HYDRO INTELLIGENCE

WATER RESOURCE ASSESSMENT

145 Fernleigh Rd, **Caveside**

Mersey River Catchment, Tasmania

CLIENT
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HI-2025-003

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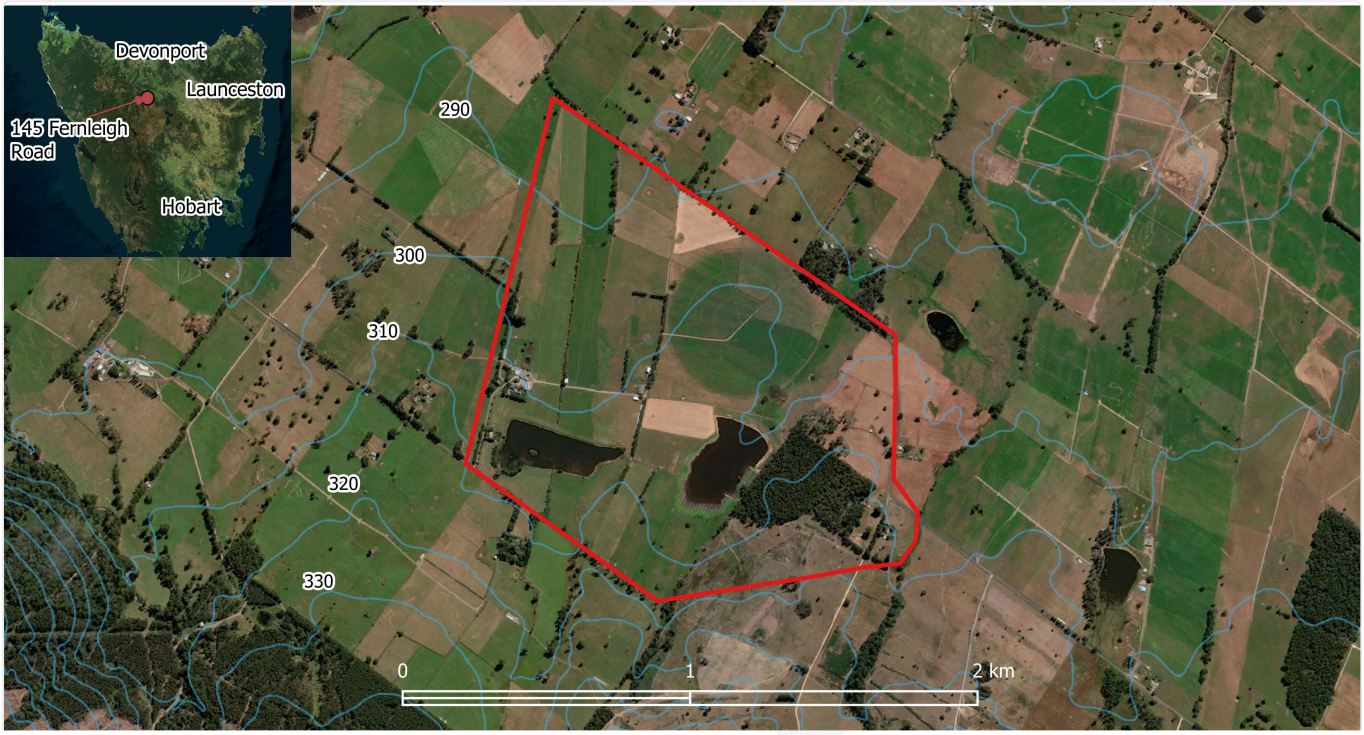
Water at a Glance

145 Fernleigh Rd, Caveside — Mersey River Catchment, Tasmania



Property Boundary Elevation Contours (mAHD)

402	2	5 & 6	2
ML / YEAR	LICENCES	SURETY LEVELS	DAMS
LICENSED VOLUME	SURFACE WATER	ALLOCATION RELIABILITY	ON PROPERTY

SURFACE WATER

Total Licensed	402 ML/yr
Surety 5 (Winter)	270 ML
Surety 6 (Summer)	132 ML
Restriction Risk	Moderate

GROUND WATER

Licence Required	No
Aquifer Type	Karstic Limestone
Nearby Bore Success	~22%
Potential Yield	Variable (1-20 L/s)

Assessment at a Glance

RISK SUMMARY

Seasonal Water Availability (SW)	Restrictions likely Jan-Mar
Summer Allocation Expansion (SW)	Fully allocated, none available
Groundwater Drilling Success (GW)	~22% achieve medium-to-high yield
Groundwater Licensing (GW)	Not required, no declared area
Licence Transfer Risk (SW)	Must be secured before settlement

KEY OPPORTUNITIES

- Groundwater supplementation via new bore(s), no licence needed
- Water trading or leasing to increase peak-period availability
- Use pre-stored dam water during restriction periods (new diversion is prohibited, but stored water remains accessible)
- Review dam condition and capacity for potential expansion to increase licenced volume

PRIORITY ACTIONS

1	Secure licence transfer as part of property transaction	HIGH
2	If additional water is needed, investigate groundwater via geophysics and targeted drilling	MEDIUM
3	Register for NRE restriction notifications	IMMEDIATE
4	Review dam storage capacity and condition for potential applications to increase licenced volume	MEDIUM

Well-suited to irrigation with appropriate planning for seasonal variability. Existing surface water entitlements provide a substantial base, with groundwater offering additional supplementary potential if required during peak demand.

