APPENDIX B-2

Process Effluent Data

TABLE B-2A
Comparison of 2007 Lagoon 3 (WNSP001) Liquid Effluent Radioactivity Concentrations With U.S. Department of Energy Guidelines

Isotope [a]	*Discharge Activity* [b] *(Ci)*	*Radioactivity* [c] *(Becquerels)*	*Average Concentration (µCi/mL)*	*DCG* [d] *(µCi/mL)*	*Ratio of Concentration to DCG*
Gross Alpha	1.11±0.11E-03	4.12±0.40E+07	2.73±0.26E-08	NA[e]	NA
Gross Beta	1.01±0.02E-02	3.75±0.08E+08	2.49±0.05E-07	NA[e]	NA
H-3	5.27±0.14E-02	1.95±0.05E+09	1.29±0.03E-06	2E-3	0.0006
C-14	-0.52±5.73E-04	-0.19±2.12E+07	-0.13±1.41E-08	7E-5	<0.0002
K-40	-3.17±9.90E-04	-1.17±3.66E+07	-0.78±2.43E-08	NA[f]	NA
Co-60	4.61±3.41E-05	1.71±1.26E+06	1.13±0.84E-09	5E-6	0.0002
Sr-90	3.95±0.07E-03	1.46±0.03E+08	9.71±0.18E-08	1E-6	0.0971
Tc-99	5.68±0.43E-04	2.10±0.16E+07	1.40±0.11E-08	1E-4	0.0001
I-129	6.98±1.76E-05	2.58±0.65E+06	1.71±0.43E-09	5E-7	0.0034
Cs-137	2.42±0.10E-03	8.94±0.36E+07	5.94±0.24E-08	3E-6	0.0198
U-232[g]	2.63±0.10E-04	9.72±0.37E+06	6.46±0.24E-09	1E-7	0.0646
U-233/234[g]	1.72±0.08E-04	6.35±0.31E+06	4.22±0.21E-09	5E-7	0.0084
U-235/236[g]	1.10±0.21E-05	4.08±0.78E+05	2.71±0.52E-10	5E-7[h]	0.0005
U-238[g]	1.57±0.08E-04	5.82±0.30E+06	3.86±0.20E-09	6E-7	0.0064
Pu-238	1.53±0.72E-06	5.66±2.67E+04	3.76±1.77E-11	4E-8	0.0009
Pu-239/240	1.40±0.68E-06	5.19±2.53E+04	3.45±1.68E-11	3E-8	0.0012
Am-241	1.94±0.83E-06	7.17±3.08E+04	4.76±2.05E-11	3E-8	0.0016
Sum of Ratios					**0.205**

NA - Not applicable

[a] Half-lives are listed in Table UI-4.

[b] Total volume released: 4.07E+10 mL (1.08E+07 gal)

[c] 1 curie (Ci) = 3.7E+10 becquerels (Bq); 1Bq = 2.7E-11 Ci

[d] DOE-derived concentration guides (DCGs) are listed for reference only. DCGs are applicable at the point at which water is available for ingestion by the public (i.e., at the site boundary), but not to release point concentrations, as might be inferred from their inclusion in this table.

[e] DOE DCGs do not exist for indicator parameteres gross alpha and gross beta.

[f] The DCG is not applied to potassium-40 (K-40) activity because of its natural origin.

[g] Total U (g) = 4.70±0.05E+02; Average U (µg/mL) = 1.15±0.01E-02

[h] DCG for U-236 is used for this comparison.

TABLE B-2B
2007 SPDES Results for Outfall 001 (WNSP001): Water Quality

Permit Limit	Ammonia (mg/L) Monitor		BOD_5 day (mg/L) 10.0 mg/L daily maximum		Discharge Rate (MGD) Monitor		Nitrate (as N) (mg/L) Monitor	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	0.040	0.053	<2.0	2.0	0.313	0.371	0.50	0.51
February	0.066	0.074	<2.0	<2.0	0.306	0.339	0.97	1.0
March [a]	--	--	--	--	--	--	--	--
April	<0.011	<0.011	<2.0	<2.0	0.303	0.329	0.91	1.0
May [a]	--	--	--	--	--	--	--	--
June	<0.016	0.020	<2.1	2.1	0.151	0.175	<0.034	0.057
July [a]	--	--	--	--	--	--	--	--
August	<0.017	0.022	<2.3	2.6	0.119	0.178	<0.011	<0.011
September [a]	--	--	--	--	--	--	--	--
October	<0.051	0.090	2.8	2.9	0.127	0.175	<0.011	<0.011
November [a]	--	--	--	--	--	--	--	--
December [a]	--	--	--	--	--	--	--	--

