

# NM0031288 El Vado Reservoir Dam Seepage Modification Project

## Antodegradation Analysis

Nazario (USBOR) and Larsen (USEPA)  
Attachment

Calculations to Baseline Water Quality and Determine Significance of Degradation (See 2020 WQMP/CPP Appendix A Sections 4 and 5, respectively)

Determine Critical Low Flow / Mixing Zones (See 20.6.4.11 NMAC (Applicability of Water Quality Standards):

### Streams:

Human Health-Organism Only Criteria = Harmonic Mean (HM) or Modified (See 20.6.4.7 (H)(2) & 20.6.4.11(B)(1) NMAC)  
All Other Narrative and Numeric Criteria = 4Q3 (See 20.6.4.7 (A)(1) & 20.6.4.11(B)(2) NMAC)

4Q3 Notes: Minimum average four consecutive day flow that occurs with a frequency of once in three years and may be determined on an annual, a seasonal or a monthly basis, as appropriate, after due consideration of site-specific conditions.

### Lakes, Reservoirs, Playas:

See 20.6.4.11(E)(1) NMAC Mixing Zone Limitations / Criteria applicable "at point of discharge"

See 20.6.4.11(E)(1) NMAC Mixing Zone Limitations / Criteria applicable "at point of discharge"

Lake Notes: Antideg Procedures" omit Mixing Zone Limitations in 20.6.4.11 NMAC (Applicability of Water Quality Standards) and "Critical lake and reservoir water levels will be determined on a case-by-case basis."

Determine Reasonably Expected Concentration Effluent (Ce):

Reasonably Expected Pollutants: Determined by NPDES application, Safety Data Sheets, intake or source waters

Ce Calculation Notes: See calculation notes for Cbwq

Determine Baseline Water Quality (BWQ):

Baseline Water Quality Concentration = Cbwq = Cs = Ca (concentration surface water quality above discharge)

Cbwq Calculation Notes: Method Detection Limit = MDL (See 2020 WQMP/CPP Appendix A Glossary and USEPA 40 CFR 136 Appendix B)

Minimum Level (ML) = Reported Level (RL) or Quantitation Level (See USEPA Sufficiently Sensitive Method Rule)

If pollutant "not detected" or "less than" MDL and MDL < or = Cwqs; then use Geometric Mean of MDL

If at least one data point detected (i.e., = or > MDL meaning estimated data may be used), then use MDL/2 for "less than"

If data not provided / not retested at MDL that is lower or < Cwqs, then Cbwq = MDL/2

If data not reported to MDL, then may substitute reported or quantitation minimum level (ML)

If higher ML or 1/2 ML (using same instructions for MDL) results in no or allowable degradation, then use of MDL or 1/2 MDL will also result in no or allowable degradation.

Evaluate Level of Degradation (Surface Water + Discharge):

Mass Balance Equation: = (Qs x Cs) + (Qd x Cd) = (Qr x Cr)

Solve for Cd = [(Qr x Cr) - (Qs x Cs)] / (Qd)

Qr = (Qs + Qd)

Cd = [(Qs + Qd) x (Cr)] - (Qs x Cs) / (Qd)

### Where (Streams):

= Flow x Concentration + Flow x Concentration = Flow x Concentration

Qs = critical low flow stream (4Q3 or HM)

Qd = flow discharge (cfs or MGD)

Qr = flow resulting in-stream or downstream of outfall (cfs or MGD)

Cs = concentration stream (mg/L)

Cd = concentration discharge (mg/L)

Cr = concentration resultant (in-stream) (mg/L)

### Where (Lakes, Reservoirs, Playas - Antidegradation Procedure Only, Simplified Model):

= Volume x Concentration + Volume x Concentration = Volume x Concentration

Qs = volume critical lake water level case by case (acre-feet or million gallons US)

Qd = discharge flow rate cfs or MGD or volume (acre-feet or million gallons US)

Qr = volume surface water resulting (assumes mixing) (acre-feet or million gallons US)

Cs = concentration surface water (mg/L)

Cd = concentration discharge (mg/L)

Cr = concentration resultant (assumes mixing) (mg/L)

"Antideg Procedures" omit an intake water credit when reasonably expected pollutants in the discharge are caused or contributed by source water which is also receiving surface water.

Concentration Water Quality Standard = Cwqs (limiting segment or use-specific numeric criteria (mg/L or as indicated))

Assimilative Capacity = AC = Cwqs-Cbwq (mg/L)

Notes: If AC negative (-), then water may not be high-quality. Tier 2 review not applicable and/or Tier 2 review not applicable at this time.

If AC negative (-), then evaluate need for additional testing or condition that Ce = Cwqs at point of discharge, outfall or end of pipe.

