PVNGS Annual Groundwater Pumpage (Ac-ft/year)					
Well Location	**2005[e]**	**2004[d]**	**2003[c]**	**2002[b]**	**2001[a]**
55-613122	0	0	0	0	0
55-613123	1797.78	1,604.37	1004	1608	1690
55-613124	445	280.70	865	299	343
55-900619	0.09	0.03	--	--	--
Total withdrawn	2242.87	1885.1	1869	1907	2033
Ave (2001-2005). (Ac-ft/yr)	1,987.394				
GPM	1,390.4 gpm	1,168.6 gpm	1,158.7 gpm	1,182.2 gpm	1,260.3 gpm
Average rate 2001-2005	1,232 gpm				
Effluent Water	62,072.5	66,015	67,855	72,614 [f]	64,973
Average Annual Rate	66,705.9 Ac-ft				

References **a) APSC 2002, b) APSC 2003, c) APSC 2004, d) APSC 2005, e) APSC 2006, f) Eroh 2006**

Domestic, fire protection, demineralized water.

Conversion of Ac-ft to gpm

1,987 Ac-ft /yr (yr/365 d)(d/24 hrs)(hr/60 min) ($3.26 \times 10^{+5}$) = 1,232 gpm

Surface Water Conversion of gallons to Ac-ft

23,660,423,583 gallons/year (3.069×10^{-6}) = 72,613.8 Ac-ft/yr

Tolleson Effluent contract

13,000 ac-ft/yr (yr/365 days) ($3.26 \times 10^{+5}$) = 11.6 MGD

Ave. Annual Effluent conversion

66,706 ac-ft/yr (yr/365 days) ($3.26 \times 10^{+5}$) = 60 MGD

Conversion factors from Fetter 1980, p. 467, Appendix 9

Groundwater data from **p. 2.4-109 of the PVNGS Updated FSAR** were used (unless noted) as input to the confined aquifer spread sheet based on included in this Calculation package. This data includes:

Transmissivity: 100,000 gallons per day per foot (1 ft^3/7.48 gallons) = 13,369 ft^2/day

Storage Coeficient: 0.005

Pumping rate used (from above): 1,232 gpm

Distance used measured 15,882 feet from well to site boundary (2-mi buffer zone) from 55-613124 (B-1-0-6-0-34abb) (**GeoTrans 2006** and **Brown and Caldwell Regional Wells Map for 2005 Water Level Measurements, Location of Geologic Cross Sections and Offsite Well Locations Figure 1, March 27**).

The data along with the time data inputs [10 to 60 years (in days) of operation that includes current operation and relicense] were entered into the computer model for the Theis (1935) Non-equilbrium Well Equation (See attached). . The computer program calculated the u value. The Wu value was looked up in Driscol 1989, page 921 and entered into the program. The pumping rate of 1,232 gpm was entered and the computer program calculated the drawdown at the boundary.

The program does not consider the periodic changes in pumping rates over time during operations to the present time. The current pumping rate of 1,232 gpm was used as though this value was initially used by PVNGS. A nonleaky aquifer scenario was used to simulate site conditions. The equations used in the calculations assume that the aquifer is homogeneous, isotopic, with negligible rechargė and gradient, and that boundary impacts do not occur. By using these assumptions the drawdown values calculated are conservative. When the drawdown is compared to the potentiometric maps (**APS 1975 and PVNGS 2006)** and groundwater elevation data (**Brown and Caldwell 2005**), one can see that the calculated drawdown is greater than that indicated by the potentiometric surface maps and would indicate that the potentiometric surface of the regional aquifer has changed very little over the operational life of the plant.

References:

APS (Arizona Public Service Company) 1975, *Palo Verde Nuclear Generating Station, Environmental Report Construction Permit Stage Vol. II*, Februay 3.

APSC (Arizona Public Servic Company) 2002, *2001 Annual Water Withdrawal and Use Report for Right/Permit No. 59-114051.0001, Palo Verde Nuclear Generating Station*, March 22.

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APSC (Arizona Public Servic Company) 2006, *2005 Annual Water Withdrawal and Use Report for Right/Permit No. 59-114051.0001, Palo Verde Nuclear Generating Station*, March 29.

Brown and Caldwell 2006, *2005 Annual Monitoring and Compliance Report APP No p-100388, Arizona Public Service Company, Palo Verde Nuclear Generating Station, 2005 Water Level Measurements*, Figure 1-9, May 15.

Driscol (Fletcher G. Driscol) 1989, *Groundwater and Wells*, Second Edition, published by Johnson Filtration Systems, Inc.

Eroh (Martin Eroh) 2006, *Secondary treated effluent data for 2002*, E-mail from Martin Eroh (APS) to Gary Gunter (Tetra Tech NUS), November 3.

Fetter (C.W. Fetter) 1980, *Applied Hydrology*, Charles E. Merrill Publishing Company, Columbus, Ohio.

GeoTrans 2006, *PVNGS APP Compliance Support, Location of Geologic Cross Sections and Offsite Well Locations*, Figure 1, March 27.

PVNGS (Palo Verde Nuclear Generating Station) 2006, *Updated Final Safety Analysis Report, Palo Verde Nuclear Generating Station Units 1, 2, and 3*, Revision 13- List D, May 2006.

DISTANCE or TIME VS. DRAWDOWN for a CONFINED AQUIFER*

SITE: PVNGS **WELL:** 55-613124 (B-1-0-6-0-34abb)

Given the Theis (1935) Non-equilibrium Well Equations:

$s = [Q / 4(3.14)T](Wu)$

Where s = drawdown, ft; T = transmissivity, ft^2/day; Q = pumping rate, gpm; W(u) = Theis well function

Also, from the non-equilibrium well equation:

$u = r^2S / 4Tt$

Where S = coefficient of storage; t = time since pumping started, days; r = distance to 2-mi buffer zone from well location, ft

CALCULATIONS:

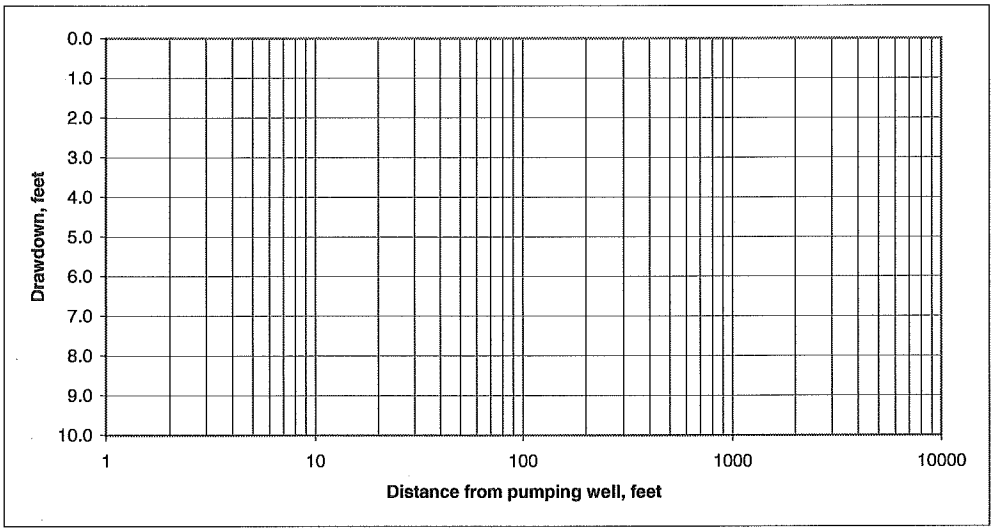
Case:	10 yr	20 yr	30 yr	40 yr	50 yr	6
r =	15882	15882	15882	15882	15882	400
S =	0.005	0.005	0.005	0.005	0.005	0.00019
T =	13,369	13,369	13369	13369	13369	13636
t =	3650	7300	10950	14600	18250	0.5
Then:						
u =	0.006461	0.003231	0.002154	0.001615	0.001292	0.001115

Lookup:(a)						
Wu =	4.47	5.17	5.54	5.86	6.07	6.24

Given:						
Q, gpm =	1232	1232	1232	1232	1232	500
Then:						
s =	6.3	7.3	7.8	8.3	8.6	3.5

* May be used for unconfined aquifer where drawdown is small portion of saturated thickness

(a) Table of u vs. Wu may be found in Driscol 1989, p.921.



Note: Case #6 above should verify 3.5' DD shown by Driscoll, page 220.

DISTANCE or TIME VS. DRAWDOWN for a CONFINED AQUIFER*

SITE: PVNGS **WELL:** 55-613124 (B-1-0-6-0-34abb)

Given the Theis (1935) Non-equilibrium Well Equations:

$s = [Q / 4(3.14)T](Wu)$

Where s = drawdown, ft; Q = pumping rate, gpm; T = transmissivity, ft^2/day; W(u) = Theis well function

Also, from the non-equilibrium well equation:

$u = r^2S / 4Tt$

Where S = coefficient of storage; t = time since pumping started, days; r = distance to 2-mi buffer zone from well location, ft

CALCULATIONS:

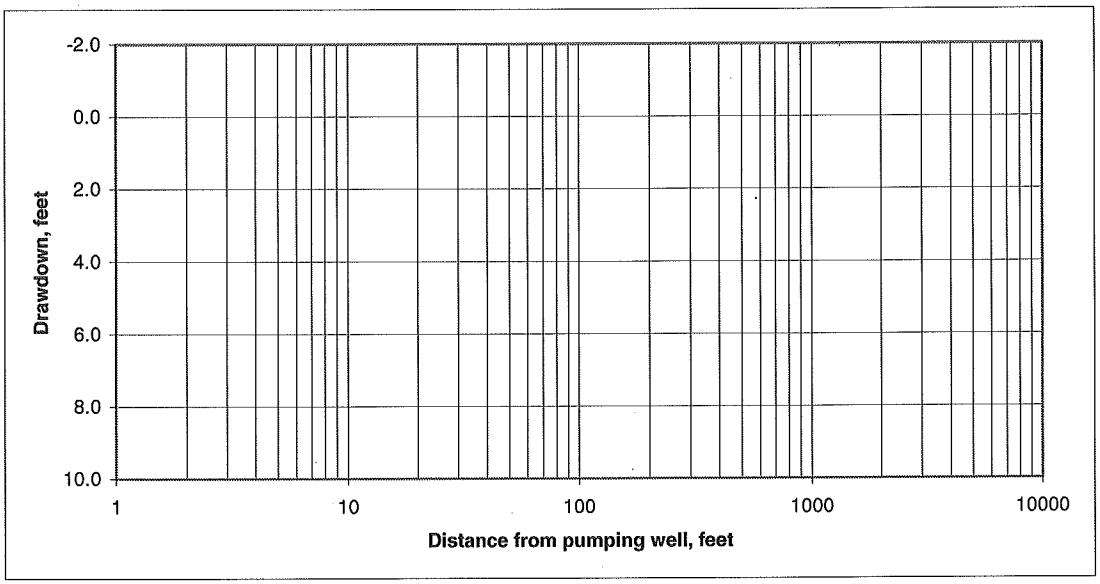
Case:	60 yr	2	3	4	5	6
r =	15882					400
S =	0.005					0.00019
T =	13,369					13636
t =	21,900					0.5
Then:						
u =	0.001077	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.001115

Lookup:(a)						
Wu =	6.24					6.24

Given:						
Q, gpm =	1232					500
Then:						
s =	8.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3.5

* May be used for unconfined aquifer where drawdown is small portion of saturated thickness

(a) Table of u vs. Wu may be found in Driscol 1989, p.921.



Note: Case #6 above should verify 3.5' DD shown by Driscoll, page 220.

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including emergency diesel generators, shutdown cooling, essential chillers, fuel pool cooling, and nuclear cooling water priority loads, as well as for chemistry control, and testing.

Separate makeup water lines are provided to each spray pond from two independent water supply sources; i.e., the station makeup water reservoir (Units 2 and 3 only) and the domestic water system. None of the makeup water sources are safety-related since the two spray ponds for each unit contain sufficient water in storage to permit safe shutdown and cooldown of the unit and to maintain it in a safe shutdown condition for 26 days. The independent makeup water sources described above ensure a continued capability after 26 days in the safe shutdown condition.

Plant firewater requirements and sources are described in subsection 9.5.1. Firewater is not drawn from the ultimate heat sink.

2.4.12 DISPERSION, DILUTION, AND TRAVEL TIME OF ACCIDENTAL RELEASES OF LIQUID EFFLUENTS IN SURFACE WATERS

The circulating water system blowdown and waste water from other miscellaneous station sources are discharged through piping systems into the onsite evaporation ponds. Since the ponds are designed to retain the waste water, including water from a PMP, over the plant life, accidental releases of liquid effluents in surface waters are not expected to occur.

2.4.13 GROUNDWATER

2.4.13.1 Description and Onsite Use

2.4.13.1.1 Geologic Setting

The site area (5-mile radius) is in the Lower Hassayampa-Centennial groundwater basin. This basin lies within the

townships T.2N, T.1N, T.1S, and the northern half of T.2S, in Ranges R.3W through R.7W (figure 2.4-26) encompassing an area of about 400 square miles.

The hydrogeologic profile of the site area is defined by three major sedimentary units, each having distinctly different lithologic and hydrologic characteristics. These units, found in most Central Arizona water basins (U.S. Bureau of Reclamation, 1977)[34], are identified herein as:

- Upper Alluvial Unit
- Middle Fine-Grained Unit
- Lower Coarse-Grained Unit

The generalized hydrogeologic profile of the site area is depicted in figure 2.4-27. A description of the sediments as they relate to the groundwater regime of the site is presented in the following paragraphs. A detailed description of the site geology is presented in paragraph 2.5.1.2.

2.4.13.1.1.1 Upper Alluvial Unit. This unit consists of primarily silty and gravelly sands of varying proportions with interlayered, discontinuous lenses of clays and silty clays. This unit, equivalent to lithozone 5 (see paragraph 2.5.1.2.3), extends to a depth of about 30 feet to 60 feet beneath the site. Individual layers are about 3 to 10 feet thick and are characteristically moderate to poorly bedded. The stratification is typical of sediments deposited in a high-energy fluvial environment. Primary sedimentary structures identified during the detailed geologic mapping of power block excavations (appendix 2D) consist of channel cut and fill features.

The permeability of the upper alluvial unit soils was determined by inflow and outflow (pumping) type field tests. The typical horizontal permeability of these deposits is about 10 gallons per day per square foot ($5x10^{-4}$ centimeters per second). Because of the extensive stratification, the vertical permeability (not measured) can be expected to be significantly lower than the horizontal permeability.

2.4.13.1.1.2 Middle Fine-Grained Unit. This unit consists of massive, continuous layers of clays and silty clays, interbedded with thinner layers and scattered lenses of clayey silt, clayey sand, and silty sand. The thickness of the unit is about 250 feet. The upper contact of the middle fine-grained unit is equivalent to a well-defined boundary between two distinctive depositional environments and can be clearly identified across the site. Locally, the contact is transitional where a few scattered lenses of silt and fine sand are encountered. A structure contour map of the top of the middle fine-grained unit is presented in figure 2.4-28. The middle fine-grained unit corresponds to lithozones 3 and 4 of the geologic model (see paragraph 2.5.1.2.3). The distinction between the two zones in the middle fine-grained unit is based on subtle but definite differences in geotechnical and hydrologic properties. Silty clays of medium plasticity predominate in the upper zone (lithozone 4), while clays of somewhat higher plasticity predominate in the lower zone (lithozone 3 -- the Palo Verde clay). The two zones are separated by a relatively continuous coarse-grained soil layer.

The permeability characteristics of soils in the upper portion of the unit were evaluated by both laboratory and field tests (appendix 2G). The vertical permeability, determined by laboratory tests, is on the order of 0.001 gallons per day per

square foot ($5x10^{-8}$ centimeters per second). The horizontal permeability, determined by field tests, is approximately one order of magnitude higher. The permeability characteristics of the Palo Verde clay were evaluated only by laboratory tests. Measured permeabilities in the vertical and horizontal directions are on the order of 0.0005 gallons per day per square foot ($2.5x10^{-8}$ centimeters per second) and 0.01 gallons per day per square foot ($5x10^{-7}$ centimeters per second), respectively.

2.4.13.1.1.3 Lower Coarse-Grained Unit. In general, the lower coarse-grained unit is described as a "variably cemented conglomerate which lies directly on the undifferentiated basement complex".[34] In the site area, the lower coarse-grained unit consists of a tilted interbedded sequence of volcanic flows and flow breccias, tuffs, tuffaceous sandstones, and coarse-grained arkosic sandstone. The flow breccias (which may be interpreted as the "variably cemented conglomerate") are common throughout the sequence (lithozone 0). Locally mantling this volcanic/sedimentary section are deposits of moderately-to well-lithified fanglomerates (lithozone 1). The entire sequence is overlain by an unlithified to poorly-cemented silty sand, sand, and gravelly sand (lithozone 2) (refer to figure 2.4-27).

The permeability of the regional aquifer was assessed by reviewing irrigation well pumping records (see paragraph 2.4.13.2) and performing an aquifer pumping test (appendix 2G). Yields from irrigation wells which tap the regional aquifer range from 400 to 2800 gallons per minute. The average specific capacity is 35 gallons per minute per foot of drawdown. The aquifer pumping test, performed on an existing irrigation well (B-1-6 - 34abb) resulted in a calculated transmissivity of

100,000 gallons per day per foot and a storage coefficient of 0.005. The pumping rate during the test was 2360 gallons per minute.

2.4.13.1.2 Groundwater Conditions

In the site area, the groundwater reservoir consists of an extensive regional aquifer and a local perched water zone.

2.4.13.1.2.1 Regional Aquifer. In the site area, the lower coarse-grained unit, described in the preceding section, comprises the regional aquifer that extends to over 400 square miles. The regional aquifer is bounded by the mountain masses that encompass the Lower Hassayampa Centennial area (figure 2.4-26).

The primary recharge source to the regional aquifer in the site area is underflow from upper Hassayampa Valley, north of the site area. The general flow direction is north to south. Reversal of flow direction occurs locally where the groundwater levels are depressed due to pumping for irrigation purposes. Infiltration of precipitation, surface runoff, and return flow from irrigation in the vicinity of the site comprise a small portion of the total recharge of the regional aquifer.

Discharge from the regional groundwater reservoir occurs as underflow to Arlington Valley (to the south of the site) and pumpage from irrigation wells. A detailed discussion of water use in the vicinity of the site is provided in paragraph 2.4.13.2.

Piezometric levels in the vicinity of the site are at depths ranging from 100 to 250 feet below the ground surface. A water level contour map of the regional aquifer in the lower

Hassayampa-Centennial area was constructed by the U.S. Geological Survey[35] and is reproduced in figure 2.4-29. The most conspicuous hydrological features indicated by the water level contours are the large cone of depression beneath the site, and a broader but shallower cone of depression south of the site. A smaller cone of depression also occurs immediately north of the Palo Verde Hills. The cones of depression have been formed by long-term pumpage from irrigation wells in the area (see paragraph 2.4.13.2). Artesian conditions prevail within the aquifer in the site area. Confinement is generally provided by the middle fine-grained layer.