SURFACE WATER

01

1.1 Catchment & Regulatory Context

This property is located within the **Mersey River Catchment** and is governed by the **Mersey River Catchment Water Management Plan 2024**. Surface water within this catchment is a proclaimed resource, subject to licensing, allocation limits, and flow-based access rules administered by Natural Resources and Environment Tasmania (NRE Tasmania).

Under the current management framework, summer surface water allocations (1 November to 30 April) are **fully allocated** at the catchment scale, meaning no new allocations are available during peak irrigation demand. Winter allocations (1 May to 31 October) remain available at lower surety levels and are assessed on a case-by-case basis.

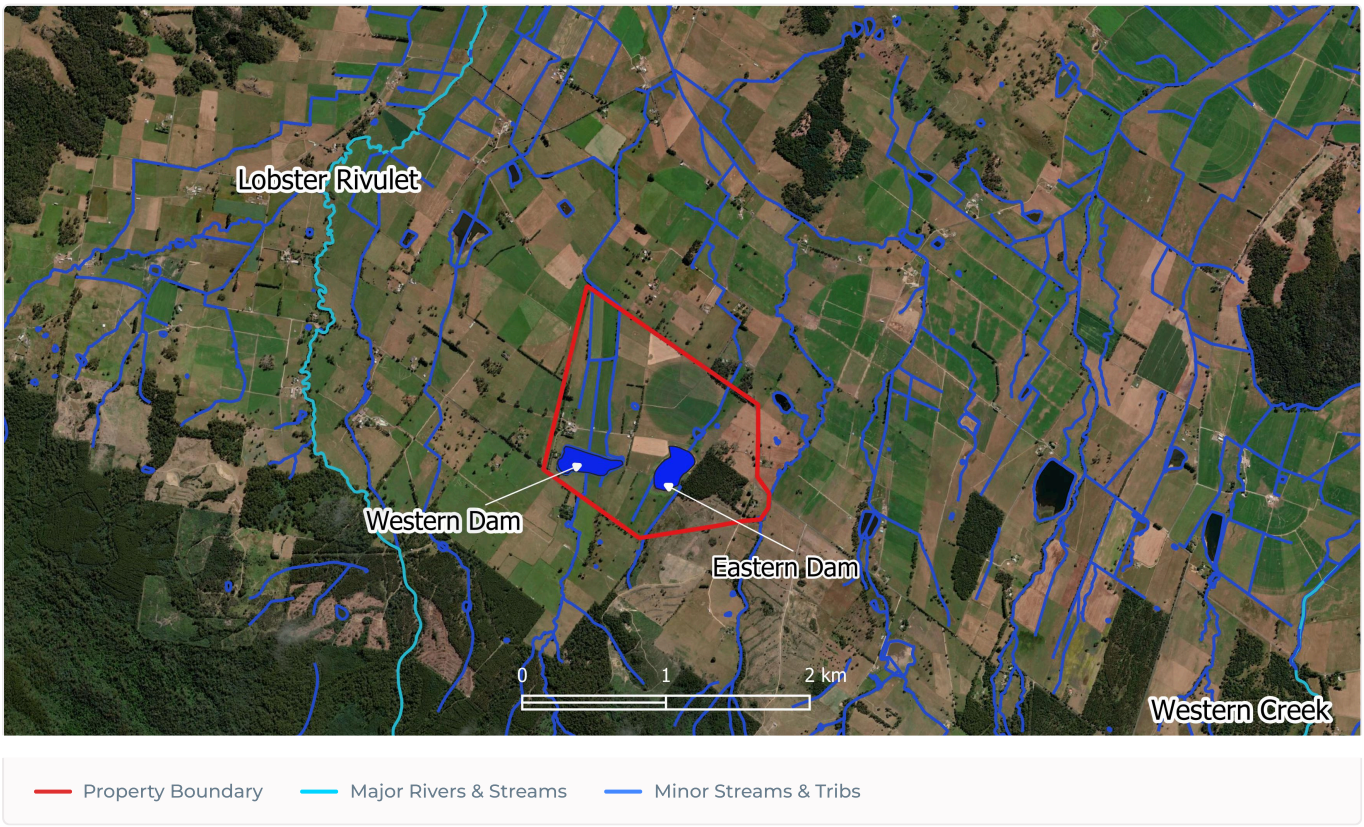


FIGURE 2. PROPERTY BOUNDARY WITH WATERCOURSES.

