

Cox, Sharla

From: Cefalo, James
Sent: Thursday, November 29, 2018 1:11 PM
To: Del Kohtz (del@idahowatercompany.com); Greg Sullivan; Travis Thompson; jar@idahowaters.com; 'Kent Fletcher'
Cc: Cox, Sharla
Subject: Application for Transfer 82746 (Idaho Water Company) - IDWR Staff Memo
Attachments: Application 82746 - Staff Memo.pdf

Dear Parties,

Attached is a staff memo prepared by Jennifer Sukow evaluating the technical information provided with Application 82746. The protest period for the application ended on November 5th and the Department has not yet scheduled a pre-hearing conference. Sharla Cox will contact you in the coming weeks about your availability in January and February. We can discuss this staff memo during the pre-hearing conference.

James Cefalo
Water Resources Program Manager
IDWR Eastern Region
(208) 525-7161

MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: November 26, 2018
To: James Cefalo, Water Resources Program Manager
Cc: Sean Vincent, P.G., Hydrology Section Manager
From: Jennifer Sukow, P.E., P.G., Hydrology Section
Subject: Hydrology staff review of application for transfer 82746

This memorandum summarizes my review of application for transfer 82746, which requests to transfer a portion of groundwater right 29-7006 from a location in Marsh Valley to a location in the lower Portneuf River Valley (Figure 1). The transfer proposes changing the water use from seasonal irrigation use to year-round industrial use. The applicant's consultant, Brockway Engineering, PLLC (Brockway), submitted a hydrologic analysis in support of the application. You requested hydrology staff review the analysis submitted by Brockway.

The proposed points of diversion (PODs) are located within the lower Portneuf River Valley (LPRV) aquifer system as described by Welhan (2006)¹. The LPRV aquifer is hydraulically connected to the eastern Snake Plain aquifer (ESPA) and there is not a definitive boundary at the transition between the aquifers. Figure 2 shows the location of the proposed PODs, the LPRV aquifer as delineated by Welhan (2006), and the ESPA area of common groundwater supply. Note the northern portion of the LPRV aquifer overlaps with the ESPA area of common groundwater.

Between the Portneuf Gap and Batiste Road (Figure 2), the Portneuf River is perched and is not hydraulically connected to the aquifer (Welhan, 2006). Figure 3 shows a conceptual cross-section of the LPRV (Thackray, 2010)². The bedrock constriction in Figure 3 is located in the vicinity of Red Hill, which is shown for reference on Figure 2. The proposed PODs are located in the lower

¹ Welhan, 2006, *Water Balance and Pumping Capacity of the Lower Portneuf River Valley Aquifer, Bannock County, Idaho*. Staff Report 06-5, Idaho Geological Survey, Moscow, Idaho, 33 p.

² Thackray, G., 2010, *Hydrology and Vulnerability of the Lower Portneuf Valley Aquifer*. Idaho State University Department of Geosciences, 30 slides.

end of the aquifer system, where there is little water in the Bonneville Gravels, and most production wells obtain water from confined aquifers (Figure 3).