2.4.13.1.2.2 Perched Water Zone. The Palo Verde site is situated in an area that was under cultivation from about 1950 to late 1975. Water for crop irrigation was pumped from the regional aquifer. Most of the water was consumed by the crops (primarily cotton) through evapo-transpiration. The remainder of the water percolated through the upper alluvial sediments and perched on top of the underlying aquitard (middle fine-grained unit). The shape of the perched mound is consistent with the shape of the irrigated area within the site (see figure 2.4-30). Water table conditions prevail within the perched water zone.

During the 25-year period of agricultural activity at the site, the prime source of recharge of the perched water zone was excess irrigation water that percolated through the upper sediments. Since 1975, when agricultural activity stopped within the site, the only source of recharge has been precipitation and surface runoff. However, as evidenced by the sharp decline in perched water levels since 1975 (3 feet per year average -- refer to paragraph 2.4.13.2) local natural recharge is insufficient to maintain the perched mound. The

decay of the perched water mound is caused mainly by radial flow outward from the center of the mound and some downward leakage through the aquitard.

2.4.13.1.3 Onsite Use

A detailed discussion of present and projected groundwater use, as well as its effect on groundwater levels, is presented in paragraph 2.4.13.2.

2.4.13.2 Sources

2.4.13.2.1 Regional Water Use

Water for irrigation is the major use of groundwater in the lower Hassayampa-Centennial area. An average of 78,000 acre-feet per year was pumped during the period 1966 through 1972. The water for municipal and domestic use, also obtained from the groundwater reservoir, is very small. Annual pumpage for municipalities, livestock, or industrial purposes is less than 1% of the total.

The production history of wells in the lower Hassayampa-Centennial area is compiled in table 2.4-24. The table lists well locations for known active wells and the annual pumpage rate for each well for the years 1966 through 1972. The location of these wells is shown in figure 2.4-31. A steady decline of the water levels in the area began about 1950 due to the increase in pumping of groundwater for agriculture. The water level has declined by as much as 100 feet near the centers of cones of depression during the past 25 years (see figure 2.4-32). The water level decline is attributed to pumping of wells and the resultant spread of the cones of depression and consequent interference effects between wells.

2.4.13.2.2 Onsite Water Use

During the 25-year period (1950-1975) of agricultural activity at the site, water was pumped heavily from the regional aquifer, resulting in the localized depression of water levels depicted in figure 2.4-29. The locations of irrigation wells in the site area and its vicinity are shown in figure 2.4-33. In 1972, four existing irrigation wells within the PVNGS property yielded a total of 7542 acre-feet of water. The site wells yielded a total average of 6000 acre-feet per year from 1966 through 1972. Most of the water (83%) was pumped from wells (B-1-6)34abb and 34acc.

Irrigation stopped in late 1975, a few months prior to the start of construction. Well No. (B-1-6)34abb has been used since as the primary well for construction water supply with (B-1-6)27ddc as the backup well. During the period 1976 through 1978, the combined pumping rate of these two wells has been about 350 acre-feet per year (see table 2.4-25). This quantity corresponds to approximately one-twentieth of the annual groundwater withdrawal from onsite wells during the last few years of irrigation.

The impact of groundwater withdrawal on regional aquifer water levels is demonstrated in the hydrographs of onsite wells (figure 2.4-32). Water levels declined steadily during the 25-year period (1950-1975) of agricultural activity. During this period, water level declines in the wells ranged from 50 to 100 feet. Since 1975, water levels have risen in response to the cessation of agricultural pumpage. The significant

Table 2.4-24

PUMPAGE RECORDS OF WELLS IN THE LOWER HASSAYAMPA-CENTENNIAL AREA[a] (Sheet 1 of 2)

WELL NO.		ANNUAL PUMPAGE (IN ACRE-FEET)						
		1966	1967	1968	1969	1970	1971	1972
(B-1-5)	6ddb$_2$						80	
	7aab						80	
	10bbc				1		2	5
	10ccc				1	5		
	15bbb$_2$				2	2		
	16bbb	556	654	470	663	0		
	16bca	558	550	372	448	0		
	17acd	105	117	92	96	212	328	140
	21bbb	249	284	34	14	0		
	21ddb	82	75	58	81	30	36	
	27bbc	101	48	54	49	41	55	48
	28aaa$_2$	83	74	61	81		15	56
(B-1-6)	7bdd	258	240	249	309	290	302	154
	8abb	398	1,959	799	852	435	758	715
	10aab	592	812	763	709	492	661	813
	11bca	40	35	97	33	18	103	161
	20dab	57	76	42	76			
	20dbb	25	43	129	486	478	1,155	849
	27cbc[b]	63	106	315	97	22	24	44
	27ddc[b]	723	957	790	916	655	779	1,277
	34abb[b]	2,099	2,684	2,373	2,176	2,157	2,105	2,583
	34acc[b]	2,079	2,960	2,319	2,914	2,247	2,343	3,638
	34adc[b]				166	31	45	0
(B-1-7)	1bbb	1,725	1,820	2,690	2,800	3,064	2,991	3,815
(B-2-6)	5daa				1,374	1,363	1,277	1,707
	6daa				1.827	1,659	1,997	2,087
	8aaa				1,580	1,372	2,193	2,303
	9bba				1,334	979	1,995	1,896
	16caa				561	414	448	647
	17aaa				1,925	2,200	2,193	2,412
	17daa				1,022	1,479	1,463	1,565
	19bbb						20	
	19daa				89	207	680	998
	20bba				841	806	981	890
	20daa	758	762	827	661	545	802	604
	21bba				386	662	466	670
	23aab	364	1,140	1,205	706	807	805	705
	24cba						100	
	28bab	1,184	1,494	1,829	984	1,340	1,661	1,767
	31daa	1,557	2,325	2,581	2,394	2,365	2,258	2,505
	32db							
	33caa	658	1,341	994	962	1,134	1,069	2,038
(B-2-7)	12cbb						20	
	14cbb				1,241	1,489	1,461	1,866
	22bbb							
	22cbb	549	670	355	353	144	246	
	23ccb	773	1,399	1,454	1,453	1,685	1,631	1,562
	25bca	15	35	475	386	588	1,058	946
	26aac	1.9	2.1	3	4	4		
	26abb	619	884	682	724	759	713	697
	26acb	1,286	1,588	1,305	1,216	1,340	1,467	1,479
	26bab	318	516	674	802	1,106	970	823
	27aab	358	491	607	594	598		
	28bab	1,020	1,067	909	919	667	1,283	1,390
	28bbb	528	564	442	394	410	466	559
	34bba	653	822	393	80			
	36abb	1,324	1,996	2,012	2,041	3,198	3,407	3,414
	36bba	477	952	895	845	776	720	606
	36cbb	503	1,110	1,121	1,056	887	986	832

a. Data compiled from files of Water Resources Division, U.S. Geological Survey, Phoenix,Arizona.

b. Wells located within the PVNGS Site.

Table 2.4-24

PUMPAGE RECORDS OF WELLS IN THE LOWER HASSAYAMPA-CENTENNIAL AREA[a] (Sheet 2 of 2)

WELL NO.	ANNUAL PUMPAGE (IN ACRE-FEET)						
	1966	1967	1968	1969	1970	1971	1972
(C-1-5) 1cdd						500	
3baa$_2$				422	300	502	106
4aaa$_2$				26	21	44	46
13aab				2,429	2,028	1,633	2,193
13aad				1,624	1,310	790	1,018
13bad				917	1,578	1,431	1,255
13bba				1,076	1,647	787	1,049
13cdd				910	1,616	1,245	1,167
21cdd	501	736	382	476	678	1,330	556
22ccc	614	1,541	531	858	1,328	1,875	1,060
23ccc				2,513	2,545	3,614	1,496
23dca				951	747	1,071	360
24ccb				574	861	1,302	502
36abb				1,838	2,352	4,336	2,380
27ddd$_2$	1,117	1,201	1,763	1,751	1,212	1,704	1,536
28aab	343	490	405	356	583	621	608
29adc	571	820	471	910	588	1,490	614
32baa	1,395	1,988	1,600	2,578	2,000(a)	2,547	1,475
32ccb	713	526		1,113	1,250	1,944	986
34adc	301	548	862	755	660	890	677
34dbd	36		0	308	359	255	63
(C-1-6) 13cab	397	545	513	544			
14dbb	1,150	2,019	1,935	1,538	1,270	1,763	1,892
17abb	1,738	673	1,269	1,242	1,231	1,310	2,260
18bbb	1,196	1,005	752	1,496	728	1,750	1,300
19abb	79	867	772	1,388	66		
21cbb$_2$	153	816	870	1,016			
23adb	1,026	1,500	1,219	1,131	1,120	974	1,468
23bab	410	260	396	374	234	478	488
23caa		965	901	772	878	1,016	1,345
26aba	711	956	926	830	561	604	539
26dad	1,510	1,714	1,672	1,939	1,685	2,066	2,130
27bbc	2,391	2,560	2,239	2,454	2,046	1,955	894
28acc$_2$	1,560	2,610	1,996	1,992	1,792	1,384	985
(C-1-7) 14bbb	141	78	135		114		
(C-2-5) 3aaa				928	752	999	764
5bcb		913	718	959	1,126	1,595	745
5ccb	617	1,022	511	518	588	999	333
8abb		1,281	906	1,160	1,130	1,064	1,317
8ccc	2,237	2,726	1,541	2,135	1,770	2,546	3,254
9cbb		2,865	2,189	2,726	2,238	1,145	907
16abb	0		1,450	1,106	1,197	1,265	840
16daa	1,111	1,060	1,342	530	530	1,490	1,641

Table 2.4-25

WELL PUMPING RATES DURING CONSTRUCTION

Well No.	Annual Pumpage in Acre Feet		
	1976	1977	1978
(B-1-6)34abb	287	283	314
(B-1-6)27ddc	48	68	58
Total	335	351	372

reduction (from 6000 to 350 acre-feet per year) in annual groundwater withdrawal rates has resulted in water level rises of about 20 feet in 3 years.

As noted in paragraph 2.4.13.1, agricultural activity also created a perched water mound above the aquitard beneath the site. Perched water levels have been monitored since late 1973. Hydrographs for perched water level monitoring wells are presented in figures 2.4-34 through 2.4-38. The locations of these wells are shown in figures 2.4-30 and 2.4-39. During the last 2 years of irrigation (1974 and 1975), perched water levels remained essentially constant (except for seasonal fluctuations), indicating that approximately steady-state conditions had been reached. A steady decline in perched water levels has been observed since 1975 when agricultural activities ceased in the site area. The average rate of perched water level decline since 1975 has been about 3 feet per year. Most hydrographs show a decrease in the rate of water level decline with time.

2.4.13.2.3 Projected Groundwater Use and its Impact on Water Levels

During plant operation, groundwater from the regional aquifer will be used only for the domestic water supply. The domestic water requirement for three units is estimated to be about 1000 gallons per minute (1600 acre-feet per year). This rate of groundwater withdrawal is about one-fourth the withdrawal rate during the last few years of irrigation.

The effects of onsite pumping for the domestic water supply on regional aquifer water levels were evaluated by an analysis presented in the PVNGS 1, 2, and 3 PSAR. The analysis was based on values of transmissivity (100,000 gallons per day per foot) and storage coefficient (0.005) determined by a pump test conducted on the production well (B-1-6-34abb). For the projected pumping rate of 1600 acre-feet per year, the predicted drawdown in the production well after 35 years of operation is 30 feet. By the same analysis, the predicted drawdown at distances of 0.5, 1, 2, 5, and 10 miles is 10.6, 9.1, 7.5, 5.3, and 3.7 feet, respectively.

These predictions are very conservative because they do not incorporate the compensating effects of cessation of irrigation in the site area. As noted in paragraph 2.4.13.2.2, a significant rise in water levels has been observed since 1975 due to the reduction of onsite pumping rates from about 6000 acre-feet per year (related to agricultural activity) to 350 acre-feet per year during construction. Because of this reduced pumping rate, regional aquifer water levels are expected to continue to rise during construction. When all three units are in operation, and the pumping rate is increased to 1600 acre-feet per year, water levels can be expected to decline, but at a rate slower than that observed during

irrigation (prior to 1975). The net impact of pumping for plant operations is, therefore, expected to be even smaller than that predicted by the analysis presented in the PSAR.

2.4.13.2.4 Recharge From Local Sources

To analyze the long-term seepage effect on the movement of the perched-water table, a digital simulation was performed. Figure 2.4-42 shows the general configuration of the water storage reservoir and evaporation pond used in this analysis. The time-dependent, two-dimensional flow of groundwater in a nonhomogeneous and isotropic aquifer is governed by the following equation:

$$\frac{\partial}{\partial x}\left(T\frac{\partial h}{\partial x}\right)+\frac{\partial}{\partial y}\left(T\frac{\partial h}{\partial y}\right)=S\frac{\partial h}{\partial t}+Q \qquad (9)$$

Terms in this relationship, along with others used in the text, are defined as follows:

x,y = Cartesian coordinates

T = aquifer transmissivity = $k_h h$

h = thickness of horizontal flow zone

S = aquifer storage coefficient

t = time

Q = net groundwater loss rate per unit area

$K_{(h)}$ = horizontal permeability (hydraulic conductivity)

There is no general solution to the above equation; however, numerical solutions can be obtained. Prickett and Lonnquist[36] have developed a digital computer simulation code through a finite difference approach at the Illinois State Water Survey. Many different types of groundwater simulation conditions were presented in their report. The Water Table Condition Code,

which was designed to simulate groundwater mound decay and recharge, was used in this study.

A. Assumptions Used in Simulation

Water was assumed to seep from the bottom of the 80-acre water storage reservoir at the rate of 75 feet per year and be immediately transported down to the aquitard surface. Seepage from the storage reservoir continued in the simulation at the rate of 75 feet per year until the perched-groundwater mound rose to the bottom of the reservoir, at which time the seepage decreased linearly to zero as the groundwater mound surface approached the maximum reservoir water level. The simulation was insensitive to the initial seepage rate because the perched mound rose to the reservoir bottom in a matter of months. From then on the seepage rate declined, being controlled by other site parameters.

Inflow to the evaporation pond was assumed to be 954 gallons per minute per unit as the respective units start up in May 1983, May 1984, and May 1986. When the groundwater mound was below the bottom of the evaporation pond (elevation 920 feet above msl), the incoming blowdown was assumed to seep into the ground. When the groundwater mound rose above the bottom of the evaporation pond, an annual evaporation rate of 72 inches was assumed.[37] Evaporation was only considered when water was standing in the evaporation pond. Seepage was decreased linearly in the same manner as in the storage reservoir. Leakage through the fine-grained aquitard was allowed to occur in the simulation in the downward direction only. The complication of some actual horizontal movement within the aquitard was avoided by considering only

vertical permeabilities and gradients. Leakage through the aquitard was simulated using the following equation:

$$Q_n = (K_v / m') \Delta h A_s \quad (10)$$

where:

Q_n = infiltration rate through the aquitard

K_v = vertical permeability of the aquitard

m' = thickness of the aquitard

Δh = head difference across the aquitard

A_s = area of a grid square

K_v and m' are obtained from field data.

B. Summary of Simulation Conditions and Assumptions

- Time zero was October 1976.
- Each time step represented 30 days.
- Grid points were 1000 feet apart in the north-south and east-west directions.
- Both the storage reservoir and evaporation pond were assumed to be unlined.
- Storage reservoir was assumed to be full at Unit 1 startup in May 1983.
- Each grid point in the storage reservoir was initially assumed to seep 75 feet per year multiplied by the area in square feet of that grid square within the reservoir and above the aquitard until the groundwater mound rose to the reservoir bottom. At that point, seepage began to decrease linearly to

zero as the groundwater mound approached the maximum water surface elevation of the reservoir.

- The bottom of the storage reservoir was taken as 921 feet above msl with a water surface of 950 feet msl.
- The evaporation pond was assumed to receive 954 gallons per minute per unit as the respective units start up in May 1983, May 1984, and May 1986.
- When the groundwater mound was below the bottom of the evaporation pond (elevation 920 feet msl), all of the incoming blowdown was assumed to seep into the ground. When the groundwater mound rose above the bottom of the evaporation pond, an annual evaporation rate of 72 inches was assumed.[37]
- K_h of the upper coarse-grained material was represented by 10 gallons per day per square foot.
- K_v of the aquitard was represented by 0.001 gallons per day per square foot.
- The storage coefficient S of the upper coarse-grained material was assumed to be 0.2.
- Aquitard surface contours, figure 2.4-28.
- Aquitard thickness contours, figure 2.4-39.

C. Site Parameters

In the seepage model, the horizontal permeability (hydraulic conductivity) of the upper coarse-grained soil layer was represented by a value of 10 gallons per day per square foot (5×10^{-4} centimeters per second). Similarly, the vertical permeability of the fine-grained soil layer (aquitard) was represented by a value of 0.001 gallons per day per square

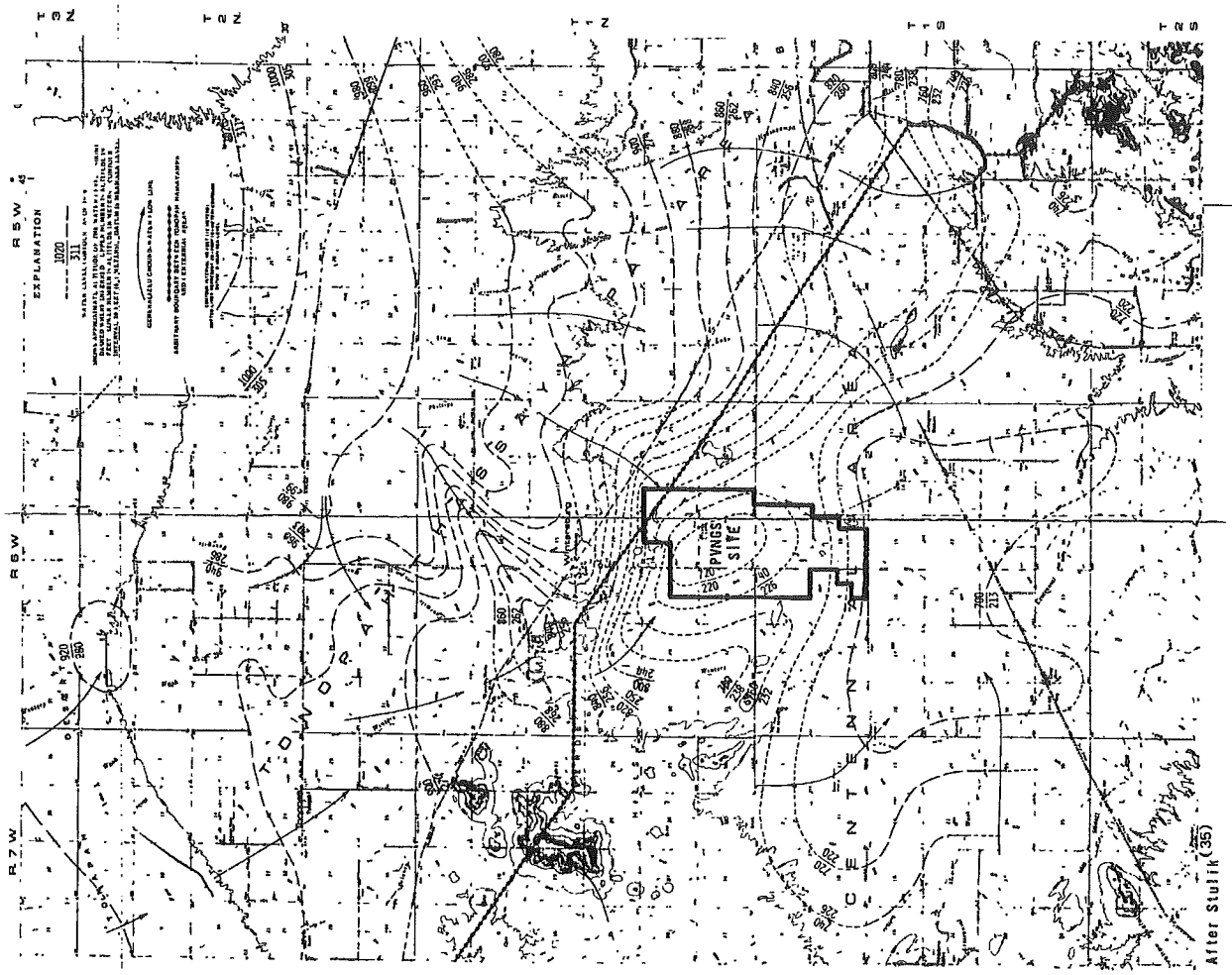
foot (5×10^{-8} centimeters per second). These values were selected after a thorough evaluation of field and laboratory permeability test data developed at the site for this purpose. The selection process is described in detail in PVNGS 4 and 5 PSAR, Appendix 2Y. Permeability test data are presented in appendix 2G.

