

MEMO

TO: 72-7573 Thompson Creek Mining Co.

FROM: Sandy Hemenway

DATE: 2/17/2011

REF: Review for Licensing

On 9/9/1999, the **Permit** was approved for Industrial (1.50 cfs), with a Wilderness Area Moratorium Order being signed and sent to the Permit holder on 10/26/1999. On 12/8/1999 Elam & Burke submitted a Request for Stay, and on 1/5/2000 a Preliminary Order granting request for a stay in the development was issued. The proof due date was removed because an indefinite stay in the development period was granted for the Wilderness moratorium. On **11/9/2005 an Order Rescinding the Salmon – Clearwater Basin Moratorium and Wilderness Area was issued**. On 11/21/2005 a letter from IDWR/Gary Spackman was sent to Thompson Creek Mining stating that the Director had rescinded the moratorium, allowing continued development, and beneficial use of water authorized by existing permits. On 10/1/2006 Proof of Beneficial Use was due. On **9/21/2006, Moffat Thomas/Scott Campbell submitted a Request for Extension** to submit proof of Beneficial Use. On 10/20/2006, and Extension was **approved allowing proof to be submitted on or before 10/1/2007**.

On **9/4/2007, an Application for Amendment of a Permit** was received (\$50 fee paid, receipt # S029703). There is an email dated 9/4/2007 from IDWR Corey Skinner stating that the application for amendment of permit will be treated as a licensing amendment to reflect the recommended amendments described in Scott Kings beneficial use exam (this covers the change in POU and the additional POD). On **9/20/2007, Proof of Beneficial Use** was submitted.

There was a **protest** with **BLM/Fred Price** for 72-7414 (which has a POD/POU overlap with 72-7573). This was resolved if the condition was included that stated that place of use does not include federal public lands (**Condition U42** was included for licensing--- The POU shapefile is the same shapefile as 72-7219, which does not include any Federal Public Lands owned by BLM, and is within the property owned by Thompson Creek Mining Co. taxlot information).

There also is an agreement that was signed **between the U.S. Forest Service and Cyprus Thompson Creek Mining Company**. This signed agreement was for the purposes of: (1) Identifying in-stream flow changes associated with inter-basin transfer of water from the Cyprus pit in the Thompson Creek drainage to the Mill/tailing areas in the Squaw Creek drainage and, (2) Providing augmentation to Thompson Creek when flows drop below the historic low flow level (a copy of the **4/26/1999 Agreement** is in the file; a condition was on water right 72-7414, but was not included on the License for 72-7573, since it was not included on the approved permit).

Taxlot Information which was updated 10/6/2009 shows **ownership** for the property for the POU and POD to be owned by Thompson Creek Mining Co. The Idaho Secretary of State shows Thompson Creek Mining Company Organization ID D123362, filed in July 17, 2008. The corporate officers of Thompson Creek Mining Co. are as follows: Richard Fiorini, Kevin Loughrey, Kent Watson, Vicki Byrne, and Richard DeCesare.

The **contact persons for the mine are:** Bert Doughty/Supervisor Environmental Offices, and Brent Bunker PO Box 162, Clayton, ID 83227 (208) 838-2200.

The **purpose of this water right** is for the additional pump capacity. This is the same diversion system as water right 72-7414. Since 72-7414 was licensed in 1995 for 1.11 cfs, an additional 1.50 cfs of pump capacity has been added. Water is removed and utilized in the milling process (comment taken from Application for Permit Attachment A). This water right when combined with 72-7414 will supply the amount of water required for the milling processes when other sources of industrial water are not available.

