

TransAlta Water Right Acquisition: Phase I Feasibility Study Update

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TransAlta Water Right Acquisition: Trust Water Program

Overview:

1. Background: TransAlta water right and connection to Streamflow Restoration Act

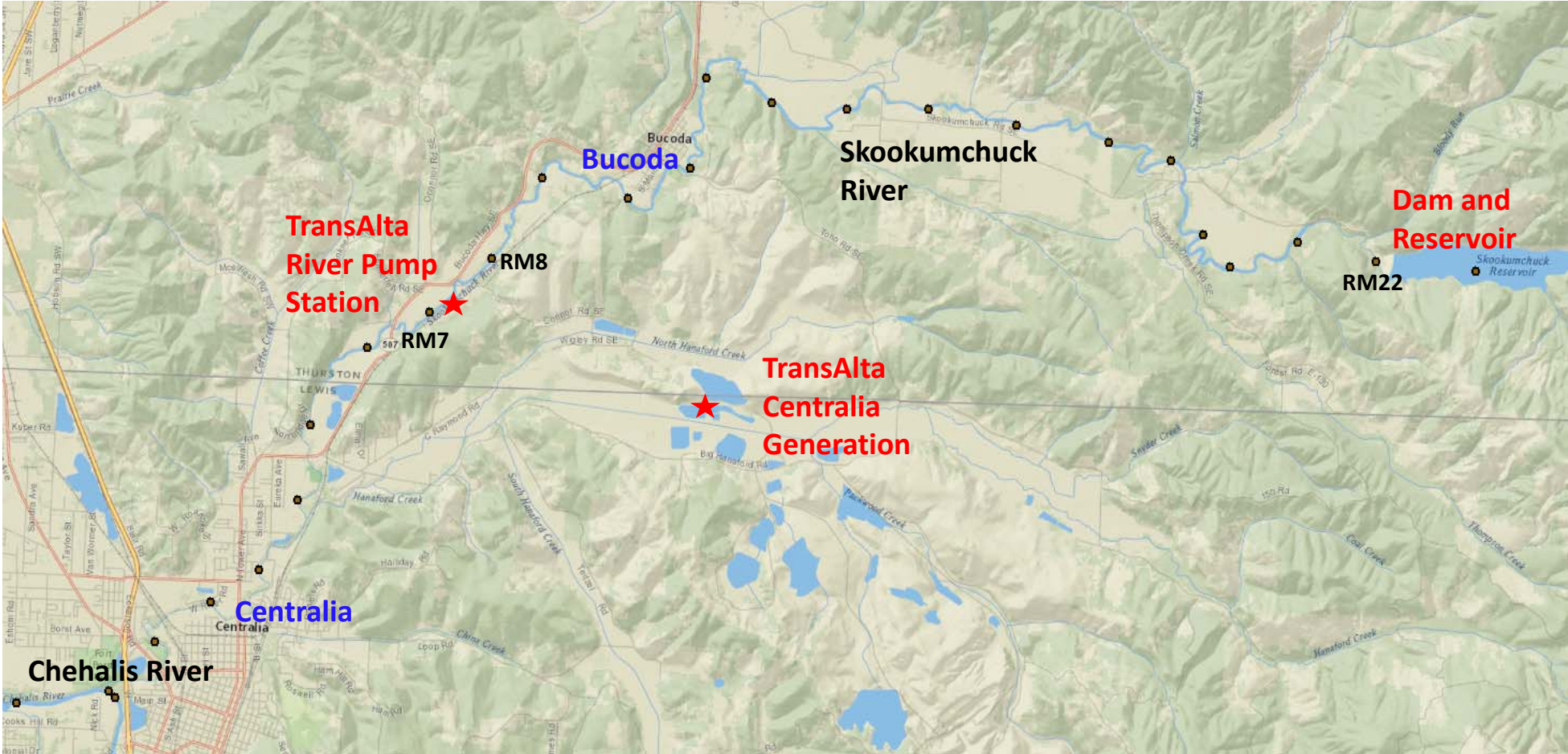
2. The TransAlta Water bank: overview and description.

3. How did Ecology determine how big the bank would be?

4. How do allowable future withdrawals compare to historical withdrawals?



Shannon, B., 2011. <https://www.theolympian.com/news/politics-government/article25297960.html>



TRANSALTA WATER RIGHT CERTIFICATE TRANSFER TO TRUST WATER RIGHT PROGRAM

- TransAlta certificated water right 51.6 cubic feet per second and 28,033 acre feet/year for power generation use year-round + reservoir certificate 35,000 acre feet/year industrial use (1966)

- The certificate pre-dates instream flow rule BUT the flow regimen is established by 1998 Agreement with Washington Fish and Wildlife.
 - Required water releases
 - Funding for hatchery operations
 - Fish handling and collection facilities

CHEHALIS WATERSHED MANAGEMENT PLAN UPDATE PER STREAMFLOW RESTORATION ACT

- Chehalis Basin Partnership + Quinault developed an updated Watershed Plan under the SRA (2020)
- Estimated future exempt well consumptive use through 2040 = 504.8 acre-feet/year
- Net Environment Benefit (water use offset) project list included acquisition of TransAlta trust water right as “largest and highest certainty” for offset (2,898 acre feet/year)
- Quinault received SRA grant to explore feasibility of purchasing TransAlta water right (2020)
 - Extent and validity analysis
 - Evaluation of effectiveness for instream flow
 - Appraisal of fair market value of TransAlta water right