Permit Limit	Nitrite (as N) (mg/L) 0.1 mg/L daily maximum		Oil & Grease (mg/L) 15.0 mg/L daily maximum		pH (standard units) 6.5 to 8.5		Solids, Settleable (ml/L) 0.3 ml/L daily maximum	
Month	**Avg**	**Max**	**Avg**	**Max**	**Min**	**Max**	**Avg**	**Max**
January	<0.02	<0.02	<2.2	<2.2	7.6	7.6	<0.1	<0.1
February	<0.02	<0.02	<2.2	<2.2	7.2	7.2	<0.1	<0.1
March [a]	--	--	--	--	--	--	--	--
April	<0.02	<0.02	<2.2	<2.2	7.3	7.3	<0.1	<0.1
May [a]	--	--	--	--	--	--	--	--
June	<0.02	<0.02	<2.2	<2.2	7.7	7.7	<0.1	<0.1
July [a]	--	--	--	--	--	--	--	--
August	<0.02	<0.02	<2.2	<2.2	7.4	7.4	<0.1	<0.1
September [a]	--	--	--	--	--	--	--	--
October	<0.02	<0.02	<3.2	4.2	7.7	7.7	<0.1	<0.1
November [a]	--	--	--	--	--	--	--	--
December [a]	--	--	--	--	--	--	--	--

Note: No results exceeded the permit limits.

[a] No discharge this month

TABLE B-2B *(concluded)*
2007 SPDES Results for Outfall 001 (WNSP001): Water Quality

Permit Limit	*Solids, Total Dissolved (mg/L)* *Monitor*		*Solids, Total Suspended (mg/L)* *45 mg/L daily maximum; 30 mg/L daily average*		*Sulfate (as S) (mg/L)* *Monitor*		*Sulfide (as S) Dissolved (mg/L)* *0.4 mg/L daily maximum*	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	745	761	<4.0	<4.0	39	40	<0.02	<0.02
February	774	782	<4.0	<4.0	43	45	<0.02	<0.02
March [a]	--	--	--	--	--	--	--	--
April	785	792	<4.0	<4.0	45	47	<0.02	<0.02
May [a]	--	--	--	--	--	--	--	--
June	942	966	<4.0	<4.0	72	81	<0.02	<0.02
July [a]	--	--	--	--	--	--	--	--
August	1,114	1,119	<4.0	<4.0	81	102	<0.02	<0.02
September [a]	--	--	--	--	--	--	--	--
October	1,151	1,193	<4.4	4.8	74	92	0.04	0.04
November [a]	--	--	--	--	--	--	--	--
December [a]	--	--	--	--	--	--	--	--

Note: No results exceeded the permit limits.
[a] No discharge this month

TABLE B-2C
2007 SPDES Results for Outfall 001 (WNSP001): Metals

Permit Limit	Aluminum Total (mg/L) 14.0 mg/L daily maximum; 7.0 mg/L daily average		Arsenic Dissolved (mg/L) 0.15 mg/L daily maximum		Cobalt Total Recoverable (mg/L) 0.005 mg/L daily maximum		Iron Total (mg/L) Monitor	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	0.266	0.266	0.0012	0.0012	<0.0008	<0.0008	0.277	0.346
February	0.126	0.126	0.0012	0.0012	<0.0008	<0.0008	0.202	0.232
March [a]	--	--	--	--	--	--	--	--
April	0.185	0.185	0.0017	0.0017	<0.0009	<0.0009	0.200	0.250
May [a]	--	--	--	--	--	--	--	--
June	0.110	0.110	0.003	0.003	<0.0009	<0.0009	0.0941	0.109
July [a]	--	--	--	--	--	--	--	--
August	0.138	0.165	0.0033	0.0033	<0.0009	<0.0009	0.222	0.230
September [a]	--	--	--	--	--	--	--	--
October	0.411	0.411	0.0032	0.0032	<0.0009	<0.0009	0.575	0.819
November [a]	--	--	--	--	--	--	--	--
December [a]	--	--	--	--	--	--	--	--