For example, may re-test to lower MDL (if available) if pollutant reasonably expected in discharge

Calculated Concentration Resultant (Cr<sub>10%</sub>) = [(Cwqs - Cbwq) x 0.1 + Cbwq]

Calculated concentration discharge that uses

10% AC (Cd<sub>10%</sub>) = { [(Cwqs - Cbwq) x 0.1 + (Cbwq) x (Qs + Qd)] - (Cs x Qs) } / [Qd]

Cs = Cbwq

# NM0031288 El Vado Reservoir Dam Seepage Modification Project

## Antidegradation Analysis

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Calculated concentration discharge that uses  
10% AC ( $Cd_{10\%}$ )  $= \{ [(Cwqs - Cbwq) \times 0.1 + (Cbwq) \times (Qs + Qd)] - (Cbwq \times Qs) \} / [Qd]$

50% cumulative cap = Not applicable for only one (1) regulated discharge  
= Only applicable for multiple regulated discharges to the same receiving water over time

**Comparison (comprehensive Tier 2 antidegradation review includes an alternatives analysis and social and economic demonstration - See 2020 WQMP/CPP Appendix A Sections 6 & 7):**

"no significant degradation" = If  $Cd_{10\%} > Ce$ , then antidegradation review process is complete and the permitting process may proceed

"comprehensive Tier 2 review required" = If  $Cd_{10\%} < \text{or} = Ce$  or  $Ce > 50\%$  cumulative cap, then "comprehensive Tier 2 review required"

Loading Calculations Notes: Calculated maximum loading capacity (with increased 10% assimilative capacity) would be flagged if further comprehensive review required.

### References:

State of New Mexico Water Quality Management Plan / Continuing Planning Process Appendix A

Antidegradation Policy Implementation Procedure for Regulated Activities Revision October 23, 2020

<https://www.env.nm.gov/surface-water-quality/wqs/>

State of New Mexico Water Quality Standards (NMWQS) effective April 23, 2022 for state purposes

<https://www.env.nm.gov/surface-water-quality/wqmp-cpp/>

2022-2024 Integrated Report Clean Water Act 303(d)/305(b) Integrated Report EPA-Approved April 26, 2022

<https://www.env.nm.gov/surface-water-quality/303d-305b/>

### Additional Information:

#### 20.6.4.900(J)(1) Use-specific criteria (effective 04/23/22):

(2) Notes applicable to the table of numeric criteria in Paragraph (1) of this subsection.

(a) Where the letter "a" is indicated in a cell, the criterion is hardness-based and can be referenced in Subsection I of 20.6.4.900 NMAC.

(b) Where the letter "b" is indicated in a cell, the criterion can be referenced in Subsection C of 20.6.4.900 NMAC.

(c) Criteria are in  $\mu\text{g/L}$  unless otherwise indicated.

(d) Abbreviations are as follows: CAS - chemical abstracts service (see definition for "CAS number" in 20.6.4.7 NMAC);

DWS - domestic water supply; Irr/Irr storage- irrigation and irrigation storage; LW - livestock watering;

WH - wildlife habitat; HH-OO - human health-organism only; C - criteria based on cancer-causing endpoint; P - persistent toxic pollutant.

(e) The criteria are based on analysis of an unfiltered sample unless otherwise indicated. The

acute and chronic aquatic life criteria for aluminum are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the department.

(f) The criteria listed under human health-organism only (HH-OO) are intended to protect human health when aquatic organisms are consumed from waters containing pollutants. These criteria do not protect the aquatic life itself; rather, they protect the health of humans who ingest fish or other aquatic organisms.

(g) The dioxin criteria apply to the sum of the dioxin toxicity equivalents expressed as 2,3,7,8-TCDD dioxin.

(h) The criteria for polychlorinated biphenyls (PCBs) apply to the sum of all congeners, to the sum of all homologs or to the sum of all aroclors.

(i) The acute and chronic aquatic life criteria for dissolved aluminum only apply when the concurrent pH is less than 6.5 or greater than 9.0 S.U. If the concurrent pH is between 6.5 and 9.0 S.U. then the hardness-dependent total recoverable aluminum criteria in Paragraphs (1) and (2) of Subsection I of 20.6.4.900 NMAC apply.

# NM0031288 USBOR El Vado Dam Treated Grout Washout Process Water Baseline Water Quality (BWQ) and Significance of Degredation Calculation Summary

Nazario (USBOR) / Larsen (USEPA)  
Attachment

**Permittee / Applicant:** United States Bureau of Reclamation (USBOR)  
**Facility / Proposed Discharge:** El Vado Dam Seepage Modification Project / Treated Grout Washout Process Water (New Discharge)  
**NPDES Permit or Application Tracking No.:** NM0031288  
**Intake / Source Water:** El Vado Lake / Reservoir  
**Receiving Water:** El Vado Lake / Reservoir  
**Segment:** 20.6.4.120 NMAC  
**Existing Uses:** Same as designated uses  
**Designated Uses:** public water supply, irrigation, coldwater aquatic life, livestock watering, wildlife habitat, and primary contact  
**Segment Specific Numeric Criteria:** E.coli bacteria  
**Use Specific Numeric Criteria / Table:** 20.6.4.900(J)(1) NMAC (Applicable to Existing, Designated or Attainable Uses unless otherwise specified in 20.6.4.97 through 20.6.4.899 NMAC)  
**Impairments:** None / "Fully Supporting," Public Water Supply "Not Assessed" in 2022-2024 Integrated Report (Source: <https://www.env.nm.gov/surface-water-quality/303d-305b/>)  
**Additional Information:** [https://usbr.gov/uc/albugu/water/SanJuanChama/Reservoirs/elvado\\_indx.html](https://usbr.gov/uc/albugu/water/SanJuanChama/Reservoirs/elvado_indx.html)