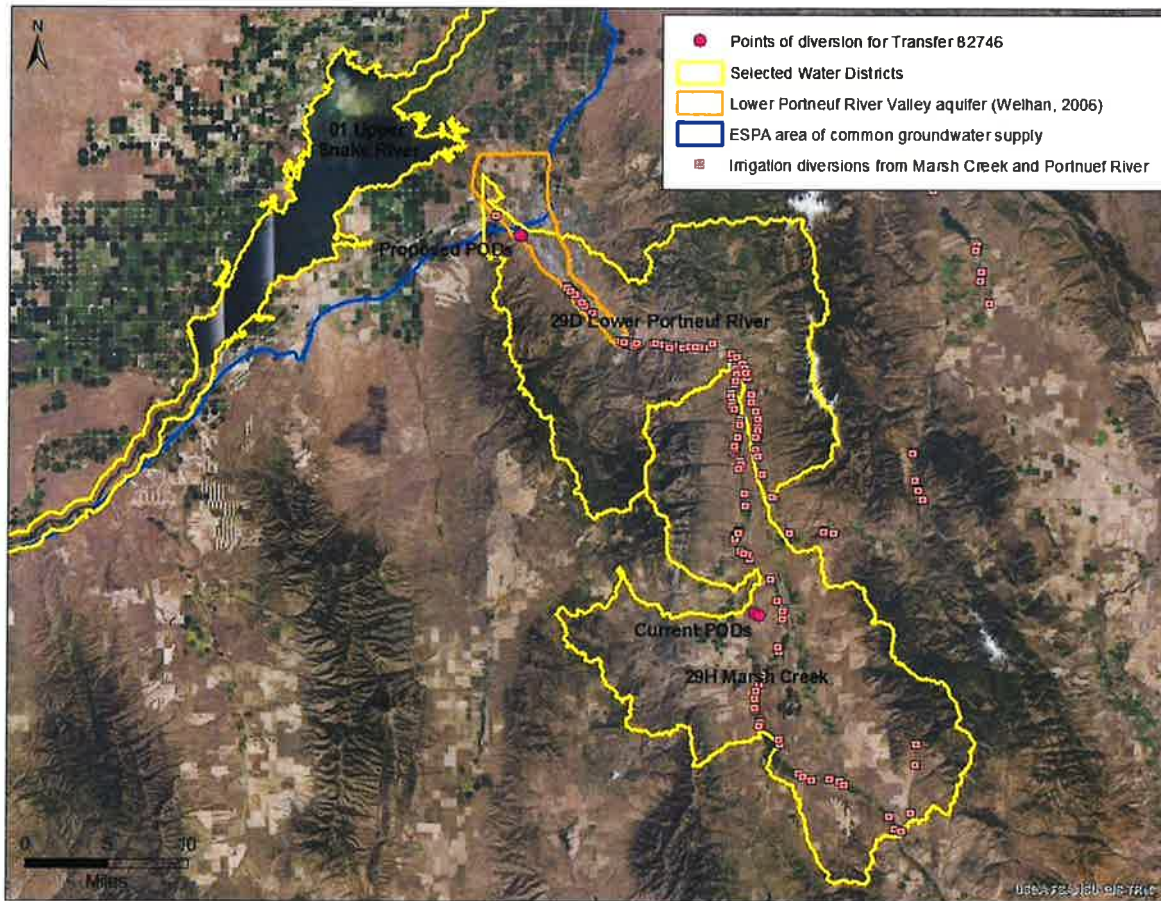


Figure 1. Location of current and proposed points of diversion.