1.2 Current Entitlements

The property holds two surface water licences associated with three authorised offtakes, supplying water to two permitted irrigation dams (referred to as the Eastern Dam and Western Dam). In total, **402 ML per year** is licensed for irrigation use.

Surety 5 — More reliable, restricted later Surety 6 — Less reliable, restricted first

LICENCE	ALLOC. ID	OFFTAKE	WATERCOURSE	VOL. (ML)	SURETY	TAKE PERIOD
501322	16699	13707	Western Dam (Lobster Rivulet trib.)	132	6	1 Dec - 30 Apr
501322	370	736	Western Dam (Lobster Rivulet trib.)	130	5	1 May - 30 Nov
501292	16160	13300	Eastern Dam (Cubits Creek trib.)	140	5	1 May - 31 Oct

TABLE 1. SUMMARY OF CURRENT SURFACE WATER LICENCES AND ALLOCATIONS REGISTERED TO THIS PROPERTY.

WHAT THIS MEANS

Your Surety 5 allocations (270 ML) cover the cooler months when water is more reliably available. The Surety 6 allocation (132 ML) covers the peak summer irrigation period but is the first to be restricted during low-flow conditions.

1.3 Water Reliability & Restrictions

UNDERSTANDING SURETY LEVELS

Surety levels describe how reliably a water allocation can be expected to be available under varying flow conditions.

SURETY	RELIABILITY	DURING RESTRICTIONS	THIS PROPERTY
5	Higher Water available more often	Restricted **last**, water continues flowing longer	**270 ML** Winter (May-Oct/Nov)
6	Lower More vulnerable to cutbacks	Restricted **first**, cut off before Surety 5	**132 ML** Summer (Dec-Apr)

CEASE-TO-TAKE RULES

The Water Management Plan defines flow thresholds that trigger staged restrictions during both winter and summer periods. Once flows fall below defined thresholds, partial restrictions apply to Surety 6 allocations first, with further declines triggering full suspension and eventual restrictions on Surety 5. At the lowest thresholds, all irrigation takes must cease and in-stream dams must pass all inflows downstream. **Important:** The maximum daily take rate specified on the licence only applies during restriction periods. When no restrictions are in place, there is no daily take limit, however the standard licence condition requiring at least 50% of instantaneous streamflow at the offtake to be passed downstream always applies.

RESTRICTION RISK CALENDAR

Based on the past seven years of flow and restriction data:

JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Low	Low	Low	Low	Low	Med	High	High	Med	Low	Low	Low
S5	S5	S5	S5	S6	S6	S6	S6	S6	S6	S5	S5

FIGURE 3. INDICATIVE RESTRICTION RISK BY MONTH. GREEN = SURETY 5 TAKE PERIOD (WINTER, MORE RELIABLE). WARM COLOURS = SURETY 6 TAKE PERIOD (SUMMER, RESTRICTED FIRST).

HISTORICAL RESTRICTION FREQUENCY

SUMMER RESTRICTIONS (DAYS)	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	TOTAL	AVG
Partial Surety 6	18	0	0	0	0	5	7	**30**	4.3
Total Surety 6	7	7	0	0	0	7	31	**52**	7.4
Total S6 + Partial S5	-	-	-	-	-	9	17	**26**	13
Total Surety 5 & 6	0	23	0	0	0	13	2	**38**	5.4

WINTER RESTRICTIONS (DAYS)	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	TOTAL	AVG
Partial Surety 6	0	8	0	0	0	4	0	**12**	1.7
Total Surety 6	0	0	7	0	0	0	0	**7**	1
Total S6 + Partial S5	-	-	-	-	-	6	0	**6**	3
Total Surety 5 & 6	0	7	16	0	0	17	24	**64**	9.1

Analysis of restriction history over the past seven years indicates that partial restrictions affecting Surety 6 occur intermittently during most summers. Full cease-to-take conditions affecting all allocations have occurred on average approximately **5-6 days per summer** irrigation period. Winter restrictions are less common and typically shorter in duration.

MODERATE

Seasonal Water Availability Risk

Based on historic flow patterns, you should expect partial restrictions during January to March in most years. Plan irrigation schedules to front-load water use in November to December when restrictions are less likely. During restriction periods, water already stored in dams remains accessible for use, though no new diversion from watercourses is permitted.

HIGH

No Additional Summer Allocation Available

Surface water allocation for the November to April period is fully allocated across the catchment. Additional irrigation capacity during summer must come from alternative sources: groundwater, dam storage, or water trading.