## Lakes, Reservoirs, Playas - Antidegradation Procedure Only, Simplified Model:

Reasonably Expected Pollutants: USBOR NPDES Form 2D Application, Carpi Pilot Study Results

Ce Calculation Notes: See calculation notes for Cs and Cbwq, Used Ce from Carpi Pilot Study Data EV-5 Grout Mix Supernatant except for Benzidine. Used Cs or Cbwq if detected in 2012-2014 Lake Survey Data

$$Cd = \frac{[(Qs + Qd) \times (Cr) - (Qs \times Cs)]}{(Qd)}$$

Where:

= Volume x Concentration + Volume x Concentration = Volume x Concentration

Qs = volume critical lake water level case by case (acre-feet or million gallons US)

Qd = discharge flow rate cfs or MGD or volume (acre-feet or million gallons US)

Qr = volume surface water resulting (assumes mixing) (acre-feet or million gallons US)

Cs = concentration surface water (mg/L)

Cd = concentration discharge (mg/L)

Cr = concentration resultant (assumes mixing) (mg/L)

Cwqs = Concentration water quality standard (mg/L or as indicated)

Cbwq = Concentration baseline water quality

Cr = resultant concentration set equal to  $[(WQS-Cbwq) \times 0.1 + Cbwq]$

Reservoir Restricted Water Level Elevation = 6785 feet (USBOR NPDES Form 1 & 2D Attachments)

Qs = Reservoir Restricted Water Level Volume (Carpi Pilot Study Report) 674 MG US

Qd = Proposed discharge flow rate (MGD) x days (Carpi Pilot Study Report) 1.61 MG US

Qr = Qs = assumes constant El Vado Reservoir volume during construction/discharge 674 MG US

Cs = Cbwq = Geometric Mean of NMED SWQB MASS Lake Surveys 2012 & 2014

Cd = USBOR data EV-1 & EV-1FD, Carpi Pilot Study Report

Notes: Total Proposed Discharge Volume =

Grout Mix Phase II (153 days x 0.00825 MGD)+ Grout Mix Phase III (122 days x 0.00285 MGD) = 1.61 MG US

Conversion 1 ac-ft / 325851.42857143 gal (US) x 1 million gallons / 1000000 gal = MG

Calculated concentration discharge that uses  
10% Assimilative Capacity or AC (Cd 10%) =  $\frac{[(((Cwqs - Cbwq) \times 0.1 + (Cbwq) \times (Qs + Qd)) - (Cbwq \times Qs))]}{[Qd]}$

Cs = Cbwq

Excel Spreadsheet Formula =  $\frac{(((Cwqs-Cbwq)*0.1)+(Cbwq)*(674+(1.61))-(Cbwq*674))}{(1.61)}$

4:1 Mix = Ce ug/L =  $\frac{((EV-5 \text{ Grout Mix mg/L}) + (\text{Geomean EV-1 and EV-1FD Intake or Source Water mg/L} * 3.66))}{4.66}$

For Benzidine "Not Reasonably Expected" by Applicant, using Cbwq results in "No Significant Degradation"

For Benzidine both RL/2 & MDL/2 > Cwqs, therefore 4:1 Mix Dilution =  $\frac{((0.00374/2) + (0.001/2 * 3.66))}{4.66} = 0.000794 \text{ mg/L}$  was not used

Discharge Description: The total maximum storage of El Vado Reservoir is 180,000 acre-feet (58,653 million gallons). Grouting operation intake or source water and the proposed process water discharge would be to El Vado Lake (Reservoir) which is described in Section 20.6.4.120 NMAC. Designated uses of El Vado Reservoir are irrigation storage, livestock watering, wildlife habitat, public water supply, primary contact and coldwater aquatic life. Use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses. Reservoir water releases are to the Rio Chama and on-site power station. The proposed maximum process water discharge is 0.00825 million gallons per day (MGD). A total proposed discharge volume was calculated to be 1.61 million gallons. During construction and proposed discharge, the reservoir restricted water level elevation corresponds to a volume of 2,067 acre-feet or 674 million gallons. USBOR's contractor Carpi USA conducted a Pilot Test for El Vado Grouting Operations with a Final Report dated July 7, 2022. It is not required that NMED accept the contractor's pilot study report recommendations and conclusions. Information in the NPDES application and pilot study grout mix supernatant concentrations were used to determine reasonably expected pollutants and concentrations. The pilot study report descriptions of dilution (4:1) of the actual discharge to the grout supernatant concentrations was determined unnecessary for purposes of the State's antidegradation calculations. NMED SWQB 2012 and 2014 Lake Survey Data, supplemented by the pilot study source water data, was used to determine baseline water quality and assimilative capacity compared to NMWQS numeric criteria per the above-referenced antidegradation procedures.

