

NM0031235 Eastern New Mexico Water Utility Authority Pilot Project, Water Treatment Plant Antidegradation Analysis

Calculations to Determine Baseline Water Quality and Evaluate the Level or Significance of Degradation

See 2020 Water Quality Management Plan / Continuous Planning Process Appendix A Sections 4 and 5.

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 Harmonic Mean (MHM)
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 is the minimum average flow over four consecutive days that occurs with a frequency of once in three years. 4Q3 may be determined on an annual, a seasonal, or a monthly basis, as appropriate, after due consideration of site-specific conditions.

Lakes, Reservoirs, Playas:

- Mixing zones are not allowed. Effluent discharges shall meet criteria at point of discharge.
See 20.6.4.11(E)(1) NMAC.
- Mixing zones are not allowed. Effluent discharges shall meet criteria at point of discharge.
See 20.6.4.11(E)(1) NMAC.
- Omit Mixing Zone Limitations in 20.6.4.11 NMAC (Applicability of Water Quality Standards). Critical lake and reservoir water levels will be determined on a case-by-case basis.

Determine Reasonably Expected Concentration Effluent (Ce):

- Determined by a review of process and effluent data in the NPDES application, Form 2; site-specific background (and intake) water quality data by provided NMED MASS and the permittee and their engineering consultant; site-specific effluent modeling results provided by the permittee and their engineering consultant; Safety Data Sheets and manufacturer's labels; and NMED guidance document Risk Assessment Guidance for Site Investigation and Remediation Volume (Nov. 2022).

Determine Baseline Water Quality (Cbwq):

- Baseline Water Quality Concentration (Cbwq) = concentration of pollutant in stream/waterbody above the discharge; baseline water quality
- Cbwq Calculation Notes: Minimum Detection Limit = MDL (See 2020 WQMP/PPP 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 is "not detected" or is "less than" MDL and MDL < or = Cwqs; then use Geometric Mean of MDL
- If at least one data point is 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):

See 2020 Water Quality Management Plan / Continuous Planning Process Appendix A Section 5.3 Calculations to Determine Significance of Degradation.

Mass Balance Equation:

$$[(\text{discharge flow} \times \text{discharge concentration}) + (\text{stream/waterbody flow} \times \text{stream/waterbody concentration})] \\ = (\text{resulting flow downstream of discharge} \times \text{resulting concentration downstream of discharge}) \\ [(Q_s \times C_s) + (Q_d \times C_d)] = (Q_r \times C_r)$$

Where (for streams):

- Qs = stream flow above discharge (cfs or MGD)
4Q3 or HM
- Qd = discharge flow (cfs or MGD)
- Qr = resulting flow in-stream downstream of discharge (cfs or MGD)
Qs + Qd (cfs or MGD)
- Cs = concentration of pollutant in stream above the discharge (mg/L)
- Cd = concentration of pollutant in discharge (mg/L)
- Cr = resulting concentration of pollutant in-stream downstream of discharge (mg/L)

Where (for lakes, reservoirs, and playas):

- Qs = volume of lake at critical lake water level (ac-ft or MG)
- Qd = discharge flow (cfs or MGD) or discharge volume (ac-ft or MG)
- Qr = resulting volume of lake after discharge (ac-ft or MG)
Qs + Qd (ac-ft or MG)
- Cs = concentration of pollutant in lake (mg/L)
- Cd = concentration of pollutant in discharge (mg/L)
- Cr = resulting concentration of pollutant in lake (mg/L)

Solve for Cd

$$C_d = \frac{[(Q_r \times C_r) - (Q_s \times C_s)]}{Q_d} \\ \frac{[(Q_s + Q_d) \times C_r] - (Q_s \times C_s)}{Q_d}$$

Determining Assimilative Capacity

- Concentration Water Quality Standard (Cwqs) = segment-specific criteria or designated use-specific numeric criteria (mg/L or other unit as indicated)
- Assimilative Capacity (AC) = The difference between the most stringent applicable water quality standard for a pollutant (Cwqs) and the baseline water quality concentration for that pollutant (Cbwq).
Cwqs - Cbwq (mg/L)
- Notes: If AC is negative (-), then water may not be high-quality. Antidegradation Tier 2 review may not applicable at this time.
If AC is negative (-), then evaluate the need for additional testing or condition that Ce = Cwqs at point of discharge, outfall or end of pipe.
For example, a permittee may re-test at a lower MDL (if available) if a pollutant is reasonably expected in discharge

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For purposes of Tier 2 antidegradation reviews, NMED solves for the discharge concentration that uses 10% of the assimilative capacity.