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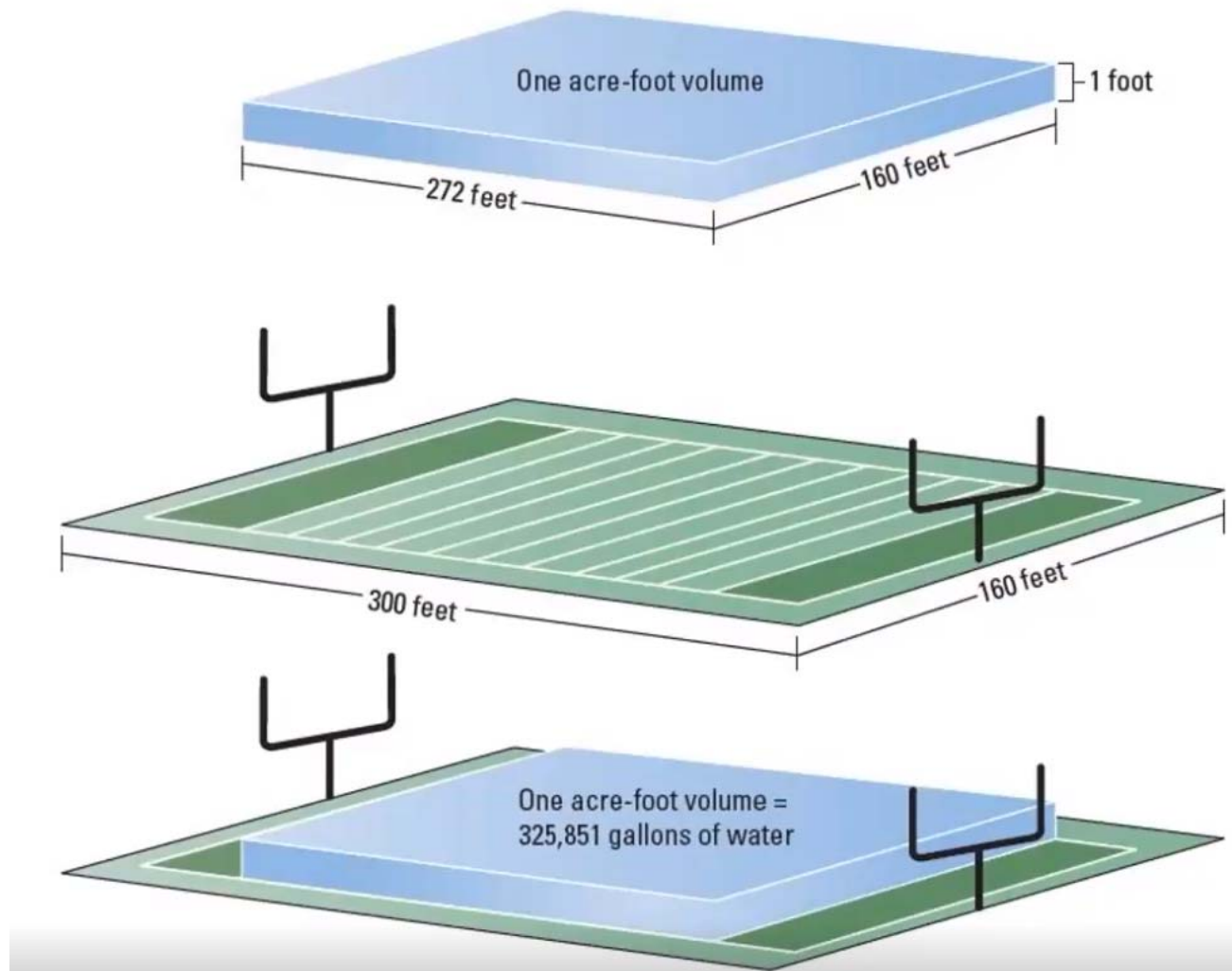


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There are currently 46 water banks in Washington. Here are the largest 10:

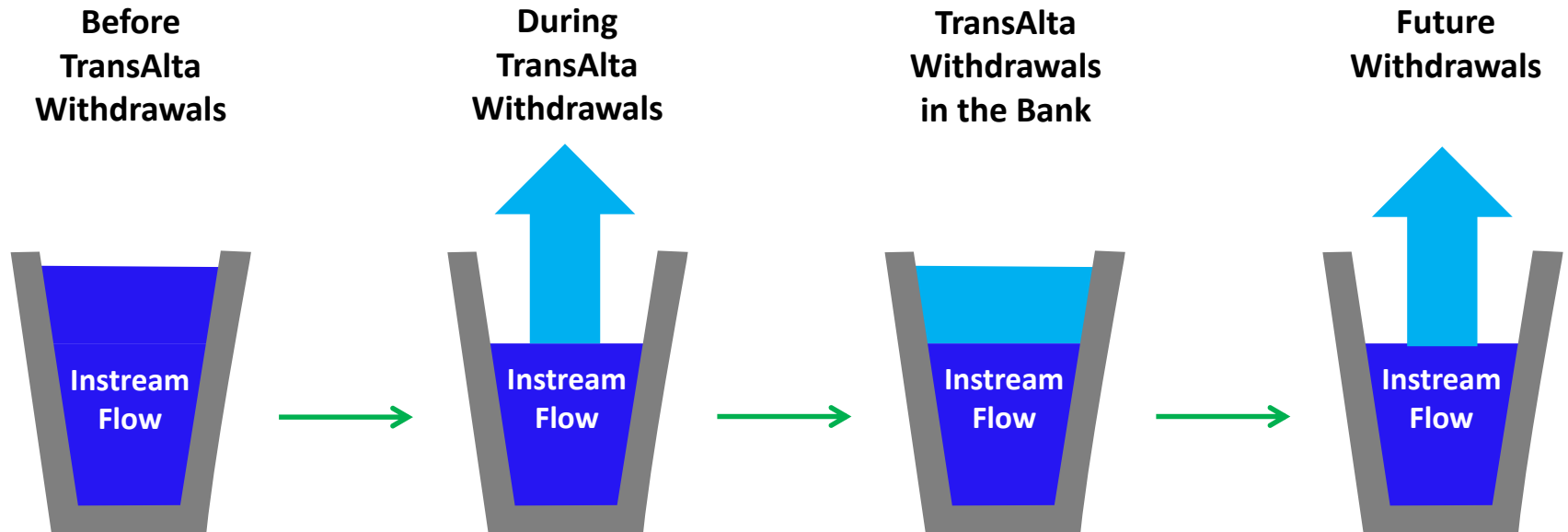
Water Bank Name	Starting Amount (acre-ft/yr)
Oroville-Tonasket Irrigation District	33,070
TransAlta	26,631
Ecology (Lake Roosevelt)	25,000
Selah-Moxee Irrigation District	11,570
Ecology (Sullivan Lake)	9,333
Ecology (Walla Walla Leases)	4,170
Ecology (Georgia-Pacific)	2,501
New Suncadia (Swauk-First Creek)	676
Benton County	425
New Suncadia	419

Source: <https://ecology.wa.gov/Water-Shorelines/Water-supply/Water-rights/Water-banks#searchbanks>. Accessed 10/1/2022.



Adapted from <https://waterknowledge.colostate.edu/water-management-administration/water-uses/> and <https://chehalisbasinstrategy.com/wp-content/uploads/2022/09/Skookumchuck-Webinar-092822.mp4>

How the water banking system is intended to work:



TransAlta Power Generation Overview:

Opened in 1972.

Two coal-fired boiler units. Coal was from adjacent mine until 2006.

