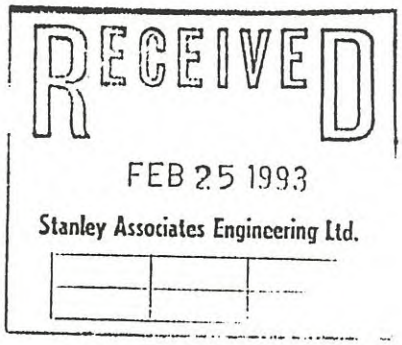
REGIONAL DISTRICT OF NORTH OKANAGAN

9848 ABERDEEN ROAD • VERNON, B.C. V1B 2K9 • TELEPHONE 545-5368 • FAX 545-1445

OFFICE OF Fire Prevention Officer

YOUR FILE: 91-793-01-01

OUR FILE: 9300
9230
Cold



February 22, 1993

Stanley Associates Engineering Ltd.
Suite 201 - 595 K.L.O. Road
KELOWNA, B.C.
V1Y 8E7

Attention: **Mr. Charlie W. Higgins, P. Eng.**

Dear Sir:

Re: Your letter dated February 15th, 1993

We require a minimum fire flow at the hydrant of 450 gallons per minute, and recommend that all N.F.P.A. standards regarding water supplies be followed.

Yours truly,

K. Vander Haeghe

Ken Vander Haeghe
Fire Prevention Officer

KVH/jb

APPENDIX B
COMPUTER MODELLING

Waterworks All-in-one - Water System Analysis Report

DATA : CLD6.WK1

FIRST : MAXIMUM DAY DEMAND, NO PUMPS RUNNING
SECOND : FIRE 85 L/S @ NODE 106.
THIRD :
FOURTH :

Short Report

The analysis use Hazen-Williams's formula
Iteration termination threshold: 0.00100
Maximum number of iterations: 40

There are: 35 Pipes(s)
31 nodes(s)
1 sources(s)
0 booster pump(s)
2 pressure reducing valve(s)
0 check valve(s)
0 pressure sustaining valve(s)

PIPE TABLE

Pipe	UpNode	DnNode	Length	Diameter	Roughness	Flow	Velocity	Head
			m	mm		l/s	m/s	
1	2	1	137.00	250.00	140.00	-0.00	-0.00	
2	2	3	356.00	150.00	140.00	-23.48	-1.33	
3	4	3	16.00	150.00	140.00	23.48	1.33	
104	108	106	10.00	200.00	140.00	84.04	2.68	
5	106	5	200.00	150.00	140.00	-5.14	-0.29	
6	7	6	218.00	150.00	140.00	-0.65	-0.04	
7	6	7	20.00	150.00	140.00	2.36	0.13	
8	8	5	30.00	150.00	140.00	5.71	0.32	
9	9	8	32.00	150.00	140.00	-0.10	-0.01	
10	10	110	10.00	150.00	140.00	6.76	0.38	
11	11	10	130.00	150.00	140.00	12.65	0.72	
12	12	11	136.00	150.00	140.00	13.13	0.74	
13	12	13	158.00	150.00	140.00	17.75	1.00	
14	13	10	118.00	150.00	140.00	-4.84	-0.27	
15	13	14	68.00	150.00	140.00	20.69	1.17	
16	14	4	184.00	150.00	140.00	23.48	1.33	
17	15	14	150.00	150.00	140.00	2.79	0.16	
18	16	12	396.00	150.00	140.00	31.08	1.76	
19	17	16	86.00	150.00	140.00	99.47	5.63	1
20	18	17	14.00	150.00	140.00	-7.52	-0.43	
21	19	18	92.00	150.00	140.00	-5.14	-0.29	
22	20	19	166.00	150.00	140.00	-0.95	-0.05	
23	21	19	376.00	150.00	140.00	-0.67	-0.04	
24	22	18	48.00	150.00	140.00	-2.38	-0.13	
25	25	22	162.00	150.00	140.00	-0.47	-0.03	
26	23	22	474.00	150.00	140.00	-1.34	-0.08	
27	24	23	264.00	150.00	140.00	-0.67	-0.04	
28	26	17	184.00	200.00	140.00	106.99	3.41	
29	15	16	458.00	200.00	140.00	-68.10	-2.17	
106	106	6	88.00	150.00	140.00	89.18	5.05	1
107	108	107	210.00	200.00	140.00	-60.56	-1.93	
108	107	15	210.00	200.00	140.00	-60.56	-1.93	
102	102	108	249.00	500.00	140.00	23.48	0.12	
103	2	102	156.00	200.00	140.00	23.48	0.75	
110	110	8	238.00	150.00	140.00	6.76	0.38	