D. Groundwater Level Prediction

Predicted groundwater levels, as shown in figure 2.4-40, from the digital simulation are 915, 909, and 909 feet for Units 1, 2, and 3, respectively. The design groundwater levels of the units are 927, 924, and 921 feet for Units 1, 2, and 3, respectively. Throughout the operating life, therefore, water levels under each unit are predicted to stay below design groundwater levels.

The analysis of long-term seepage effects was based on an evaporation pond location as indicated in figure 2.4-42. If eventual construction of some or all of the evaporation pond was further south than shown on figure 2.4-42 or at a bottom elevation less than 920 feet msl, water levels under the units would be lower than those predicted here. This conclusion is based on the following facts:

- The distance from the evaporation pond to the units would be increased by moving the ponds southward
- The aquitard surface slopes to the south
- Lowering the pond bottom elevation would lead to a decreased head difference between the water level in the pond and the design structural integrity levels under the units.



PALO VERDE NUCLEAR GENERATING STATION UPDATED FSAR

WATER LEVEL CONTOUR MAP
OF THE REGIONAL AQUIFER

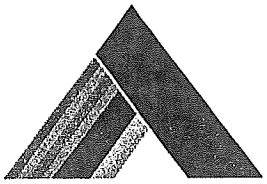
FIGURE 2.4-29

JUNE 2001 REVISION 11

Drains w/Ltr dtd 10/2/94

4.5

PALO VERDE NUCLEAR GENERATING STATION

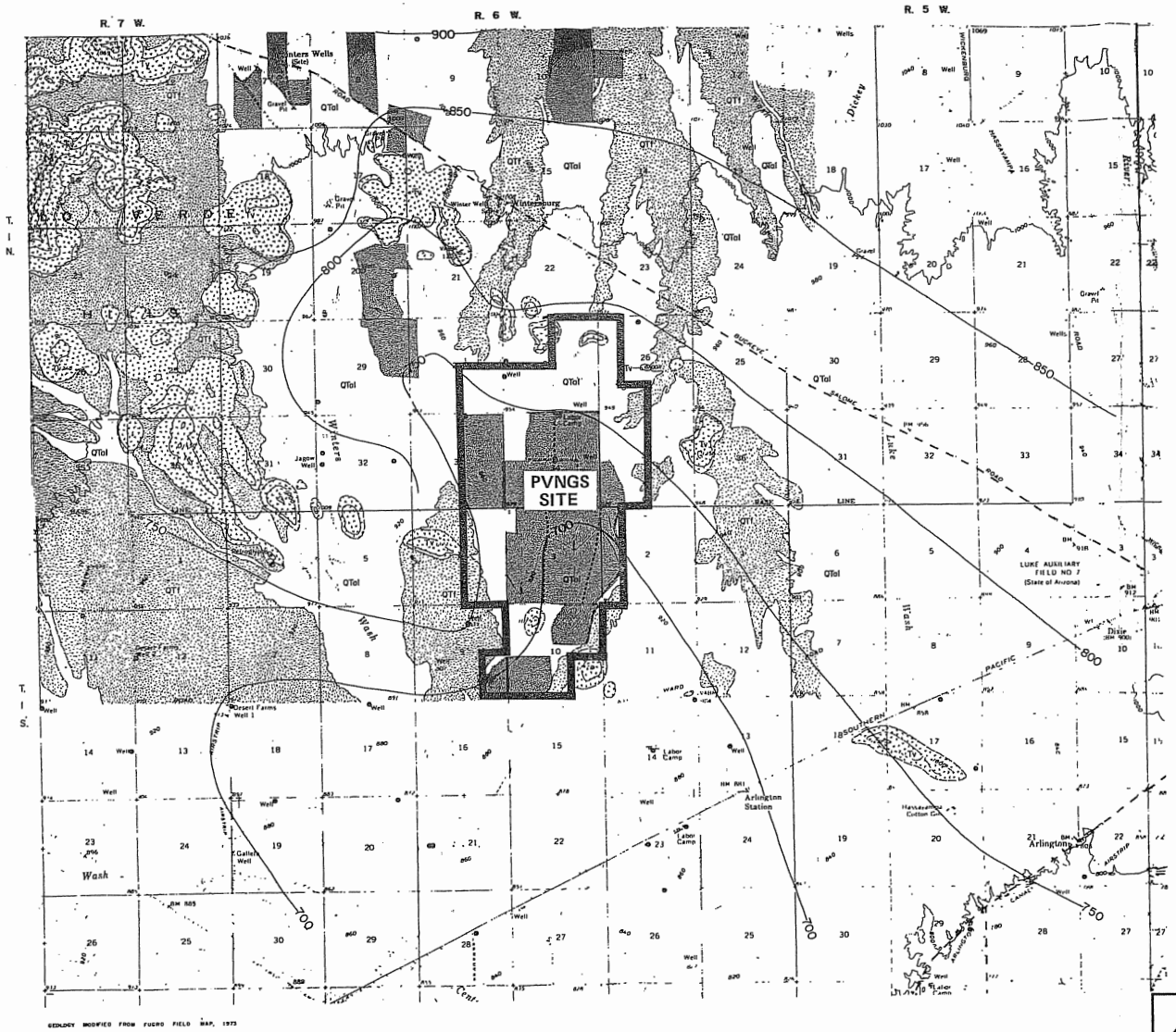


UNITS 1,2&3

ENVIRONMENTAL REPORT CONSTRUCTION PERMIT STAGE

VOLUME II

ARIZONA PUBLIC SERVICE COMPANY
PROJECT MANAGER AND OPERATING AGENT



LEGEND

QTal
ALLUVIUM:
BROWN SILT AND CLAY, GRAVEL AND SAND LENSES (UNDIFFERENTIATED)

QTT
POORLY CEMENTED DEPOSITS OF GRAYISH BROWN SILT, SAND, AND GRAVEL

VOLCANICS:
GRAY ANDESITE AND BROWN BASALT (UNDIFFERENTIATED)

GEOLOGICAL CONTACT

WATER WELL OR BOREHOLE

800
WATER LEVEL CONTOUR
REGIONAL AQUIFER (1969–1973 DATA)
IN FEET, MSL DATUM

IRRIGATED CROPLAND IN 1973

NORTH

0 1 2 MI
SCALE

0 8000 FT
SCALE

Arizona Nuclear Power Project
Palo Verde Nuclear Generating Station
Units 1, 2 & 3

HYDROGEOLOGICAL MAP OF
PALO VERDE SITE AREA

Figure 2.5-4

ER

GeoTrans 2006

PV-035

Palo Verde Nuclear Generating Station APP Compliance Support

Location of Geologic Cross Sections and Offsite Well Locations

Explanation

- 2-Mile Buffer of PVNGS Site Boundary
- Townships
- Section
- Wells within 2-miles of PVNGS March 2006
- **Registered Wells**
  - Wells 1980 to 1982
  - Wells after 2003 (Owner NOI)
  - Wells 1982 to 2003
  - Wells Prior to 1980
  - Wells 2001 to 2003
  - Wells Prior to 1980 (Late Registration)
  - Wells after 2003 (Driller NOI)

Cross Section Locations

Line_name

- 1-2
- 11-12
- 13-14
- 15-16
- 17-18
- 19-20
- 21-22
- 23-24
- 25-26
- 27-28
- 29-30
- 3-4
- 31-32
- 5-6
- 7-8
- 9-10

N

0 1,250 2,500 5,000 7,500 10,000 12,500 Feet

Date:	March 27, 2006
Drawn by:	PRP
File:	Updated Offsite Well Map.mxd

GeoTrans, Inc.

Figure 1

Brown and Caldwell
2006

2005 ANNUAL MONITORING AND COMPLIANCE REPORT
APP NO. P-100388

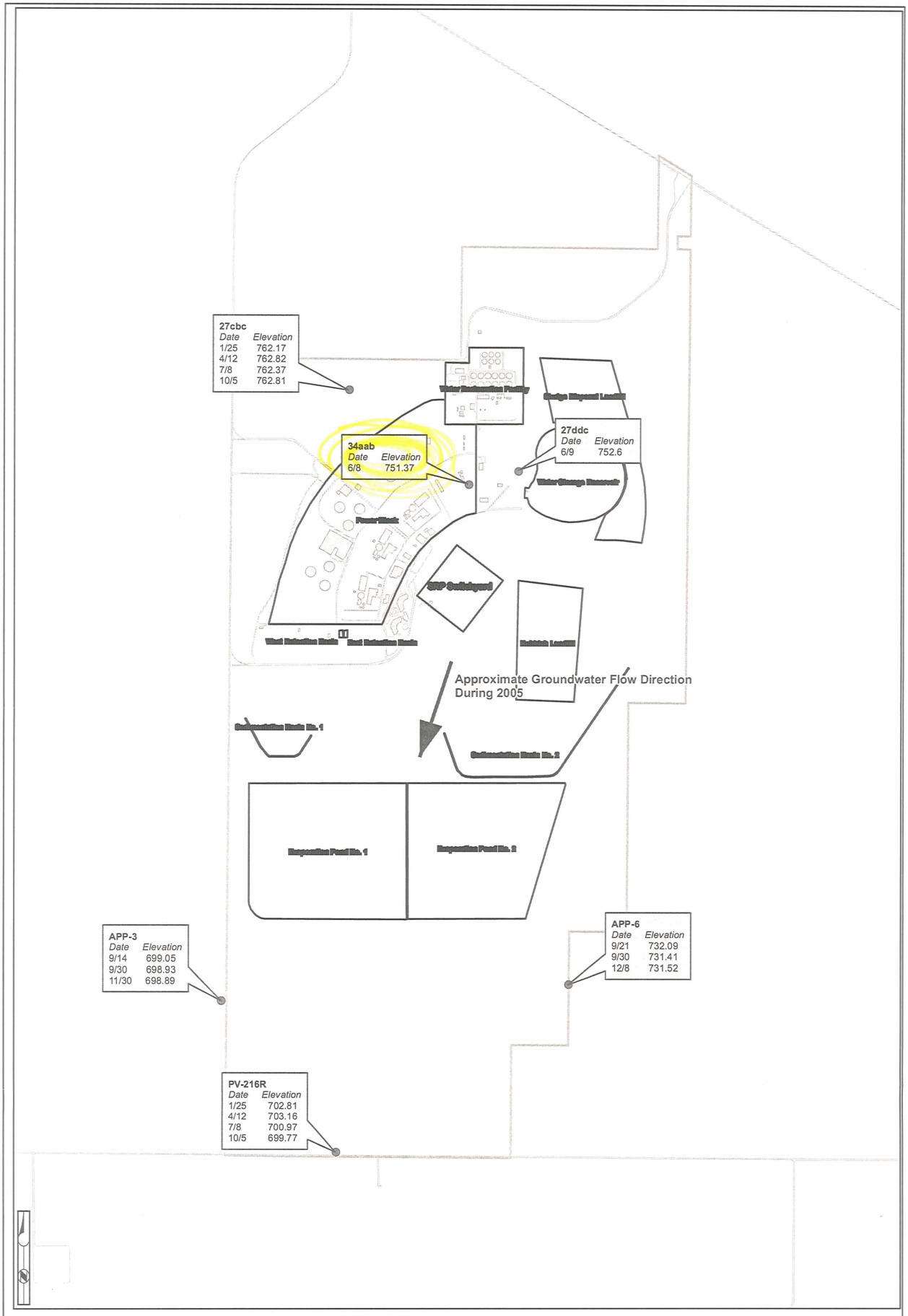
ARIZONA PUBLIC SERVICE CO.
PALO VERDE NUCLEAR GENERATING STATION

MAY 15, 2006

Prepared for: Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Prepared by: Brown and Caldwell
201 East Washington Street, Suite 500
Phoenix, Arizona 85004

Brown and Caldwell Project #: 130496.001



0 1,000 2,000

SCALE IN FEET

BROWN AND CALDWELL

EXPLANATION

- Wells (WL Elevation in Feet Above Mean Sea Level)
- Facilities
- Site Boundary
- Buildings

Figure 1-9

Palo Verde Nuclear Generating Station
Regional Wells
2005 Water Level Measurements

P:\BC - Tucson\APS-PVNGS\G128186 - APP Annual Rptng\GIS\128186021 5/11/06

Groundwater and Wells

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NONEQUILIBRIUM WELL EQUATION

Theis developed the nonequilibrium well equation in 1935. The Theis equation was the first to take into account the effect of pumping time on well yield. Its derivation was a major advance in groundwater hydraulics. By use of this equation, the drawdown can be predicted at any time after pumping begins. Transmissivity and average hydraulic conductivity can be determined during the early stages of a pumping test rather than after water levels in observation wells have virtually stabilized. Aquifer coefficients can be determined from the time-drawdown measurements in a single observation well rather than from two observation wells as required in Equations 9.3 and 9.4.

Derivation of the Theis equation is based on the following assumptions:

1. The water-bearing formation is uniform in character and the hydraulic conductivity is the same in all directions.
2. The formation is uniform in thickness and infinite in areal extent.
3. The formation receives no recharge from any source.
4. The pumped well penetrates, and receives water from, the full thickness of the water-bearing formation.
5. The water removed from storage is discharged instantaneously when the head is lowered.
6. The pumping well is 100-percent efficient.
7. All water removed from the well comes from aquifer storage.
8. Laminar flow exists throughout the well and aquifer.
9. The water table or potentiometric surface has no slope.

These assumptions are essentially the same as those for the equilibrium equation except that the water levels within the cone of depression need not have stabilized or reached equilibrium.

In its simplest form, the Theis equation is:

$$s = \frac{114.6\,Q\,W(u)}{T} \qquad s = \frac{1}{4\pi}\frac{Q}{T}W(u) \qquad (9.5)$$

where

s = drawdown, in ft, at any point in the vicinity of a well discharging at a constant rate
Q = pumping rate, in gpm
T = coefficient of transmissivity of the aquifer, in gpd/ft
$W(u)$ = is read "well function of u" and represents an exponential integral

where

s = drawdown, in m, at any point in the vicinity of a well discharging at a constant rate
Q = pumping rate, in m^3/day
T = coefficient of transmissivity of the aquifer, in m^2/day
$W(u)$ = is read "well function of u" and represents an exponential integral

In the $W(u)$ function, u is equal to:

$$u = \frac{1.87r^2S}{Tt} \qquad u = \frac{r^2S}{4Tt} \qquad (9.5a)$$

where

r = distance, in ft, from the center of a

where

r = distance, in m, from the center of a

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in gpd/ft
t = time since pumping started, in days

pumped well to a point where the drawdown is measured
S = coefficient of storage (dimensionless)
T = coefficient of transmissivity, in m^2/day
t = time since pumping started, in days

The well function of u [$W(u)$] originated as a term to represent the heat distribution in a flat plate with a heating element at its center. Theis recognized that this same concept could be applied to the regular distribution of the groundwater head around a pumping well even though water flows toward the point source rather than away from it. The mathematical principles remain the same.

Analysis of pumping test data* using the Theis equation can yield transmissivity and storage coefficients for all nonequilibrium situations. In actual practice, however, the Theis method is often avoided because it requires curve-matching interpretation and is somewhat laborious. In fact, the work of applying the Theis method can be avoided in most cases. For example, if the pumping test is sufficiently long or the distance from the well to where the drawdown is measured is sufficiently small, the $W(u)$ function can be replaced by a simpler mathematical function which makes the analysis easier. The Theis method is developed at the end of this chapter, but at this point the simplified version is examined because it serves well in most cases.

MODIFIED NONEQUILIBRIUM EQUATION

In working with the Theis equation, Cooper and Jacob (1946) point out that when u is sufficiently small, the nonequilibrium equation can be modified to the following form without significant error:

$$s = \frac{264Q}{T} \log \frac{0.3\ Tt}{r^2S} \qquad s = \frac{0.183Q}{T} \log \frac{2.25\ Tt}{r^2S} \qquad (9.6)$$

where the symbols represent the same terms as in Equation 9.5 and 9.5a.

For values of u less than about 0.05, Equation 9.6 gives essentially the same results as Equation 9.5. The value of u becomes smaller as t increases and r decreases. Thus, Equation 9.6 is valid when t is sufficiently large and r is sufficiently small. Equation 9.6 is similar in form to the Theis equation except that the exponential integral function, $W(u)$, has been replaced by a logarithmic term which is easier to work with in practical applications of well hydraulics.

For a particular situation where the pumping rate is held constant, Q, T, and S are all constants. Equation 9.6 shows, therefore, that the drawdown, s, varies with log t/r^2 when u is less than 0.05. From this relationship, two important relationships can be stated:

1. For a particular aquifer at any specific point (where r is constant), the terms s and t are the only variables in Equation 9.6. Thus, s varies as log C_1t, where C_1 represents all the constant terms in the equation.
2. For a particular formation and at a given value of t, the terms s and r are the

*The performance of newly completed wells is often checked by pumping tests. During the test, the drawdown in the pumping well and observation wells is measured at a constant discharge rate. When properly conducted, these tests yield information on transmissivity and storage capability. See Chapter 16 for a detailed analysis of pumping test procedures.