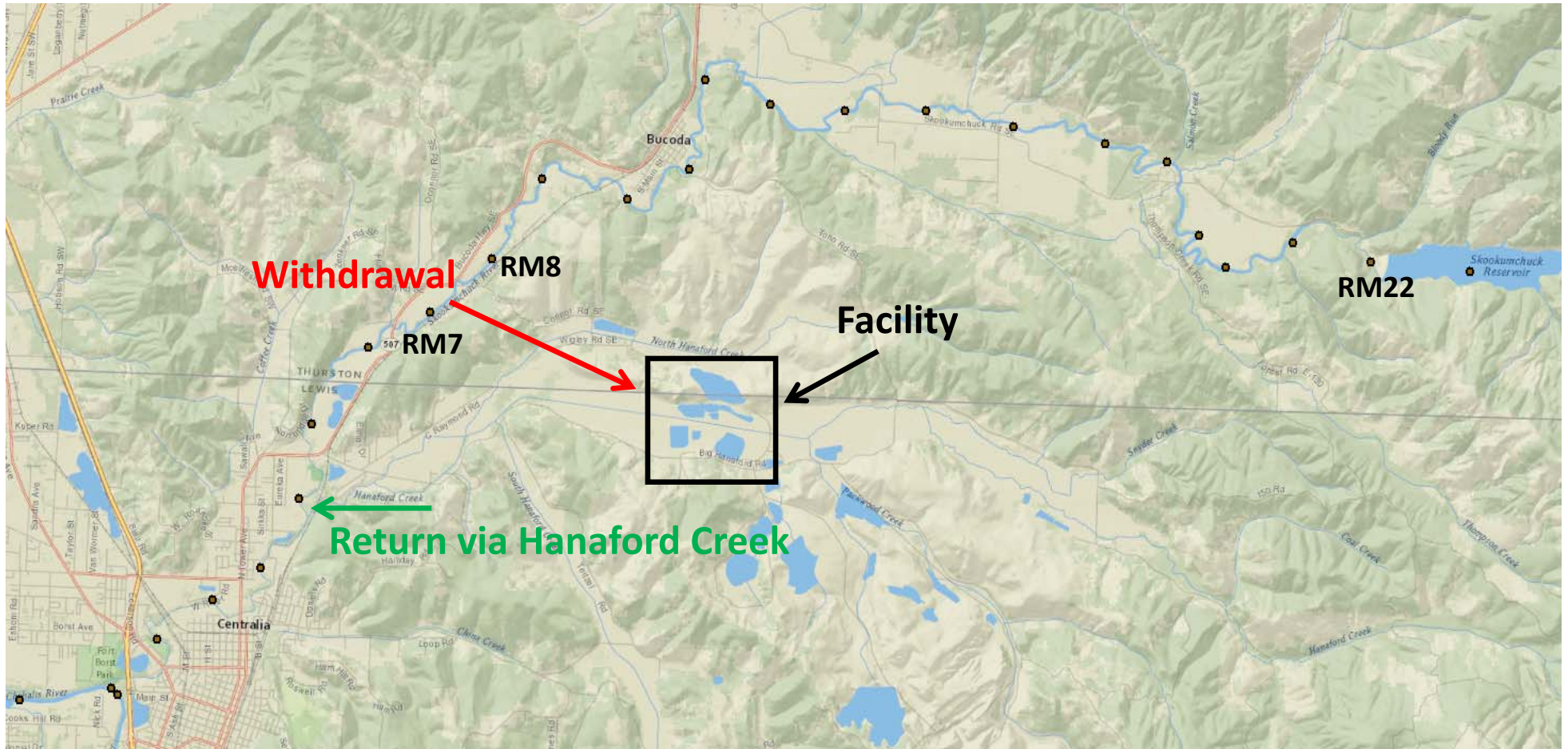
In average year, produced enough electricity for more than 600,000 homes.

One boiler unit was decommissioned in 2020 and the second unit is scheduled for decommission by 2025.

The water source for the plant is the Skookumchuck River.

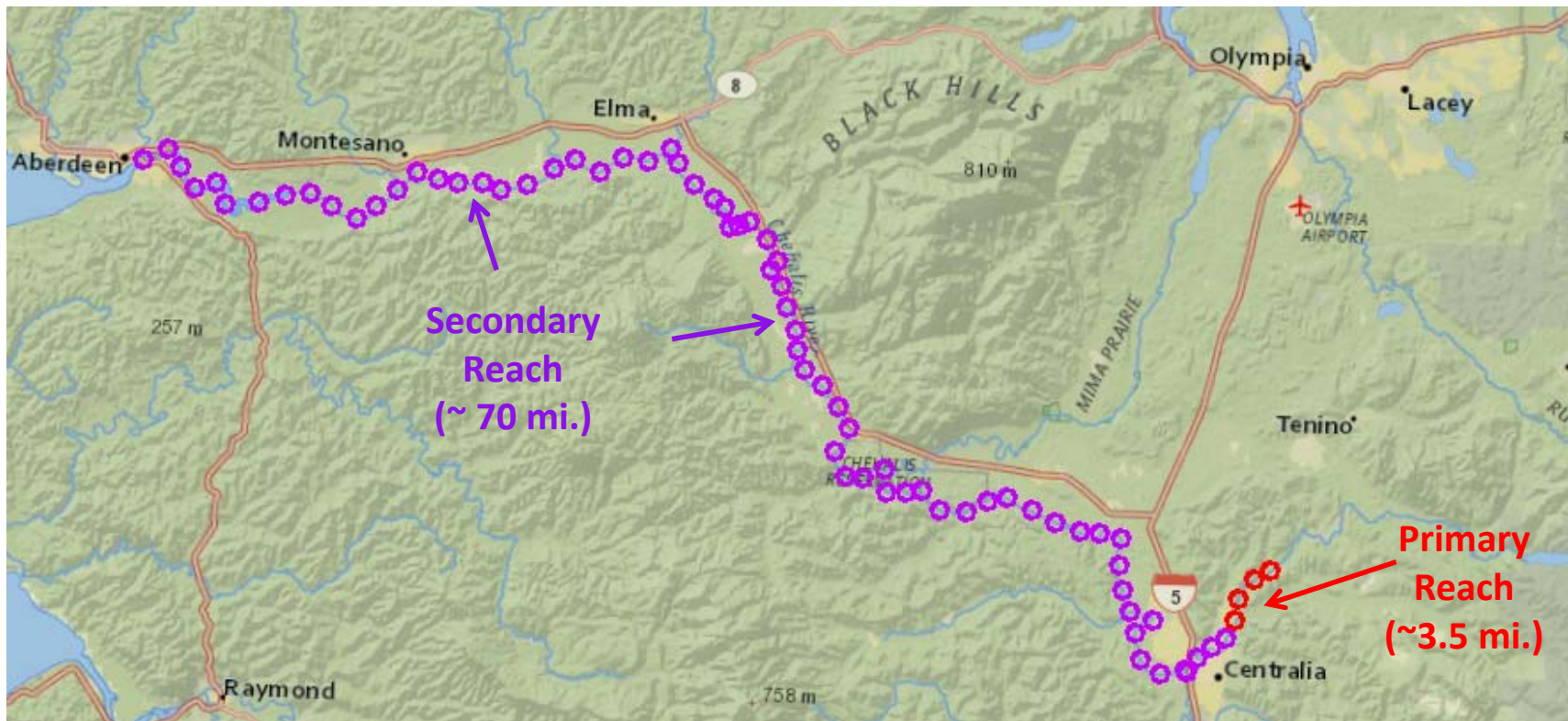


Water withdrawal, water use, and water return flow



Primary Reach: From TransAlta diversion (river mile 7.2) to return flow at Hanaford Creek (river mile 3.8)