Laboratory data from NMED SWQB MASS Lake Surveys 2012 & 2014 and Carpi Pilot Study in separate spreadsheets were migrated into this document. Stations 29ElVadoResSH (shallow) & 29ElVadoResDP (deep) from various NMED SWQB MASS Surveys and Projects 2012 thru 2014 geometric mean data was used to calculate  $C_{bwq}$  for most pollutants. Geometric mean of Carpi Pilot Study reservoir (intake or source water) labeled EV1 and EV-1FD data was used if not included in MASS survey to establish the 10% assimilative capacity to determine Cd per Antideg Procedures.

If data was absent an method detection limit (MDL), then a higher quantification minimum level (ML) was used in calculations.

If use of higher ML or not applying 1/2 DL results in allowable or no significant degradation, then use of MDL or 1/2 MDL will also result in allowable or no significant degradation.

**Results / Conclusions:** See attached summary. "No Significant Degradation" of reasonably expected pollutants in the discharge identified by the applicant on the NPDES Form 2D application. Reasonably expected pollutant concentrations consistent with the Antidegradation Procedures did not exceed the calculated concentration or 10% of the AC. For pollutants with a negative AC based on MDL or ML, then Tier 2 review not applicable and/or Tier 2 review not applicable at this time. If AC negative (-), then NMED will further evaluate need for additional testing during the discharge. NMED will further evaluate need for additional testing for Benzidine and Dioxins

**NM0031288 USBOR El Vado Dam Treated Grout Washout Process Water  
Baseline Water Quality (BWQ) and Significance of Degredation Calculation Summary**