Calculated Resulting Concentration of Pollutant at 10% AC (C_{r10}) = Calculate the resulting concentration of pollutant in-stream downstream of the discharge (mg/L) when 10% of the assimilative capacity has been used.

$$10\% \text{ AC } (C_{r10}) = (AC \times 0.1) + C_{bwq}$$

$$((C_{wqs} - C_{bwq}) \times 0.1) + C_{bwq}$$

Calculated Concentration of Pollutant in the Discharge that uses 10% AC (C_{d10}) = Calculate the discharge concentration at 10% AC using C_{r10}

$$= \frac{(((C_{wqs} - C_{bwq}) \times 0.1) + C_{bwq}) \times (Q_s + Q_d) - (Q_s \times C_s)}{Q_d}$$

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 $C_{d10\%} > C_e$, then antidegradation review process is complete and the permitting process may proceed.

Further degradation analysis needed. Calculated maximum loading capacity (with increased 10% assimilative capacity) would be flagged if further comprehensive review required.

If $C_{d10\%} < \text{or} = C_e$ or if $C_e > 50\%$ cumulative cap, then "Further Antidegradation 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/>

2024-2026 Integrated Report Clean Water Act 303(d)/305(b) Integrated Report EPA-Approved May 13, 2024

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

Additional Information:

20.6.4.900(j)(1) Use-specific criteria (effective April 23, 2022)

(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.

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Permittee / Applicant: Eastern New Mexico Water Utility Authority (ENMWUA)
 Facility / Proposed Discharge: Pilot Project, Water Treatment Plant
 NPDES Permit/Application Tracking #: NM0031235
 Source Water: Ute Reservoir
 Receiving Water: Ute Reservoir, 20.6.4.302 NMAC
 Segment: Not applicable for reservoirs.
 Designated Uses: Livestock watering, wildlife habitat, public water supply, industrial water supply, primary contact and warmwater aquatic life.
 Existing Uses: Same as designated uses.
 Segment Specific Numeric Criteria: Monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less
 Use Specific Numeric Criteria / Table: 20.6.4.900(I)(1) NMAC (Applicable to Existing, Designated or Attainable Uses unless otherwise specified in 20.6.4.97 through 20.6.4.899 NMAC)
 Impairments: Mercury

$$Cd_{10} = \frac{(((Cwqs - Cbwq) \times 0.1) + Cbwq) \times (Qd + Qs) - (Cbwq \times Qs)}{Qd}$$

Cd₁₀ = concentration of pollutant in discharge (mg/L)
 Cwqs = water quality standard
 Cbwq = baseline water quality (mg/L)
 Qd = discharge flow (cfs or MGD) or discharge volume (ac-ft or MG)
 Qs = volume of lake at critical lake water level, case by case (acre-feet (ac-ft) or million gallons (MG))
 Cs = concentration of pollutant in lake (mg/L)
 Cr = Cr = resulting concentration of pollutant at 10% Assimilative capacity, set equal to $\frac{((Cwqs - Cbwq) \times 0.1) + Cbwq}{1}$

Solve for Cd (NMED solves for the discharge concentration that would use up 10% of the assimilative capacity):

	cubic feet per second (cfs)	million gallons per day (MGD)	
Qd1 (effluent discharge flow) =	0.356 cfs	0.230 MGD	0.230 MGD from ENMWUA mass balance for WTP; NPDES Permit Form 2 0.125 MGD)
Qd (effluent discharge flow) =	0.356 cfs	0.230 MGD	
Qs (4Q3) =	3880.065 cfs	2507.749 MGD	7,696 acre-feet, Ute Lake volume minimum from New Mexico Office of the State Engineer
Qd + Qs (total streamflow) =	3880.421 cfs	2507.979 MGD	
Qs (Harmonic Mean) =	Not applicable for lakes, use Qs (harmonic mean) = 0		
Qd + Qs (total streamflow, HM for HH-OO) =	3880.421 cfs	2507.979 MGD	
Cs (in-stream) =	Same as Cbwq, baseline water quality		
Cbwq =	Ute Reservoir (Source water and receiving water)		
	variable concentration (mg/L) from NMED and ENMWUA and their consultant		
	Cd₁₀ (mg/L) = Effluent discharge concentration using 10% AC		

The calculated discharge concentration (Cd) is compared with the proposed discharge concentration. If the proposed discharge is less than 10% of the assimilative capacity (calculated > proposed) and existing uses are maintained, the antidegradation review process is complete and the permitting process may proceed. If the proposed discharge consumes more than 10% of available assimilative capacity (calculated < proposed), a comprehensive Tier 2 review is required.