Practical Example

During the December to April period (Surety 6 take period), if NRE-monitored flows fall below 225 ML/day, the Surety 6 allocation is restricted to 50% of its maximum daily take — reducing from 3 ML/day to 1.5 ML/day. If flows decline further, Surety 6 allocations must cease entirely. At the most severe restriction stage (Stage 4), all Surety 5 and 6 takes must cease and in-stream dams must pass all flows downstream. Note: Surety 5 and Surety 6 take periods do not overlap, so restrictions affect each allocation independently within its own season. Water already stored in dams remains accessible for use during restriction periods.

CEASE-TO-TAKE THRESHOLDS & RESTRICTION STAGES

The tables below show the staged restriction thresholds defined in the Mersey River Catchment Water Management Plan 2024. Flow thresholds are in ML/day measured at the reference gauge.

Winter Restrictions (June – September)

STAGE	JUN	JUL	AUG	SEP	RESTRICTIONS
Stage 1	360	570	690	610	Ban on all Surety Level 6 takes. Surety 5 entitlement holders may take 100% of their Maximum Daily Take unless the restriction notice specifies differently.
Stage 2	330	540	660	580	Cease-to-take threshold. Ban on all Surety 5 and 6 takes. In-stream dams must pass all flows downstream where outlet structures permit.

Summer Restrictions (October – May)

STAGE	OCT	NOV	DEC–MAY	RESTRICTIONS
Advisory	—	—	—	Warning issued within 10 ML/day of Stage 1 thresholds for all Surety 5 and 6 licence holders.
Stage 1	400	290	225	50% ban on Surety 6 takes. Surety 5 limited to Maximum Daily Take.
Stage 2	390	280	215	Ban on all Surety 6 takes. Surety 5 limited to Maximum Daily Take.
Stage 3	380	270	205	50% ban on Surety 5 takes.
Stage 4	370	260	195	Cease-to-take threshold. Ban on all Surety 5 and 6 takes. In-stream dams must pass all flows downstream where outlet structures permit.

WHAT THIS MEANS

The Surety 5 and Surety 6 allocations have separate, non-overlapping take periods. **Summer (Dec-Apr):** Only the Surety 6 allocation (132 ML) is active, with a maximum daily take of 3 ML/day during restrictions. At Stage 1, this is halved to 1.5 ML/day. At Stage 2, Surety 6 must cease entirely. **Winter (May-Oct/Nov):** Only the Surety 5 allocations (270 ML) are active, each with a maximum daily take of 1 ML/day during restrictions. At Stage 2, all takes must cease and in-stream dams must pass all flows downstream. When no restrictions are in place, the maximum daily take rate does not apply, but the standard licence condition requiring at least 50% of instantaneous streamflow to pass downstream at the offtake always applies.

SOURCE: MERSEY RIVER CATCHMENT WATER MANAGEMENT PLAN 2024.

1.4 Compliance Requirements

Water licences do not transfer with the land. Any purchaser must ensure surface water licences are transferred as part of the property transaction, or secured separately through an approved transfer process with NRE Tasmania.

Metering

All offtakes must have NRE-approved meters installed and maintained. Metering must comply with the Tasmanian Standard for Non-Urban Water Meters.

Record-keeping

Licence holders must keep accurate records of water taken for a minimum of five years and provide records to authorised officers upon request (Water Management Regulations 2019, Regulations 30(2) and 30(3)).

Restriction compliance

When restrictions are declared via official notice, pumping must cease within 24 hours. In-stream dams must pass all inflows downstream during cease-to-take periods. Notices are published on the NRE website and via SMS.

Streamflow passing requirement

A standard licence condition requires that whenever water is being taken under an allocation, at least 50% of the instantaneous streamflow at the offtake must be passed downstream. This condition applies at all times, regardless of whether restrictions are in place.

Licence transfers

Transfer or lease of water allocations requires NRE Tasmania approval. Licences are held by individuals, not land. Processing time is typically 6-8 weeks.

GROUND WATER

02

2.1 Regulatory Status

The property is **not within a declared groundwater area**. Under current Tasmanian legislation, groundwater may be taken for any purpose without a licence, unless restrictions are imposed due to environmental or third-party impacts.

> **WHAT THIS MEANS**
>
> You can currently extract groundwater from this property without a water licence, making it a flexible supplementary source with no regulatory barriers to entry. However, this could change if the area is declared in future.

2.2 Hydrogeological Setting

The dominant groundwater resource in this area is a **karstic limestone aquifer** associated with Ordovician limestones (Gordon Limestone). This aquifer is characterised by solution channels, cavities, and conduits, resulting in highly variable groundwater occurrence and yields.

Based on surface geology mapping, drilling is likely to intercept limestone between 12 and 20 metres below ground level. However, interception of a productive cavity is not guaranteed even at greater depths.