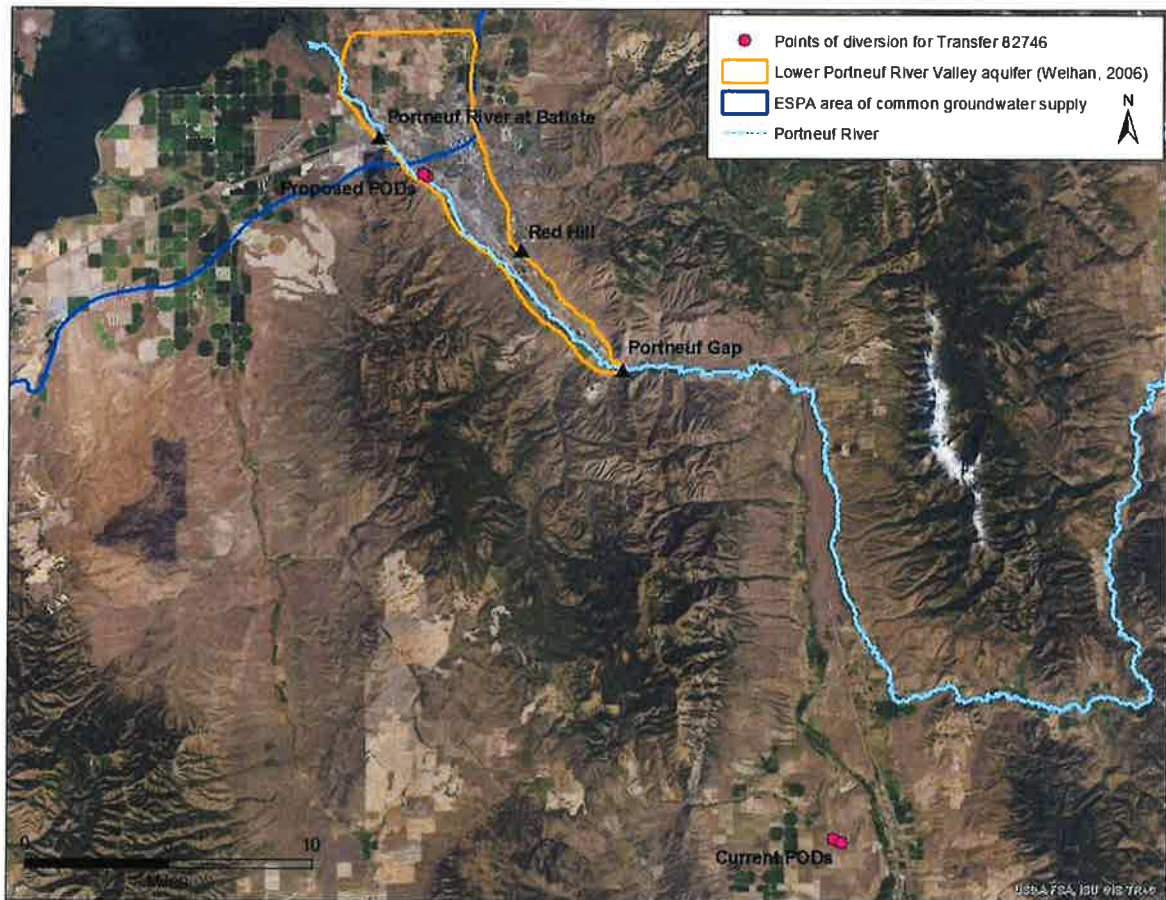


Figure 2. Location of points of diversion and the LPRV aquifer system.