Secondary Reach: From Hanaford Creek (river mile 3.8) to the Chehalis River (river mile 67) to Grays Harbor



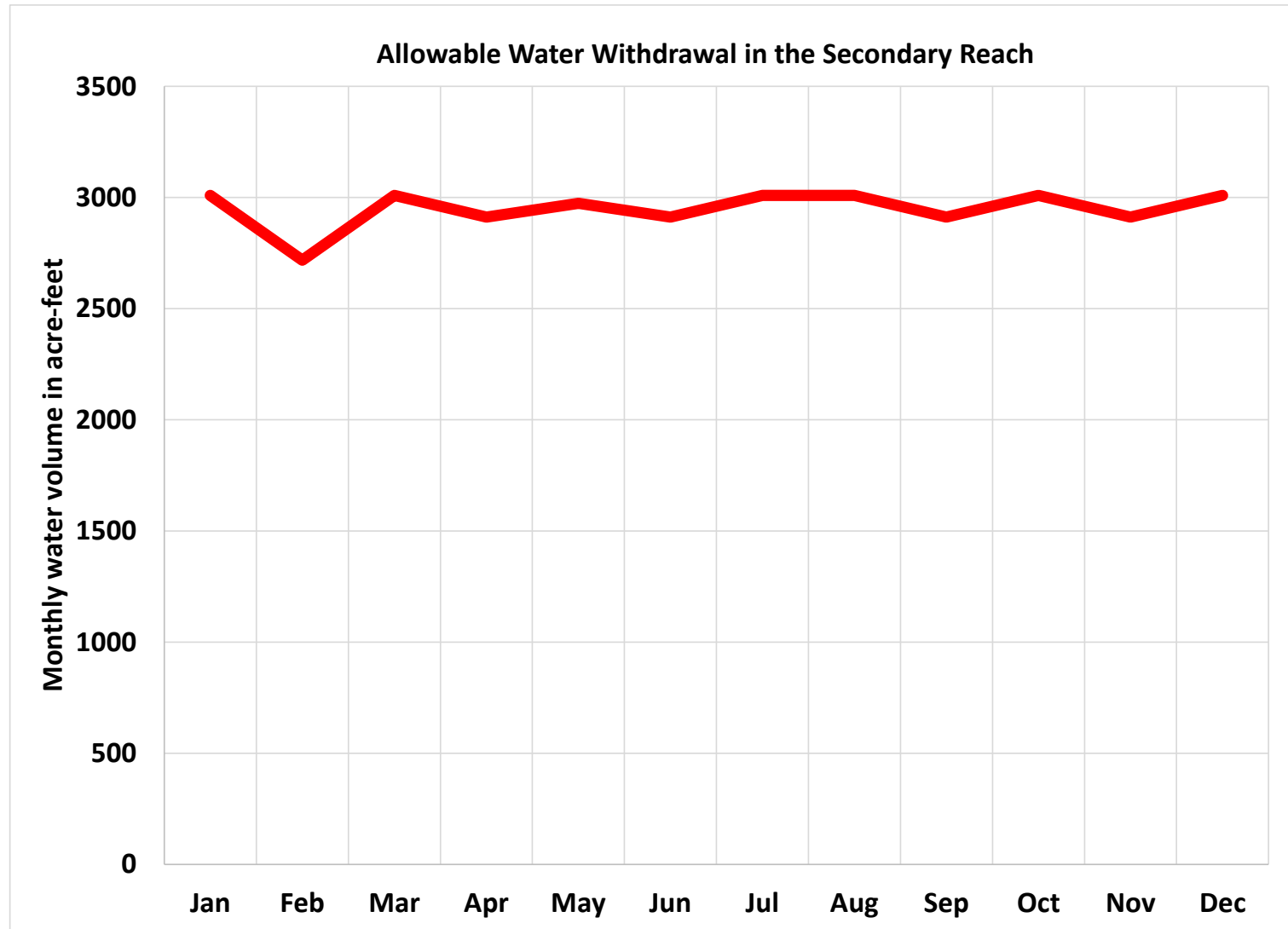
What the bank allows:

TransAlta can sell or lease water rights that allow withdrawals downstream of historical intake.

Future allowable withdrawals are prescribed on a monthly basis.

The total annual withdrawal is limited to 26,630 acre feet in the secondary reach.