Nazario (USBOR) / Larsen (USEPA)  
Attachment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Pollutant	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) ug/L or other as indicated	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) mg/L	Baseline Water Quality Concentration (Cbqw) mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq) mg/L	Significant Degradation (Cbqw+10% AC) mg/L		Allowable Effluent Discharge (Cd) mg/L = $\frac{[(Cwqs - Cbwq) \times 0.1 + Cbwq](Qs + Qd)}{[(Cbqw)(Qs)]/Qd}$ , where Qd = 1.61 MG, Qs = 674 MG		USEPA Form 2D or Attachment; or Pilot Study Grout Supernatant (Ce) or EV-5 mg/L		Allowable or "no significant degradation"		Calculated Effluent Concentration @ 10% of AC Daily Max (Cd)	Allowable Effluent Load @ 10% of AC (Daily Max)
1															
2	Aluminum, dissolved	5000	5	0.061091147	4.938908853	0.110480236		207.314		<	0.1	Yes		Not Required	Not Required
3	Aluminum, total recoverable ***	1310	1.310	0.725130095	0.584869905	0.730978794		25.268			0.919	Yes		Not Required	Not Required
4	Antimony, dissolved	640	0.640	0.00011	0.63989	0.0065089		26.852		<	0.005	Yes		Not Required	Not Required
5	Arsenic, dissolved**	9	0.009	0.001	0.008	0.00108		0.337			0.001	Yes		Not Required	Not Required
6	Asbestos (fibers/L)														
7	Barium, dissolved			0.00041											
8	Beryllium, dissolved			0.00028											
9	Boron, dissolved (Ce NPDES Application) ***	750	0.750	0.00087	0.74913	0.0083613		31.437			0.02	Yes		Not Required	Not Required
10	Cadmium, dissolved	0.443	0.000443	0.00013	0.000313	0.00013313		0.013							
11	Chloride*	230000	230	2.175	227.825	4.45325		9562.476		<	500	Yes		Not Required	Not Required
12	Chlorine residual	11	0.011												
13	Chromium III, dissolved	72.2	0.0722												
14	Chromium VI, dissolved	11	0.011												
15	Chromium, dissolved	100	0.100	0.00016	0.09984	0.0011584		4.190							
16	Cobalt, dissolved	50	0.050	0.00005	0.04995	0.0005495		2.096							
17	Copper, dissolved	13	0.013	0.00106	0.01194	0.0011794		0.502							
18	Cyanide, total recoverable	5.2	0.0052		0.0052	0.000052		0.218							
19	Iron	1000	1.000		1	0.01		41.963							
20	Lead, dissolved	2.43	0.00243	0.00009	0.00234	0.0001134		0.098							
21	Manganese, dissolved ***	1630	1.630	0.000748887	1.629251113	0.017041398		68.370							
22	Mercury	0.77	0.00077	0.00002	0.00075	0.0000275		0.031							
23	Mercury, dissolved	0.77	0.00077	0.00002	0.00075	0.0000275		0.031							
24	Methylmercury mg/kg in fish tissue	0.3	0.3												
25	Molybdenum, dissolved	1000	1.000	0.000185664	0.999814336	0.010183807		41.956							
26	Molybdenum, total recoverable	1895	1.895		1.895	0.01895		79.521							
27	Nickel, dissolved	50.6	0.0506	0.00219	0.04841	0.0026741		2.034		<	0.002	Yes		Not Required	Not Required
28	Nitrate as N mg/L														
29	Nitrite + Nitrate mg/L **	132	132	0.010926254	131.9890737	1.330816991		5538.715			0.010926254	Yes		Not Required	Not Required
30	Selenium, dissolved ***	0.13	0.13	0.00039	0.12961	0.0016861		5.439			0.015	Yes		Not Required	Not Required
31	Selenium, total recoverable ***	5	0.005	0.00039	0.00461	0.0004361		0.194			0.015	Yes		Not Required	Not Required
32	Silver, dissolved	3	0.003	0.00008	0.00292	0.0001092		0.123							
33	Thallium, dissolved	0.47	0.00047	0.00004	0.00043	0.0000443		0.018							
34	Uranium, dissolved														
35	Vanadium, dissolved **	100	0.1	0.002	0.098	0.00298		4.114			0.002	Yes		Not Required	Not Required
36	Zinc, dissolved	118	0.118	0.0006	0.1174	0.001774		4.927		<	0.02	Yes		Not Required	Not Required
37	Adjusted gross alpha pCi/L	15	15												
38	Radium 226 + Radium 228 pCi/L	30	30												
39	Strontium 90 pCi/L														
40	Tritium pCi/L	20000	20000												
41	Acenaphthene	90	0.09	0.0001	0.0899	0.000999		3.773		<	0.001	Yes		Not Required	Not Required
42	Acrolein	3	0.003	0.001664932	0.001335068	0.001678283		0.058		<	0.05	Yes		Not Required	Not Required
43	Acrylonitrile	70	0.07	0.001571623	0.068428377	0.002255907		2.873		<	0.01	Yes		Not Required	Not Required
44	Aldrin	0.0000077	7.7E-09	0.0002	-0.000199992	0.000198		-0.008		<	0.00005	Not Reasonably Expected		Not Required	Not Required
45	Anthracene	400	0.4	0.0003	0.3997	0.004297		16.773		<	0.001	Yes		Not Required	Not Required
46	Benzene	160	0.16	0.000289828	0.159710172	0.001886929		6.702		<	0.001	Yes		Not Required	Not Required
47	Benzidine **	0.11	0.00011	0.0001	0.00001	0.0001001		0.001			0.0001	Yes		Not Required	Not Required
48	Benzo(a)anthracene	0.013	0.000013	0.0002	-0.000187	0.00019813		-0.008		<	0.001	Not Reasonably Expected		Not Required	Not Required
49	Benzo(a)pyrene	0.0013	0.0000013	0.0003	-0.0002987	0.000297013		-0.012		<	0.001	Not Reasonably Expected		Not Required	Not Required
50	Benzo(b)fluoranthene	0.013	0.000013	0.0001	-0.000087	0.00009913		-0.004		<	0.001	Not Reasonably Expected		Not Required	Not Required
51	Benzo(k)fluoranthene	0.13	0.00013	0.0001	0.00003	0.0001003		0.001		<	0.001	Yes		Not Required	Not Required
52	alpha-BHC	0.0039	0.0000039	0.0001	-0.0000961	0.000099039		-0.004		<	0.00005	Not Reasonably Expected		Not Required	Not Required

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Baseline Water Quality (BWQ) and Significance of Degredation Calculation Summary**

