

PROTEST OF APPLICATION 55675
WESTPAC UTILITIES

REVISED

Prepared by,
Water Research & Development

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EXHIBIT

tabbles

TCWD 255

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to be certain, however, it is recommended that the Company plan that its average annual pumping rate not be more than 8 to 10 million gallons per day." At these pumping rates, pumped continuously the year around, the annual diversion amount will vary from about 8,960 to 11,200 AF/Y. Due to these conditions, TCID is requesting river depletions be quantified and problems addressed regarding increased groundwater pumpage within the Truckee Meadows, especially within the one-mile corridor area.

RETURN FLOWS:

Westpac has suggested that since approximately 50% of the groundwater will return to the River via treatment plant discharge that there will be a net gain in River flow. This is true only if less than 50% of the well's supply is taken from the River. Figure 2 shows that annually, the average return flow is about 46% from the Reno Sparks Wastewater Treatment Plant (RSWWTP). However, during the period of May through September, the return flows vary from about 27 percent to 37 percent. Underground diversions made from wells that are recharged by the River in amounts greater than these percentages will reduce the amount of water flowing to downstream water users. Based upon Hydrologic Consultants, Inc. (HCI) preliminary analysis (see Appendix C), and results generated by a groundwater model developed by Water Research and Development (WRD), discussed later in this report, ultimately all water pumped from the Glendale well will come from the River.

FIGURE 2. RSWWTP RETURN FLOWS
AVERAGED OVER 1980-1988

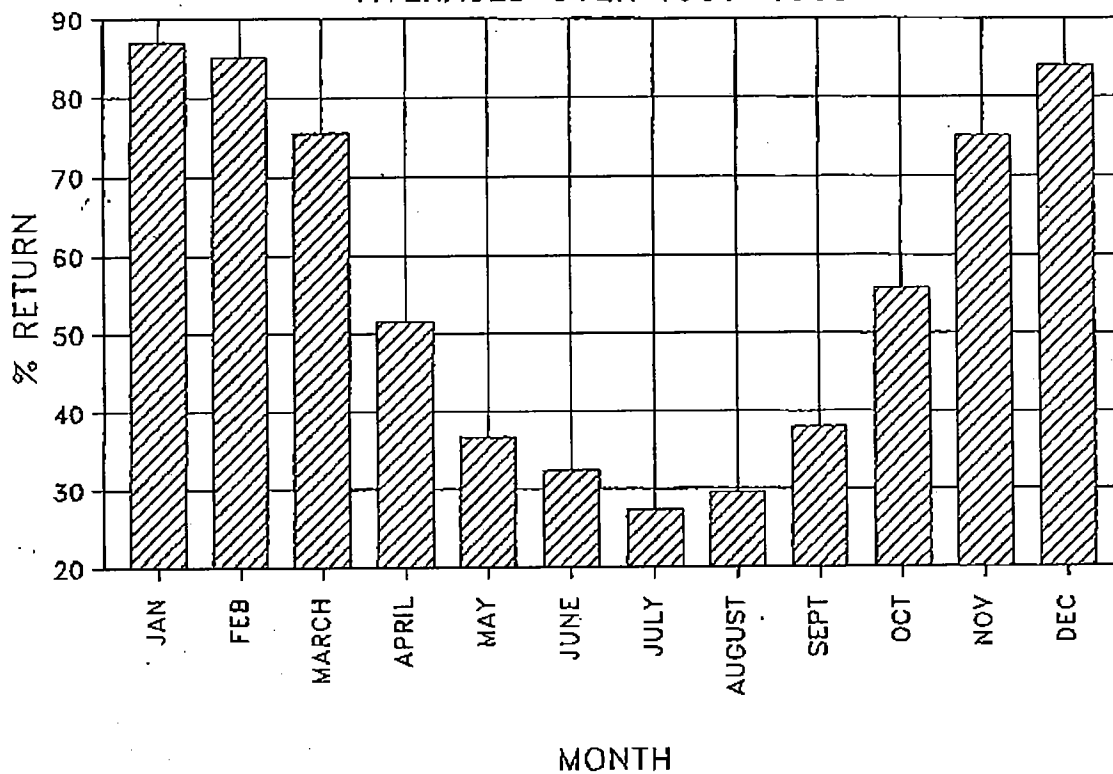


Table 2: Summer month Westpac surface water (SW) and groundwater (GW) usage compared to Reno-Sparks Treatment Plant return flows.