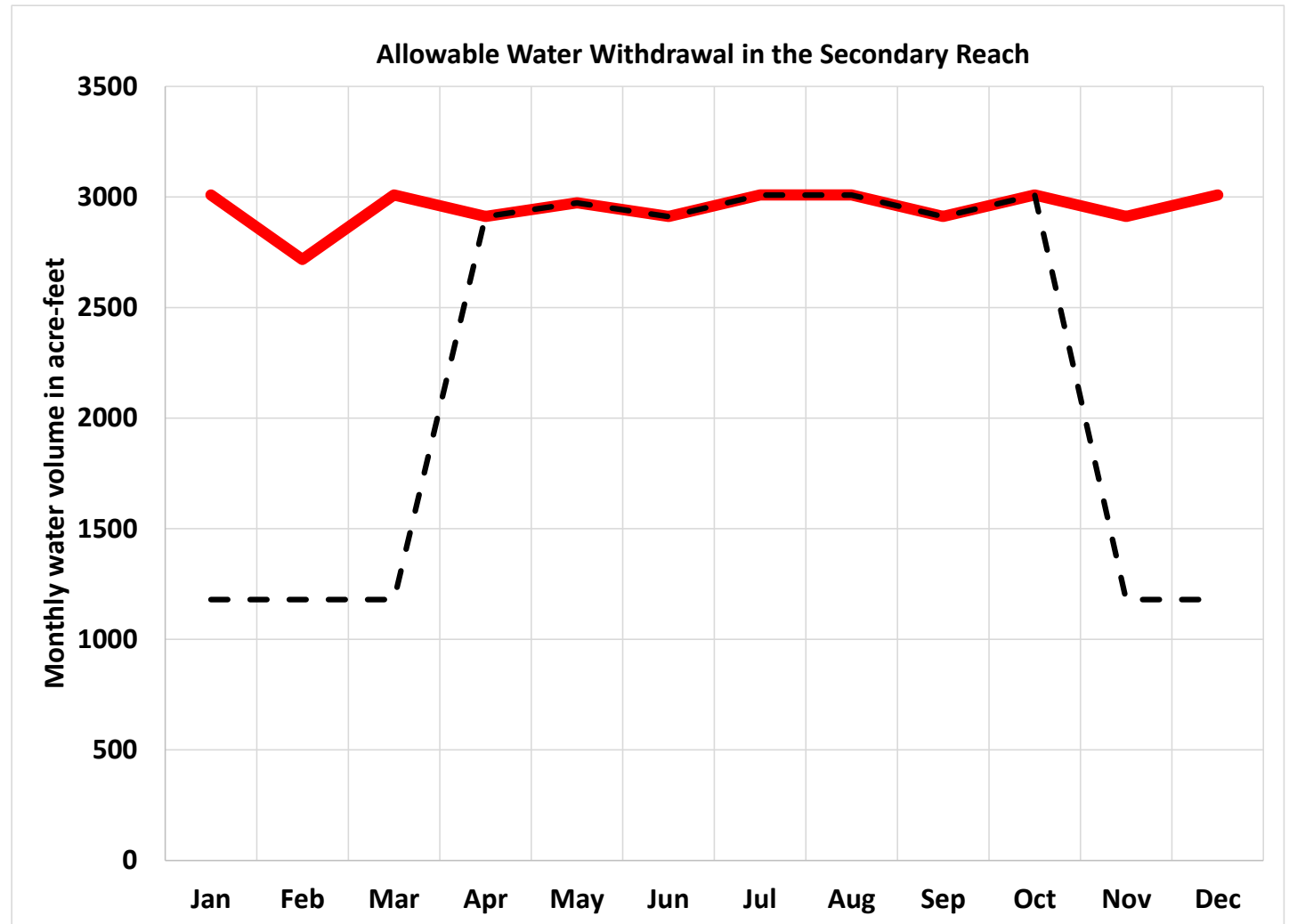
The purchased rights keep the original priority date (1966).



An example of allowable water withdrawals in the secondary reach.

Total annual withdrawal:
26,630 acre-ft.

Note: this pattern of
withdrawals can occur
every year.



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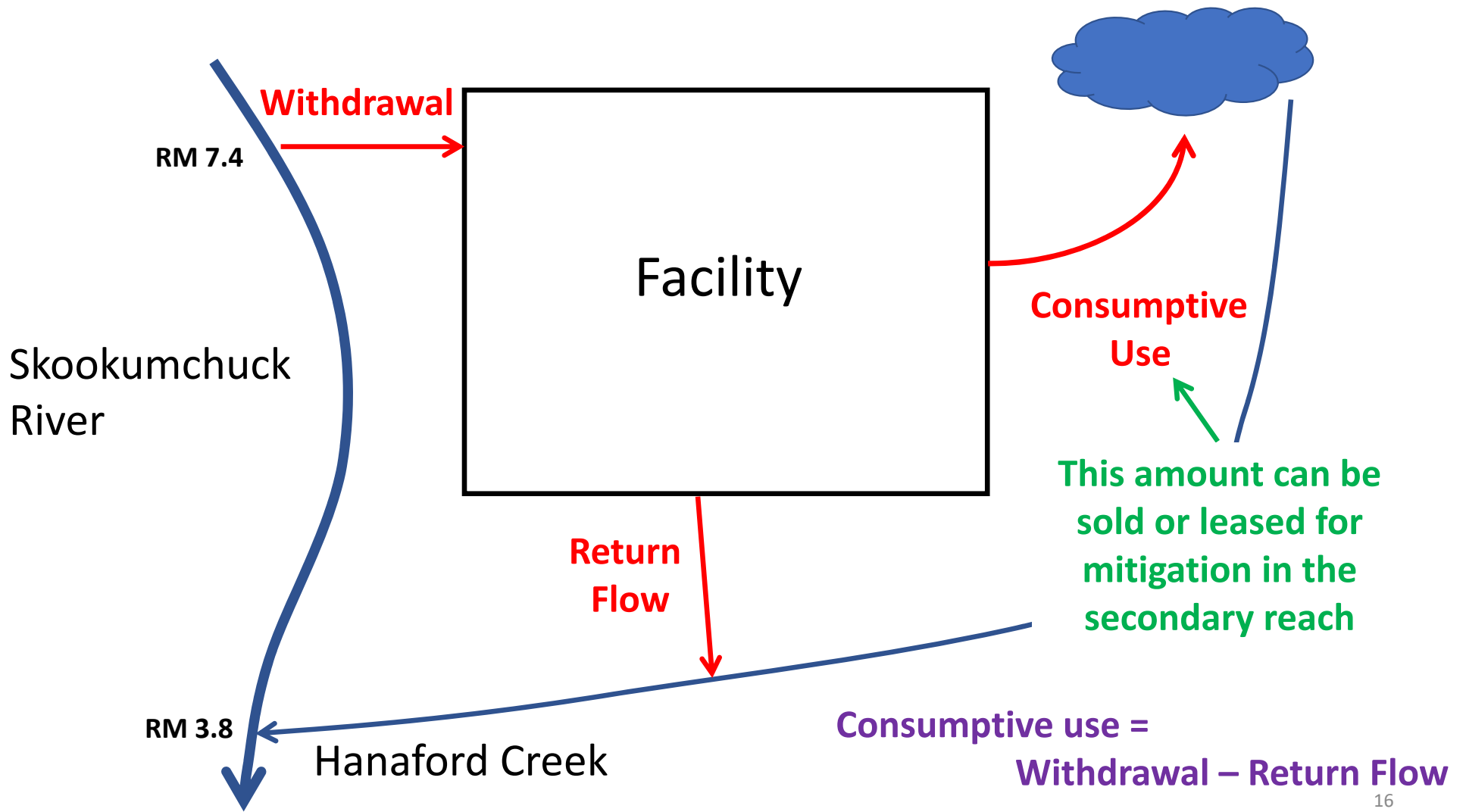
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$$\text{Consumptive use} = \text{Withdrawal} - \text{Return Flow}$$