NODE TABLE

Node	Elevation	Demand	Pressure	HGL	XCoord	YCoord	Status
	m	l/s	kPa	m			ON
1	341.70	0.00	1370.66	481.68	10391	193	
2	343.80	0.00	1350.10	481.68	10392	214	
3	431.90	0.00	526.98	485.73	10452	553	
4	433.10	0.00	517.01	485.92	10466	558	
5	433.30	0.57	460.93	480.39	10472	564	
6	420.15	86.17	472.29	468.40	10228	406	
7	416.30	3.01	509.97	468.40	10225	389	
8	434.30	0.95	450.73	480.35	10500	577	
9	433.35	0.10	460.04	480.35	10499	540	
10	450.10	1.05	377.73	488.69	10572	798	
11	462.40	0.48	261.88	489.16	10552	925	
12	465.40	0.20	237.67	489.69	10417	916	
13	457.90	1.90	300.63	488.62	10460	765	
14	456.85	0.00	304.92	488.01	10485	700	
15	477.00	4.75	107.91	488.04	10340	690	
16	464.75	0.29	318.20	497.27	10027	932	
17	464.25	0.00	461.96	511.45	9944	940	
18	463.75	0.00	466.67	511.43	9930	943	
19	454.10	3.52	560.56	511.36	9852	923	
20	452.05	0.95	580.58	511.36	9909	771	
21	441.50	0.67	683.89	511.36	9477	974	
22	468.50	0.57	420.07	511.42	9914	975	
23	448.25	0.67	618.12	511.39	9459	1020	
24	438.00	0.67	718.46	511.39	9288	999	
25	479.75	0.48	309.88	511.42	10073	987	
26	517.00	0.00	29.13	520.00	9964	1122	
106	424.70	0.00	543.81	480.25	10288	436	
107	482.00	0.00	25.63	484.64	10185	590	
102	395.00	0.00	844.40	481.25	10320	370	
108	426.00	0.00	540.73	481.24	10320	370	
110	449.00	0.00	309.42	480.62	10320	370	

INFLOW TABLE

Node	Pumps	OpCurve	%Estimate	%Actual	Inflow l/s	Status ON
26	1	PUMP1	75	1.00	-106.99	

<< Booster data not available >>

REDUCING (PRV) TABLE

Pipe	Source	Pressure kPa	OpenK	CKV	PRVLoss m	CKVState
104	26	545.00	0.00	YES	0.69	Open
10	26	310.00	0.00	YES	8.06	Open

<< PSV data not available >>

<< CKV data not available >>

PUMP1

<------- Input ------>

Flow	Head
l/s	m
0.00	3.00
6.30	3.00
12.60	3.00
18.90	3.00
25.20	3.00
31.50	3.00
37.80	3.00
44.10	3.00
50.40	3.00

```
+-------------------------------------------------------------------------+
|        Waterworks All-in-one   -   Water System Analysis Report         |
+-------------------------------------------------------------------------+
|                                                                         |
| DATA   : CLD6.WK1                                                       |
|                                                                         |
| FIRST  : MAXIMUM DAY DEMAND, NO POMPS RUNNING.                          |
| SECOND :      FIRE BSE/S @ NODE 106, PIPE 29 TO NODE 17                 |
| THIRD  :                                                                |
| FOURTH :                                                                |
|                                                                         |
+---------------------------  Short Report  -----------------------------+
|                                                                         |
| The analysis use Hazen-Williams's formula                               |
| Iteration termination threshold:  0.00100                               |
| Maximum number of iterations:   40                                      |
|                                                                         |
| There are:   35 Pipes(s)                                                |
|              31 nodes(s)                                                |
|               1 sources(s)                                              |
|               0 booster pump(s)                                         |
|               2 pressure reducing valve(s)                              |
|               0 check valve(s)                                          |
|               0 pressure sustaining valve(s)                            |
|                                                                         |
+-------------------------------------------------------------------------+
```