The Lower Portneuf Valley Aquifer System

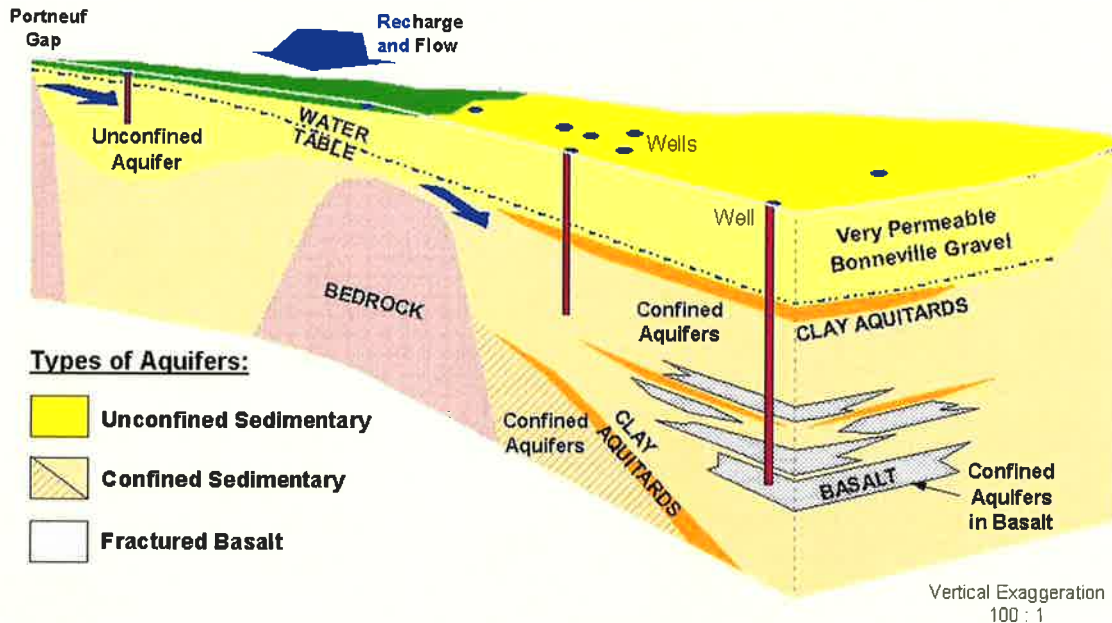


Figure 3. Cross-section of LPRV aquifer by John Welhan, Idaho Geological Survey (from Thackray, 2010)

In the hydrologic analysis submitted with the transfer application, Brockway argues that 471.5 acre-feet per year of groundwater not pumped at the existing point of diversion (POD) will accrue to streamflow in Marsh Creek and be conveyed down the Portneuf River. Brockway further argues that groundwater pumped from the proposed PODs will result in depletions to the Portneuf River at a location approximately 380 feet to the west of the PODs, and that at least 50% of the pumped groundwater will come from the Portneuf River within 24 hours. Brockway also acknowledges that the Portneuf River is perched and does not interact with groundwater at this location, which contradicts the assumptions of the stream-aquifer interaction analysis submitted by Brockway.

I disagree with the underlying assumptions in the hydrologic analysis submitted by Brockway and have the following comments:

1. Brockway's stream-aquifer interaction analysis assumes the Portneuf River is hydraulically connected to the aquifer at a distance of 380 feet from the proposed PODs. Because the Portneuf River is perched between the Portneuf Gap and Batiste Road, this

assumption is incorrect. The nearest location at which the Portneuf River is hydraulically connected to the aquifer is at a distance of approximately 2.2 miles from the proposed PODs. Because the distance is much greater than assumed in Brockway's stream-aquifer interaction, the Portneuf River will not supply more than 50% of the pumped water in less than 24 hours. Depletions from pumping at the proposed location will impact aquifer storage in the LPRV aquifer and the ESPA, and will impact ESPA discharge to the Portneuf River downstream of Batiste Road and other river reaches hydraulically connected to the ESPA. Because I disagree with the distance assumed in Brockway's stream-aquifer interaction analysis, I did not review the other assumptions or calculations used in the analysis.

2. Brockway's analysis does not provide information on well construction, production zones, and water levels in the three proposed PODs, which apparently are existing wells currently used to divert water right 29-7504. The submittal includes one driller's log for an Idaho Malt Company well drilled in 1980, but does not state if this well is one of the proposed PODs. The driller's log is consistent with the lower end of Welhan's cross-section and indicates the well produces water from the confined sedimentary and basalt aquifers shown in Figure 3.
3. Brockway's analysis states, "*non-pumped groundwater from 29-7006 is discharged into Marsh Creek and is conveyed down the Portneuf River.*" Brockway's analysis does not address the timing of the impacts of not pumping at the existing POD location on streamflow in Marsh Creek and the Portneuf River, or the effect of existing surface water rights on the fate of increased streamflow in Marsh Creek. Brockway's analysis does not address the issues identified in Findings of Fact 10 and 11 of the Preliminary Order Denying Application for transfer number 79844³, which appear to also be applicable to this transfer application.
4. Brockway's analysis assumes an average consumptive use of 2.3 feet per acre per year for 205 acres to calculate the proposed diversion volume of 471.5 acre feet per year for industrial use. This assumption is based on two affidavits that state hay and grain were historically grown on the existing place of use, prior to entry into a Conservation Reserve Program contract in 1997. One of the affidavits states the property was irrigated from 1968 through 1996. Evapotranspiration (ET) data computed by the University of Idaho using Mapping EvapoTranspiration at high Resolution with Internalized Calibration (METRIC) are available for the irrigation seasons of 1986, 1992, and 1996. The METRIC data indicate

³ Preliminary Order Denying Application, In the Matter of Application for Transfer No. 79844 (Water Right No. 29-7006) in the Name of Idaho Water Company, LLC, Idaho Department of Water Resources, October 22, 2015, 7 p.