Year	Month	WESTPAC		TOTAL (AF)	RENO-SPARKS Return flow (AF)	Percent Return Flow
		SW Usage (AF)	GW Usage (AF)			
1980	Jan	923.0	1,222.0	2,145.0	2,034.0	94.8
	Feb	602.0	1,602.0	2,204.0	1,779.0	80.7
	March	1,996.0	471.0	2,467.0	1,882.0	76.3
	April	3,033.0	473.0	3,506.0	1,790.0	51.1
	May	4,261.0	395.0	4,656.0	1,901.0	40.8
	June	5,402.0	714.0	6,116.0	1,862.0	30.4
	July	6,150.0	1,291.0	7,441.0	1,999.0	26.9
	Aug	5,937.0	1,134.0	7,071.0	2,069.0	29.3
	Sept	4,456.0	491.0	4,947.0	1,845.0	37.3
	Oct	3,753.0	108.0	3,861.0	1,947.0	50.4
	Nov	2,354.0	241.0	2,595.0	1,810.0	69.7
	Dec	2,267.0	199.0	2,466.0	1,889.0	76.6
	Total	41,134.0	8,341.0	49,475.0	22,807.0	46.1
1981	Jan	1,943.0	472.0	2,415.0	1,905.0	78.9
	Feb	1,509.0	704.0	2,213.0	1,639.0	74.1
	March	1,675.0	963.0	2,638.0	1,985.0	75.2
	April	3,064.0	965.0	4,029.0	2,109.0	52.3
	May	4,722.0	249.0	4,971.0	2,192.0	44.1
	June	6,374.0	440.0	6,814.0	2,177.0	31.9
	July	7,104.0	864.0	7,968.0	2,116.0	26.6
	Aug	6,786.0	748.0	7,534.0	2,091.0	27.8
	Sept	5,551.0	286.0	5,837.0	2,126.0	36.4
	Oct	3,196.0	26.0	3,222.0	2,140.0	66.4
	Nov	2,003.0	294.0	2,297.0	2,115.0	92.1
	Dec	1,438.0	790.0	2,228.0	2,116.0	95.0
	Total	45,365.0	6,801.0	52,166.0	24,711.0	47.4
1982	Jan	1,052.0	1,419.0	2,471.0	2,091.0	84.6
	Feb	892.0	1,294.0	2,186.0	1,959.0	89.6
	March	1,152.0	1,306.0	2,458.0	2,036.0	82.8
	April	1,558.0	1,793.0	3,351.0	1,943.0	58.0
	May	5,183.0	762.0	5,945.0	1,913.0	32.2
	June	3,824.0	614.0	4,438.0	1,895.0	42.7
	July	5,914.0	924.0	6,838.0	2,112.0	30.9
	Aug	6,352.0	770.0	7,122.0	2,235.0	31.4
	Sept	4,108.0	152.0	4,260.0	2,292.0	53.8
	Oct	2,662.0	151.0	2,813.0	2,254.0	80.1
	Nov	1,523.0	715.0	2,238.0	2,108.0	94.2
	Dec	1,557.0	829.0	2,386.0	2,197.0	92.1
	Total	35,777.0	10,729.0	46,506.0	25,035.0	53.8
1983	Jan	1,668.0	845.0	2,513.0	2,150.0	85.6
	Feb	1,436.0	783.0	2,219.0	2,036.0	91.8
	March	1,506.0	986.0	2,492.0	2,293.0	92.0
	April	2,118.0	604.0	2,722.0	2,171.0	79.8
	May	3,682.0	1,397.0	5,079.0	2,008.0	39.5
	June	5,049.0	1,220.0	6,269.0	2,347.0	37.4
	July	6,394.0	1,676.0	8,070.0	2,178.0	27.0
	Aug	5,624.0	951.0	6,575.0	2,378.0	36.2
	Sept	5,236.0	486.0	5,722.0	2,248.0	39.3
	Oct	3,115.0	519.0	3,634.0	2,247.0	61.8
	Nov	1,868.0	671.0	2,539.0	2,298.0	90.5
	Dec	1,981.0	348.0	2,329.0	2,327.0	99.9
	Total	39,677.0	10,486.0	50,163.0	26,681.0	53.2

MONFLOWS TAB

1984	Jan	2,064.0	255.0	2,319.0	2,288.0	98.7
	Feb	1,779.0	598.0	2,377.0	2,099.0	88.3
	March	1,793.0	1,271.0	3,064.0	2,286.0	74.6
	April	3,658.0	1,000.0	4,658.0	2,164.0	46.5
	May	5,377.0	1,259.0	6,636.0	2,293.0	34.6
	June	6,116.0	893.0	7,009.0	2,299.0	32.8
	July	7,100.0	1,366.0	8,466.0	2,192.0	25.9
	Aug	6,876.0	1,177.0	8,053.0	2,293.0	28.5
	Sept	5,338.0	1,340.0	6,678.0	2,237.0	33.5
	Oct	3,545.0	580.0	4,125.0	2,245.0	54.4
	Nov	2,296.0	364.0	2,660.0	2,191.0	82.4
	Dec	2,246.0	548.0	2,794.0	2,131.0	76.3
	Total	48,188.0	10,651.0	58,839.0	26,718.0	45.4