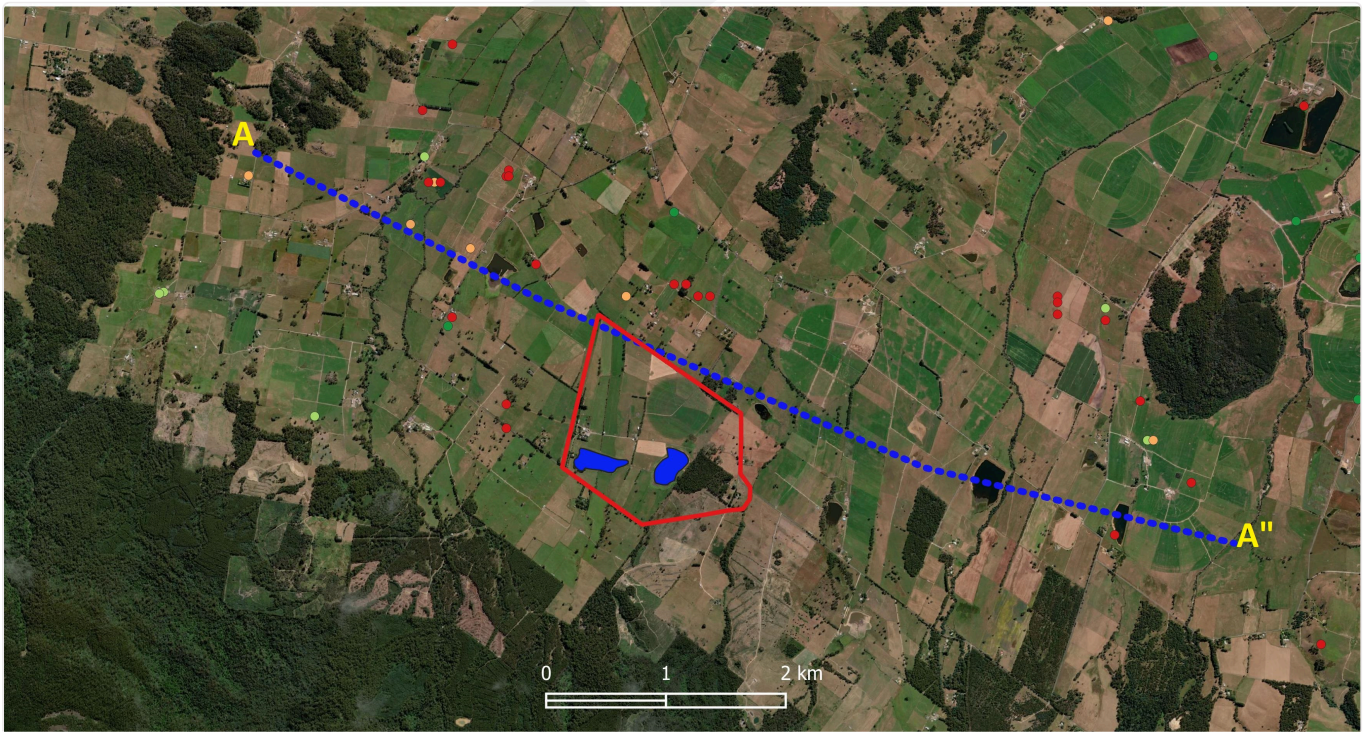


FIGURE 4. BORE LOCATIONS AND YIELDS RELATIVE TO THE PROPERTY BOUNDARY. THE DASHED LINE INDICATES THE CROSS-SECTION ALIGNMENT (A–A") SHOWN ON THE FOLLOWING PAGE.

STRATIGRAPHIC CROSS-SECTION

This cross-section shows the intersection of various lithologies (rock, sand, clays) beneath the property based on nearby water bore drilling logs. This can be used to evaluate and plan any potential new bore constructions. The cross-section runs from A to A' as marked in Figure 4.