APPENDIX 9.E.

Values of $W(u)$ Corresponding to Values of u for Theis Nonequilibrium Equation

N \ u	$N\times10^{-15}$	$N\times10^{-14}$	$N\times10^{-13}$	$N\times10^{-12}$	$N\times10^{-11}$	$N\times10^{-10}$	$N\times10^{-9}$	$N-10^{-8}$	$N\times10^{-7}$	$N\times10^{-6}$	$N\times10^{-5}$	$N\times10^{-4}$	$N\times10^{-3}$	$N\times10^{-2}$	$N\times10^{-1}$	N
1.0	33.9616	31.6590	29.3564	27.0538	24.7512	22.4486	20.1460	17.8435	15.5409	13.2383	10.9357	8.6332	6.3315	4.0379	1.8229	0.2194
1.1	33.8662	31.5637	29.2611	26.9585	24.6559	22.3533	20.0507	17.7482	15.4456	13.1430	10.8404	8.5379	6.2363	3.9436	1.7371	.1860
1.2	33.7792	31.4767	29.1741	26.8715	24.5689	22.2663	19.9637	17.6611	15.3586	13.0560	10.7534	8.4509	6.1494	3.8576	1.6595	.1584
1.3	33.6992	31.3966	29.0940	26.7914	24.4889	22.1863	19.8837	17.5811	15.2785	12.9759	10.6734	8.3709	6.0695	3.7785	1.5889	.1355
1.4	33.6251	31.3225	29.0199	26.7173	24.4147	22.1122	19.8096	17.5070	15.2044	12.9018	10.5993	8.2968	5.9955	3.7054	1.5241	.1162
1.5	33.5561	31.2535	28.9509	26.6483	24.3458	22.0432	19.7406	17.4380	15.1354	12.8328	10.5303	8.2278	5.9266	3.6374	1.4645	.1000
1.6	33.4916	31.1890	28.8864	26.5838	24.2812	21.9786	19.6760	17.3735	15.0709	12.7683	10.4657	8.1634	5.8621	3.5739	1.4092	.08631
1.7	33.4309	31.1283	28.8258	26.5232	24.2206	21.9180	19.6154	17.3128	15.0103	12.7077	10.4051	8.1027	5.8016	3.5143	1.3578	.07465
1.8	33.3738	31.0712	28.7686	26.4660	24.1634	21.8608	19.5583	17.2557	14.9531	12.6505	10.3479	8.0455	5.7446	3.4581	1.3098	.06471
1.9	33.3197	31.0171	28.7145	26.4119	24.1094	21.8068	19.5042	17.2016	14.8990	12.5964	10.2939	7.9915	5.6906	3.4050	1.2649	.05620
2.0	33.2684	30.9658	28.6632	26.3607	24.0581	21.7555	19.4529	17.1503	14.8477	12.5451	10.2426	7.9402	5.6394	3.3547	1.2227	.04890
2.1	33.2196	30.9170	28.6145	26.3119	24.0093	21.7067	19.4041	17.1015	14.7989	12.4964	10.1938	7.8914	5.5907	3.3069	1.1829	.04261
2.2	33.1731	30.8705	28.5679	26.2653	23.9628	21.6602	19.3576	17.0550	14.7524	12.4498	10.1473	7.8449	5.5443	3.2614	1.1454	.03719
2.3	33.1286	30.8261	28.5235	26.2209	23.9183	21.6157	19.3131	17.0106	14.7080	12.4054	10.1028	7.8004	5.4999	3.2179	1.1099	.03250
2.4	33.0861	30.7835	28.4809	26.1783	23.8758	21.5732	19.2706	16.9680	14.6654	12.3628	10.0603	7.7579	5.4575	3.1763	1.0762	.02844
2.5	33.0453	30.7427	28.4401	26.1375	23.8349	21.5323	19.2298	16.9272	14.6246	12.3220	10.0194	7.7172	5.4167	3.1365	1.0443	.02491
2.6	33.0060	30.7035	28.4009	26.0983	23.7957	21.4931	19.1905	16.8880	14.5854	12.2828	9.9802	7.6779	5.3776	3.0983	1.0139	.02185
2.7	32.9683	30.6657	28.3631	26.0606	23.7580	21.4554	19.1528	16.8502	14.5476	12.2450	9.9425	7.6401	5.3400	3.0615	.9849	.01918
2.8	32.9319	30.6294	28.3268	26.0242	23.7216	21.4190	19.1164	16.8138	14.5113	12.2087	9.9061	7.6038	5.3037	3.0261	.9573	.01686
2.9	32.8968	30.5943	28.2917	25.9891	23.6865	21.3839	19.0813	16.7788	14.4762	12.1736	9.8710	7.5687	5.2687	2.9920	.9309	.01482
3.0	32.8629	30.5604	28.2578	25.9552	23.6526	21.3500	19.0474	16.7449	14.4423	12.1397	9.8371	7.5348	5.2349	2.9591	.9057	.01305
3.1	32.8302	30.5276	28.2250	25.9224	23.6198	21.3172	19.0146	16.7121	14.4095	12.1069	9.8043	7.5020	5.2022	2.9273	.8815	.01149
3.2	32.7984	30.4958	28.1932	25.8907	23.5881	21.2855	18.9829	16.6803	14.3777	12.0751	9.7726	7.4703	5.1706	2.8965	.8583	.01013
3.3	32.7676	30.4651	28.1625	25.8599	23.5573	21.2547	18.9521	16.6495	14.3470	12.0444	9.7418	7.4395	5.1399	2.8668	.8361	.008939
3.4	32.7378	30.4352	28.1326	25.8300	23.5274	21.2249	18.9223	16.6197	14.3171	12.0145	9.7120	7.4097	5.1102	2.8379	.8147	.007891
3.5	32.7088	30.4062	28.1036	25.8010	23.4985	21.1959	18.8933	16.5907	14.2881	11.9855	9.6830	7.3807	5.0813	2.8099	.7942	.006970
3.6	32.6806	30.3780	28.0755	25.7729	23.4703	21.1677	18.8651	16.5625	14.2599	11.9574	9.6548	7.3526	5.0532	2.7827	.7745	.006160
3.7	32.6532	30.3506	28.0481	25.7455	23.4429	21.1403	18.8377	16.5351	14.2325	11.9300	9.6274	7.3252	5.0259	2.7563	.7554	.005448
3.8	32.6266	30.3240	28.0214	25.7188	23.4162	21.1136	18.8110	16.5085	14.2059	11.9033	9.6007	7.2985	4.9993	2.7306	.7371	.004820
3.9	32.6006	30.2980	27.9954	25.6928	23.3902	21.0877	18.7851	16.4825	14.1799	11.8773	9.5748	7.2725	4.9735	2.7056	.7194	.004267
4.0	32.5753	30.2727	27.9701	25.6675	23.3649	21.0623	18.7598	16.4572	14.1546	11.8520	9.5495	7.2472	4.9482	2.6813	.7024	.003779
4.1	32.5506	30.2480	27.9454	25.6428	23.3402	21.0376	18.7351	16.4325	14.1299	11.8273	9.5248	7.2225	4.9236	2.6576	.6859	.003349
4.2	32.5265	30.2239	27.9213	25.6187	23.3161	21.0136	18.7110	16.4084	14.1058	11.8032	9.5007	7.1985	4.8997	2.6344	.6700	.002969
4.3	32.5029	30.2004	27.8978	25.5952	23.2926	20.9900	18.6874	16.3848	14.0823	11.7797	9.4771	7.1749	4.8762	2.6119	.6546	.002633
4.4	32.4800	30.1774	27.8748	25.5722	23.2696	20.9670	18.6644	16.3619	14.0593	11.7567	9.4541	7.1520	4.8533	2.5899	.6397	.002336
4.5	32.4575	30.1549	27.8523	25.5497	23.2471	20.9446	18.6420	16.3394	14.0368	11.7342	9.4317	7.1295	4.8310	2.5684	.6253	.002073
4.6	32.4355	30.1329	27.8303	25.5277	23.2252	20.9226	18.6200	16.3174	14.0148	11.7122	9.4097	7.1075	4.8091	2.5474	.6114	.001841
4.7	32.4140	30.1114	27.8088	25.5062	23.2037	20.9011	18.5985	16.2959	13.9933	11.6907	9.3882	7.0860	4.7877	2.5268	.5979	.001635
4.8	32.3929	30.0904	27.7878	25.4852	23.1826	20.8800	18.5774	16.2748	13.9723	11.6697	9.3671	7.0650	4.7667	2.5068	.5848	.001453
4.9	32.3723	30.0697	27.7672	25.4646	23.1620	20.8594	18.5568	16.2542	13.9516	11.6491	9.3465	7.0444	4.7462	2.4871	.5721	.001291
5.0	32.3521	30.0495	27.7470	25.4444	23.1418	20.8392	18.5366	16.2340	13.9314	11.6289	9.3263	7.0242	4.7261	2.4679	.5598	.001148
5.1	32.3323	30.0297	27.7271	25.4246	23.1220	20.8194	18.5168	16.2142	13.9116	11.6091	9.3065	7.0044	4.7064	2.4491	.5478	.001021

Appendix 9.E. Continued

N \ u	$N\times10^{-15}$	$N\times10^{-14}$	$N\times10^{-13}$	$N\times10^{-12}$	$N\times10^{-11}$	$N\times10^{-10}$	$N\times10^{-9}$	$N\times10^{-8}$	$N\times10^{-7}$	$N\times10^{-6}$	$N\times10^{-5}$	$N\times10^{-4}$	$N\times10^{-3}$	$N\times10^{-2}$	$N\times10^{-1}$	N
5.2	32.3129	30.0103	27.7077	25.4051	23.1026	20.8000	18.4974	16.1948	13.8922	11.5896	9.2871	6.9850	4.6871	2.4306	.5362	.0009086
5.3	32.2939	29.9913	27.6887	25.3861	23.0835	20.7809	18.4783	16.1758	13.8732	11.5706	9.2681	6.9659	4.6681	2.4126	.5250	.0008086
5.4	32.2752	29.9726	27.6700	25.3674	23.0648	20.7622	18.4596	16.1571	13.8545	11.5519	9.2494	6.9473	4.6495	2.3948	.5140	.0007198
5.5	32.2568	29.9542	27.6516	25.3491	23.0465	20.7439	18.4413	16.1387	13.8361	11.5336	9.2310	6.9289	4.6313	2.3775	.5034	.0006409
5.6	32.2388	29.9362	27.6336	25.3310	23.0285	20.7259	18.4233	16.1207	13.8181	11.5155	9.2130	6.9109	4.6134	2.3604	.4930	.0005708
5.7	32.2211	29.9185	27.6159	25.3133	23.0108	20.7082	18.4056	16.1030	13.8004	11.4978	9.1953	6.8932	4.5958	2.3437	.4830	.0005085
5.8	32.2037	29.9011	27.5985	25.2959	22.9934	20.6908	18.3882	16.0856	13.7830	11.4804	9.1779	6.8758	4.5785	2.3273	.4732	.0004532
5.9	32.1866	29.8840	27.5814	25.2789	22.9763	20.6737	18.3711	16.0685	13.7659	11.4633	9.1608	6.8588	4.5615	2.3111	.4637	.0004039
6.0	32.1698	29.8672	27.5646	25.2620	22.9595	20.6569	18.3543	16.0517	13.7491	11.4465	9.1440	6.8420	4.5448	2.2953	.4544	.0003601
6.1	32.1533	29.8507	27.5481	25.2455	22.9429	20.6403	18.3378	16.0352	13.7326	11.4300	9.1275	6.8254	4.5283	2.2797	.4454	.0003211
6.2	32.1370	29.8344	27.5318	25.2293	22.9267	20.6241	18.3215	16.0189	13.7163	11.4138	9.1112	6.8092	4.5122	2.2645	.4366	.0002864
6.3	32.1210	29.8184	27.5158	25.2133	22.9107	20.6081	18.3055	16.0029	13.7003	11.3978	9.0952	6.7932	4.4963	2.2494	.4280	.0002555
6.4	32.1053	29.8027	27.5001	25.1975	22.8949	20.5923	18.2898	15.9872	13.6846	11.3820	9.0795	6.7775	4.4806	2.2346	.4197	.0002279
6.5	32.0898	29.7872	27.4846	25.1820	22.8794	20.5768	18.2742	15.9717	13.6691	11.3665	9.0640	6.7620	4.4652	2.2201	.4115	.0002034
6.6	32.0745	29.7719	27.4693	25.1667	22.8641	20.5616	18.2590	15.9564	13.6538	11.3512	9.0487	6.7467	4.4501	2.2058	.4036	.0001816
6.7	32.0595	29.7569	27.4543	25.1517	22.8491	20.5465	18.2439	15.9414	13.6388	11.3362	9.0337	6.7317	4.4351	2.1917	.3959	.0001621
6.8	32.0446	29.7421	27.4395	25.1369	22.8343	20.5317	18.2291	15.9265	13.6240	11.3214	9.0189	6.7169	4.4204	2.1779	.3883	.0001448
6.9	32.0300	29.7275	27.4249	25.1223	22.8197	20.5171	18.2145	15.9119	13.6094	11.3068	9.0043	6.7023	4.4059	2.1643	.3810	.0001293
7.0	32.0156	29.7131	27.4105	25.1079	22.8053	20.5027	18.2001	15.8976	13.5950	11.2924	8.9899	6.6879	4.3916	2.1508	.3738	.0001155
7.1	32.0015	29.6989	27.3963	25.0937	22.7911	20.4885	18.1860	15.8834	13.5808	11.2782	8.9757	6.6737	4.3775	2.1376	.3668	.0001032
7.2	31.9875	29.6849	27.3823	25.0797	22.7771	20.4746	18.1720	15.8694	13.5668	11.2642	8.9617	6.6598	4.3636	2.1246	.3599	.00009219
7.3	31.9737	29.6711	27.3685	25.0659	22.7633	20.4608	18.1582	15.8556	13.5530	11.2504	8.9479	6.6460	4.3500	2.1118	.3532	.00008239
7.4	31.9601	29.6575	27.3549	25.0523	22.7497	20.4472	18.1446	15.8420	13.5394	11.2368	8.9343	6.6324	4.3364	2.0991	.3467	.00007364
7.5	31.9467	29.6441	27.3415	25.0389	22.7363	20.4337	18.1311	15.8286	13.5260	11.2234	8.9209	6.6190	4.3231	2.0867	.3403	.00006583
7.6	31.9334	29.6308	27.3282	25.0257	22.7231	20.4205	18.1179	15.8153	13.5127	11.2102	8.9076	6.6057	4.3100	2.0744	.3341	.00005886
7.7	31.9203	29.6178	27.3152	25.0126	22.7100	20.4074	18.1048	15.8022	13.4997	11.1971	8.8946	6.5927	4.2970	2.0623	.3280	.00005263
7.8	31.9074	29.6048	27.3023	24.9997	22.6971	20.3945	18.0919	15.7893	13.4868	11.1842	8.8817	6.5798	4.2842	2.0503	.3221	.00004707
7.9	31.8947	29.5921	27.2895	24.9869	22.6844	20.3818	18.0792	15.7766	13.4740	11.1714	8.8689	6.5671	4.2716	2.0386	.3163	.00004210
8.0	31.8821	29.5795	27.2769	24.9744	22.6718	20.3692	18.0666	15.7640	13.4614	11.1589	8.8563	6.5545	4.2591	2.0269	.3106	.00003767
8.1	31.8697	29.5671	27.2645	24.9619	22.6594	20.3568	18.0542	15.7516	13.4490	11.1464	8.8439	6.5421	4.2468	2.0155	.3050	.00003370
8.2	31.8574	29.5548	27.2523	24.9497	22.6471	20.3445	18.0419	15.7393	13.4367	11.1342	8.8317	6.5298	4.2346	2.0042	.2996	.00003015
8.3	31.8453	29.5427	27.2401	24.9375	22.6350	20.3324	18.0298	15.7272	13.4246	11.1220	8.8195	6.5177	4.2226	1.9930	.2943	.00002699
8.4	31.8333	29.5307	27.2282	24.9256	22.6230	20.3204	18.0178	15.7152	13.4126	11.1101	8.8076	6.5057	4.2107	1.9820	.2891	.00002415
8.5	31.8215	29.5189	27.2163	24.9137	22.6112	20.3086	18.0060	15.7034	13.4008	11.0982	8.7957	6.4939	4.1990	1.9711	.2840	.00002162
8.6	31.8098	29.5072	27.2046	24.9020	22.5995	20.2969	17.9943	15.6917	13.3891	11.0865	8.7840	6.4822	4.1874	1.9604	.2790	.00001936
8.7	31.7982	29.4957	27.1931	24.8905	22.5879	20.2853	17.9827	15.6801	13.3776	11.0750	8.7725	6.4707	4.1759	1.9498	.2742	.00001733
8.8	31.7868	29.4842	27.1816	24.8790	22.5765	20.2739	17.9713	15.6687	13.3661	11.0635	8.7610	6.4592	4.1646	1.9393	.2694	.00001552
8.9	31.7755	29.4729	27.1703	24.8678	22.5652	20.2626	17.9600	15.6574	13.3548	11.0523	8.7497	6.4480	4.1534	1.9290	.2647	.00001390
9.0	31.7643	29.4618	27.1592	24.8566	22.5540	20.2514	17.9488	15.6462	13.3437	11.0411	8.7386	6.4368	4.1423	1.9187	.2602	.00001245
9.1	31.7533	29.4507	27.1481	24.8455	22.5429	20.2404	17.9378	15.6352	13.3326	11.0300	8.7275	6.4258	4.1313	1.9087	.2557	.00001115
9.2	31.7424	29.4398	27.1372	24.8346	22.5320	20.2294	17.9268	15.6243	13.3217	11.0191	8.7166	6.4148	4.1205	1.8987	.2513	.000009988
9.3	31.7315	29.4290	27.1264	24.8238	22.5212	20.2186	17.9160	15.6135	13.3109	11.0083	8.7058	6.4040	4.1098	1.8888	.2470	.000008948
9.4	31.7208	29.4183	27.1157	24.8131	22.5105	20.2079	17.9053	15.6028	13.3002	10.9976	8.6951	6.3934	4.0992	1.8791	.2429	.000008018
9.5	31.7103	29.4077	27.1051	24.8025	22.4999	20.1973	17.8948	15.5922	13.2896	10.9870	8.6845	6.3828	4.0887	1.8695	.2387	.000007185
9.6	31.6998	29.3972	27.0946	24.7920	22.4895	20.1869	17.8843	15.5817	13.2791	10.9765	8.6740	6.3723	4.0784	1.8599	.2347	.000006439

Appendix 9.E. Continued

Appendix 9.E. Continued

N \ u	$N\times10^{-15}$	$N\times10^{-14}$	$N\times10^{-13}$	$N\times10^{-12}$	$N\times10^{-11}$	$N\times10^{-10}$	$N\times10^{-9}$	$N\times10^{-8}$	$N\times10^{-7}$	$N\times10^{-6}$	$N\times10^{-5}$	$N\times10^{-4}$	$N\times10^{-3}$	$N\times10^{-2}$	$N\times10^{-1}$	N
9.7	31.6894	29.3868	27.0843	24.7817	22.4791	20.1765	17.8739	15.5713	13.2688	10.9662	8.6637	6.3620	4.0681	1.8505	.2308	.000005771
9.8	31.6792	29.3766	27.0740	24.7714	22.4688	20.1663	17.8637	15.5611	13.2585	10.9559	8.6534	6.3517	4.0579	1.8412	.2269	.000005173
9.9	31.6690	29.3664	27.0639	24.7613	22.4587	20.1561	17.8535	15.5509	13.2483	10.9458	8.6433	6.3416	4.0479	1.8320	.2231	.000004637

NOTE: See page 218 for Theis equation and definitions of terms.