1985	Jan	2,853.0	399.0	3,252.0	2,215.0	68.1
	Feb	2,710.0	595.0	3,313.0	1,968.0	59.4
	March	2,890.0	814.0	3,704.0	2,138.0	57.7
	April	4,128.0	1,042.0	5,170.0	2,130.0	41.2
	May	6,647.0	620.0	7,267.0	2,234.0	30.7
	June	6,994.0	1,494.0	8,488.0	2,277.0	26.8
	July	7,627.0	1,801.0	9,428.0	2,433.0	25.8
	Aug	7,470.0	1,633.0	9,103.0	2,459.0	27.0
	Sept	5,038.0	717.0	5,755.0	2,342.0	40.7
	Oct	4,344.0	271.0	4,615.0	2,352.0	51.0
	Nov	3,607.0	531.0	4,138.0	2,266.0	54.8
	Dec	2,349.0	662.0	3,011.0	2,350.0	78.0
	Total	56,685.0	10,579.0	67,264.0	27,164.0	40.4

1986	Jan	1,498.0	1,130.0	2,628.0	2,351.0	89.5
	Feb	944.0	1,451.0	2,395.0	2,518.0	105.1
	March	1,529.0	1,629.0	3,158.0	2,506.0	79.4
	April	3,536.0	361.0	3,897.0	2,366.0	60.7
	May	5,402.0	1,170.0	6,572.0	2,478.0	37.7
	June	6,993.0	1,291.0	8,284.0	2,429.0	29.3
	July	7,318.0	1,668.0	8,986.0	2,582.0	28.7
	Aug	7,355.0	2,102.0	9,457.0	2,613.0	27.6
	Sept	5,603.0	783.0	6,386.0	2,440.0	38.2
	Oct	3,661.0	840.0	4,501.0	2,506.0	55.7
	Nov	2,729.0	279.0	3,008.0	2,384.0	79.3
	Dec	2,099.0	400.0	2,499.0	2,446.0	97.9
	Total	48,667.0	13,104.0	61,771.0	29,619.0	47.9

1987	Jan	1,463.0	1,191.0	2,654.0	2,440.0	91.9
	Feb	1,956.0	469.0	2,425.0	2,140.0	88.2
	March	2,384.0	465.0	2,849.0	2,341.0	82.2
	April	5,421.0	758.0	6,179.0	2,287.0	37.0
	May	6,263.0	607.0	6,870.0	2,435.0	35.4
	June	7,594.0	844.0	8,438.0	2,429.0	28.8
	July	8,526.0	1,510.0	10,036.0	2,642.0	26.3
	Aug	8,797.0	1,624.0	10,421.0	2,622.0	25.2
	Sept	7,569.0	729.0	8,298.0	2,570.0	31.0
	Oct	6,011.0	237.0	6,248.0	2,569.0	41.1
	Nov	4,507.0	26.0	4,533.0	2,474.0	54.6
	Dec	2,893.0	646.0	3,539.0	2,458.0	69.5
	Total	63,384.0	9,106.0	72,490.0	29,407.0	40.6

	Jan	1,926.0	805.0	2,731.0	2,475.0	90.6
	Feb	1,689.0	846.0	2,535.0	2,250.0	88.8
	March	2,644.0	1,385.0	4,029.0	2,384.0	59.2
	April	5,660.0	745.0	6,405.0	2,360.0	36.8
	May	6,511.0	381.0	6,892.0	2,434.0	35.3

	June	6,687.0	913.0	7,600.0	2,423.0	31.9
1988	July	7,655.0	1,304.0	8,959.0	2,524.0	28.2
	Aug	6,731.0	683.0	7,414.0	2,499.0	33.7
	Sept	6,273.0	1,203.0	7,476.0	2,375.0	31.8
	Oct	4,199.0	1,650.0	5,849.0	2,401.0	41.0
	Nov	3,492.0	560.0	4,052.0	2,354.0	58.1
	Dec	1,927.0	1,430.0	3,357.0	2,365.0	70.4
	Total	55,394.0	11,905.0	67,299.0	28,844.0	42.9

RSWMP RETURN FLOWS

AVERAGED OVER 1980-1988

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC
1980	94.8	80.7	76.3	51.1	40.8	30.4	26.9	29.3	37.3	50.4	69.7	76.6
1981	78.9	74.1	75.2	52.3	44.1	31.9	26.6	27.8	36.4	66.4	92.1	95.0
1982	84.6	89.6	82.8	58.0	32.2	42.7	30.9	31.4	53.8	80.1	94.2	92.1
1983	85.6	91.8	92.0	79.8	39.5	37.4	27.0	36.2	39.3	61.8	90.5	99.9
1984	98.7	88.3	74.6	46.5	34.6	32.8	25.9	28.5	33.5	54.4	82.4	76.3
1985	68.1	59.4	57.7	41.2	30.7	26.8	25.8	27.0	40.7	51.0	54.8	78.0
1986	89.5	105.1	79.4	60.7	37.7	29.3	28.7	27.6	38.2	55.7	79.3	97.9
1987	91.9	88.2	82.2	37.0	35.4	28.8	26.3	25.2	31.0	41.1	54.6	69.5
1988	90.6	88.8	59.2	36.8	35.3	31.9	28.2	33.7	31.8	41.0	58.1	70.4
AVERAGE	87.0	85.1	75.5	51.5	36.7	32.4	27.4	29.6	38.0	55.8	75.1	84.0