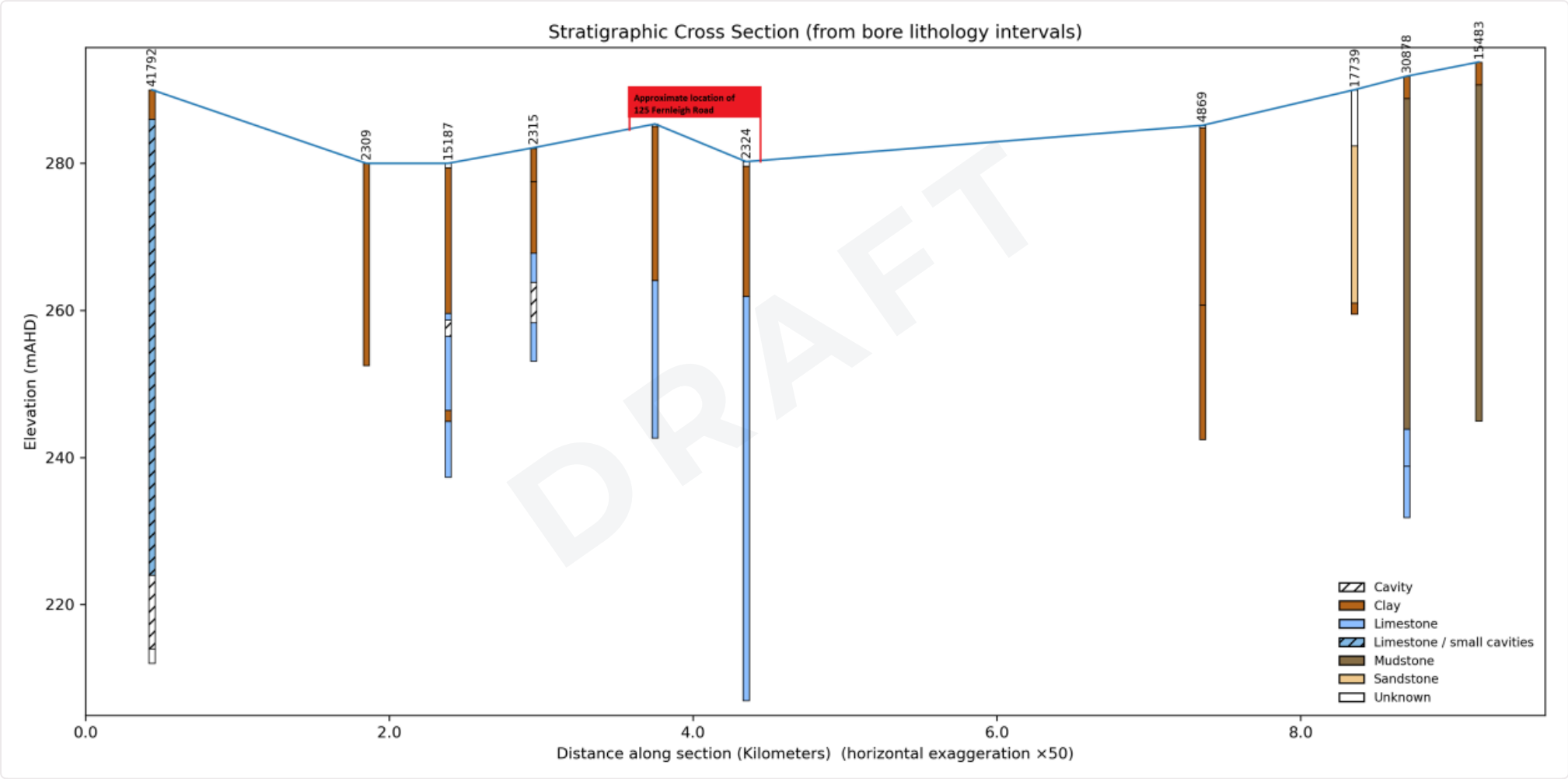


FIGURE 5. STRATIGRAPHIC CROSS-SECTION DERIVED FROM BORE LITHOLOGY RECORDS ALONG ALIGNMENT A–A". LIMESTONE (BLUE) IS THE TARGET AQUIFER FOR GROUNDWATER DEVELOPMENT.

WHAT THIS MEANS

The cross-section on the preceding page shows the depth at which different geological materials are intercepted below the ground surface. The blue shading represents limestone, the target aquifer where water is most likely to be found. Productive bores in karstic limestone typically rely on intercepting a cavity or solution channel within the rock. The property sits within the limestone zone, which is a positive indicator for groundwater potential.

2.3 Bore Analysis

There are **34 bores** recorded within a 3.5 km radius of the property. Of these, 8 bores are classified as medium-to-high yield (≥5 L/s). Historical data shows yields ranging from less than 1 L/s to greater than 12 L/s.

Bore Yield Distribution

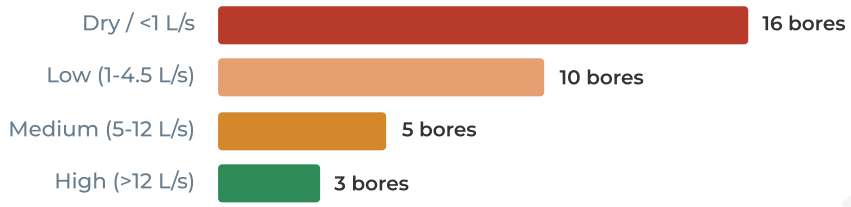


FIGURE 6. DISTRIBUTION OF RECORDED BORE YIELDS WITHIN 3.5 KM OF THE PROPERTY BOUNDARY.

Case Study: Drilling Variability

Two bores on a nearby property (1.2 km west) illustrate the unpredictable nature of karstic aquifers. **Bore 2318**, drilled to 50.2 m, intercepted a cavity at 47 m depth and achieved 12.5 L/s. **Bore 2317**, just 100 m away and drilled to 85.4 m, encountered limestone but no cavities, resulting in negligible yield (0.25 L/s). In karstic limestone, groundwater flows through solution-enlarged cavities and channels rather than through the rock itself. Intercepting a cavity is typically what determines whether a bore achieves a productive yield, which is why results can vary dramatically over short distances.