PIPE TABLE

Pipe	UpNode	DnNode	Length	Diameter	Roughness	Flow	Velocity	Head
			m	mm		l/s	m/s	
1	2	1	137.00	250.00	140.00	-0.00	-0.00	
2	2	3	356.00	150.00	140.00	-23.42	-1.33	
3	4	3	16.00	150.00	140.00	23.42	1.33	
104	108	106	10.00	200.00	140.00	84.05	2.68	1
5	106	5	200.00	150.00	140.00	-5.13	-0.29	
6	7	6	218.00	150.00	140.00	-0.65	-0.04	
7	6	7	20.00	150.00	140.00	2.36	0.13	
8	8	5	30.00	150.00	140.00	5.70	0.32	
9	9	8	32.00	150.00	140.00	-0.10	-0.01	
10	10	110	10.00	150.00	140.00	6.75	0.38	2
11	11	10	130.00	150.00	140.00	11.94	0.68	
12	12	11	136.00	150.00	140.00	12.42	0.70	
13	12	13	158.00	150.00	140.00	16.67	0.94	
14	13	10	118.00	150.00	140.00	-4.14	-0.23	
15	13	14	68.00	150.00	140.00	18.91	1.07	
16	14	4	184.00	150.00	140.00	23.42	1.33	
17	15	14	150.00	150.00	140.00	4.51	0.26	
18	16	12	396.00	150.00	140.00	29.29	1.66	
19	17	16	86.00	150.00	140.00	29.58	1.67	
20	18	17	14.00	150.00	140.00	-7.52	-0.43	
21	19	18	92.00	150.00	140.00	-5.14	-0.29	
22	20	19	166.00	150.00	140.00	-0.95	-0.05	
23	21	19	376.00	150.00	140.00	-0.67	-0.04	
24	22	18	48.00	150.00	140.00	-2.38	-0.13	
25	25	22	162.00	150.00	140.00	-0.47	-0.03	
26	23	22	474.00	150.00	140.00	-1.34	-0.08	
27	24	23	264.00	150.00	140.00	-0.67	-0.04	
28	26	17	184.00	200.00	140.00	106.99	3.41	
29	15	17	458.00	200.00	140.00	-69.89	-2.22	
106	106	6	88.00	150.00	140.00	89.18	5.05	1
107	108	107	210.00	200.00	140.00	-60.63	-1.93	
108	107	15	210.00	200.00	140.00	-60.63	-1.93	
102	102	108	249.00	500.00	140.00	23.42	0.12	
103	2	102	156.00	200.00	140.00	23.42	0.75	
110	110	8	238.00	150.00	140.00	6.75	0.38	

NODE TABLE

<---------- Input ---------->		<----- Output ---->		<--- Optional --->		<-Input->
Node	Elevation	Demand	Pressure	HGL	XCoord	YCoord	Status
	m	l/s	kPa	m			ON
1	341.70	0.00	1504.91	495.39	10391	193	
2	343.80	0.00	1484.35	495.39	10392	214	
3	431.90	0.00	661.04	499.42	10452	553	
4	433.10	0.00	651.06	499.60	10466	558	
5	433.30	0.57	460.93	480.39	10472	564	
6	420.15	86.17	472.30	468.40	10228	406	
7	416.30	3.01	509.97	468.40	10225	389	
8	434.30	0.95	450.75	480.35	10500	577	
9	433.35	0.10	460.05	480.35	10499	540	
10	450.10	1.05	510.58	502.26	10572	798	
11	462.40	0.48	394.27	502.68	10552	925	
12	465.40	0.20	369.55	503.16	10417	916	
13	457.90	1.90	433.67	502.21	10460	765	
14	456.85	0.00	438.88	501.69	10485	700	
15	477.00	4.75	242.33	501.77	10340	690	
16	464.75	0.29	442.37	509.95	10027	932	
17	464.25	0.00	461.96	511.45	9944	940	
18	463.75	0.00	466.67	511.43	9930	943	
19	454.10	3.52	560.56	511.36	9852	923	
20	452.05	0.95	580.58	511.36	9909	771	
21	441.50	0.67	683.89	511.36	9477	974	
22	468.50	0.57	420.07	511.42	9914	975	
23	448.25	0.67	618.12	511.39	9459	1020	
24	438.00	0.67	718.46	511.39	9288	999	
25	479.75	0.48	309.88	511.42	10073	987	
26	517.00	0.00	29.13	520.00	9964	1122	
106	424.70	0.00	543.82	480.25	10288	436	
107	482.00	0.00	159.97	498.36	10185	590	
102	395.00	0.00	978.67	494.96	10320	370	
108	426.00	0.00	675.00	494.95	10320	370	
110	449.00	0.00	309.42	480.62	10320	370	

INFLOW TABLE

Node	Pumps	OpCurve	%Estimate	%Actual	Inflow l/s	Status ON
26	1	PUMP1	75	1.00	-106.99	

<< Booster data not available >>

REDUCING (PRV) TABLE

Pipe	Source	Pressure kPa	OpenK	CKV	PRVLoss m	CKVState
104	26	545.00	0.00	YES	14.40	Open
10	26	310.00	0.00	YES	21.63	Open