Difficult to
measure directly

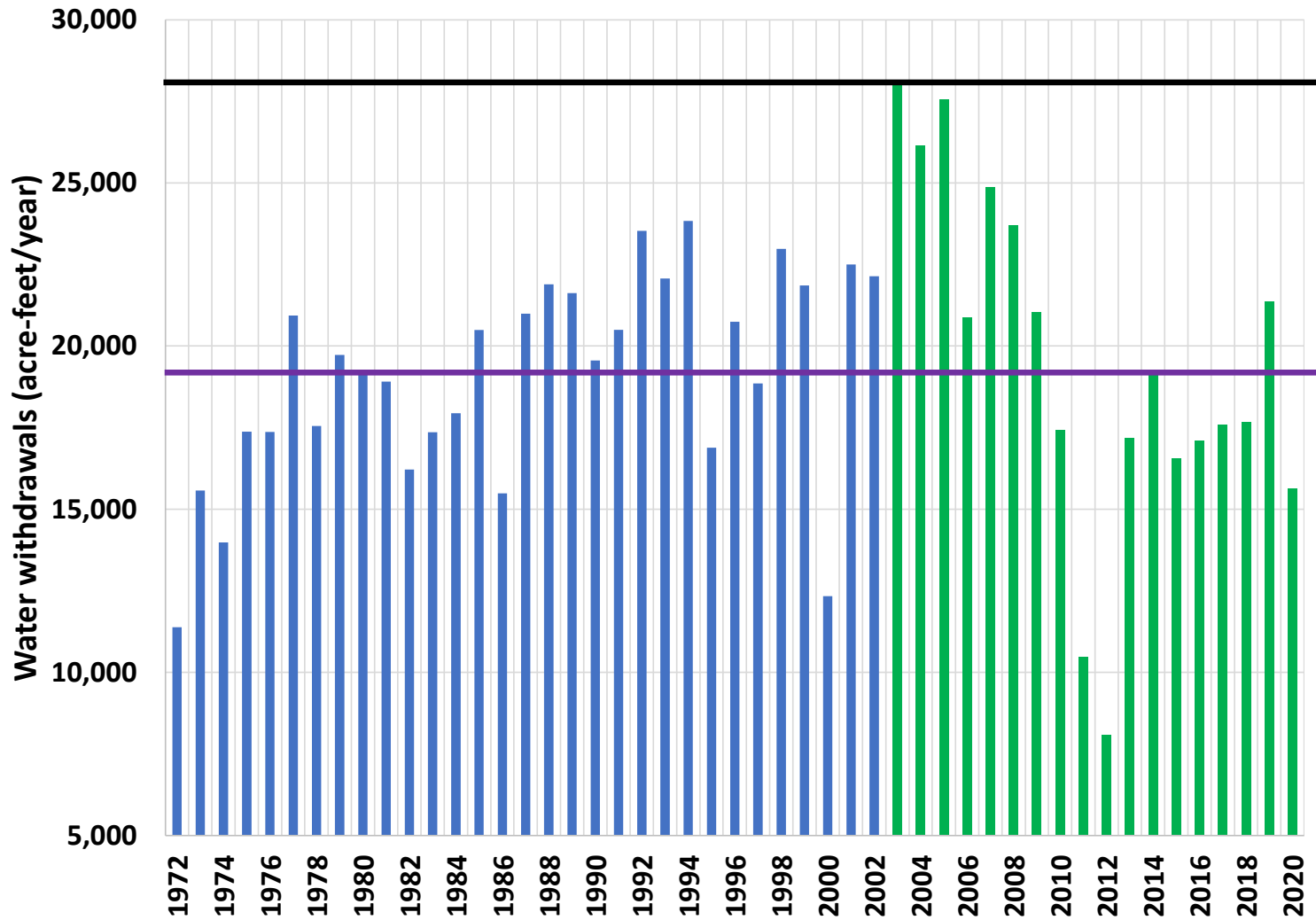


Meter data available after 2002



No reliable data,
especially from
years with
highest water
use.

Consumptive use = **Withdrawal** – Return Flow



Maximum: 28,033

Average: 19,227

Typically: “averaged over the two years of greatest use within the most recent five-year period.”