Values of $W(u)$ for u between 1×10^{-15} and 1×10^{-3} computed by R.G. Kazmann assisted by M.M. Evans, U.S. Geological Survey; values for u between 1×10^{-3} and 9.9 adapted from Tables of Exponential and Trigonometric Integrals.

From Water Supply Paper 887, U.S. Geological Survey, 1942.

Applied Hydrogeology

C. W. FETTER, JR.
University of Wisconsin—Oshkosh

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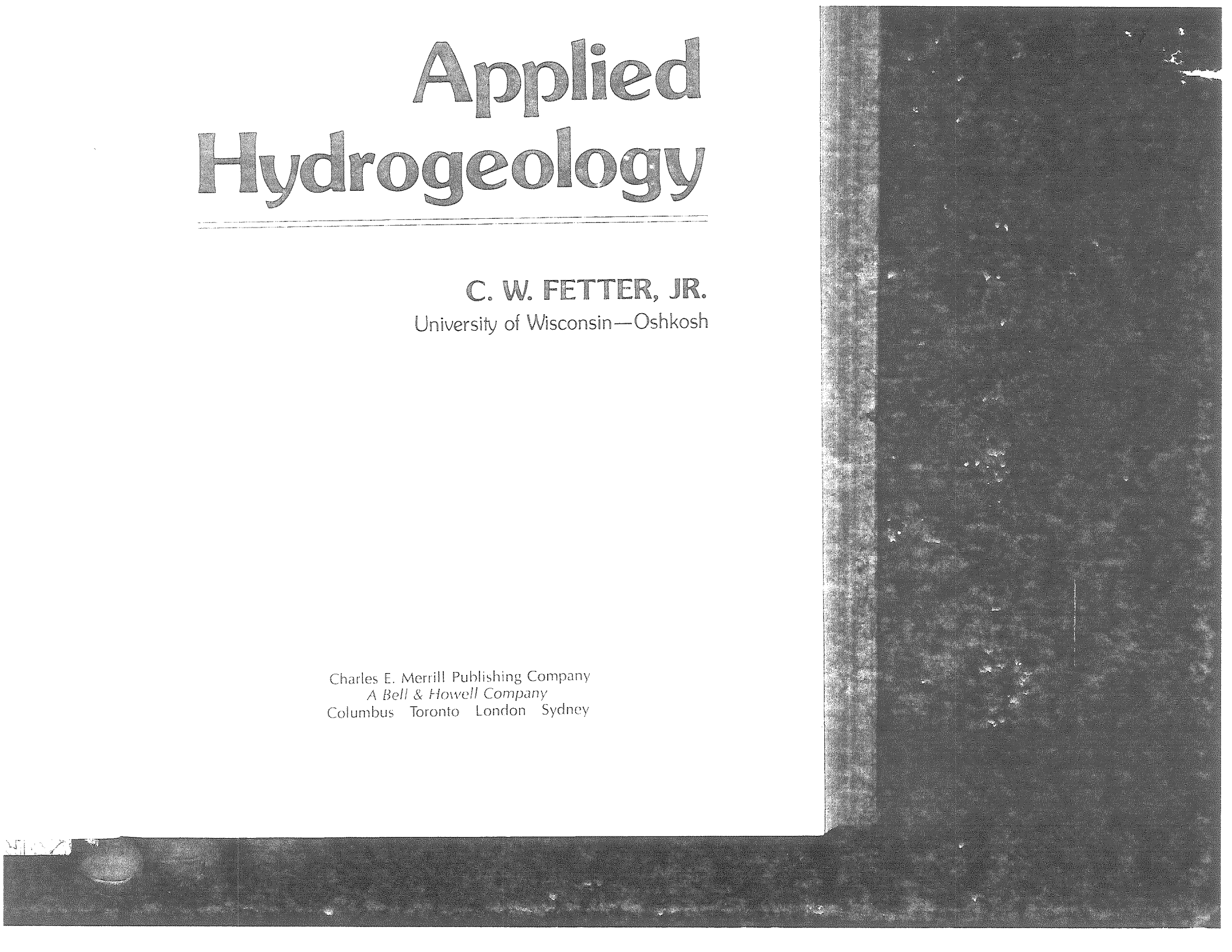

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APPENDIX 9. Table for volume conversion

Unit	mℓ	liters	m^3	in^3	ft^3	gal	ac-ft	million gal
1 milliliter	1	0.001	10^{-6}	0.06102	3.53×10^{-5}	2.64×10^{4}	8.1×10^{-10}	2.64×10^{-10}
1 liter	10^3	1	0.001	61.02	0.0353	0.264	8.1×10^{-7}	2.64×10^{-7}
1 cu. meter	10^6	1000	1	61,023	35.31	264.17	8.1×10^{-4}	2.64×10^{-4}
1 cu. inch	16.39	1.64×10^{-2}	1.64×10^{-5}	1	5.79×10^{-4}	4.33×10^{-3}	1.218×10^{-8}	4.329×10^{-9}
1 cu. foot	28,317	28.317	0.02832	1728	1	7.48	2.296×10^{-5}	7.48×10^{6}
1 U.S. gallon	3785.4	3.785	3.78×10^{-3}	231	0.134	1	3.069×10^{-6}	10^6
1 acre-foot	1.233×10^9	1.233×10^6	1233.5	75.27×10^6	43,560	3.26×10^5	1	0.3260
1 million gallons	3.785×10^9	3.785×10^6	3785	2.31×10^8	1.338×10^5	10^6	3.0684	1

APPENDIX 10. Table for time conversion

Unit	sec	min	hours	days	years
1 second	1	1.67×10^{-2}	2.77×10^{-4}	1.157×10^{-5}	3.17×10^{-8}
1 minute	60	1	1.67×10^{-2}	6.94×10^{-4}	1.90×10^{-6}
1 hour	360	60	1	4.17×10^{-2}	1.14×10^{-4}
1 day	8.64×10^4	1440	24	1	2.74×10^{-3}
1 year	3.15×10^7	5.256×10^5	8760	365	1

Eroh 2006

Gunter, Gary -- NUS

From: Martin.Eroh@aps.com
Sent: Friday, November 03, 2006 10:38 AM
To: Gary.Gunter@ttnus.com
Cc: Steven.Connor@ttnus.com
Subject: RE: Secondary treated effluent data for 2002

The total treated effluent for 2002 was 23.66 billion gallons of water (23,660,423,583). Let me know if you need anything else.

Marty Eroh
Palo Verde Nuclear Generating Station
Section Leader Environmental Dept.
Office: 623-393-6688 (82-6688)
Cell Phone: 602-320-0671
martin.eroh@aps.com

From: Gunter, Gary -- NUS [mailto:Gary.Gunter@ttnus.com]
Sent: Thursday, November 02, 2006 8:45 AM
To: Eroh, Martin P(K00352)
Cc: Connor, Steven -- NUS
Subject: RE: Secondary treated effluent data for 2002

I need the amount of treated effluent for 2002. I have the treated effluent data for 2001, 2003, 2004, and 2005. Any help would be greatly appreciated.

From: Martin.Eroh@aps.com [mailto:Martin.Eroh@aps.com]
Sent: Wednesday, November 01, 2006 4:04 PM
To: Gary.Gunter@ttnus.com
Cc: Henry.Day@aps.com
Subject: FW: Secondary treated effluent data for 2002

Gary -- I just wanted to make certain that you had received this information - attached is a copy of a note that Jeff Cocking sent to Joe Trujillo on this subject. Let me know if you have any other questions.

> ***From:*** *Cocking, Jeffery D(Z03359)*
> ***Sent:*** *Friday, October 27, 2006 3:06 PM*
> ***To:*** *Trujillo, Joe M(Z95391)*
> ***Cc:*** *Divito, Franklin D(Z32650); Lesan, Harvey C(Z99540)*
> ***Subject:*** *RE: Secondary treated effluent data for 2002*
>
> *Joe,*
>
> *I looked at our old hard copies and you are not missing information on the 2002 Schedule G-3 form. I also looked at the 2001 and 2003 copies and noticed that ADWR changed forms in 2002 and then re-worded*

ARIZONA DEPARTMENT OF WATER RESOURCES, 500 NORTH THIRD STREET, PHOENIX, AZ 85004-3921

ANNUAL WATER WITHDRAWAL AND USE REPORT

GROUNDWATER SUMMARY - WQ 2004

OWNER OF GROUNDWATER RIGHT

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
PO BOX 52034, MS-7626
PHOENIX AZ 85072-2034

TYPE OF RIGHT

TYPE-1 GFR

RIGHT / PERMIT NO.

58-114051.0001

REPORTING PARTY

58-114051.0001

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
PO BOX 52034, MS-7626
PHOENIX AZ 85072-2034

PHOENIX AMA (602) 417-2465
LOCATION: E2 33 1.0N 6.0W
ALLOTMENT: 5171.00 AF

FACILITY NAME:

PALO VERDE NUCLEAR PLANT

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14 Schedule A attached
Complete this section only if you operate a non-exempt well.

1885.10	$ 2.75	$ 5184.02
ACRE - FEET X	Withdrawal Fee =	

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

1885.10 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ $ 0
($25.00 X number of months late)

3) Calculate Late Payment Fee _____ $ 0
(10 % X number of months late X withdrawal fee calculated in Part I above)

PART VI WATER QUALITY

From WQARF Worksheet attached $ 3996.41

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 9180.43

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2005. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2005.

REPORTS FILED AFTER MARCH 31, 2005 ARE SUBJECT TO LATE FEES AS PER A.R.S. § 45-632 AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X Daniel E. Blackson — AUTHORIZED SIGNATURE

ENVIRONMENTAL SECTION LEADER — TITLE

2/9/05 — DATE

DANIEL E. BLACKSON — PRINTED NAME

623-393-6567 — TELEPHONE NUMBER

ID#: 291-03221-DEB/SRR
February 23, 2005

ID#: 291-03221-DEB/SRR
February 23, 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE REVOLVING FUND

ANNUAL REPORT 2004

OWNER

ARIZONA PUBLIC SERVICE

RIGHT/PERMIT NUMBER

58-114051.0001

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

Total amount of groundwater withdrawn by this right/permit as reported on Part I of the Annual Water Withdrawal and Use Report Summary page: 1885.10 Acre-Feet

DO YOU NEED TO PAY WQARF FEES?

Groundwater withdrawn by this right or permit is subject to the WQARF fee if none of the following conditions apply:

	YES	NO
1. Was water withdrawn by a city, town, private water company, or cuntry improvement district ?	☐	X
2. Was groundwater withdrawn pursuant to a withdrawal permit but **not** put to a beneficial use(e.g. pumped from well directly into a riverbed, sewer, etc) ?	☐	X
3. Was groundwater withdrawn and used within the Buckeye waterlogged area pursuant to a drainage water withdrawal permit?	☐	X

NOTE Grounw ater w ithdraw n by a city, tow n, private w ater company, or country improvement district and delivered to customers for use and not for resale, is subject to a tax on potable w ater impossed by A.R.S. § 42-5302.

---

if **YES** to any of the above question - NO WQARF FEES OWED.

if **NO** to all questions - calculate your WQARF fees owed:

Total groundwater withdrawn for beneficial use: 1885.10 Acre-Feet X $2.12 = $ 3996.41

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2005.

ID#: 291-03221-DEB/SRR
February 23, 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF PUMPING

Owner
ARIZONA PUBLIC SERVICE

[1] **RIGHT/PERMIT/BMP Farm Unit NO.**
58-114051.0001

ANNUAL REPORT 2004

Note: Pumpage for each well must be shown on the attached worksheet. Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO.						[3] Depth to Static Water Level (Designated Providers Only)			[4] Ground-water Pumped	RECOVERED WATER PUMPED N/A				PUMPED WATER RECEIVED IN EXCHANGE N/A				[13] Total Pumped
10 Q	40 Q	160 Q	LOCATION SEC	TWN	RNG	Date # 1 / Date # 2	Msmt # 1 / Msmt # 2	Well Running? (Y/N)		[5] CAP	[6] SW	[7] EFF/ IN	[8] EFF/ OUT	[9] GW	[10] CAP	[11] SW	[12] EFF	
55-613122						N/A			0									0
SW	NW	SW	27	1.0N	6.0W													
55-613123						N/A			1604.37									1604.37
SW	SW	SE	27	1.0N	6.0W													
55-613124						N/A			280.70									280.70
NW	NW	NE	34	1.0N	6.0W													
55-900619						N/A			0.03									0.03
NE	SE	NW	10	1.0N	6.0W													

[14] TOTAL GROUNDWATER WITHDRAWN (acre-feet) 1885.10

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE

WORKSHEET W-1 2004

GROUNDWATER RIGHT/PERMIT/ BMP Farm Unit NO. 58-114051.0001

1

DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
55-613122	SW	NW	SW	27	1.0N	6.0W

2

TYPE OF MEASURING DEVICE	MAKE / MODEL
NONE	
SIZE	UNITS MEASURED
INSTALLATION OR OVERHAUL DATE	
NO METER - WELL NOT IN SERVICE	

3

POWER CO. NAME	ACCOUNT NO.	POWER METER NO.

ENERGY CONSUMPTION	UNITS

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	0

1

DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
55-613123	SW	SW	SE	27	1.0N	6.0W

2

TYPE OF MEASURING DEVICE	MAKE / MODEL
TOTALIZER	MCCROMETER / 86-10-559
SIZE	UNITS MEASURED
10-INCH	1000 GALLONS
INSTALLATION OR OVERHAUL DATE	
New install on 11/16/2004	

3

POWER CO. NAME	ACCOUNT NO.	POWER METER NO.
ARIZONA PUBLIC SERVICE	N/A	465704

ENERGY CONSUMPTION	UNITS
1,045,680	KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
104139/00000	543245/83679	439106/83679

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	1604.37	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	1604.37

1

DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
55-613124	NW	NW	NE	34	1.0N	6.0W

2

TYPE OF MEASURING DEVICE	MAKE / MODEL
TOTALIZER	MCCROMETER / 03-04703-10
SIZE	UNITS MEASURED
10-INCH	1000 GALLONS
INSTALLATION OR OVERHAUL DATE	
New install on 2/18/2004 and 8/26/2004	

3

POWER CO. NAME	ACCOUNT NO.	POWER METER NO.
ARIZONA PUBLIC SERVICE	N/A	371857

ENERGY CONSUMPTION	UNITS
167,040	KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
248046/00000/00000	253812/51683/34016	5766/51683/34016

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	280.70	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	280.70

1

DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
55-900619	NE	SE	NW	10	1.0N	6.0W

2

TYPE OF MEASURING DEVICE	MAKE / MODEL
TOTALIZER	SENSUS / SRII
SIZE	UNITS MEASURED
3-INCH	GALLONS
INSTALLATION OR OVERHAUL DATE	
New install July 29, 2004	

3

POWER CO. NAME	ACCOUNT NO.	POWER METER NO.
ARIZONA PUBLIC SERVICE		H74241

ENERGY CONSUMPTION	UNITS
16,687	KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☒ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
000000	010920	10920

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0.03	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	0.03

SCHEDULE G-3

ARIZONA DEPARTMENT OF WATER RESOURCES

ELECTRICAL POWER OPERATIONS

ANNUAL REPORT 2004

Facility Name: PALO VERDE NUCLEAR PLANT

Facility No.: 13-213001.0000

Facility Owner : ARIZONA PUBLIC SERVICE

Contact Name: BLACKSON, DANIEL E.

Contact Address: ARIZONA PUBLIC SERVICE
PO BOX 52034, MS 7626
PHOENIX, AZ 85072-2034

Contact Phone: 623-393-6567

Rights Used at Facility:

58-114051.0001

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2004 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to Chapter 6 of the Third Management Plan of your Active Management Area, all electric power operations are required to supply the following information. Please complete one form per electrical power plant. Instructions are listed on the reverse side of this form.

PART 1 - FACILITY TOWER INFORMATION

Tower #	Date of Construction	Cooling Capacity (tons)
UNIT 1	1977 - 1978	764,830
UNIT 2	1977 - 1978	764,830
UNIT 3	1977 - 1978	764,830

Tower #	Date of Modification	Cooling Capacity (tons)

PART 2 - INDIVIDUAL TOWERS

Tower	Avg Cycles of concentration	Non-Exempt Y/N	Blowdown produced (acre-feet)	Blowdown TDS (ppm)	Makeup TDS (ppm)	Type of Water	Percent of Effluent use
1	25	Y	896	26,292	1040	EFFL	100%
2	25	Y	970	26,510	1040	EFFL	100%
3	26	Y	816	26,533	1040	EFFL	100%

PART 3 - FACILITY INFORMATION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Power Generated (MW-hrs x 1000)	2886	2155	2339	1945	2470	1975	2655	2777	2692	1893	1814	2520	28121
Fully operational use periods (days/mo)	31	29	31	30	31	30	31	31	30	31	30	31	366

PART 4 - ALL WATER RECIEVED

Amount of water	Metered		Type of Water	Purpose
	Yes	No		
66,015 AC-FT	X		SECONDARY-TREATED EFFLUENT	CONDENSER COOLING
1885.10 AC-FT	X		GROUNDWATER	DOMESTIC, FIRE PROTECTION,
				DEMINERALIZED WATER

ID#: 291-03221-DEB/SRR
February 23, 2005

ID#: 291-03221-DEB/SRR
February 23, 2005

EMERGENCY TEMPORARY DEWATERING PERMIT
59-205073.0000

ARIZONA DEPARTMENT OF WATER RESOURCES, 500 NORTH THIRD STREET, PHOENIX, AZ 85004-3921

ANNUAL WATER WITHDRAWAL AND USE REPORT

GROUNDWATER SUMMARY - WQ **2004**

TYPE OF RIGHT

EMERGENCY TEMPORARY DEWATERING PERMIT

OWNER OF GROUNDWATER RIGHT

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
PO BOX 52034, MS-7626
PHOENIX AZ 85072-2034

RIGHT / PERMIT NO.