ET on the place of use for water right 29-7006 averaged 0.9 to 1.1 feet per acre during those irrigation seasons (Figure 4 through Figure 6). These values do not significantly exceed annual precipitation and do not support the volume of historic consumptive use assumed in Brockway's analysis. While METRIC ET data have only been computed for this area for three years prior to 1997, Normalized Difference Vegetation Index (NDVI) data can be viewed on Climate Engine⁴ for the years of 1984 through 1996 (Attachment A). The NDVI data indicate that consumptive use at the current place of use was relatively low for all years between 1986 and 1996, and do not support the volume of historic consumptive use assumed in Brockway's analysis. NDVI data do indicate consumptive use on a portion of the place of use was higher during the 1984 and 1985 irrigation seasons than during the 1986 through 1996 irrigation seasons.

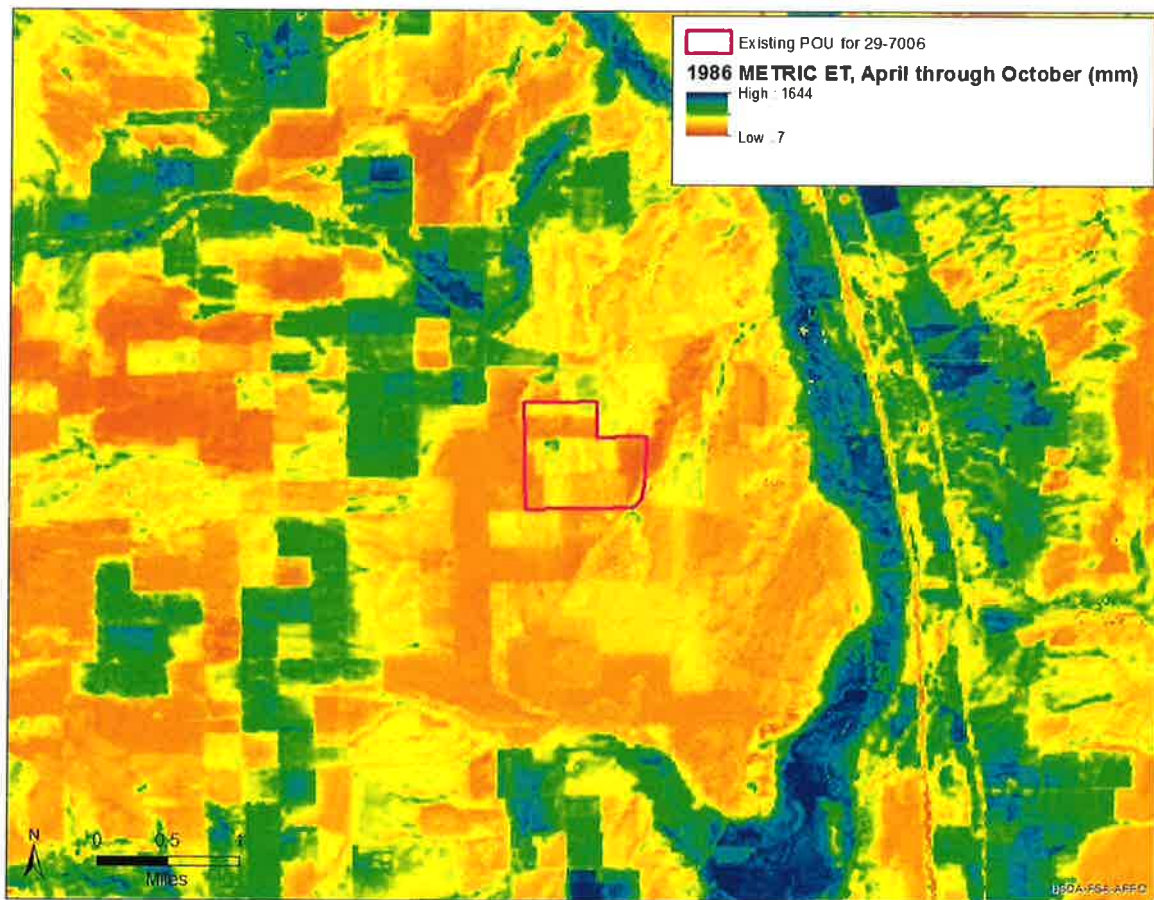


Figure 4. 1986 METRIC ET at existing place of use

⁴ Desert Research Institute and University of Idaho, <http://climateengine.org/>.