$$\text{Consumptive use} = \text{Withdrawal} - \text{Return Flow}$$

Difficult to measure

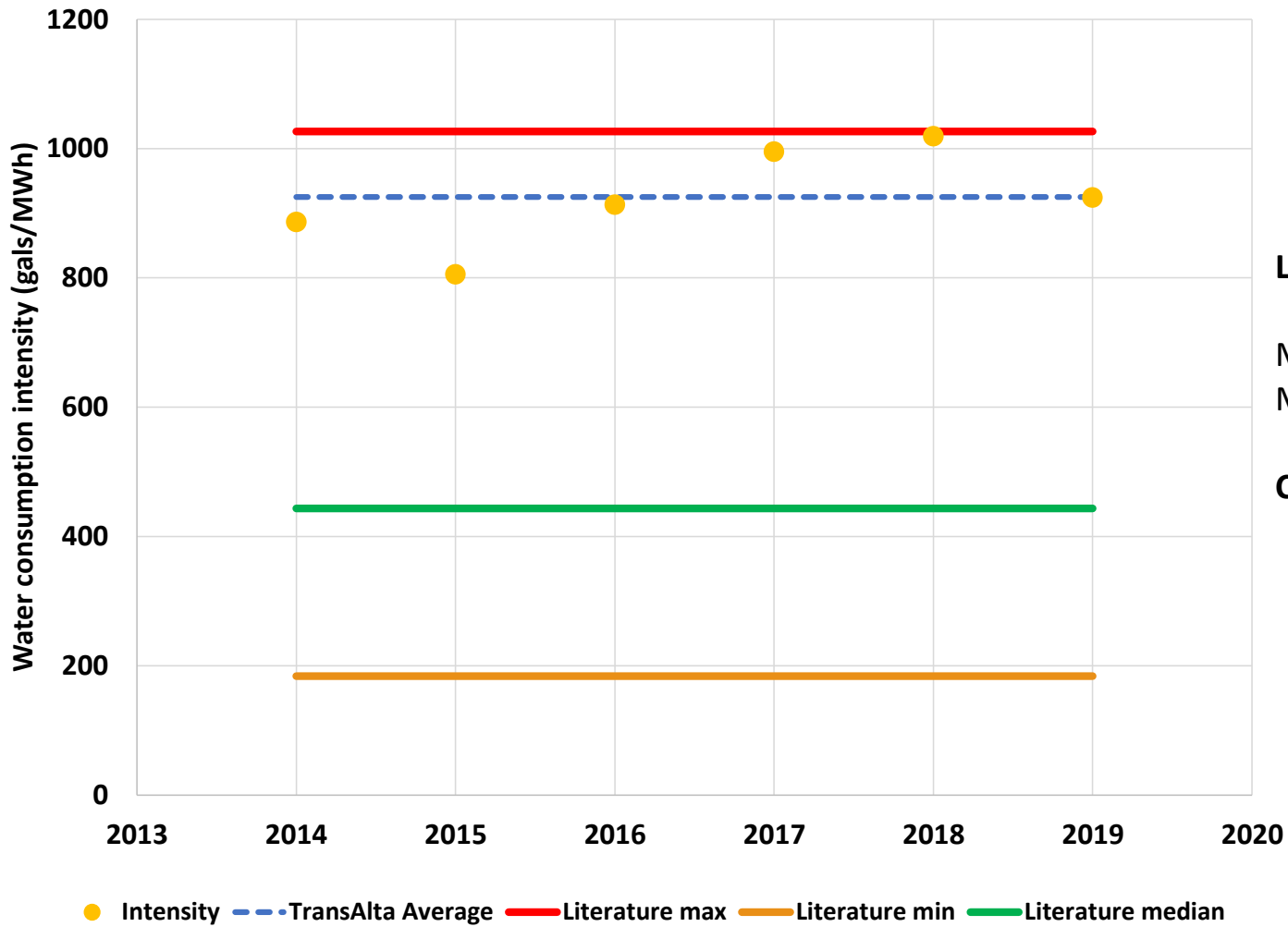
Meter data

No reliable data

- Relatively common situation in agricultural applications.
- Approach is to estimate consumptive use based on typical practice.
- For systems similar to TransAlta: ~80% consumptive use.
- Ecology ROE: 95%



Trans Alta's consumptive use relative to literature values



Literature review: 210 facilities

Median withdrawal: 569 gals/MWh

Median consumption: 443 gals/MWh

Consumptive use: 78%

Uncertainty in consumptive use

Consumptive use = **Withdrawal** – **Return Flow**

↑
2003
data

↑
2014-2020
data

Water withdrawal data from 2003. Data for return flows are from 2014 to 2020. Water use patterns had changed between these periods:

- Coal mining was occurring in 2003. Water from the power plant was used in the coal mining operations. The coal mines were shut down in 2006.
- Extended periods of no power generation in 2014-2020, yet high water consumptive values reported. How this water was consumptively used is unclear.

Ecology assumed consumptive use=95% of withdrawal (return flow=5% of withdrawal). This is a high value compared to other similar facilities.



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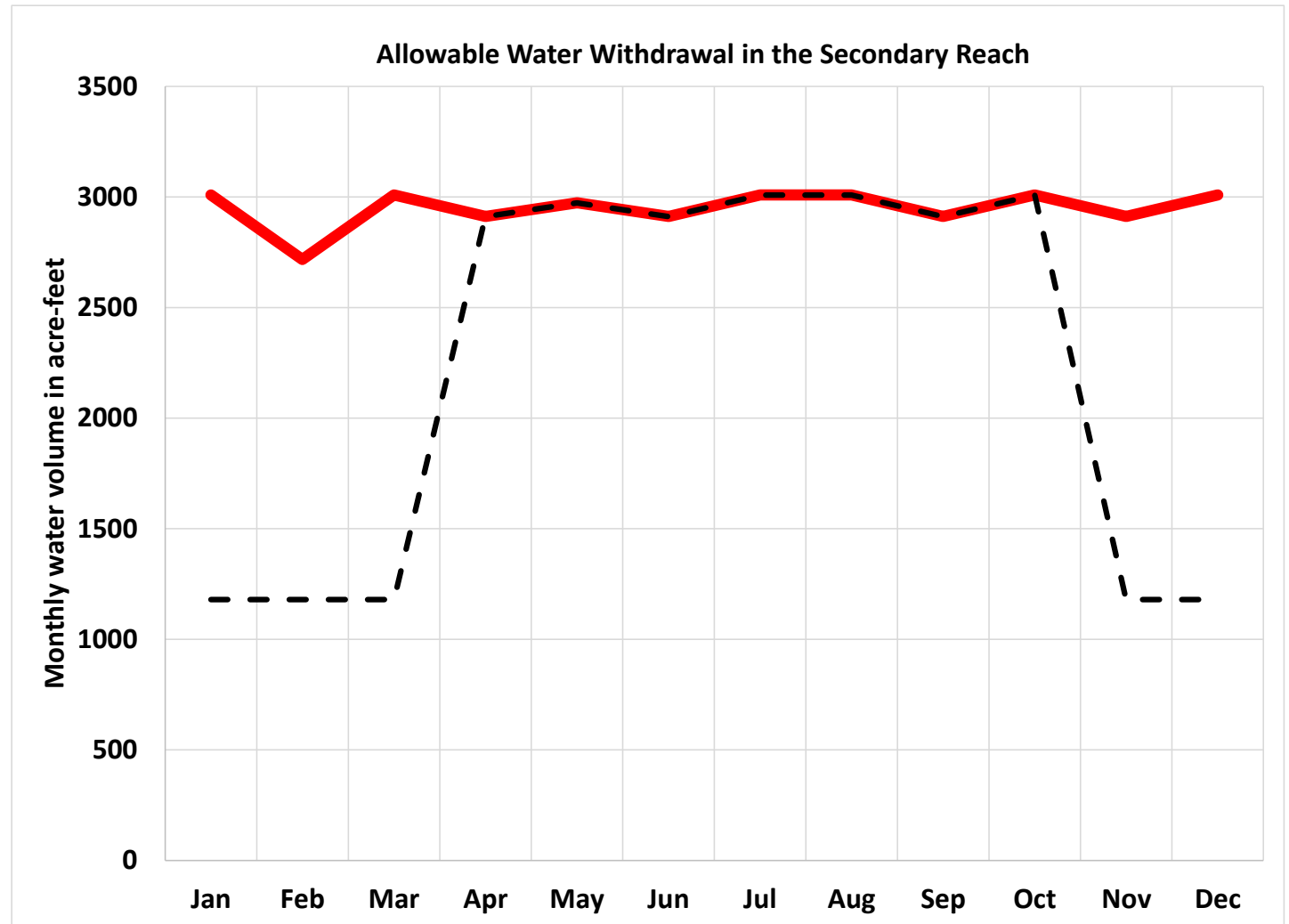


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An example of allowable water withdrawals in the secondary reach.