59-205073.0000

REPORTING PARTY

29-205073.0000

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
PO BOX 52034, MS-7626
PHOENIX AZ 85072-2034

PHOENIX AMA (602) 417-2465
LOCATION: SEC 25 1.0N 1.0W
ALLOTMENT: 10.00 AF

FACILITY NAME:

PALO VERDE NUCLEAR PLANT

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14 Schedule A attached
Complete this section only if you operate a non-exempt well.

0.08	$ 2.75	$ 0.22
ACRE - FEET	X Withdrawal Fee =	

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

0.08 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ $ 0
($25.00 X number of months late)

3) Calculate Late Payment Fee _____ $ 0
(10 % X number of months late X withdrawal fee calculated in Part I above)

PART VI WATER QUALITY

From WQARF Worksheet attached $ 0.17

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 0.39

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2005. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2005.

REPORTS FILED AFTER MARCH 31, 2005 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER WELL REGISTRATIONS

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X Daniel E. Blackson — ENVIRONMENTAL SECTION LEADER — 2/9/05
PRINTED SIGNATURE — TITLE — DATE

DANIEL E. BLACKSON — 623-393-6567
PRINTED NAME — TELEPHONE NUMBER

ID#: 291-03221-DEB/SRR
February 23, 2005

ID#: 291-03221-DEB/SRR
February 23, 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE REVOLVING FUND

ANNUAL REPORT 2004

OWNER

ARIZONA PUBLIC SERVICE

RIGHT/PERMIT NUMBER

59-205073.0000

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

Total amount of groundwater withdrawn by this right/permit as reported on Part I of the Annual Water Withdrawal and Use Report Summary page: 0.08 Acre-Feet

DO YOU NEED TO PAY WQARF FEES?

Groundwater withdrawn by this right or permit is subject to the WQARF fee if none of the following conditions apply:

	YES	NO
1. Was water withdrawn by a city, town, private water company, or cuntry improvement district ?	☐	☒
2. Was groundwater withdrawn pursuant to a withdrawal permit but **not** put to a beneficial use(e.g. pumped from well directly into a riverbed, sewer, etc) ?	☐	☒
3. Was groundwater withdrawn and used within the Buckeye waterlogged area pursuant to a drainage water withdrawal permit?	☐	☒

NOTE: Grounwater withdrawn by a city, town, private water company, or country improvement district and delivered to customers for use and not for resale, is subject to a tax on potable water impossed by A.R.S. § 42-5302.

---

if **YES** to any of the above question - NO WQARF FEES OWED.

if **NO** to all questions - calculate your WQARF fees owed:

Total groundwater withdrawn for beneficial use: 0.08 Acre-Feet X $2.12 = $ 0.17

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2005.

ID#: 291-03221-DEB/SRR
February 23, 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF PUMPING

Owner
ARIZONA PUBLIC SERVICE

[1] **RIGHT/PERMIT/BMP Farm Unit NO.**
59-205073.0000

ANNUAL REPORT 2004

Note: Pumpage for each well must be shown on the attached worksheet.
Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO.						[3] Depth to Static Water Level (Designated Providers Only)			[4]	RECOVERED WATER PUMPED N/A				PUMPED WATER RECEIVED IN EXCHANGE N/A				[13]
10 Q	40 Q	160 Q	LOCATION SEC	TWN	RNG	Date # 1 / Date # 2	Msmt # 1 / Msmt # 2	Well Running? (Y/N)	Ground-water Pumped	[5] CAP	[6] SW	[7] EFF/ IN	[8] EFF/ OUT	[9] GW	[10] CAP	[11] SW	[12] EFF	Total Pumped
55-205075						N/A			0									0
SW	SW	NW	26	1.0N	1.0W													
55-205076						N/A			0									0
SE	SW	NW	25	1.0N	1.0W													
55-205077						N/A			0.08									0.08
SE	SW	NW	25	1.0N	1.0W													

[14] TOTAL GROUNDWATER WITHDRAWN (acre feet) — 0.08

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE

WORKSHEET W-1 2004

GROUNDWATER RIGHT/PERMIT/ BMP Farm Unit NO. 59-205073.0000

1 DWR WELL REGISTRATION NO. 55-205075

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	SW	NW	26	1.0N	1.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER
MAKE / MODEL: MCCROMETER / MG100
SIZE: 3-INCH
UNITS MEASURED: GALLONS
INSTALLATION OR OVERHAUL DATE: OCTOBER 11, 2004 - NOT USED

3 POWER CO. NAME: PORTABLE GENERATOR
ACCOUNT NO.: N/A
POWER METER NO.: N/A
ENERGY CONSUMPTION: N/A
UNITS: N/A

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
10,177,000	10,177,000	0

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	0

---

1 DWR WELL REGISTRATION NO. 55-205076

10 Q	40 Q	160 Q	Sec	Twn	Rng
SE	SW	NW	25	1.0N	1.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER
MAKE / MODEL: MCCROMETER / MG100
SIZE: 3-INCH
UNITS MEASURED: GALLONS
INSTALLATION OR OVERHAUL DATE: OCTOBER 11, 2004 - NOT USED

3 POWER CO. NAME: PORTABLE GENERATOR
ACCOUNT NO.: N/A
POWER METER NO.: N/A
ENERGY CONSUMPTION: N/A
UNITS: N/A

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
58,948,000	58,948,000	0

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	0

---

1 DWR WELL REGISTRATION NO. 55-205077

10 Q	40 Q	160 Q	Sec	Twn	Rng
SE	SW	NW	25	1.0N	1.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER
MAKE / MODEL: MCCROMETER / MG100
SIZE: 3-INCH
UNITS MEASURED: GALLONS
INSTALLATION OR OVERHAUL DATE: OCTOBER 11, 2004 (REMOVED OCTOBER 15, 2004)

3 POWER CO. NAME: PORTABLE GENERATOR
ACCOUNT NO.: N/A
POWER METER NO.: N/A
ENERGY CONSUMPTION: N/A
UNITS: N/A

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
7,323,900	7,350,900	27,000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0.08	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	0.08

---

1 DWR WELL REGISTRATION NO.

10 Q	40 Q	160 Q	Sec	Twn	Rng

2 TYPE OF MEASURING DEVICE
MAKE / MODEL
SIZE
UNITS MEASURED
INSTALLATION OR OVERHAUL DATE

3 POWER CO. NAME
ACCOUNT NO.
POWER METER NO.
ENERGY CONSUMPTION
UNITS

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	

ID#: 291-03221-DEB/SRR
February 23, 2005

ARIZONA DEPARTMENT OF WATER RESOURCES, 500 NORTH THIRD STREET, PHOENIX, AZ 85004-3921

ANNUAL WATER WITHDRAWAL AND USE REPORT

GROUNDWATER SUMMARY - WQ 2002

OWNER OF GROUNDWATER RIGHT

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
P.O. BOX 52034, MS 7626
PHOENIX AZ 85072-2034

TYPE OF RIGHT

TYPE-I GFR

RIGHT / PERMIT NO.

59-114051.0001

REPORTING PARTY
58-114051.0001

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
P.O. BOX 52034, MS 7626
PHOENIX AZ 85072-2034

FACILITY NAME:

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 12 Schedule A attached
Complete this section only if you operate a non-exempt well.

1907	$ 2.75	$ 5244.25
ACRE - FEET	X Withdrawal Fee =	

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 11 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

1907 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ $ 0
($25.00 X number of months late)

3) Calculate Late Payment Fee _____ $ 0
(10 % X number of months late X withdrawal fee calculated in Part I above)

PART VI WATER QUALITY

From WQARF Worksheet attached $ 4042.84

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 9287.09

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2003. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2003.

REPORTS FILED AFTER MARCH 31, 2003 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X _____ ENVIRONMENTAL SECTION LEADER 3/19/03
AUTHORIZED SIGNATURE — TITLE — DATE

DANIEL E. BLACKSON — 623-393-6567
PRINTED NAME — TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE REVOLVING FUND

ANNUAL REPORT 2002

OWNER

ARIZONA PUBLIC SERVICE

RIGHT/PERMIT NUMBER

58-1.14051.0001

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

Total groundwater withdrawn by this right as reported on Part I of the Annual Water Withdrawal and Use Report Summary page.

1907
Acre-Feet

DO YOU NEED TO PAY WQARF FEES?

Groundwater withdrawn by this right is NOT subject to the WQARF fee if any of the following conditions apply:

	YES	NO
1. Groundwater withdrawn but is subject to the tax on potable water imposed by A.R.S. § 42-1552. This water must by withdrawn by a city, town, or private water company and be used as part of their service area deliveries and not for resale.	☐	☒
2. Groundwater was withdrawn pursuant to a withdrawal permit and was not put to a beneficial use by this permit or any other right.	☐	☒

If you answered no to both questions then calculate your WQARF fees owed:

Total groundwater withdrawn 1907 **Acre-Feet** X $2.12 = $ 4042.84

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2003.

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF GROUNDWATER WITHDRAWALS

ANNUAL REPORT 2002

OWNER
ARIZONA PUBLIC SERVICE

[1] **RIGHT/PERMIT NO.**
58-114051.0001

Note: Pumpage for each well must be shown on the attached worksheet.
Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO.						[3] POWER COMPANY NAME										
10 Q	40 Q	160 Q	LOCATION SEC	TWN	RNG	ACCOUNT NUMBER	METER NO.	[4] DV TYPE	[5] OTH USES	[6] ENERGY CONSUMED	FOR DEVICE TYPE 2 thru 6 ONLY [7] AVERAGE DISCHARGE	[8] DIVIDER TOTAL HRS	[9] GROUNDWTR WITHDRAWN IN ACRE-FEET	[10] EXCHANGE G WITHDRAWI IN ACRE-FEE
55-613122						ARIZONA PUBLIC SERVICE		N/A	N/A	N/A	N/A	N/A	0	0
SW	NW	SW	27	1.0N	6.0W									
55-613123						ARIZONA PUBLIC SERVICE		1	N	1,091,280	N/A	N/A	1608	0
SW	SW	SE	27	1.0N	6.0W		465704							
55-613124						ARIZONA PUBLIC SERVICE		1	N	176,080	N/A	N/A	299	0
NW	NW	NE	34	1.0N	6.0W		371857							

[11]	+	
	-	

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF SUMMARY PAGE

[12] TOTAL ACRE-FEET WITHDRAWN	1907

WORKSHEET W-1 2002

GROUNDWATER RIGHT/PERMIT NO. 58-114051.0001

1 DWR WELL REGISTRATION NO. 55-613122

10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
SW	NW	SW	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: NONE
MAKE / MODEL:
SIZE:
UNITS MEASURED:
INSTALLATION OR OVERHAUL DATE: NO METER - WELL NOT IN SERVICE

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE
ACCOUNT NO.:
POWER METER NO.:

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION	UNITS
0	

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	0

---

1 DWR WELL REGISTRATION NO. 55-613123

10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
SW	SW	SE	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER
MAKE / MODEL: MCCROMETER / L0236-00
SIZE: 10 INCH
UNITS MEASURED: 1000 GALLONS
INSTALLATION OR OVERHAUL DATE: OCTOBER 4, 2002

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE
ACCOUNT NO.:
POWER METER NO.: 465704

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION	UNITS
1,091,280	KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
129702/000000	555789/97802	426087/97802

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	1608	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	1608

---

1 DWR WELL REGISTRATION NO. 55-613124

10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng
NW	NW	NE	34	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER
MAKE / MODEL: MCCROMETER / L0236-00
SIZE: 10 INCH
UNITS MEASURED: 1000 GALLONS
INSTALLATION OR OVERHAUL DATE: FEBRUARY 13, 2002

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE
ACCOUNT NO.:
POWER METER NO.: 371857

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION	UNITS
176,080	KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
109412/000000	113925/92776	4513/92776

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	299	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	299

---

1 DWR WELL REGISTRATION NO.

10 Q	40 Q	160 Q	LOCATION Sec	Twn	Rng

2 TYPE OF MEASURING DEVICE
MAKE / MODEL:
SIZE:
UNITS MEASURED:
INSTALLATION OR OVERHAUL DATE:

3 POWER CO. NAME
ACCOUNT NO.:
POWER METER NO.:

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION	UNITS

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	

SCHEDULE G-3

ARIZONA DEPARTMENT OF WATER RESOURCES

ELECTRICAL POWER OPERATIONS

ANNUAL REPORT 2002

Facility Name: PALO VERDE POWER PLANT

Facility No.: 13-213001.0000

Facility Owner : ARIZONA PUBLIC SERVICE

Contact Name: BLACKSON, DANIEL E.

Contact Address: ARIZONA PUBLIC SERVICE
P.O. BOX 52034, MS 7626
PHOENIX, AZ 85072-2034

Contact Phone: 623-393-6567

Rights Used at Facility:

56-002030.0000 58-114051.0001

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2002 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to the Third Management Plan of your Active Management Area, all electric power operations are required to supply the following information. Please complete one form per electrical power plant. Instructions are listed on the reverse side of this form.

PART 1 - FACILITY TOWER INFORMATION

Tower #	Date of Construction	Cooling Capacity (tons)
UNIT 1	1977 - 1978	764,830
UNIT 2	1977 - 1978	764,830
UNIT 3	1977 - 1978	764,830

Tower #	Date of Modification	Cooling Capacity (tons)

PART 2 - INDIVIDUAL TOWERS

Tower	Avg Cycles of concentration (see note below)	Non-Exempt Y/N	Blowdown produced (acre-feet)	Blowdown TDS (ppm)	Makeup TDS (ppm)	Type of Water	Percent of Effluent use
1	28	Y	829.8	27785	859	EFFL	100%
2	25	Y	808.3	24957	859	EFFL	100%
3	25	Y	946.0	25210	859	EFFL	100%

NOTE: THE CYCLES OF CONCENTRATION ARE DETERMINED BY MONITORING THE CHEMICAL PARAMETER POTASSIUM WHICH IS NOT INFLUENCED BY CHEMICAL ADDITIONS OR SOLIDS DEPOSITION. THE RATIO OF BLOWDOWN TDS TO MAKEUP TDS YIELDS ARTIFICIALLY ELEVATED CYCLE VALUES IN THE PVNGS COOLING WATER SYSTEM.

PART 3 - FACILITY INFORMATION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Power Generated (MEGAWATT-HRS X 1000)	2844	2567	2344	2170	2819	2718	2792	2794	2615	1880	2507	2813
Fully operational use periods (days per month)	31	28	31	30	31	30	31	31	30	31	30	31

PART 4 - OTHER WATER USES

Amount of water	Type of Water	Purpose
622 AC-FT (ESTIMATED)	GROUNDWATER	FIRE PROTECTION

ARIZONA DEPARTMENT OF WATER RESOURCES, 500 NORTH THIRD STREET, PHOENIX, AZ 85004-3921

A 1
G5 1
W1 1
WQ 1

ANNUAL WATER WITHDRAWAL AND USE REPORT
GROUNDWATER SUMMARY - WQ 2001

OWNER OF GROUNDWATER RIGHT
ARIZONA PUBLIC SERVICE
C/O DANIEL E. BLACKSON
PO BOX 52034, MS-7626
PHOENIX AZ 85072-3999

REPORTING PARTY
58-114051.0001
BLACKSON, DANIEL E.
ARIZONA PUBLIC SERVICE
PO BOX 52034, MS 7626
PHOENIX AZ 85072-2034

TYPE OF RIGHT
TYPE-I GFR

RIGHT / PERMIT NO.
58-114051.0001

PHOENIX AMA (602) 417-2465
LOCATION: E2 33 1.0N 6.0W
ALLOTMENT: 5171.00 AF

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 12 Schedule A attached
Complete this section only if you operate a non-exempt well.

2033 ACRE - FEET X $ 2.75 Withdrawal Fee = $ 5,590.75

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 10 Schedule D attached

Ø ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

Ø ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

2033 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late Ø (Maximum of 6)

2) Calculate Late Report Fee _____ ($25.00 X number of months late) $ Ø

3) Calculate Late Payment Fee _____ (10 % X number of months late X withdrawal fee calculated in Part I above) $ Ø

PART VI WATER QUALITY

From Box C, WQARF schedule attached $ 4,309.96

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 9,900.71

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2002. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2002.

REPORTS FILED AFTER MARCH 31, 2002 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X Daniel E. Blackson
AUTHORIZED SIGNATURE

ENVIRONMENTAL SECTION LEADER
TITLE

3/22/02
DATE

DANIEL E. BLACKSON
PRINTED NAME

623-393-6567
TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF SCHEDULE

WATER QUALITY ASSURANCE REVOLVING FUND

ANNUAL REPORT 2001

SCHEDULE FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

OWNER

ARIZONA PUBLIC SERVICE

RIGHT/PERMIT NUMBER

58-114051.0001

WQARF FEE CALCULATION

I. Total groundwater withdrawn by this right as reported on Part I of the Annual Water Withdrawal and Use Report Summary page. **A.** 2033 Acre-Feet

II. Groundwater withdrawn by this right and NOT subject to the WQARF fee.

1. Groundwater withdrawn but subject to the tax on potable water imposed by A.R.S. § 42-1552. Must by withdrawn by a city, town, or private water company and be used as part of their service area deliveries, not for resale.
   Ø Acre-Feet
2. Groundwater withdrawn pursuant to a withdrawal permit and not put to a beneficial use by this permit or any other right.
   Ø Acre-Feet

Total of 1 and 2 above **B.** Ø Acre-Feet

III. WQARF fees owed: A - B = 2033 Acre-Feet X $2.12 = **C.** 4,309.96

Subtract amount in Box B from amount in Box A and multiply resulting amount by the dollar amount shown here to calculate WQARF fee due.

IV. Transfer the amount of WQARF fees in Box C to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2002.

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF GROUNDWATER WITHDRAWALS

ANNUAL REPORT 2001

OWNER

ARIZONA PUBLIC SERVICE

[1] **RIGHT/PERMIT NO.**

58-114051.0001

Note: Pumpage for each well must be shown on the attached worksheet. Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO.						[3] POWER COMPANY NAME				FOR DEVICE TYPE 2 thru 6 ONLY				
10 Q	40 Q	160 Q	LOCATION SEC	TWN	RNG	ACCOUNT NUMBER	METER NO.	[4] DV TYPE	[5] OTH USES	[6] ENERGY CONSUMED	[7] AVERAGE DISCHARGE	[8] DIVIDER TOTAL HRS	[9] GROUNDWTR WITHDRAWN IN ACRE-FEET	[10] EXCHANGE GW WITHDRAWN IN ACRE-FEET
55-613122						ARIZONA PUBLIC SERVICE		NA X	NA N	NA	NA	NA	Ø	Ø
SW	NW	SW	27	1.0N	6.0W									
55-613123						ARIZONA PUBLIC SERVICE								
SW	SW	SE	27	1.0N	6.0W		465704	1	N	1,144,560 KwH	NA	NA	1690	Ø
55-613124						ARIZONA PUBLIC SERVICE								
NW	NW	NE	34	1.0N	6.0W		~~465517~~ 371857	1	N	178,960 KwH	NA	NA	343	Ø

PHOENIX AMA ONLY: A party involved in a noticed exchange agreement is responsible for reporting and paying withdrawal fees on the groundwater given in the exchange. If applicable, please subtract groundwater withdrawn from your wells for which another party is responsible and add groundwater withdrawn by another party for which you are responsible. For additional information/instructions, please refer to the Annual Water Withdrawal and Use Report - Water Exchange attachment.