The **groundwater source is seepage water in the pit.** With deepening of the pit there has been an increase of seepage of groundwater (per 1/10/2011 conversation with Bert Doughty). Water diverted from the pit is directly correlated with contributing flows from direct precipitation, snowmelt, runoff, and tributary ground water. Climate station and stream gauging records show that water quantities entering the pit are expected to vary. In 2009 the combined index was 70.1. In 1974 it was 107.9, which is 54 percent more water that would be expected to enter the pit ($107.9/70.1 = 1.54$). The National Resource Conservation Service NRCS has 3 NRCS SNOTEL weather stations surrounding the mine. The greater the precipitation, the greater the removal of water from the pit. Removal of water that collects in the mine pit is essential to continued mine operation. Stream gauging records also demonstrate potential variability in anticipated diversion volume. The USGS maintains a stream gauging station on Thompson Creek since 1972 (site no. 13297330). The annual discharge statistics on Thompson Creek for 2009 averaged a discharge of 19.4 cfs, in comparison to 1997 which was 37.9 cfs, and nearly twice the 2009 mean discharge. Copies of the 2009 Pit Dewatering Diversion Volume Report, NRCS Snow Water Content Indexes, and USGS Thompson Creek Annual Discharge Statistics are included with the 4/28/2010 correspondence from SPF Water Engineering. Per management, **IDAHO CODE 42-228** Drilling and Use of Wells for Drainage or Recovery Purposes Excepted, would cover the years where additional water is required to be removed from the pit due to additional precipitation, run-off or seepage of groundwater.

Milling consists of the mill crushing and grinding the mined ore to fine particles, to the consistency of face powder. The milled ore/gangue powder is mixed with a liquid (water) and aerated in the floatation step. The less dense ore rises in the froth to be collected, while the gangue sinks to be discarded. Flotation separates the metallic

minerals from the gangue this way and in the case of copper/molybdenum ores separates molybdenite from copper sulphide (a binary compound of sulphuret).

A beneficial use field exam was conducted on 6/5/2007, by Scott King, SPF Water Engineering. The water diversion and use system is similar to the system described for 72-7414, with the following major differences and changes. There are 2 PODs (Sec 3 NENE/intermediate sump and 300 Hp vertical turbine Floway pump intercepts water that would otherwise accumulate before flowing down to the lower sump, and Sec 2 SWNW/deep pit sump and 140 Hp Flygt submersible pump diverts water from the lowest elevation mine pit sump and discharges to an intermediate level sump about 1/3 mile to the northwest). When the lift is not as great, a trailer mounted Gorman Rupp self priming diesel engine pump (model 16C2 F4L, 6 inch X 6 inch) is used in place of the Flygt submersible for pumping to the intermediate level sump. The actual diversion points will migrate along the axis of the mine between these 2 locations as the mine is developed. The pumps are larger and with greater flow and lift capacity than those listed in the field exam for 72-7414, to maintain adequate dewatering for continued mine operation. The water is pumped from the collection sump in the bottom of the mine pit and discharged into 10 inch pipe running 4 miles to the booster station which is 100 ft. vertically higher, with (2)-300 Hp Floway model 12JKH vertical turbine pumps. **A permanently installed Krohne Altometer magnetic flowmeter** (10 inch discharge) is located in the discharge piping of the pit booster station (averaging 1278 gpm or 2.85 cfs during the field exam). At the booster station, the turbine pumps send water to either the fresh water or reclaim water storage/head tanks about 1000 feet away, or to the tailings pond. At the storage/holding tank it is piped to the tailings pond through 4 miles of 8 inch pipe and/or to the milling site. Water is subsequently diverted from the storage/holding tanks and/or tailings pond to the mill for final use. Water can be diverted from the tailings pond to the reclaim water head tank. The mine has an hourly flow meter that can be installed on the discharge from the tailings pond, but nothing has been installed permanently. There is 2 miles of pipe from the tailings pond to the milling site. There are 24 inch and 8 inch pipe from the mill site and storage/holding tank to the tailing pond. The mill receives water from the fresh water and/or reclaim water head tanks. The Mill operates 24 hours per day 365 days per year.

According to a 4/16/2001 Memo from Shelley Keen, on page 2, it states that one set of calculations assumes the maximum potential **size of the tailings pond** is 310 acres. The second set of calculations assumes the tailings pond to be 95 acres, which is still probably in excess of historic proportions. Dave Hollingshead said the tailings pond is unlikely to ever actually reach a size of 310 acres.