Analysis, pilot test discharge, potable water treatment plant (no effluent data revisions):

Pollutant	CAS	20.6.4 NMAC Water Quality Standard (Cwqs), ug/L	20.6.4 NMAC Water Quality Standard (Cwqs), mg/L	Baseline Concentration (Cbwq) In-Stream, mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq), mg/L	Significant degradation (Cbwq+10% AC), mg/L	Mixing Calculation		Loading Calculation		Antidegradation Analysis					
							Calculated Effluent Concentration (Cd) ((Cwqs - Cbwq) x 0.1 + Cbwq) x (Qd + Qs), mg/L	Cs*Qs	Calculated Effluent Concentration @ 10% of AC Daily Max (Cd ₁₀), mg/L	Allowable Effluent Load @ 10% of AC Daily Max, lbs/D	Pollutant	Average (Geomean) Effluent Data, mg/L	Proposed discharge based on current effluent data, lbs/day	Proposed Discharge: if > Allowable Effluent Load @ 10% of AC Daily, then Further Degradation Analysis Required	Pollutants reported as below MDL (non-detect)	Flagging Pollutants Reported at MDL, all others No Additional Degradation Analysis
Aluminum, dissolved	7429-90-5	750	1	0.000488458	0.7495	0.075439612	189.201	1.2249	817.2872	1,567.7203	Aluminum, dissolved	0.006700	0.012852	No additional degradation analysis required.	Not applicable	
Antimony, dissolved	7440-36-0	640	0.64	0.00020618	0.6400	0.064018556	160.557	0.0517	697.8500	1,338.6159	Antimony, dissolved	0.001224	0.002348	No additional degradation analysis required.	Not applicable.	
Arsenic, dissolved	7440-38-2	9	0.009	0.000630262	0.0084	0.001467236	3.680	1.5805	9.1272	17.5078	Arsenic, dissolved	0.000459	0.000880	No additional degradation analysis required.	Not applicable.	
Boron, dissolved	7440-42-8	5000	5.00	0.023061003	4.9769	0.520754902	1306.043	57.8312	5427.0057	10,410.0822	Boron, dissolved	0.250000	0.479550	No additional degradation analysis required.	Not applicable.	
Cadmium, dissolved *	7440-43-9	3.42939	0.0034	0.000029450	0.0034	0.000369444	0.92656	0.0739	3.7074	7.1116	Cadmium, dissolved *	0.000084	0.000161	No additional degradation analysis required.	Not applicable.	
Chloride	7782-50-5	230,000	230	91.268830000	138.7312	105.141947	263693.826	228879.3442	151367.3132	290,352.7802	Chloride	109.550000	210.138810	No additional degradation analysis required.	Not applicable.	
Chromium III, dissolved *	16065-83-1	152.1048248	0.152	0.001500000	0.1506	0.016560482	41.533	3.7616	164.2249	315.0162	Chromium III, dissolved *	0.011100	0.021292	No additional degradation analysis required.	Not applicable.	
Chromium VI, dissolved	18540-29-9	11	0.011	0.002101000	0.0089	0.0029909	7.501	5.2688	9.7058	18.6177	Chromium VI, dissolved	0.000116	0.000222	No additional degradation analysis required.	Not applicable.	
Chromium, dissolved	7440-47-3	1000	1.000	0.000017669	1.0000	0.100015902	250.838	0.0443	1090.4065	2,091.6178	Chromium, dissolved	0.021766	0.041752	No additional degradation analysis required.	Not applicable.	
Cobalt, dissolved	7440-48-4	1000	1.000	0.000007902	1.0000	0.100007111	250.816	0.0198	1090.4172	2,091.6382	Cobalt, dissolved	0.003300	0.006329	No additional degradation analysis required.	Not applicable.	
Copper, dissolved *	7440-50-8	27.6432183	0.0276	0.000047779	0.0276	0.002807323	7.041	0.1198	30.0908	57.7202	Copper, dissolved *	0.002460	0.004719	No additional degradation analysis required.	Not applicable.	
Cyanide, total recoverable	57-12-5	5.2	0.005	0.001000000	0.0042	0.00142	3.561	2.5077	4.5808	8.7869	Cyanide, total recoverable	0.001000	0.001918	No additional degradation analysis required.	Not applicable.	