[11]	+	
	-	

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF SUMMARY PAGE

[12] TOTAL ACRE-FEET WITHDRAWN	2033

WORKSHEET W-1 2001

GROUNDWATER RIGHT/PERMIT NO. 58-114051.0001

1 DWR WELL REGISTRATION NO. 55-613122

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	NW	SW	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE ~~TOTALIZER~~ NONE

MAKE / MODEL

SIZE

UNITS MEASURED

INSTALLATION OR OVERHAUL DATE: NO METER - WELL NOT IN SERVICE.

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE | ACCOUNT NO. | POWER METER NO.: NA

Enter Total Energy Consumption in Column 6 of Schedule A | ENERGY CONSUMPTION: Ø | UNITS

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	Ø	9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A | 10 TOTAL IN ACRE-FEET: Ø

---

1 DWR WELL REGISTRATION NO. 55-613123

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	SW	SE	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER | MAKE / MODEL: McCROMETER/MCO 500

SIZE: 10 INCH | UNITS MEASURED: 1000 GALLONS

INSTALLATION OR OVERHAUL DATE: OCTOBER 12, 2001

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE | ACCOUNT NO.: NA | POWER METER NO.: 465704

Enter Total Energy Consumption in Column 6 of Schedule A | ENERGY CONSUMPTION: 1,144,560 | UNITS: KwH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
90370/00000	511362/129702	420992/129702

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	1690	9 BREAKDOWN ESTIMATE	NA

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A | 10 TOTAL IN ACRE-FEET: 1690

---

1 DWR WELL REGISTRATION NO. 55-613124

10 Q	40 Q	160 Q	Sec	Twn	Rng
NW	NW	NE	34	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER | MAKE / MODEL: McCROMETER/MCO 500

SIZE: 10 INCH | UNITS MEASURED: 1000 GALLONS

INSTALLATION OR OVERHAUL DATE: FEBRUARY 14, 2001

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE | ACCOUNT NO. | POWER METER NO.: ~~465517~~ 37857

Enter Total Energy Consumption in Column 6 of Schedule A | ENERGY CONSUMPTION: 178,960 | UNITS: KwH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
98324/00000	100654/109412	2330/109412

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	343	9 BREAKDOWN ESTIMATE	NA

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A | 10 TOTAL IN ACRE-FEET: 343

---

1 DWR WELL REGISTRATION NO.

10 Q	40 Q	160 Q	Sec	Twn	Rng

2 TYPE OF MEASURING DEVICE | MAKE / MODEL

SIZE | UNITS MEASURED

INSTALLATION OR OVERHAUL DATE

3 POWER CO. NAME | ACCOUNT NO. | POWER METER NO.

Enter Total Energy Consumption in Column 6 of Schedule A | ENERGY CONSUMPTION | UNITS

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? Yes ☐ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A | 10 TOTAL IN ACRE-FEET

SCHEDULE G-5

GENERAL INDUSTRIAL USERS

ANNUAL REPORT 2001

ARIZONA DEPARTMENT OF WATER RESOURCES

Facility Name: PALO VERDE NUCLEAR GEN. STA.

Facility No.: _____

Rights Used at Facility:

58-114051.0001

Facility Owner: ARIZONA PUBLIC SERVICE CO.

Contact Name: DANIEL E. BLACKSON

Contact Address: ARIZONA PUBLIC SERVICE
PO BOX 52034, MS 7626
PHOENIX, AZ 85072-2034

Contact Phone: 623-393-6567

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2001 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to Chapter 6 of the Second Management Plan, all persons holding one or more Type 1 or Type 2 non-irrigation Grandfathered Right(s), and/or groundwater withdrawal permits totaling over 10 acre-feet per year are required to supply the following information for calendar year 2001.

PART 1 - DESCRIPTION OF WATER USES

Please describe the primary purposes for which water from any source, including effluent, is used.

EFFLUENT: RECIRCULATING COOLING WATER (COOLING TOWERS)
GROUNDWATER: (1) DRINKING WATER; (2) FIRE PROTECTION WATER; (3) UNIT MAKEUP WATER; AND (4) SPRAY POND COOLING WATER.

PART 2 - AMOUNTS USED FOR VARIOUS PURPOSES

Please provide metered quantities of water used annually from any source, including effluent, for the following purposes:

Purpose	Amount Metered (AF)	Amount Estimated (AF)
Industrial Process Water	2033	
Process Cooling Water	64,973	
Process Cleaning Water		
Space Cooling Water		
Landscape Watering		
Other (Please Specify)		

PART 3 - WASTEWATER PRODUCTION AND USE

Please provide estimated quantities of wastewater generated and recycled.

GENERATED	4,037 AF	RECYCLED	913 AF

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE REVOLVING FUND

ANNUAL REPORT 2003

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

OWNER

ARIZONA PUBLIC SERVICE

RIGHT/PERMIT NUMBER

58-114051.0001

Total groundwater withdrawn by this right as reported on Part I of the Annual Water Withdrawal and Use Report Summary page.

1869
Acre-Feet

DO YOU NEED TO PAY WQARF FEES?

Groundwater withdrawn by this right is NOT subject to the WQARF fee if any of the following conditions apply:

	YES	NO
1. Groundwater withdrawn but is subject to the tax on potable water imposed by A.R.S. § 42-1552. This water must by withdrawn by a city, town, or private water company and be used as part of their service area deliveries and not for resale.	☐	☒
2. Groundwater was withdrawn pursuant to a withdrawal permit and was not put to a beneficial use by this permit or any other right.	☐	☒

If you answered no to both questions then calculate your WQARF fees owed:

Total groundwater withdrawn 1869 **Acre-Feet** X $2.12 = $ 3962.28

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2004.

ARIZONA DEPARTMENT OF WATER RESOURCES, 500 NORTH THIRD STREET, PHOENIX, AZ 85004-3921

ANNUAL WATER WITHDRAWAL AND USE REPORT

GROUNDWATER SUMMARY - WQ 2003

OWNER OF GROUNDWATER RIGHT

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
P.O. BOX 52034, MS 7626
PHOENIX AZ 85072-2034

REPORTING PARTY
58-114051.0001

ARIZONA PUBLIC SERVICE
ATTN: DANIEL E BLACKSON
P.O. BOX 52034, MS 7626
PHOENIX AZ 85072-2034

TYPE OF RIGHT
TYPE-1 GFR

RIGHT / PERMIT NO.
59-114051.0001

PHOENIX AMA (602) 417-2465
LOCATION E2 33 1.0N 6.0W
ALLOTMENT: 5171.00 AF

FACILITY NAME:
PALO VERDE POWER PLANT

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 12 Schedule A attached
Complete this section only if you operate a non-exempt well.

1869 ACRE - FEET X Withdrawal Fee $ 2.75 = $ 5139.75

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 11 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

1869 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee ($25.00 X number of months late) $ 0

3) Calculate Late Payment Fee (10 % X number of months late X withdrawal fee calculated in Part I above) $ 0

PART VI WATER QUALITY

from WQARF worksheet attached $ 3962.28

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 9102.03

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2004. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2004.

REPORTS FILED AFTER MARCH 31, 2004 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X _____ ENVIRONMENTAL SECTION LEADER 2/13/04
AUTHORIZED SIGNATURE — TITLE — DATE

DANIEL E. BLACKSON 623-393-6567
PRINTED NAME — TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF GROUNDWATER WITHDRAWALS

ANNUAL REPORT 2003

OWNER
ARIZONA PUBLIC SERVICE

[1] **RIGHT/PERMIT NO.**
58-114051.0001

Note: Pumpage for each well must be shown on the attached worksheet. Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO.						[3] POWER COMPANY NAME		FOR DEVICE TYPE 2 thru 6 ONLY						
10 Q	40 Q	160 Q	LOCATION SEC	TWN	RNG	ACCOUNT NUMBER	METER NO.	[4] DV TYPE	[5] OTH USES	[6] ENERGY CONSUMED	[7] AVERAGE DISCHARGE	[8] DIVIDER TOTAL HRS	[9] GROUNDWTR WITHDRAWN IN ACRE-FEET	[10] EXCHANGE G WITHDRAWI IN ACRE-FEE
55-613122						ARIZONA PUBLIC SERVICE		N/A	N/A	N/A	N/A	N/A	0	0
SW	NW	SW	27	1.0N	6.0W									
55-613123						ARIZONA PUBLIC SERVICE		1	N	710,160	N/A	N/A	1004	0
SW	SW	SE	27	1.0N	6.0W		465704							
55-613124						ARIZONA PUBLIC SERVICE		1	N	521,600	N/A	N/A	865	0
NW	NW	NE	34	1.0N	6.0W		371857							

PHOENIX AMA ONLY: A party involved in a noticed exchange agreement is responsible for reporting and paying withdrawal fees on the groundwater given in the exchange. If applicable, please subtract groundwater withdrawn from your wells for which another party is responsible and add groundwater withdrawn by another party for which you are responsible. For additional information/instructions, please refer to the Annual Water Withdrawal and Use Report - Water Exchange attachment.

[11] + / -

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF SUMMARY PAGE

[12] TOTAL ACRE-FEET WITHDRAWN 1869

SCHEDULE G-3

ELECTRICAL POWER OPERATIONS

ANNUAL REPORT 2003

ARIZONA DEPARTMENT OF WATER RESOURCES

Facility Name: PALO VERDE POWER PLANT

Facility No.: 13-213001.0000

Facility Owner : ARIZONA PUBLIC SERVICE

Contact Name: BLACKSON, DANIEL E.

Contact Address: ARIZONA PUBLIC SERVICE
P.O. BOX 52034, MS 7626
PHOENIX, AZ 85072-2034

Contact Phone: 623-393-6567

Rights Used at Facility:

56-002030.0000	58-114051.0001

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2003 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to the Third Management Plan of your Active Management Area, all electric power operations are required to supply the following information. Please complete one form per electrical power plant. Instructions are listed on the reverse side of this form.

PART 1 - FACILITY TOWER INFORMATION

Tower #	Date of Construction	Cooling Capacity (tons)
UNIT 1	1977 - 1978	764,830
UNIT 2	1977 - 1978	764,830
UNIT 3	1977 - 1978	764,830

Tower #	Date of Modification	Cooling Capacity (tons)

PART 2 - INDIVIDUAL TOWERS

Tower	Avg Cycles of concentration (see note below)	Non-Exempt Y/N	Blowdown produced (acre-feet)	Blowdown TDS (ppm)	Makeup TDS (ppm)	Type of Water	Percent of Effluent use
1	26	Y	821.3	27618	980	EFFL	100%
2	23	Y	653.5	24880	980	EFFL	100%
3	25	Y	726.2	27030	980	EFFL	100%

NOTE: THE CYCLES OF CONCENTRATION ARE DETERMINED BY MONITORING CHEMICAL PARAMETERS WHICH ARE NOT INFLUENCED BY CHEMICAL ADDITIONS OR SOLIDS DEPOSITION. THE RATIO OF BLOWDOWN TDS TO MAKEUP TDS YIELDS ARTIFICIALLY ELEVATED CYCLE VALUES IN THE PVNGS COOLING WATER SYSTEM.

PART 3 - FACILITY INFORMATION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Power Generated (MEGAWATT-HRS X 1000)	2819	2545	2560	1801	2742	2499	2604	2486	2574	1852	1811	2292
Fully operational use periods (days per month)	31	28	31	30	31	30	31	31	30	31	30	31

PART 4 - ALL WATER RECEIVED

Amount of water	Metered Yes No	Type of Water	Purpose
67,855 AC-FT	YES	SECONDARY-TREATED EFFLUENT	CONDENSER COOLING
1869 AC-FT	YES	GROUNDWATER	DOMESTIC, FIRE PROTECTION, DEMINERALIZED WATER

WORKSHEET W-1 2003

GROUNDWATER RIGHT/PERMIT NO. 58-114051.0001

1 DWR WELL REGISTRATION NO. 55-613122

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	NW	SW	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: NONE

MAKE / MODEL:

SIZE:

UNITS MEASURED:

INSTALLATION OR OVERHAUL DATE: NO METER - WELL NOT IN SERVICE

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE

ACCOUNT NO.:

POWER METER NO.:

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION: 0

UNITS:

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS

5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	0

---

1 DWR WELL REGISTRATION NO. 55-613123

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	SW	SE	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER

MAKE / MODEL: MCCROMETER / L0236-10

SIZE: 10 INCH

UNITS MEASURED: 1000 GALLONS

INSTALLATION OR OVERHAUL DATE: OCTOBER 17, 2003

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE

ACCOUNT NO.:

POWER METER NO.: 465704

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION: 710,160

UNITS: KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS

5 INITIAL	6 ENDING	7 DIFFERENCE
97802/000000	320692/104139	222890/104139

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	1004	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	1004

---

1 DWR WELL REGISTRATION NO. 55-613124

10 Q	40 Q	160 Q	Sec	Twn	Rng
NW	NW	NE	34	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: TOTALIZER

MAKE / MODEL: MCCROMETER / L0236-10

SIZE: 10 INCH

UNITS MEASURED: 1000 GALLONS

INSTALLATION OR OVERHAUL DATE: FEBRUARY 18, 2003

3 POWER CO. NAME: ARIZONA PUBLIC SERVICE

ACCOUNT NO.:

POWER METER NO.: 371857

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION: 521,600

UNITS: KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS

5 INITIAL	6 ENDING	7 DIFFERENCE
92776/000000	126692/248046	33916/248046

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	865	9 BREAKDOWN ESTIMATE	N/A

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	865

---

1 DWR WELL REGISTRATION NO.

10 Q	40 Q	160 Q	Sec	Twn	Rng

2 TYPE OF MEASURING DEVICE

MAKE / MODEL:

SIZE:

UNITS MEASURED:

INSTALLATION OR OVERHAUL DATE:

3 POWER CO. NAME

ACCOUNT NO.:

POWER METER NO.:

Enter Total Energy Consumption in Column 6 of Schedule A

ENERGY CONSUMPTION:

UNITS:

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS

5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	

Enter total Acre-feet Shown in 10 in Column 9 of Schedule A

10 TOTAL IN ACRE-FEET	

1200.1.2

A subsidiary of Pinnacle West Capital Corporation

Harvey C. Lesan
Section Leader, Environmental
Palo Verde Nuclear
Generating Station

Tel. 623-393-6490
Fax 623-393-5442
e-mail Harvey.Lesan@aps.com

Mail Station 7626
PO Box 52034
Phoenix, Arizona 85072-2034

ID#: 291-03467-HCL/JDC
April 5 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Arizona Department of Water Resources
Groundwater Management Division
500 North Third Street
Phoenix, AZ 85004-3921

Attention: Ms. Tana Zachreson

Dear Ms. Zachreson:

Subject: Energy Consumption Corrections for Permit #58-114051.0001

Enclosed is a corrected W-1 Worksheet for Permit #58-114051.0001. The worksheet that was submitted with the 2005 Annual Water Withdrawal and Use Report did not have the correct values for energy consumption for wells 55-613123 and 55-613124. This correction does not affect the fees that were submitted with the 2005 Annual Water Withdrawal and Use Report.

Please contact me at (623) 393-6490 should you have any questions regarding this submittal.

Sincerely,

HCL/JDC/hsc

Enclosure

Enclosure

WORKSHEET W-1

WORKSHEET W-1 2005

GROUNDWATER RIGHT/PERMIT/ BMP Farm Unit NO. 58-114051.0001

1 DWR WELL REGISTRATION NO. 55-613122

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	NW	SW	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: None
MAKE / MODEL:
SIZE:
UNITS MEASURED:
INSTALLATION OR OVERHAUL DATE: No Meter- Well not in service

3 POWER CO. NAME: | ACCOUNT NO.: | POWER METER NO.:
ENERGY CONSUMPTION: | UNITS:

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE

8 ACRE FEET	0	9 BREAKDOWN ESTIMATE	N/A
Enter total Acre-feet Shown in 10 in Column 13 of Schedule A		10 TOTAL IN ACRE-FEET	0

---

1 DWR WELL REGISTRATION NO. 55-613123

10 Q	40 Q	160 Q	Sec	Twn	Rng
SW	SW	SE	27	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: Totalizer
MAKE / MODEL: MCCrometer / 86-10-559
SIZE: 10-Inch
UNITS MEASURED: 1000 Gallons
INSTALLATION OR OVERHAUL DATE: New install on 11/16/04

3 POWER CO. NAME: Arizona Public Service | ACCOUNT NO.: N/A | POWER METER NO.: 465704
ENERGY CONSUMPTION: 845,280 | UNITS: KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
83679	669489	585810

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE

8 ACRE FEET	1797.78	9 BREAKDOWN ESTIMATE	N/A
Enter total Acre-feet Shown in 10 in Column 13 of Schedule A		10 TOTAL IN ACRE-FEET	1797.78

---

1 DWR WELL REGISTRATION NO. 55-613124

10 Q	40 Q	160 Q	Sec	Twn	Rng
NW	NW	NE	34	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: Totalizer
MAKE / MODEL: MCCrometer / 03-04703-10
SIZE: 10- Inch
UNITS MEASURED: 1000 Gallons
INSTALLATION OR OVERHAUL DATE: New Install on 8/26/05

3 POWER CO. NAME: Arizona Public Service | ACCOUNT NO.: N/A | POWER METER NO.: 371857
ENERGY CONSUMPTION: 267,760 | UNITS: KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☐ No ☒

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
34016/00000	158555/20464	124539/20464

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE

8 ACRE FEET	445.00	9 BREAKDOWN ESTIMATE	N/A
Enter total Acre-feet Shown in 10 in Column 13 of Schedule A		10 TOTAL IN ACRE-FEET	445.00

---

1 DWR WELL REGISTRATION NO. 55-900619

10 Q	40 Q	160 Q	Sec	Twn	Rng
NE	SE	NW	10	1.0N	6.0W

2 TYPE OF MEASURING DEVICE: Totalizer
MAKE / MODEL: Sensus/ SRII
SIZE: 3-Inch
UNITS MEASURED: Gallons
INSTALLATION OR OVERHAUL DATE: New install 7/29/04

3 POWER CO. NAME: Arizona Public Service | ACCOUNT NO.: N/A | POWER METER NO.: H74241
ENERGY CONSUMPTION: 30,290 | UNITS: KWH

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? Yes ☒ No ☐

ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
010920	038841	27921

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE

8 ACRE FEET	0.09	9 BREAKDOWN ESTIMATE	N/A
Enter total Acre-feet Shown in 10 in Column 13 of Schedule A		10 TOTAL IN ACRE-FEET	0.09

ARIZONA DEPARTMENT OF WATER RESOURCES, 3550 NORTH CENTRAL AVENUE, PHOENIX, AZ 85012-2105

ANNUAL WATER WITHDRAWAL AND USE REPORT
GROUNDWATER SUMMARY - WQ 2005

OWNER OF GROUNDWATER RIGHT

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

REPORTING PARTY
58-114051.0001

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

TYPE OF RIGHT
TYPE-1 GFR

RIGHT / PERMIT NO.
58-114051.0001

PHOENIX AMA (602) 771-8585
LOCATION: E2 33 1.0N 6.0W
Withdrawal Allotment: 5157.00 AF

FACILITY NAME:
Palo Verde Power Plant

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14 Schedule A attached
Complete this section only if you operate a non-exempt well.