Nazario (USBOR) / Larsen (USEPA)  
Attachment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Pollutant	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) ug/L or other as indicated	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) mg/L	Baseline Water Quality Concentration (Cbqw) mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq) mg/L	Significant Degradation (Cbqw+10% AC) mg/L		Allowable Effluent Discharge (Cd) mg/L = $\frac{[(Cwqs - Cbwq) \times 0.1 + Cbwq](Qs + Qd)}{[(Cbqw)(Qs)]/Qd}$ , where Qd = 1.61 MG, Qs = 674 MG		USEPA Form 2D or Attachment; or Pilot Study Grout Supernatant (Ce) or EV-5 mg/L	Allowable or "no significant degradation"			Calculated Effluent Concentration @ 10% of AC Daily Max (Cd)	Allowable Effluent Load @ 10% of AC (Daily Max)
1															
53	beta-BHC	0.14	0.00014	0.0002	-0.00006	0.0001994		-0.002		<	0.00005	Not Reasonably Expected		Not Required	Not Required
54	gamma-BHC (Lindane)	0.95	0.00095	0.0001	0.00085	0.0001085		0.036		<					
55	Bis(2-chloroethyl) ether	22	0.022	0.0001	0.0219	0.000319		0.919		<	0.01	Yes		Not Required	Not Required
56	Bis(2-chloro-1-methylethyl) ether	4000	4	0.0001	3.9999	0.040099		167.849		<					
57	Bis(2-ethylhexyl) phthalate	3.7	0.0037	0.0002	0.0035	0.000235		0.147		<	0.003	Yes		Not Required	Not Required
58	Bis(chloromethyl) ether	0.17	0.00017	0.0001	0.00007	0.0001007		0.003							
59	Bromoform	1200	1.2	0.00011869	1.199888131	0.01211075		50.351		<	0.001	Yes		Not Required	Not Required
60	Butylbenzyl phthalate	1	0.001	0.0001	0.0009	0.000109		0.038		<	0.003	Yes		Not Required	Not Required
61	Carbaryl	2.1	0.0021												
62	Carbon tetrachloride	50	0.05	0.000214476	0.049785524	0.000712331		2.089		<	0.001	Yes		Not Required	Not Required
63	Chlordane	0.0032	0.0000032	0.005	-0.0049968	0.004950032		-0.205		<	0.005	Not Reasonably Expected		Not Required	Not Required
64	Chlorobenzene	800	0.8	0.000181659	0.799818341	0.008179842		33.563		<	0.001	Yes		Not Required	Not Required
65	Chlorodibromomethane	210	0.21	0.000122474	0.209877526	0.00222125		8.807		<	0.001	Yes		Not Required	Not Required
66	Chloroform	2000	2	0.000282843	1.999717157	0.020280014		83.915		<	0.005	Yes		Not Required	Not Required
67	Chlorpyrifos	0.041	0.000041												
68	2-Chloronaphthalene	1000	1	0.0001	0.9999	0.010099		41.959		<	0.001	Yes		Not Required	Not Required
69	2-Chlorophenol	800	0.8	0.000125992	0.799874008	0.008124732		33.566		<	0.01	Yes		Not Required	Not Required
70	Chrysene	1.3	0.0013	0.0002	0.0011	0.000211		0.046		<	0.001	Yes		Not Required	Not Required
71	Demeton	0.1	0.0001												
72	Diazinon	0.17	0.00017												
73	2,4-Dichlorophenoxyacetic acid *	12000	12	0.002	11.998	0.12198		503.478		<	0.002	Yes		Not Required	Not Required
74	Dichlorodiphenyldichloroethane (DDD)	0.0012	0.0000012	0.000125992	-0.000124792	0.000124744		-0.005		<	0.00005	Not Reasonably Expected		Not Required	Not Required
75	Dichlorodiphenyldichloroethylene (DDE)	0.00018	0.00000018	0.0001	-0.00009982	9.90018E-05		-0.004		<	0.00005	Not Reasonably Expected		Not Required	Not Required
76	Dichlorodiphenyltrichloroethane (DDT)	0.0003	0.0000003	0.000208008	-0.000207708	0.000205931		-0.009		<	0.00005	Not Reasonably Expected		Not Required	Not Required
77	4,4'-DDT and derivatives	0.001	0.000001	0.000208008	-0.000207008	0.000205938		-0.008		<	0.00015	Not Reasonably Expected		Not Required	Not Required
78	Dibenzo(a,h)anthracene	0.0013	0.0000013	0.0003	-0.0002987	0.000297013		-0.012				Not Reasonably Expected			
79	Dibutyl phthalate	30	0.03	0.0001	0.0299	0.000399		1.255							
80	1,2-Dichlorobenzene	3000	3	0.000112468	2.999887532	0.030111344		125.885							
81	1,3-Dichlorobenzene	10	0.01	0.0001	0.0099	0.000199		0.416							
82	1,4-Dichlorobenzene	900	0.9	0.000121788	0.899878212	0.00912057		37.762							
83	3,3'-Dichlorobenzidine	1.5	0.0015	0.0004	0.0011	0.000411		0.047		<	0.01	Yes		Not Required	Not Required
84	Dichlorobromomethane	270	0.27	0.000173205	0.269826795	0.002871473		11.323		<	0.001	Yes		Not Required	Not Required
85	1,2-Dichloroethane	6500	6.5	0.000144914	6.499855086	0.065143465		272.756		<	0.001	Yes		Not Required	Not Required
86	1,1-Dichloroethylene	20000	20	0.000309839	19.99969016	0.20030674		839.254							
87	2,4-Dichlorophenol	60	0.06	0.0001	0.0599	0.000699		2.514		<	0.01	Yes		Not Required	Not Required
88	1,2-Dichloropropane	310	0.31	0.000194936	0.309805064	0.003292987		13.001		<	0.001	Yes		Not Required	Not Required
89	1,3-Dichloropropene	120	0.12	0.000144225	0.119855775	0.001342783		5.030							
90	Dieldrin	0.000012	0.000000012	0.0001	-0.000099988	9.90001E-05		-0.004				Not Reasonably Expected			
91	Diethyl phthalate	600	0.6	0.0002	0.5998	0.006198		25.170		<	0.003	Yes		Not Required	Not Required
92	Dimethyl phthalate	2000	2	0.0001	1.9999	0.020099		83.923		<	0.003	Yes		Not Required	Not Required
93	2,4-Dimethylphenol	3000	3	0.0001	2.9999	0.030099		125.886		<	0.01	Yes		Not Required	Not Required
94	Dinitrophenols	1000	1	0.0004	0.9996	0.010396		41.947		<	0.01	Yes		Not Required	Not Required
95	2,4-Dinitrophenol	300	0.3	0.0004	0.2996	0.003396		12.573		<	0.01	Yes		Not Required	Not Required
96	2,4-Dinitrotoluene	17	0.017	0.0002	0.0168	0.000368		0.705		<	0.01	Yes		Not Required	Not Required
97	Dioxin* and ***	5.10E-08	5.1E-11	0.00E+00	5.10E-11	5.1E-13		2.14E-09			1.7E-10	Yes		Not Required	Not Required
98	1,2-Diphenylhydrazine	2	0.002												
99	alpha-Endosulfan	0.056	0.000056	0.0001	-0.000044	0.00009956		-0.002		<	0.00005	Not Reasonably Expected		Not Required	Not Required
100	beta-Endosulfan	0.056	0.000056	0.0002	-0.000144	0.00019856		-0.006		<	0.00005	Not Reasonably Expected		Not Required	Not Required
101	Endosulfan sulfate	40	0.04	0.0002	0.0398	0.000598		1.670		<	0.00005	Yes		Not Required	Not Required
102	Endrin	0.03	0.00003	0.0002	-0.00017	0.0001983		-0.007		<	0.00005	Not Reasonably Expected		Not Required	Not Required
103	Endrin aldehyde	1	0.001	0.0001	0.0009	0.000109		0.038		<	0.00005	Yes		Not Required	Not Required