Permit Limit	Mercury, Total (per EPA Method 1631) (ng/L) 200 ng/L daily maximum		Selenium Total Recoverable (mg/L) 0.004 mg/L daily maximum		Vanadium Total Recoverable (mg/L) 0.014 mg/L daily maximum	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	3.17	3.29	<0.0004	<0.0004	<0.00098	<0.00098
February	4.57	4.92	<0.0004	<0.0004	<0.00098	<0.00098
March [a]	--	--	--	--	--	--
April	3.20	3.64	<0.0004	<0.0004	<0.00078	<0.00078
May [a]	--	--	--	--	--	--
June	2.66	2.88	0.001	0.001	<0.00078	<0.00078
July [a]	--	--	--	--	--	--
August	2.24	2.41	0.0009	0.001	<0.00078	<0.00078
September [a]	--	--	--	--	--	--
October	8.09	8.98	<0.001	0.002	0.001	0.001
November [a]	--	--	--	--	--	--
December [a]	--	--	--	--	--	--

Note: No results exceeded the permit limits.
[a] No discharge this month

TABLE B-2D
2007 SPDES Results for Outfall 007 (WNSP007): Water Quality and Iron

Permit Limit	Ammonia (as NH_3) (mg/L) Monitor		BOD_5 (mg/L) 10.0 mg/L daily maximum		Chlorine Total Residual (mg/L) 0.1 mg/L daily maximum		Discharge Rate (MGD) Monitor		Iron Total (mg/L) Monitor	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	<0.011	<0.011	<2.0	<2.0	0.02	0.03	0.013	0.017	0.105	0.122
February	<0.019	0.026	<2.0	<2.0	<0.01	0.02	0.017	0.020	0.177	0.200
March	<0.016	0.021	<2.0	<2.0	0.02	0.03	0.010	0.012	0.101	0.151
April	<0.022	0.027	<2.7	4.2	0.02	0.04	0.009	0.014	0.135	0.165
May	<0.019	0.031	<2.0	<2.0	<0.01	0.01	0.007	0.020	0.109	0.165
June	<0.012	0.014	<2.1	2.2	<0.01	0.01	0.005	0.008	0.061	0.090
July	<0.017	0.030	<2.3	2.9	0.01	0.02	0.006	0.013	0.0485	0.0579
August	<0.021	0.036	<2.1	2.2	0.01	0.02	0.006	0.012	0.0380	0.0501
September	0.031	0.037	<2.0	<2.0	<0.02	0.02	0.006	0.014	0.0355	0.0432
October	<0.012	0.015	<2.1	2.3	<0.02	0.02	0.007	0.015	0.037	0.048
November	<0.014	0.021	<2.0	<2.0	0.02	0.03	0.008	0.017	0.0701	0.116
December	<0.022	0.044	<2.4	3.2	0.02	0.02	0.0088	0.0094	0.11	0.14

Permit Limit	Nitrite (as N) (mg/L) 0.1 mg/L daily maximum		Oil & Grease (mg/L) 15.0 mg/L daily maximum		pH (standard units) 6.5 to 8.5		Solids Settleable (mL/L) 0.3 mL/L daily maximum		Solids Total Suspended (mg/L) 45 mg/L daily maximum; 30 mg/L daily average	
Month	**Avg**	**Max**	**Avg**	**Max**	**Min**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	<0.02	<0.02	<2.2	<2.2	7.0	7.9	<0.1	<0.1	<4.0	<4.0
February	<0.02	<0.02	<2.7	3.6	7.2	7.7	<0.1	<0.1	<4.0	<4.0
March	<0.02	<0.02	<2.2	<2.2	7.2	7.9	<0.1	<0.1	<4.0	<4.0
April	<0.02	<0.02	<2.2	<2.2	7.3	7.8	<0.1	<0.1	<5.3	8.0
May	<0.02	<0.02	<2.2	<2.2	7.0	7.5	<0.1	<0.1	<4.0	<4.0
June	<0.02	<0.02	<2.2	<2.2	7.4	7.7	<0.1	<0.1	<4.0	<4.0
July	<0.02	<0.02	<2.2	<2.2	7.2	7.8	<0.1	<0.1	<4.0	<4.0
August	<0.02	<0.02	<2.2	<2.2	7.5	7.8	<0.1	<0.1	<4.0	<4.0
September	<0.02	<0.02	<2.2	<2.2	7.3	7.9	<0.1	<0.1	<4.3	4.8
October	<0.02	<0.02	<2.2	<2.2	7.6	8.0	<0.1	<0.1	<4.0	<4.0
November	<0.02	<0.02	<2.6	3.5	7.6	8.5	<0.1	<0.1	<6.7	12
December	<0.02	<0.02	<2.2	<2.2	7.6	8.0	<0.1	<0.1	<7.5	14