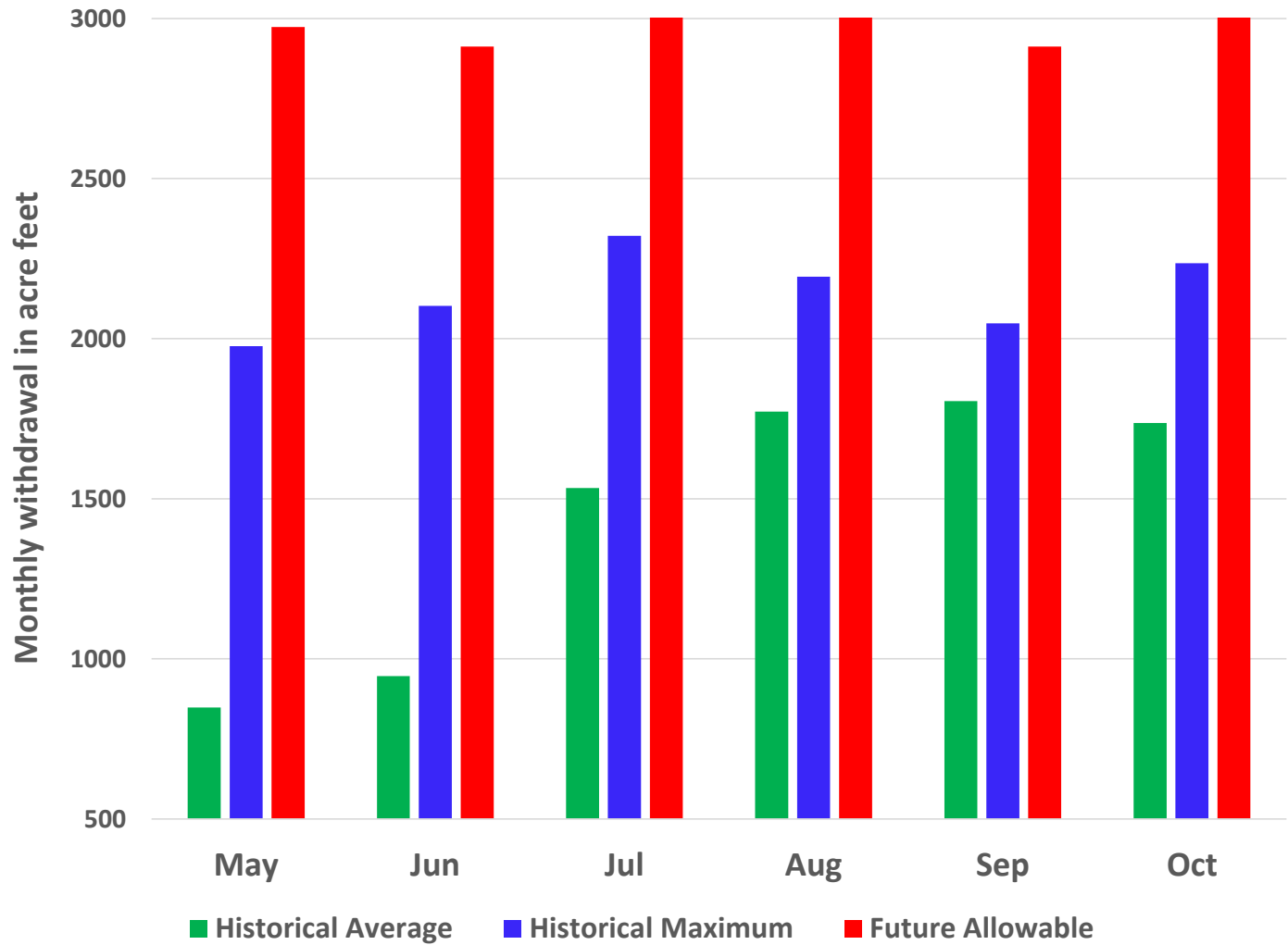
Total annual withdrawal:
26,630 acre-ft.

Note: this pattern of withdrawals can occur every year.



Comparison of past and allowable future summer withdrawals (Consumptive use 85%)

Historical withdrawals in the secondary reach were calculated using metering data from 2002 to 2019 and assuming 85% consumptive water use.



Conclusions from the consumptive use evaluation:

1. The water bank is based on the single-year maximum withdrawal of 28,033 acre-feet. The average withdrawal over the period of record is 19,200 acre-feet.
2. The consumptive use value used in the ROE is 95% of the water use in 2003. A more defensible value would be in the range of 80% to 90%.
3. Allowable withdrawals during May-October are more than twice the average withdrawals from available data and about 40% higher than the historical maximum withdrawals.



The TransAlta water bank:

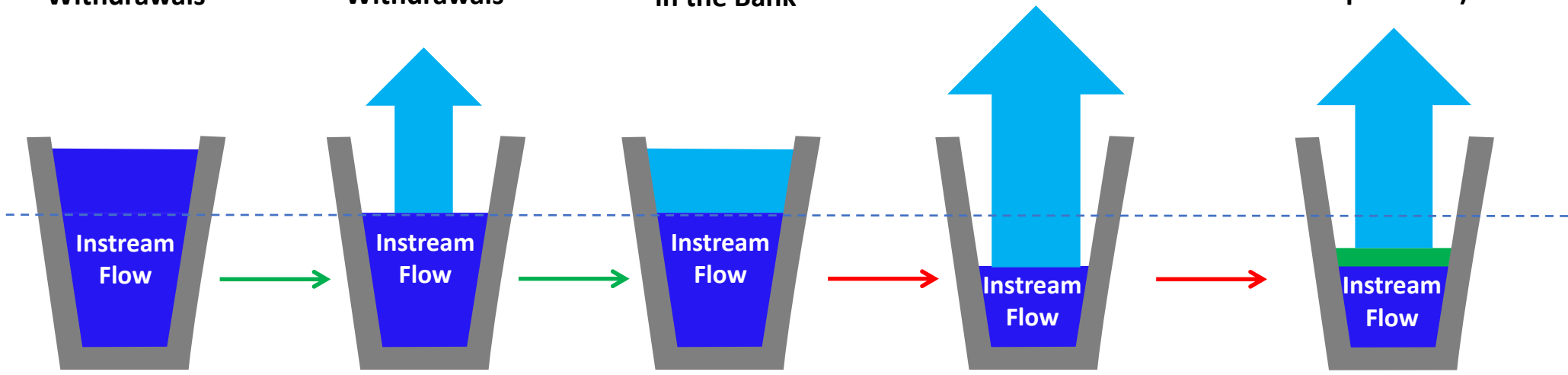
Before
TransAlta
Withdrawals

During
TransAlta
Withdrawals

TransAlta
Withdrawals
in the Bank

Future Withdrawals
(No mitigation
purchase)

Future
Withdrawals
(10% mitigation
purchase)



Next Steps/Ongoing Work

- Compile data describing current and historical flow conditions
- Compile data describing existing water right permits
- Evaluate future flow conditions
 - Reservoir operations
 - Climate impacts