The following are **POU Overlaps**: 72-7193 (Industrial from Storage, Industrial Storage, Industrial), 72-7257 (Industrial, Industrial Storage, Industrial from Storage), 72-7414 (Industrial), 72-7219 (domestic use--offices, lab, restroom, showers, concentrator site).

The following is the only **POD Overlap**: 72-7414 (both PODs)

Scott Campbell, Attorney at Law, represents the permit holder in all business matters. A copy of all correspondence is to be sent to Campbell at Moffatt, Thomas, P.O. Box 829, Boise, ID 83701-0829. Database was updated to reflect these instructions.

The 7/31/2006 **Proposed IDFG Application Review Process for the Salmon Region** asks if the project severely impacts aquatic species of special concern or wildlife resource. If no, which it is, then consider approval----as is.

There is a 5/21/2008 signed recommendation from **watermaster Water District No. 170**, stating that he did not oppose approval of this application. For licensing, Condition R05 was included.

On 1/10/2011 Bert Doughty, Supervisor Environmental Offices contact at the mine stated that the only flow meter on the system is located at the pit. He stated that they have dug deeper in the pit during the mining process, which has increased the amount of ground water seepage into the pit. He stated that the pumps run at capacity 3/4 of the year, and that they are not using as much water from their Salmon River surface water source (72-7193) due to the amount of seepage in the pit that they continue to pump out. They did not add any additional Beneficial Use, since they are continuing to mine the same amount, and mill the same amount. He stated that the same amount of water is being pumped to the Mill for processing, but instead of surface water (which is their primary source) they are using the pit seepage groundwater to dewater the pit. The water from the tailing ponds to the storage tank can be metered with an hourly meter, but no permanent flow meter has been installed to date.

RECOMMENDATIONS:

CFS and Physical Measurement

(1) Krohne Altometer Magnetic Flowmeter: (2,275,000 - 2,272,700 gallons)/1 min 48 seconds = 1278 gpm

(1278 X 0.00223 = 2.85 cfs); instantaneous readout = 1280 gpm +/- 20 gpm.

(2) Pump Curve: Floway 1770 RPM Model 12JKH vertical turbines in intermediate sump and upper booster station designed to deliver 1171 gpm (2.61 cfs) at 650 ft (with eight stages, assumed).

The purpose of this water right is for the additional pump capacity. Water Right 72- 7414 is licensed for 1.10 cfs, so recommending 72-7573 at 1.50 cfs would be within the pump curve limits, and yet lower than the amount shown on the Krohne Altometer Magnetic Flowmeter. 72-7414 (1.10 cfs) + 72-7573 (1.50 cfs) = 2.61 cfs (pump curve)

RECOMMEND: 1.5 cfs

Volume

(1) System Capacity: $2.61 \text{ cfs} \times 1.9835 \times 365 = 1889.6 \text{ af}$

(2) Approved Permit: $1.5 \text{ cfs} \times 1.9835 \times 365 = 1085.9 = 1086.0 \text{ af}$

(3) Per the 1/10/2011 conversation with Bert Doughty (mine contact), they utilized the pumps from the pit at full capacity for 3/4 of the year (274 days). Using the system capacity $2.61 \text{ cfs} \times 274 \text{ days} \times 1.9835 = 1418.5 \text{ af}$

(4) In a letter dated 9/11/2008 from Dylan Lawrence/Moffatt Thomas, It confirmed a plan agreed upon during the meeting with Aaron Marshall/IDWR:

(a) Agreed on erratic historical data, due to possible malfunctioning data logging device.

(b) Agreed on 1-year of measurements from the mining pit, to base an annual diversion volume.

A letter dated 4/28/2010 from Scott King/SPF Water Engineering, submitted the annual diversion volume data for Thompson Creek Mining's pit-water diversions from January thru December 2009:

The total diverted from the pit during the 2009 calendar year = 487.4 af.

(5) In the 1/10/2011 conversation with Bert Doughty, he stated that there was no additional production or beneficial use at the mine or mill, but that since they were digging deeper in the pit/mine, that more groundwater was seeping into the pit, requiring more water to be pumped out. Due to this increase in groundwater seepage, they had reduced pumping their primary source (surface water). Per Shelley Keen, **IDAHO CODE 42-228 Drilling and Use of Wells for Drainage or Recovery Purposes Excepted**, takes into consideration the withdrawal of water for the sole of improving or preserving the utility of land by draining them. This regulation would allow for the dewaterization of additional seepage, precipitation, etc. when there is no additional beneficial use.