Note: No results exceeded the permit limits.

TABLE B-2E
2007 SPDES Results for Sums of Outfalls 001, 007, 008, and 116: Water Quality

2007 Results for Sums of Outfalls 001, 007 and 008

Permit Limit	Ammonia [a] Flow-Weighted 1.49 mg/L daily average	2.1 mg/L daily maximum	BOD $_5$ day 5.0 mg/L daily average		Iron Total Flow-Weighted 0.30 mg/L daily maximum	
Month	**Avg**	**Max**	**Avg**	**Max**	**Avg**	**Max**
January	<0.029	<0.051	<2.0	<2.0	0.00	0.00
February	<0.046	0.071	<2.0	<2.0	0.00	0.00
March	<0.016	0.021	<2.0	<2.0	0.00	0.00
April	<0.016	0.027	<2.0	<2.0	0.00	0.00
May	<0.019	0.031	<2.0	<2.0	0.00	0.00
June	<0.015	<0.020	<2.1	2.2	0.00	0.00
July	<0.017	0.030	<2.3	2.9	0.00	0.00
August	<0.017	0.023	<2.2	2.6	0.00	0.00
September	0.031	0.037	<2.0	<2.0	0.00	0.00
October	<0.035	<0.082	<2.5	<2.8	0.00	0.00
November	<0.014	0.021	<2.0	<2.0	0.00	0.00
December	<0.022	0.044	<2.4	3.2	0.00	0.00

2007 Results for Outfall 116

Permit Limit	Total Dissolved Solids (mg/L) 500 mg/L daily maximum	
Month	**Avg**	**Max**
January	337	361
February	381	385
March [b]	--	--
April	322	374
May [b]	--	--
June	349	354
July [b]	--	--
August	346	355
September [b]	--	--
October	382	399
November [b]	--	--
December [b]	--	--

Note: No results exceeded the permit limits.
[a] Sum of Outfalls 001 and 007 only
[b] No discharge this month

TABLE B-2F
2007 Annual, Semiannual, and Quarterly SPDES Results for Outfall 001: Metals, Organics, and Water Quality

Permit Limit Parameters	*Permit Limit*	*Monitoring Frequency*	*Collection Date*	*Maximum Measured (mg/L)*
2-Butanone	0.5 mg/L daily maximum	Annual	January 2008	<0.005
3,3-Dichlorobenzidine	0.01 mg/L daily maximum	Annual	January 2008	<0.00008
Alpha-BHC	0.00001 mg/L daily maximum	Annual	January 2008	<0.000004
Cadmium, Total Recoverable	0.002 mg/L daily maximum	Annual	January 2008	<0.0004
Chromium VI, Total Recoverable	0.011 mg/L daily maximum	Annual	January 2008	<0.008
Chromium, Total Recoverable	0.3 mg/L daily maximum	Semiannual	July 2007 January 2008	<0.0007 0.01
Copper, Dissolved	Monitor	Semiannual	July 2007 January 2008	0.0039 0.0060
Copper, Total Recoverable	0.030 mg/L daily maximum	Semiannual	July 2007 January 2008	0.0029 0.0038
Cyanide, Amenable to chlorination	0.022 mg/L daily maximum	Semiannual	July 2007 January 2008	<0.0030 <0.0030
Dichlorodifluoromethane	0.01 mg/L daily maximum	Annual	January 2008	<0.002
Heptachlor	0.00001 mg/L daily maximum	Semiannual	July 2007 January 2008	<0.000005 <0.000008
Hexachlorobenzene	0.02 mg/L daily maximum	Annual	January 2008	<0.00006
Lead, Total Recoverable	0.006 mg/L daily maximum	Quarterly	April 2007 July 2007 October 2007 January 2008	0.0003 0.0003 0.0004 0.0005
Manganese, Total	2.0 mg/L daily maximum	Semiannual	July 2007 January 2008	0.063 0.052
Nickel, Total Recoverable	0.14 mg/L daily maximum	Semiannual	July 2007 January 2008	<0.0014 0.064
Surfactant as LAS	0.4 mg/L daily minimum	Semiannual	July 2007 January 2008	0.08 0.03
Tributyl phosphate	32 mg/L daily maximum	Annual	January 2008	<0.00083
Trichlorofluoromethane	0.01 mg/L daily maximum	Annual	January 2008	<0.002
Xylene	0.05 mg/L daily maximum	Annual	January 2008	<0.007
Zinc, Total Recoverable	0.48 mg/L daily maximum	Semiannual	July 2007 January 2008	0.0098 0.0054