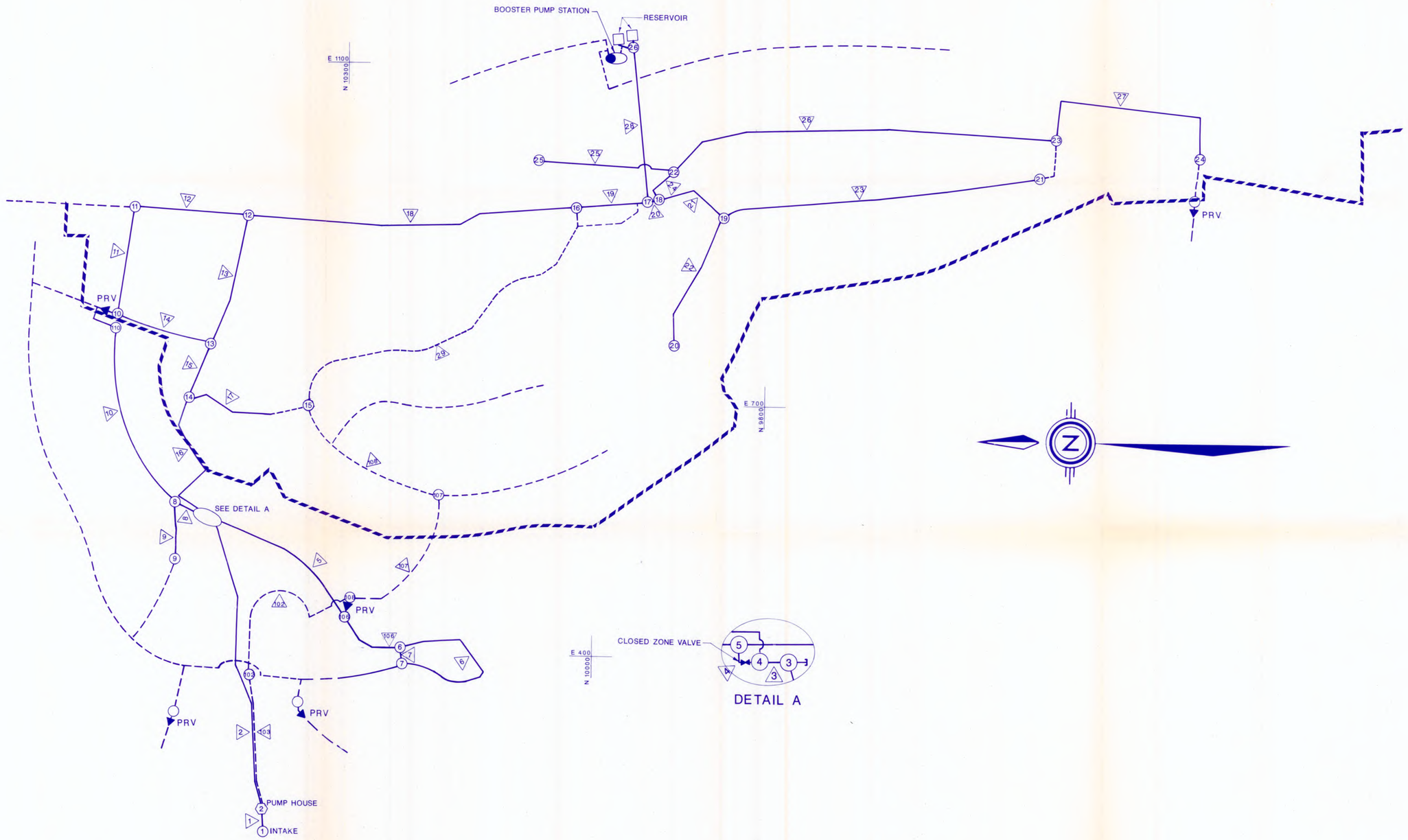
<< PSV data not available >>

<< CKV data not available >>

PUMP1

<------- Input ------>

Flow l/s	Head m
0.00	3.00
6.30	3.00
12.60	3.00
18.90	3.00
25.20	3.00
31.50	3.00
37.80	3.00
44.10	3.00
50.40	3.00



DETAIL A

No	DATE	DESCRIPTION	BY	APPROVED

REVISIONS

No	DESCRIPTION	DATE	APPROVED
6	MICROFILMED		
5	PLAN OF RECORD		
4	APPROVAL FOR CONSTRUCTION		
3	FOR TENDER		
2	FOR APPROVAL		
1	PRELIMINARY		

ISSUE DATES

Stanley
STANLEY ASSOCIATES ENGINEERING LTD.