MODERATE

Drilling Success Uncertainty

Karstic aquifer systems have inherently unpredictable yields. Of the 34 bores within 3.5 km, only ~22% achieved medium-to-high yields (5 L/s or above). Productive bores are often associated with interception of discrete cavities. Budget for the possibility of multiple drilling attempts.

2.4 Drilling Considerations

Based on historical records, **Spaulding Drillers** have completed the majority of drilling in the Mole Creek karst area. They have substantial on-the-ground experience in this region. A geophysical survey prior to drilling is recommended to identify subsurface structures and improve the probability of intercepting productive cavities. (spauldingdrillers.com.au)

Options to Increase Supply

03

Beyond the existing surface water entitlements, several pathways exist to increase or supplement the property's water supply.

3.1 WATER TRADING & LEASING

Water allocations may be transferred permanently (absolute transfer) or leased for a defined period, subject to approval by NRE Tasmania. Trading is entirely a private market process facilitated by local brokers — there is no centralised exchange or government-published pricing data. NRE Tasmania administers the formal transfer of licences between parties but does not facilitate the trading itself. More information on the transfer process is available from NRE Tasmania — Transfer a Water Licence.

3.2 TASMANIAN IRRIGATION SCHEME RELEASES

Approved Water Authorities, including Tasmanian Irrigation, may facilitate water releases into watercourses during restricted periods. Water is purchased from an irrigation scheme and released upstream for capture in on-farm storage. **Note:** This property is not located within an irrigation scheme area. Scheme releases are therefore not a current option but may become relevant if scheme boundaries change.

3.3 DAM DEVELOPMENT OR MODIFICATION

Construction of new dams or modification of existing dams is subject to a risk-based permitting process under the *Water Management Act 1999*. Lower-risk dams may follow a simplified approval pathway, while higher-risk dams require detailed engineering assessment. More information on dam construction approval and permitting, including relevant codes and forms, is available at nre.tas.gov.au/water/dams or contact Water.Operations@nre.tas.gov.au.

EXISTING DAM INFRASTRUCTURE

	WESTERN DAM	EASTERN DAM
Dam ID	5513	9043
Watercourse	U/N Trib of Lobster Rivulet	U/N Trib of Cubits Creek
Type	Irrigation	Irrigation
Year Built	1996	2015
Capacity (ML)	130	139
Height (m)	4.2	7
Crest Length (m)	500	310
Crest Width (m)	3	4
Free Board (m)	0.4	0.25
Spillway Width (m)	16	7.5

3.4 ADDITIONAL GROUNDWATER DEVELOPMENT

Given the property is not within a declared groundwater area, additional bores can be constructed without licensing. A phased approach, starting with a geophysical survey followed by targeted drilling, offers the best risk-return balance. This option is most relevant if additional water is needed beyond the existing 402 ML surface water allocation.

FIGURE 7. REGIONAL BORE YIELD MAP. COLOURED MARKERS INDICATE RECORDED YIELDS FROM HISTORICAL DRILLING.

Recommendations

04

STRATEGIC OVERVIEW

This property has substantial existing surface water entitlements but faces seasonal constraints during peak summer demand. We recommend transferring the existing water licences as part of the property transaction to secure the allocation, and maximising dam storage during unrestricted periods to ensure water is available when new diversion is prohibited. Groundwater investigation is an option if additional supply is needed beyond existing entitlements.

1 Secure Licence Transfer

Ensure all surface water licences are transferred as part of the property transaction. Licences are held by individuals, not land, and do not transfer automatically with sale.

HIGH PRIORITY | BEFORE SETTLEMENT

2 Register for Restriction Notifications

Ensure all licence holders are registered in the NRE Tasmania notification system to receive timely restriction notices via SMS and email.

IMMEDIATE | THIS WEEK

3 Review Dam Storage Capacity and Condition

Assess the condition, engineering specifications, and operational efficiency of the Western Dam and Eastern Dam. Water already stored in dams remains accessible during restriction periods, making dam storage a key buffer against seasonal constraints. Maximising storage during unrestricted periods (May to October) ensures water is available when new diversion is prohibited.

MEDIUM PRIORITY | 1-2 MONTHS

4 Investigate Groundwater (If Additional Water Needed)

If additional water is required, or if seasonal restrictions are not tolerable, engage a hydrogeologist to conduct geophysical surveys and identify optimal drilling locations. Budget for the possibility of multiple attempts given the variability of karstic aquifers.

MEDIUM PRIORITY | 2-3 MONTHS

Well-suited to irrigation with appropriate planning for seasonal variability. Existing surface water entitlements provide a substantial base, with groundwater offering additional supplementary potential if required during peak demand.