**NM0031288 USBOR El Vado Dam Treated Grout Washout Process Water  
Baseline Water Quality (BWQ) and Significance of Degredation Calculation Summary**

Nazario (USBOR) / Larsen (USEPA)  
Attachment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Pollutant	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) ug/L or other as indicated	Applicable 20.6.4 NMAC Water Quality Standard (Cwqs) mg/L	Baseline Water Quality Concentration (Cbqw) mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq) mg/L	Significant Degradation (Cbqw+10% AC) mg/L		Allowable Effluent Discharge (Cd) mg/L = $\frac{[(Cwqs - Cbwq) \times 0.1 + Cbwq](Qs + Qd)}{[(Cbqw)(Qs)]/Qd}$ , where Qd = 1.61 MG, Qs = 674 MG		USEPA Form 2D or Attachment; or Pilot Study Grout Supernatant (Ce) or EV-5 mg/L		Allowable or "no significant degradation"		Calculated Effluent Concentration @ 10% of AC Daily Max (Cd)	Allowable Effluent Load @ 10% of AC (Daily Max)
1															
104	Ethylbenzene	130	0.13	0.000256905	0.129743095	0.001554336		5.445		<	0.001	Yes		Not Required	Not Required
105	Fluoranthene	20	0.02	0.0001	0.0199	0.000299		0.835		<	0.001	Yes		Not Required	Not Required
106	Fluorene	70	0.07	0.0001	0.0699	0.000799		2.933		<	0.001	Yes		Not Required	Not Required
107	Guthion	0.01	0.00001												
108	Heptachlor	0.000059	0.000000059	0.0001	-0.000099941	9.90006E-05		-0.004		<	0.00005	Not Reasonably Expected		Not Required	Not Required
109	Heptachlor epoxide	0.00032	0.00000032	0.0002	-0.00019968	0.000198003		-0.008		<	0.00005	Not Reasonably Expected		Not Required	Not Required
110	Hexachlorobenzene	0.00079	0.00000079	0.0001	-0.00009921	9.90079E-05		-0.004		<	0.00005	Not Reasonably Expected		Not Required	Not Required
111	Hexachlorobutadiene	0.1	0.0001	0.000173205	-7.32051E-05	0.000172473		-0.003		<	0.01	Not Reasonably Expected		Not Required	Not Required
112	Hexachlorocyclohexane (HCH)-Technical	0.1	0.0001												
113	Hexachlorocyclopentadiene	4	0.004	0.0002	0.0038	0.000238		0.160		<	0.01	Yes		Not Required	Not Required
114	Hexachloroethane	33	0.033	0.0001	0.0329	0.000429		1.381		<	0.01	Yes		Not Required	Not Required
115	Ideno(1,2,3-cd)pyrene	0.013	0.000013	0.0002	-0.000187	0.00019813		-0.008		<	0.001	Not Reasonably Expected		Not Required	Not Required
116	Isophorone	18000	18	0.0001	17.9999	0.180099		755.336		<	0.01	Yes		Not Required	Not Required
117	Malathion	0.1	0.0001												
118	Methoxychlor	0.02	0.00002	0.000451436	-0.000431436	0.000447121		-0.018		<	0.00005	Not Reasonably Expected		Not Required	Not Required
119	Methyl bromide	10000	10	0.001966095	9.998033905	0.101946434		419.553							
120	3-Methyl-4-chlorophenol	2000	2	0.0001	1.9999	0.020099		83.923							
121	2-Methyl-4,6-dinitrophenol	30	0.03	0.0004	0.0296	0.000696		1.243		<	0.01	Yes		Not Required	Not Required
122	Methylene chloride	10000	10	0.000156049	9.999843951	0.100154489		419.627		<	0.005	Yes		Not Required	Not Required
123	Mirex	0.001	0.000001		0.000001	0.00000001		0.000							
124	Nitrobenzene	600	0.6	0.000707107	0.599292893	0.006700036		25.149		<	0.01	Yes		Not Required	Not Required
125	Nitrosamines	12.4	0.0124	0.0124	0.0124	0.000124		0.520							
126	Nitrosodibutylamine	2.2	0.0022	0.01	-0.0078	0.009922		-0.317		<	0.01	Not Reasonably Expected		Not Required	Not Required
127	Nitrosodiethylamine	12.4	0.0124	0.01	0.0024	0.010024		0.111		<	0.01	Yes		Not Required	Not Required