DESIGN
APPROVED C.W.H
DRAWN R.C.R
CHECKED
SCALE 1 : 2500

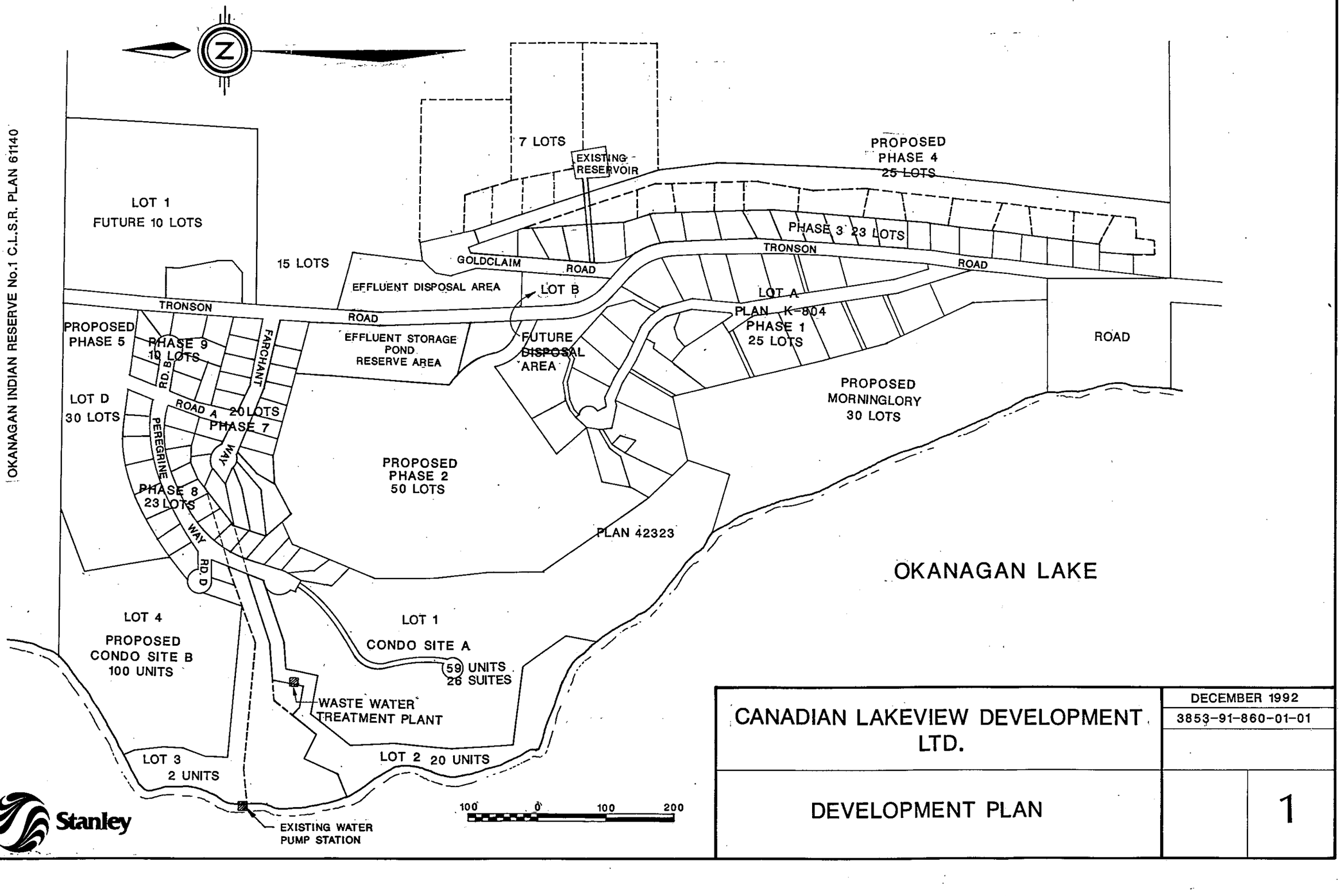
CANADIAN LAKEVIEW DEVELOPMENT

NODAL DIAGRAM

DATE OCTOBER 1992
SHEET No
JOB No 3853-91-860-01-01
REVISION No / ISSUE No
DRAWING No 1

Riley's 88

OKANAGAN INDIAN RESERVE No.1 C.L.S.R. PLAN 61140



Stanley

CANADIAN LAKEVIEW DEVELOPMENT LTD.	DECEMBER 1992 3853-91-860-01-01
DEVELOPMENT PLAN	1