Appendix A

Licence Detail

The following table presents the full licence details for surface water allocations registered to this property.

LICENCE	ALLOC. ID	OFFTAKE	WATERCOURSE	VOL. (ML)	SURETY	TAKE PERIOD	MAX DAILY
501322	16699	13707	Western Dam (U/N Trib of Lobster Rivulet)	132	6	1 Dec - 30 Apr	3
501322	370	736	Western Dam (U/N Trib of Lobster Rivulet)	130	5	1 May - 30 Nov	1
501292	16160	13300	Eastern Dam (U/N Trib of Cubits Creek)	140	5	1 May - 31 Oct	1

TABLE A1. FULL SURFACE WATER LICENCE RECORDS FOR THIS PROPERTY.

Water is sourced from artificial drainages on the property, which connect downstream to Cubits Creek and the Lobster Rivulet, a major tributary within the Mersey River system. Maximum daily take is calculated per NRE Tasmania formula: for Surety 6, (Period Amount ÷ Days) × 3, rounded up; for Surety 5, (Period Amount ÷ Days) × 1.5, rounded up. Maximum daily take rates apply only during restriction periods. When no restrictions are in place, there is no daily take limit, but the standard condition requiring at least 50% of instantaneous streamflow to pass downstream at the offtake always applies.

Appendix B

Bore Data Summary

The following table presents selected records for bores within 3.5 km of the property boundary, highlighting those with medium-to-high yields (5 L/s or above). Selection focuses on bores most relevant to assessing groundwater potential at this property.

BORE ID	DEPTH (M)	YIELD (L/S)	LITHOLOGY AT TARGET	DIST. (KM)	YEAR
4872	36.6	**12.63**	Gordon Limestone	0.7	1988
2318	50.2	**12.5**	Gordon Limestone (cavity @ 47m)	1.2	1983
41793	30	**10**	Gordon Limestone (cavity 18-25m)	2.3	2016
42868	90	**8**	Gordon Limestone (cavity 78-84m)	3.4	2025
4879	51.8	**6.31**	Gordon Limestone (cavity @ 33m)	1.8	1988
42865	84	**5.7**	Gordon Limestone (cavities 76-82m)	3.4	2024
4886	85.4	**5.05**	Gordon Limestone	3.3	1988
30877	50	**5.05**	Gordon Limestone (cavities 33-36m)	3.5	2002
15187	42.7	3.79	Gordon Limestone	1.5	1992
41792	72	3.7	Gordon Limestone (multiple zones)	2.5	2016
2317	85.4	0.25	Gordon Limestone (no cavities)	1.2	1983
4873	42.7	1.51	Gordon Limestone	0.5	1988

TABLE B1. SELECTED BORE RECORDS WITHIN 3.5 KM RADIUS (12 OF 34). HIGHLIGHTED ROWS INDICATE MEDIUM-TO-HIGH YIELD (5 L/S OR ABOVE).

Glossary

Surety Level

A classification system (1-7 in Tasmania) indicating the reliability of a water allocation. Lower numbers indicate higher reliability. Level 1 includes critical uses such as hydroelectric power generation. Typical licences for farming and agriculture are Surety Levels 5 and 6. During restrictions, higher-numbered (lower-surety) allocations are curtailed first.

Cease-to-Take

A regulatory direction requiring all water extraction from a watercourse to stop when flows fall below a critical threshold. Protects environmental flows and downstream users.

Karstic Aquifer

A groundwater system within limestone or dolomite rock where water flows through solution-enlarged fractures, channels, and cavities. Yields are highly variable and difficult to predict.

Megalitre (ML)

One million litres. Equivalent to the volume of water covering one hectare to a depth of 100 mm. A standard unit for water licensing in Australia.

Offtake

An authorised point where water may be extracted from a watercourse under a water licence. Each offtake has specific conditions including location, maximum daily take, and extraction method.

Water Management Plan

A statutory document that establishes water allocation limits, restriction triggers, and management rules for a specific catchment.

Dam

An engineered structure that impounds water. In Tasmania, construction or modification of dams is subject to regulatory approval under the Water Management Act 1999, including a dam safety category assessment.

NRE Tasmania

Natural Resources and Environment Tasmania. The state government department responsible for water resource management, licensing, and compliance.

WIST Portal

Water Information System of Tasmania. An online platform for licence holders to submit meter readings, view allocation details, and access water-related information.

Geophysical Survey

A non-invasive investigation technique used to map subsurface geological features. In groundwater exploration, it helps identify potential drilling targets such as fracture zones or cavities in rock.

Soak

A shallow, unlined excavation designed to collect groundwater seepage. Unlike dams, which impound surface water runoff, soaks intercept the water table and rely on subsurface inflow. Common on Tasmanian farms as supplementary stock water sources.