TABLE B-2G
2007 SPDES Action Level Requirement Monitoring Results for Outfalls 001, 007, and 008: Metals, Organics, and Water Quality

Outfall	*Action Level Parameters*	*Action Level*	*Monitoring Frequency*	*Collection Date*	*Maximum Measured (mg/L)*
001	**Antimony, Total**	1.0 mg/L daily maximum	Annual	January 2008	<0.0056
	Barium, Total	0.5 mg/L daily maximum	Annual	January 2008	0.01
	Boron, Total	2.0 mg/L daily maximum	Quarterly	April 2007 July 2007 October 2007 January 2008	0.033 0.039 0.059 0.036
	Bromide, Total	5.0 mg/L daily maximum	Quarterly	April 2007 July 2007 October 2007 January 2008	1.2 1.5 1.9 1.2
	Chloroform	0.3 mg/L daily maximum	Annual	January 2008	<0.0009
	Titanium	0.65 mg/L daily maximum	Semiannual	July 2007 January 2008	0.0022 0.0081
007	**Chloroform**	0.20 mg/L daily maximum	Annual	January 2008	<0.00089
008	**Arsenic, Total**	0.17 mg/L daily maximum	Annual	[a]	--
	Chromium, Total	0.13 mg/L daily maximum	Annual	[a]	--
	Silver, Total	0.008 mg/L daily maximum	Annual	[a]	--
	Zinc, Total	0.1 mg/L daily maximum	Annual	[a]	--

[a] No discharge at this outfall, drainage pipe was capped in May 2001.

TABLE B-2H
2007 SPDES Results for Outfall 01B (WNSP01B): Water Quality

Internal process monitoring point did not operate during 2007

TABLE B-2I
2007 SPDES Results for Outfall 008 (WNSP008): Water Quality

No discharge; Drainage pipe capped in May 2001

TABLE B-2J
2007 Results for Sewage Treatment Outfall (WNSP007)

Isotope [a]	*N*	*Discharge Activity* [b] *(Ci)*	*Radioactivity* [c] *Becquerels*	*Average Concentration (µCi/mL)*	*DCG (µCi/mL)*	*% of DCG*
Gross Alpha	23	-0.05±2.35E-05	-0.19±8.70E+05	-0.04±2.01E-09	NA[d]	NA
Gross Beta	23	1.14±0.25E-04	4.23±0.91E+05	9.76±2.11E-09	NA[d]	NA
Tritium	23	2.01±2.58E-04	7.42±9.54E+06	1.72±2.20E-08	2E-03	<0.01%
Sr-90	2	0.39±7.17E-06	0.15±2.65E+05	0.34±6.13E-10	1E-06	<0.06%
Cs-137	2	0.03±1.61E-05	0.10±5.96E+05	0.02±1.38E-09	3E-06	<0.05%
Total % DCG						<0.11%

N - Number of samples
NA - Not applicable
[a] Half-lives are listed in Table UI-4.
[b] Total volume released; 1.17E+10 mL (3.09E+06 gal)
[c] 1 curie (Ci) = 3.7E+10 becquerels (Bq); 1 Bq = 2.7E-11 Ci
[d] DOE derived concentration guides (DCGs) do not exist for indicator parameters gross alpha and beta.

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