128	N-Nitrosodimethylamine	30	0.03	8.92614E-05	0.029910739	0.000388369		1.255		<	0.01	Yes		Not Required	Not Required
129	N-Nitrosodi-n-propylamine	5.1	0.0051	0.000125992	0.004974008	0.000175732		0.209		<	0.01	Yes		Not Required	Not Required
130	N-Nitrosodiphenylamine	60	0.06	0.0001	0.0599	0.000699		2.514		<	0.01	Yes		Not Required	Not Required
131	N-Nitrosopyrrolidine	340	0.34	0.01	0.33	0.0133		13.858		<	0.01	Yes		Not Required	Not Required
132	Nonylphenol	6.6	0.0066		0.0066	0.000066		0.277							
133	Parathion	0.013	0.000013		0.000013	0.00000013		0.001							
134	Pentachlorobenzene	0.1	0.0001	0.01	-0.0099	0.009901		-0.405		<	0.01	Not Reasonably Expected		Not Required	Not Required
135	Pentachlorophenol	0.4	0.0004	0.00015874	0.00024126	0.000161153		0.010		<	0.01	Yes		Not Required	Not Required
136	Phenol	300000	300	0.0001	299.9999	3.000099		12589.002		<	0.01	Yes		Not Required	Not Required
137	Polychlorinated Biphenyls (PCBs)* and ***	0.014	0.000014	3.12999E-09	1.39969E-05	1.43099E-07		0.001			4.8873E-07	Yes		Not Required	Not Required
138	Pyrene	30	0.03	0.000344822	0.029655178	0.000641374		1.245		<	0.001	Yes		Not Required	Not Required
139	1,2,4,5-Tetrachlorobenzene*	0.03	0.00003	0.01	-0.0097	0.0099003		-0.408		<	0.01	Not Reasonably Expected		Not Required	Not Required
140	1,1,2,2-Tetrachloroethane	30	0.03	0.000104881	0.029895119	0.000403832		1.255		<	0.001	Yes		Not Required	Not Required
141	Tetrachloroethylene	290	0.29	0.000221042	0.289778958	0.003118831		12.160		<	0.001	Yes		Not Required	Not Required
142	Toluene	520	0.52	1.44863E-05	0.519985514	0.005214341		21.820		<	0.001	Yes		Not Required	Not Required
143	Toxaphene*	0.0002	0.0000002	0.0005	-0.0004998	0.000495002		-0.020		<	0.0005	Not Reasonably Expected		Not Required	Not Required
144	1,2-Trans-dichloroethylene	4000	4	0.000443462	3.999556538	0.040439028		167.835		<	0.001	Yes		Not Required	Not Required
145	Tributyltin (TBT)	0.072	0.000072												
146	1,2,4-Trichlorobenzene	0.76	0.00076	0.000121788	0.000638212	0.00012817		0.027		<	0.01	Yes		Not Required	Not Required
147	1,1,1-Trichloroethane	200000	200	0.000352136	199.9996479	2.000348615		8392.656		<	0.001	Yes		Not Required	Not Required
148	1,1,2-Trichloroethane	89	0.089	0.000104881	0.088895119	0.000993832		3.730		<	0.001	Yes		Not Required	Not Required
149	Trichloroethylene	70	0.07	0.000191293	0.069808707	0.00088938		2.930		<	0.01	Yes		Not Required	Not Required
150	2,4,5-Trichlorophenol	600	0.6	0.01	0.59	0.0159		24.768		<	0.01	Yes		Not Required	Not Required
151	2,4,6-Trichlorophenol	28	0.028	0.01	0.018	0.01018		0.765		<	0.01	Yes		Not Required	Not Required
152	2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	400	0.4	0.002	0.398	0.00598		16.703		<	0.002	Yes		Not Required	Not Required
153	Vinyl chloride	16	0.016	0.000218976	0.015781024	0.000376786		0.662		<	0.001	Yes		Not Required	Not Required
154															

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Nazario (USBOR) / Larsen (USEPA)  
Attachment

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1															
155	Notes: Not Required = Effluent limitation not required in NDPEs permit. The need for additional monitoring during discharge for pollutants that were not detected and not reasonably expected with negative AC is still under consideration														
156															