RECOMMENDATION:

(6) Water right 72-7414 was recommended at 803.6 af, which is already more than what was used for the 2009 mining operation (records submitted showed 487.4 af). Water rights 72-7193 + 72-7257 = a combined limit of 2916 af, and when fully diverted, 72-7414 is limited to 192.0 af. With 72-7414 at 192.0 af + 72-7573 at 295.4 af = the 2009 mining operation amount of 487.4 af. The **combined limit for 72-7193 + 72-7257 + 72-7573 + 72-7414 = 3108.0 af**. This reasoning is that 72-7414 will always be used before 72-7573 because it has an earlier priority date, and as stated by Bert Doughty on 1/10/2011, they did not add any additional Beneficial Use, since they are continuing to mine the same amount, and mill the same amount. Therefore no more than 295.4 af can be diverted under this water right.

(7) Water Right 72-7573 will be recommended at 295.4 af, with a combined limit with 72-7414 of 803.6 af. This will cover the amount required at the mill when the surface water sources are not being pumped, and all other excess water being dewatered from the pit will fall under Idaho Code 42-228.

SEE FLOW CHART IN THE FILE DESCRIBING THE ABOVE INFORMATION

Conditions Recommended:

Industrial use is associated w/mining and milling (on permit, and remains on license).

054 Used Statewide on mining use (was on permit, and remains on license).

01M (on permit, and remains on License).

R05 Water District 170, was included since it is groundwater subject to conjunctive management rules.

U42 Place of use does not include federal public lands, was included due to protest agreement.

X35 Combined Limits $72-7573 + 72-7414 = 2.61 \text{ cfs}$, 803.6 af and also

$72-7193 + 72-7257 + 72-7573 + 72-7414 = 3108.0 \text{ af}$

F06 shared PODs, 72-7573 & 72-7414

X59 PODs are in a special Wild & Scenic Watershed survey area.

065 (modified) The right holder shall make full beneficial use of all surface water rights available to the right holder for industrial use authorized under this right. The right holder shall rely on surface water, to the extent it is available before making a call for ground water against junior appropriators.

72-7573

S. Hemenway

2/8/2011

Volume Limits

1)
$$\begin{array}{ccc} 72-7257 & + & 72-7193 \\ \text{Bruno CK.} & & \text{Salmon River} \\ \swarrow & & \swarrow \\ 1600.0 \text{ af} & & 1600.0 \text{ af} \end{array} = \text{Combined Limit } 2916.0 \text{ af}$$

2)
$$\begin{array}{ccc} 72-7257 & + & 72-7193 \\ 1600.0 \text{ af} & & 1600.0 \text{ af} \\ \swarrow & & \swarrow \\ \text{when fully diverted @ } 2916.0 \text{ af} & & \end{array} + \begin{array}{c} 72-7414 \\ 803.6 \text{ af groundwater} \\ \swarrow \\ \text{limited to } 192.0 \text{ af} \end{array}$$

$$= 3108.0 \text{ af combined limit}$$

3)
$$\begin{array}{cccc} 72-7257 & + & 72-7193 & + & 72-7414 & + & 72-7573 \\ 1600.0 \text{ af} & & 1600.0 \text{ af} & & 803.6 \text{ af} & & 295.4 \text{ af groundwater} \\ \swarrow & & \swarrow & & \swarrow & & \swarrow \\ \text{when fully diverted} & & \text{limited to} & & \text{limited to} \\ 2916.0 \text{ af} & & 192.0 \text{ af} & & 295.4 \text{ af} \end{array}$$