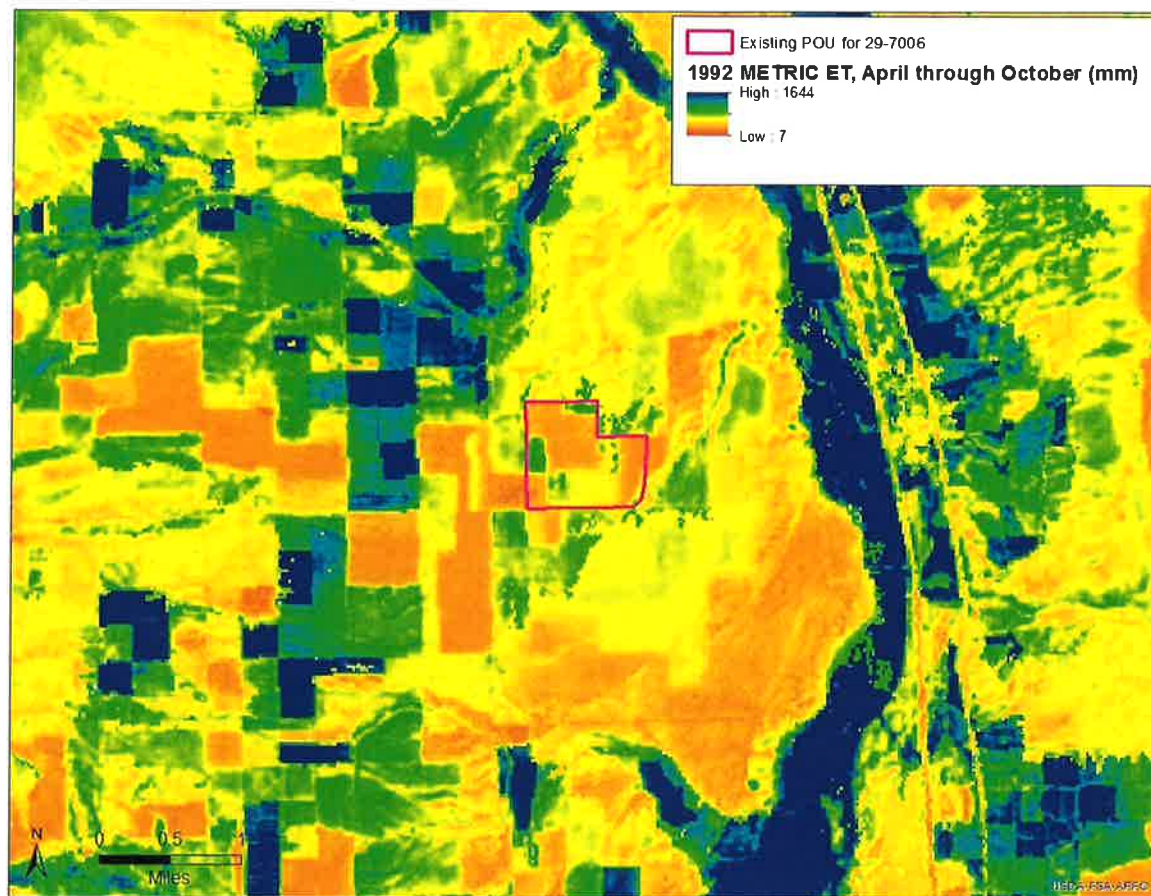


Figure 5. 1992 METRIC ET at existing place of use

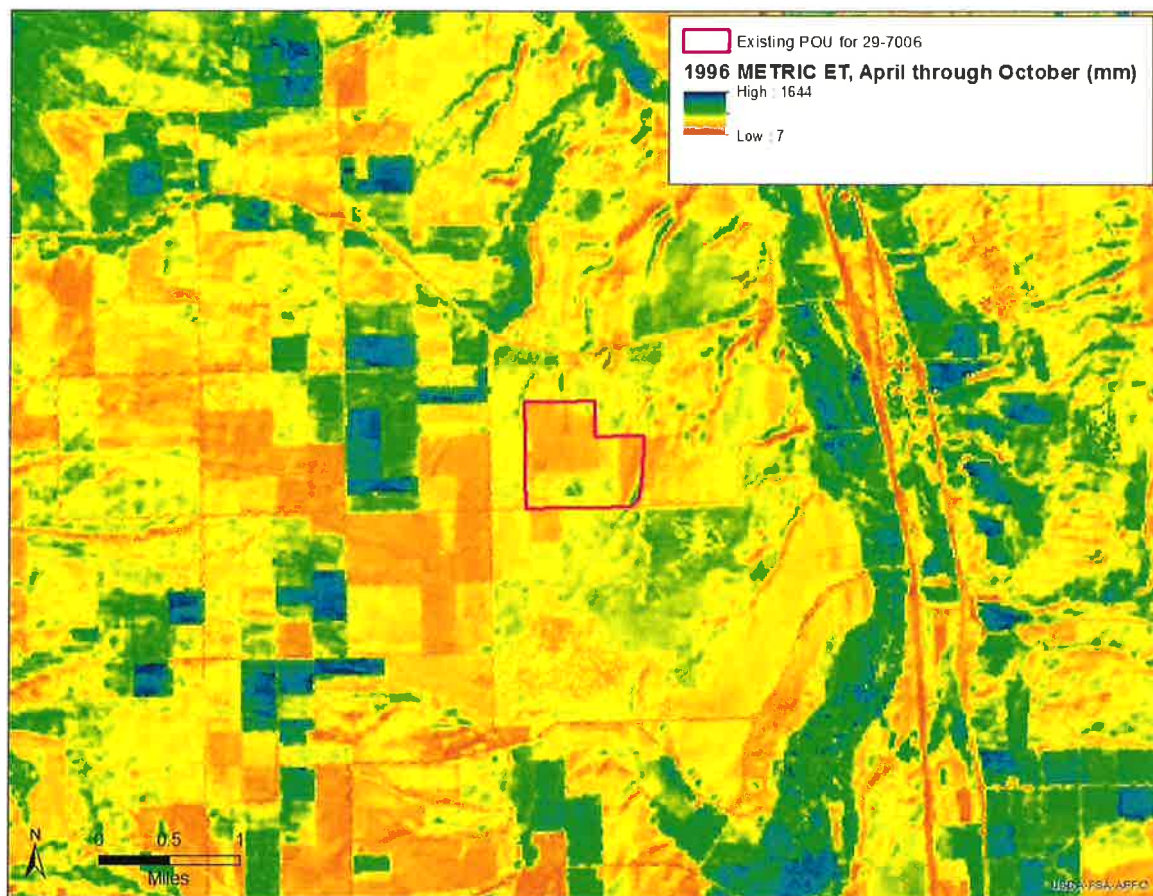


Figure 6. 1996 METRIC ET at existing place of use

ATTACHMENT A. Normalized Differential Vegetation Index (NDVI) from <http://climateengine.org/>. (Rectangle indicates approximate location of current place of use.)