2,242.87 ACRE-FEET X $ 2.75 Withdrawal Fee = $ 6,167.89

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

0 ACRE-FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE-FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

0 ACRE-FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ ($25.00 X number of months late) $ 0

3) Calculate Late Payment Fee _____ (10 % X number of months late X withdrawal fee calculated in Part I above) $ 0

PART VI WATER QUALITY

From WQARF Worksheet attached $ 4,754.88

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 10,922.77

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2006. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2006.

REPORTS FILED AFTER MARCH 31, 2006 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X _____ AUTHORIZED SIGNATURE

ENVIRONMENTAL SECTION LEADER — TITLE

3/25/06 — DATE

HARVEY C. LESAN — PRINTED NAME

623-393-6490 — TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE
REVOLVING FUND

ANNUAL REPORT 2005

OWNER
Arizona Public Service

RIGHT/PERMIT NUMBER
58-114051.0001

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

TO CALCULATE WQARF FEES OWED:

- Enter in Box A the total groundwater withdrawn pursuant to this right/permit, as reported on Part I of the Annual Water Withdrawal and Use Report Summary page

A. 2242.87 Acre-Feet

- Calculate groundwater withdrawn pursuant to this right/permit that is NOT subject to the WQARF fee as follows:

1. Enter in Box 1 the amount of groundwater (if any) withdrawn by a city, town, private water company, or county improvement district. 0 Acre-Feet — Box 1

Note: Groundwater withdrawn by a city, town, private water company, or county improvement district and delivered to customers for use and not for resale is subject to a tax on potable water imposed by A.R.S. § 42-5302.

2. Enter in Box 2 the amount of groundwater (if any) withdrawn pursuant to a withdrawal permit but **not** put to a beneficial use (e.g. pumped from well directly into a riverbed or sewer, etc.) 0 Acre-Feet — Box 2

3. Enter in Box 3 the amount of groundwater (if any) withdrawn and used within the Buckeye waterlogged area pursuant to a drainage water withdrawal permit. 0 Acre-Feet — Box 3

- Add the total of amounts entered in Boxes 1 + 2 + 3 above; this total is the amount of groundwater exempted from WQARF fee. Enter this amount in Box B.

B. 0 Acre-Feet

- Calculate the amount of groundwater that is subject to WQARF fee, and for which WQARF fees are owed:

- Total WQARF fees owed: Box A - Box B = 2242.87 (Box C: Acre-feet on which WQARF fees apply) X $2.12 = $4754.88 (WQARF Fees owed)

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2006.

SCHEDULE G-3

ELECTRICAL POWER OPERATIONS

ANNUAL REPORT 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

Facility Name: 58-114051.0001

Facility No.: 2242.87

Facility Owner : 0

Contact Name: 0

Contact Address: 0

0

2242.87

Contact Phone: 4754.88

Rights Used at Facility:

58-114051.0001

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2005 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to Chapter 6 of the Third Management Plan of your Active Management Area, all electric power operations are required to supply the following information. Please complete one form per electrical power plant. Instructions are listed on the reverse side of this form.

PART 1 - FACILITY TOWER INFORMATION

Tower #	Date of Construction	Cooling Capacity (tons)
Unit 1	1977 - 1978	764,830
Unit 2	1977 - 1978	764,830
Unit 3	1977 - 1978	764,830

Tower #	Date of Modification	Cooling Capacity (tons)

PART 2 - INDIVIDUAL TOWERS

Tower	Avg Cycles of concentration	Non-Exempt Y/N	Blowdown produced (acre-feet)	Blowdown TDS (ppm)	Makeup TDS (ppm)	Type of Water	Percent of Effluent use
1	Arizona Public Service	Y	744	24,788	940	EFFL	100%
2	28	Y	828	26,801	940	EFFL	100%
3	26	Y	842	24,747	940	EFFL	100%

PART 3 - FACILITY INFORMATION

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Power Generated (MW-hrs x 1000)	2818	2194	2710	1788	1790	1986	2550	2115	2712	1317	1861	1963	25804
Fully operational use periods (days/mo)	31	28	31	30	31	30	31	31	30	31	30	31	365

PART 4 - ALL WATER RECEIVED

Amount of water	Metered		Type of Water	Purpose
	Yes	No		
62,072.5 AC-FT	X		Secondary-Treated Effluent	Condenser Cooling
2,242.78 AC-FT	X		Groundwater	Domestic, Fire Protection,
				Demineralized Water

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF PUMPING

ANNUAL REPORT 2005

Owner
Arizona Public Service

1 RIGHT/PERMIT/BMP Farm Unit NO.
58-114051.0001

Note: Pumpage for each well must be shown on the attached worksheet.
Information for up to four wells may be shown on each worksheet.

2 DWR WELL REGISTRATION NO. / LOCATION (10 40 160 Q Q Q SEC TWN RNG)	3 Depth to Static Water Level (Designated Providers Only) Date # 1 / Date # 2	Msmt # 1 / Msmt # 2	Well Running? (Y/N)	4 Ground-water Pumped	RECOVERED WATER PUMPED 5 CAP	6 SW	7 EFF/ IN	8 EFF/ OUT	PUMPED WATER RECEIVED IN EXCHANGE 9 GW	10 CAP	11 SW	12 EFF	13 Total Pumped
55-613122 SW NW SW 27 1.0N 6.0W	N/A			0									0
55-613123 SW SW SE 27 1.0N 6.0W	N/A			1,797.78									1797.78
55-613124 NW NW NE 34 1.0N 6.0W	N/A			445.00									445.00
55-900619 NE SE NW 10 1.0S 6.0W	N/A			0.09									0.09
14 TOTAL GROUNDWATER WITHDRAWN (acre-feet)				2242.87	ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE.								

EMERGENCY TEMPORARY DEWATERING PERMIT
59-209182.0000

ARIZONA DEPARTMENT OF WATER RESOURCES, 3550 NORTH CENTRAL AVENUE, PHOENIX, AZ 85012-2105

ANNUAL WATER WITHDRAWAL AND USE REPORT

GROUNDWATER SUMMARY - WQ 2005

OWNER OF GROUNDWATER RIGHT

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

REPORTING PARTY
58-114051.0001

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

TYPE OF RIGHT
Emergency Dewatering

RIGHT / PERMIT NO.
59-209182.0000

PHOENIX AMA (602) 771-8585
LOCATION: 27 1.0N 5.0W
Withdrawal Allotment: 125.00 AF

FACILITY NAME:
Palo Verde Power Plant

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14 Schedule A attached
Complete this section only if you operate a non-exempt well.

17 ACRE - FEET X $2.75 Withdrawal Fee = $46.75

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

0 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ ($25.00 X number of months late) $ 0

3) Calculate Late Payment Fee _____ (10 % X number of months late X withdrawal fee calculated in Part I above) $ 0

PART VI WATER QUALITY

From WQARF Worksheet attached $ 36.04

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 82.79

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2006. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2006.

REPORTS FILED AFTER MARCH 31, 2006 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X _____ ENVIRONMENTAL SECTION LEADER 3/29/06

AUTHORIZED SIGNATURE | TITLE | DATE

HARVEY C. LESAN 623-393-6490

PRINTED NAME | TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE
REVOLVING FUND

ANNUAL REPORT 2005

OWNER
Palo Verde Nuclear Generating Station

RIGHT/PERMIT NUMBER
59-209182.0000

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

TO CALCULATE WQARF FEES OWED:

- Enter in Box A the total groundwater withdrawn pursuant to this right/permit, as reported on Part I of the Annual Water Withdrawal and Use Report Summary page

A. 17 Acre-Feet

- Calculate groundwater withdrawn pursuant to this right/permit that is NOT subject to the WQARF fee as follows:

1. Enter in Box 1 the amount of groundwater (if any) withdrawn by a city, town, private water company, or county improvement district. 0 Acre-Feet — Box 1

Note: Groundwater withdrawn by a city, town, private water company, or county improvement district and delivered to customers for use and not for resale is subject to a tax on potable water imposed by A.R.S. § 42-5302.

2. Enter in Box 2 the amount of groundwater (if any) withdrawn pursuant to a withdrawal permit but **not** put to a beneficial use (e.g. pumped from well directly into a riverbed or sewer, etc.) 0 Acre-Feet — Box 2

3. Enter in Box 3 the amount of groundwater (if any) withdrawn and used within the Buckeye waterlogged area pursuant to a drainage water withdrawal permit. 0 Acre-Feet — Box 3

- Add the total of amounts entered in Boxes 1 + 2 + 3 above; this total is the amount of groundwater exempted from WQARF fee. Enter this amount in Box B.

B. 0 Acre-Feet

- Calculate the amount of groundwater that is subject to WQARF fee, and for which WQARF fees are owed:

- Total WQARF fees owed: Box A - Box B = 17 (Box C: Acre-feet on which WQARF fees apply) X $2.12 = $ 36.04 (WQARF Fees owed)

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2006.

SCHEDULE G-5

GENERAL INDUSTRIAL USERS

ARIZONA DEPARTMENT OF WATER RESOURCES

Facility Name: Palo Verde Nuclear Generating Station

Facility No.: 13-213001.0000

ANNUAL REPORT 2005

Rights Used at Facility:
59-209182.0000

Facility Owner: Arizona Public Service

Contact Name: Lesan, Harvey

Contact Address: Arizona Public Service
PO Box 52034, MS 7626
Phoenix, AZ 85072-2034

Contact Phone: 623-393-6490

If you received an annual use letter from an irrigation district or municipal provider, please submit a copy of their letter with your 2005 Annual Water Withdrawal and Use Report to validate deliveries received.

Pursuant to Chapter 6 of the Third Management Plan of your Active Management Area, all general industrial use facilities are required to supply the following information. Please complete one form per general industrial use facility. Instructions are listed on the reverse side of this form.

PART 1 - DESCRIPTION OF WATER USES

Please describe the primary purposes for which water from any source, including effluent, is used.

An emergency dewatering permit was filed to begin construction on a 45-acre reservoir. The water from this project comes from an existing 80-acre reservoir that is leaking. Water from the 80-acre reservoir is then pumped into two retention tanks. From the retention tanks the water is pumped into a Water Reclamation Facility (WRF) which is used to provide cooling water to the plant.

PART 2 - AMOUNTS USED FOR VARIOUS PURPOSES

Please provide metered quantities of water used annually from any source, including effluent, for the following purposes:

Purpose	Amount Metered (AF)	Amount Estimated (AF)
Industrial Process Water		
Process Cooling Water	17	
Process Cleaning Water		
Space Cooling Water		
Landscape Watering		
Other (Please Specify)		

PART 3 - WASTEWATER PRODUCTION AND USE

Please provide estimated quantities of wastewater generated and recycled.

GENERATED	0 AF	RECYCLED	0 AF

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF PUMPING

ANNUAL REPORT 2005

Owner: Palo Verde Nuclear Generating Station (PVNGS)

[1] RIGHT/PERMIT/BMP Farm Unit NO.: 59-209182.0000

Note: Pumpage for each well must be shown on the attached worksheet. Information for up to four wells may be shown on each worksheet.

[2] DWR WELL REGISTRATION NO. / LOCATION (10 40 160 Q Q Q SEC TWN RNG)	[3] Depth to Static Water Level (Designated Providers Only) Date # 1 / Date # 2	Msmt # 1 / Msmt # 2	Well Running? (Y/N)	[4] Ground-water Pumped	RECOVERED WATER PUMPED [5] CAP	[6] SW	[7] EFF/ IN	[8] EFF/ OUT	PUMPED WATER RECEIVED IN EXCHANGE [9] GW	[10] CAP	[11] SW	[12] EFF	[13] Total Pumped
55-208828	N/A			17									17
27 1.0N 6.0W													
[14] TOTAL GROUNDWATER WITHDRAWN (acre-feet)				17									

ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE.

TEMPORARY DEWATERING PERMIT
59-208827.0000

ARIZONA DEPARTMENT OF WATER RESOURCES

WQARF WORKSHEET

WATER QUALITY ASSURANCE
REVOLVING FUND

ANNUAL REPORT .2005

OWNER
Palo Verde Nuclear Generating Station

RIGHT/PERMIT NUMBER
59-208827.0000

WORKSHEET FOR DETERMINING WHICH GROUNDWATER WITHDRAWALS ARE SUBJECT TO PAYMENT OF WATER QUALITY ASSURANCE REVOLVING FUND (WQARF) FEES AND FOR CALCULATION OF FEES DUE

TO CALCULATE WQARF FEES OWED:

- Enter in Box A the total groundwater withdrawn pursuant to this right/permit, as reported on Part I of the Annual Water Withdrawal and Use Report Summary page

A. 0 Acre-Feet

- Calculate groundwater withdrawn pursuant to this right/permit that is NOT subject to the WQARF fee as follows:

1. Enter in Box 1 the amount of groundwater (if any) withdrawn by a city, town, private water company, or county improvement district. 0 Acre-Feet Box 1

Note: Groundwater withdrawn by a city, town, private water company, or county improvement district and delivered to customers for use and not for resale is subject to a tax on potable water imposed by A.R.S. § 42-5302.

2. Enter in Box 2 the amount of groundwater (if any) withdrawn pursuant to a withdrawal permit but **not** put to a beneficial use (e.g. pumped from well directly into a riverbed or sewer, etc.) 0 Acre-Feet Box 2

3. Enter in Box 3 the amount of groundwater (if any) withdrawn and used within the Buckeye waterlogged area pursuant to a drainage water withdrawal permit. 0 Acre-Feet Box 3

- Add the total of amounts entered in Boxes 1 + 2 + 3 above; this total is the amount of groundwater exempted from WQARF fee. Enter this amount in Box B.

B. 0 Acre-Feet

- Calculate the amount of groundwater that is subject to WQARF fee, and for which WQARF fees are owed:

- Total WQARF fees owed: Box A - Box B = 0 Box C (Acre-feet on which WQARF fees apply) X $2.12 = $0 WQARF Fees owed

Transfer the amount of WQARF fees to Part VI of the Summary Page.

Note: WQARF fees MUST BE REPORTED AND PAID at the time the Annual Water Withdrawal and Use Report is filed and the withdrawal fees paid, but NOT LATER THAN MARCH 31, 2006.

ARIZONA DEPARTMENT OF WATER RESOURCES, 3550 NORTH CENTRAL AVENUE, PHOENIX, AZ 85012-2105

ANNUAL WATER WITHDRAWAL AND USE REPORT
GROUNDWATER SUMMARY - WQ 2005

OWNER OF GROUNDWATER RIGHT

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

TYPE OF RIGHT

Emergency Dewatering

RIGHT / PERMIT NO.

59-208827.0000

PHOENIX AMA (602) 771-8585
LOCATION: 27 1.0N 5.0W
Withdrawal Allotment: 125.00 AF

REPORTING PARTY
58-114051.0001

Arizona Public Service
Attn: Harvey Lesan
PO Box 52034, MS-7626
Phoenix, AZ 85072-2034

FACILITY NAME:

Palo Verde Power Plant

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14 Schedule A attached
Complete this section only if you operate a non-exempt well.

0 ACRE - FEET X $2.75 Withdrawal Fee = $ 0

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

0 ACRE - FEET

PART III WATER RECEIVED FROM OTHER SOURCES

Total from Schedule E attached

0 ACRE - FEET

PART IV TOTAL WATER USED BY THIS RIGHT

Calculate as follows: Part I + Part III - Part II

0 ACRE - FEET

PART V LATE FEES

Complete if filing after March 31.

Note: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late 0 (Maximum of 6)

2) Calculate Late Report Fee _____ ($25.00 X number of months late) $ 0

3) Calculate Late Payment Fee _____ (10 % X number of months late X withdrawal fee calculated in Part I above) $ 0

PART VI WATER QUALITY

From WQARF Worksheet attached $ 0

PART VII TOTAL FEES DUE

Add amounts from Parts I, V and VI $ 0

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2006. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2006.

REPORTS FILED AFTER MARCH 31, 2006 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

X _____ _____ _____
AUTHORIZED SIGNATURE TITLE DATE

_____ _____
PRINTED NAME TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS USED PURSUANT TO THIS RIGHT.

SCHEDULE G-5

GENERAL INDUSTRIAL USERS

ANNUAL REPORT 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

Facility Name: Palo Verde Nuclear Generating Station

Facility No.: 13-213001.0000

Rights Used at Facility:
59-208827.0000

Facility Owner: Arizona Public Service

Contact Name: Lesan, Harvey

Contact Address: Arizona Public Service
PO Box 52034, MS 7626
Phoenix, AZ 85072-2034

Contact Phone: 623-393-6490

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PART 2 - AMOUNTS USED FOR VARIOUS PURPOSES

Please provide metered quantities of water used annually from any source, including effluent, for the following purposes:

Purpose	Amount Metered (AF)	Amount Estimated (AF)
Industrial Process Water		
Process Cooling Water	0	
Process Cleaning Water		
Space Cooling Water		
Landscape Watering		
Other (Please Specify)		

PART 3 - WASTEWATER PRODUCTION AND USE

Please provide estimated quantities of wastewater generated and recycled.

GENERATED	0 AF	RECYCLED	0 AF

ARIZONA DEPARTMENT OF WATER RESOURCES

SCHEDULE A

REPORT OF PUMPING

Owner: Palo Verde Nuclear Generating Station (PVNGS)

1 RIGHT/PERMIT/BMP Farm Unit NO.: 59-208827.0000

ANNUAL REPORT 2005

Note: Pumpage for each well must be shown on the attached worksheet. Information for up to four wells may be shown on each worksheet.

2 DWR WELL REGISTRATION NO. 10 40 160 LOCATION Q Q Q SEC TWN RNG	3 Depth to Static Water Level (Designated Providers Only) Date # 1 / Msmt # 1 / Date # 2 / Msmt # 2 / Well Running? (Y/N)	4 Ground-water Pumped	RECOVERED WATER PUMPED 5 CAP	6 SW	7 EFF/ IN	8 EFF/ OUT	PUMPED WATER RECEIVED IN EXCHANGE 9 GW	10 CAP	11 SW	12 EFF	13 Total Pumped
55-208828	N/A	0									0
27 1.0N 6.0W											
14 TOTAL GROUNDWATER WITHDRAWN (acre-feet)		0	ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE.								