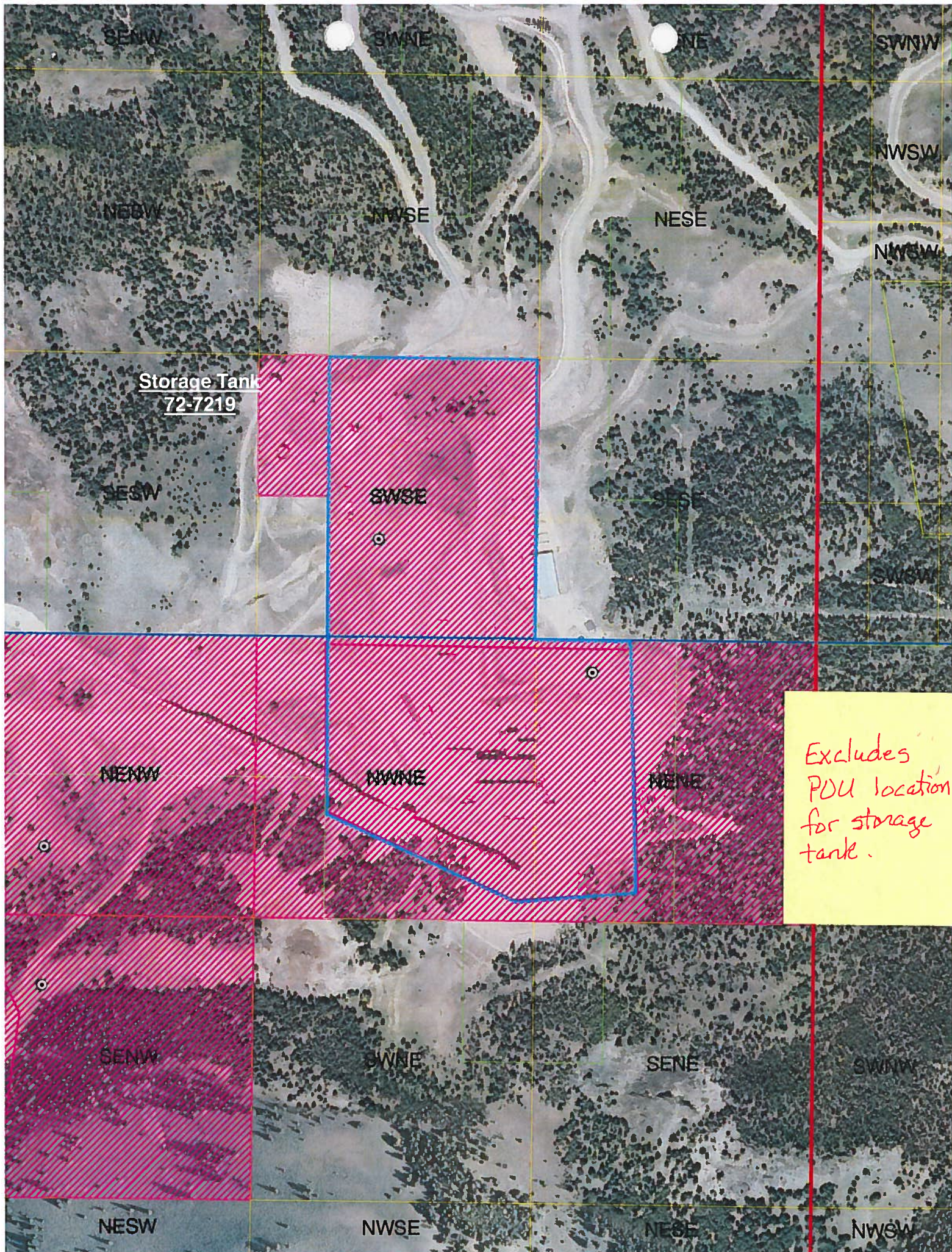
$$72-7193 + 72-7193 + 72-7414 + 72-7573 = \text{Combined limit } 3108.0 \text{ af}$$

Additional Dewaterization covered by:

Id Code 42-228 Drilling + Use of wells from Drainage or Recovery Purposes Excepted. The withdrawal of water for the sole purpose of improving the utility of land by draining them (this would cover additional seepage, precipitation, etc.)

2009 Measurement from pit to mill = 487.4 af
* see 9/11/2008 letter from Dylan Lawrence/Mohat Than + 4/28/2010 letter from Scott King/SPF with 2009 Volume Data

$$72-7414 + 72-7573 = \text{combined limit } 803.6 \text{ af}$$



Storage Tank
72-7219

Excludes
PDU location
for storage
tank.

POOH U.

A72-07257

ANALYSIS OF WATER REQUIREMENTS

PERMITS 72-7193 AND 72-7257

Flow and Consumptive use

The two permits represent the water supply for the operation of the ore concentrator. At its maximum capacity of 15,000 tons of ore per day (per Jamie Sturges during exam) the concentrator requires a water flow of approximately 10 cfs. In normal operation, all flows of Bruno Creek are diverted into the tailings impoundment and the concentrator uses water reclaimed from the tailings and seepage return ponds. The Salmon River pumping plant supplies water to make up the difference between the process requirements and the water supplied from Bruno Creek. If no water is available from Bruno Creek or in a startup situation, the Salmon River pumps have the capacity to supply the entire operating requirement until sufficient water is stored in the impoundments to operate the plant on reclaimed water.

Water balance information developed during the design of the tailings impoundment is based on a capacity of 25,000 tons per day. Adjustment of the water amounts estimated to be absorbed by slimes and sands by a factor of 1.4 gives the following estimates of water consumption at an operating capacity of 15,000 tons of ore per day:

WINTER OPERATION (274 days)

Flow consumed: 1890 gpm (4.31 cfs)
Volume consumed: 2289 acre-feet

SUMMER OPERATION (91 days)

Flow consumed: 1558 gpm (3.47 cfs)
Volume consumed: 627 acre-feet

Total volume consumed per year: 2916 acre-feet

Consumptive use

Stored volume

The tailings impoundment is designed to be able to store a probable maximum flood event (PMF). This is estimated to be 1530 acre-feet in the design report. Additionally, the impoundment has capacity to store 160 acre-feet over any 10-day period. The design storage quantities justify licensing a quantity of 1600 acre-feet for industrial storage.

MICROFILMED

SEP 25 2001

MICROFILMED

NOV 01 1994

Licensing Review for 72-7573 Thompson Creek Mining POD/POU Overlap									
By: Sandy Hemenway									
Date: 1/11/2011									
WR#	B/U	Season	Rate/cfs	Volume/af	POD	Source	POU	Combined Limits	
72-7257	Industrial	1/1-12/31	9.62		T12N R16E S25 SENESW	Bruno Creek	T11N R16E S12 NENE NWNE	w/72-7193 = 7916af	
	Industrial Storage	1/1-12/31		1600					
	Industrial From storage	1/1-12/31		1600					
	TOTAL		9.62	1600					
72-7193	Industrial	1/1-12/31	20.89		T11N R16E S25 L5NESESE	Salmon River	T11N R16E S12 NENE NWNE	w/72-7257 = 7916af	
	Industrial Storage	1/1-12/31		1600					
	Industrial From storage	1/1-12/31		1600					
	TOTAL		20.89	1600					
72-7414/74254	Industrial	1/1-12/31	1.11	803.6	(1)T11N R16E S2 SWNW	Ground Water	(1)T11N R16E S12 NENE NWNE & (1)T11N R16E S1 SWSE	w/72-7257&72-7193=3108af	
	TOTAL		1.11	803.6	& (2) T11N R16E S3 NENE		T11N R16E S1 SWSE	w/72-7573=803.6af	
72-7573	Industrial	1/1-12/31	1.5	487.4	(1)T11N R16E S2 SWNW	Ground Water	(1)T11N R16E S12 NENE NWNE & (1)T11N R16E S1 SWSE	w/72-7257&72-7193=3211.4af	
	TOTAL		1.5	487.4	& (2) T11N R16E S3 NENE		T11N R16E S1 SWSE	w/72-7414 = 803.6af	
72-7219	Domestic	1/1-12/31	0.11	11.2	T11N R16E S12 NWNE	Ground Water	T11N R16E S12 NENE NWNE	NONE	
	TOTAL		0.11	11.2					
Domestic Use: offices, lab, restroom, showers at concentrator site.									