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Analysis, shaft discharge (effluent data revisions):

Pollutant	CAS	20.6.4 NMAC Water Quality Standard (Cwqs), ug/L	20.6.4 NMAC Water Quality Standard (Cwqs), mg/L	Baseline Concentration (Cbwq) In-Stream, mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq), mg/L	Significant degradation (Cbwq+10% AC), mg/L	Mixing Calculation		Loading Calculation		Pollutant	Antidegradation Analysis				
							Calculated Effluent Concentration (Cd) ((Cwqs-Cbwq) x 0.1 + Cbwq) x (Qd + Qs), mg/L	Cs*Qs	Calculated Effluent Concentration @ 10% of AC Daily Max (Cd10), mg/L	Allowable Effluent Load @ 10% of AC Daily Max, lbs/D		Average (Geomean) Effluent Data, mg/L	Proposed discharge based on current effluent data, lbs/ day	Proposed Discharge: if > Allowable Effluent Load @ 10% of AC Daily, then Further Degradation Analysis Required	Pollutants reported as below MDL (non-detect)	Flagging Pollutants Reported at MDL, all others No Additional Degradation Analysis
Iron	7439-89-6	1,000	1.000	0.007983700	0.9920	0.10718533	268.819	20.0211	1081.7281	2,074.9709	Iron	0.010000	0.019182	No additional degradation analysis required.	Not applicable.	
Lead, dissolved *		2.092598956	0.00209	0.000006149	0.0021	0.000214794	0.539	0.0154	2.2751	4.3641	Lead, dissolved *	0.000083	0.000159	No additional degradation analysis required.	Not applicable.	
Manganese, dissolved *	7439-96-5	46.22565556	0.05	0.000014770	0.0462	0.004635859	11.627	0.0370	50.3896	96.6572	Manganese, dissolved *	0.000190	0.000364	No additional degradation analysis required.	Not applicable.	
Mercury	7439-97-6	0.77	0.001	0.000002220	0.0008	7.89978E-05	0.198	0.0056	0.8372	1.6059	Mercury	0.000080	0.000153	No additional degradation analysis required.	Not applicable.	
Mercury, dissolved	7439-97-6	0.77	0.001	0.000002168	0.0008	7.89508E-05	0.198	0.0054	0.8373	1.6060	Mercury, dissolved	0.006299	0.012082	No additional degradation analysis required.	Not applicable.	
Molybdenum, total recoverable	7439-98-7	1,895	1.895	0.000740066	1.8943	0.19016606	476.933	1.8559	2065.5506	3,962.1392	Molybdenum, total recoverable	0.006299	0.012082	No additional degradation analysis required.	Not applicable.	
Nickel, dissolved *	7440-02-0	123.109136	0.123	0.000035712	0.1231	0.012343054	30.956	0.0896	134.2025	257.4272	Nickel, dissolved *	0.009242	0.017727	No additional degradation analysis required.	Not applicable.	
Selenium, dissolved **	7782-49-2	50	0.13	0.000176412	0.1298	0.013158771	33.002	0.4424	141.5632	271.5465	Selenium, dissolved **	0.000920	0.001764	No additional degradation analysis required.	Not applicable.	
Selenium, total recoverable	7782-49-2	5	0.005	0.000171707	0.0048	0.000654536	1.642	0.4306	5.2651	10.0995	Selenium, total recoverable	0.001700	0.003261	No additional degradation analysis required.	Not applicable.	
Silver, total *	7440-22-4	18.88904052	0.019	0.000005957	0.0189	0.001894265	4.751	0.0149	20.5906	39.4969	Silver, dissolved *	0.010780	0.020678	No additional degradation analysis required.	Not applicable.	
Thallium, dissolved	7440-28-0	0.47	0.000	0.000005685	0.0005	5.21165E-05	0.131	0.0143	0.5063	0.9712	Thallium, dissolved	0.000110	0.000211	No additional degradation analysis required.	Not applicable.	
Vanadium, dissolved	7440-62-2	100	0.100	0.002321396	0.0977	0.012089256	30.320	5.8215	106.5136	204.3144	Vanadium, dissolved	0.002897	0.005557	No additional degradation analysis required.	Not applicable.	
Zinc, total *	7440-66-6	292	0.292	0.000173843	0.2918	0.029357802	73.629	0.4360	318.2296	610.4280	Zinc, dissolved *	0.022000	0.042200	No additional degradation analysis required.	Not applicable.	
Aluminum, dissolved	7429-90-5	750	1	0.000488458	0.7495	0.075439612	189.201	1.2249	817.2872	1,567.7203	Aluminum, dissolved	0.006177	0.011849	No additional degradation analysis required.	Not applicable.	
Antimony, dissolved	7440-36-0	640	0.64	0.000020618	0.6400	0.064018556	160.557	0.0517	697.8500	1,338.6159	Antimony, dissolved	0.000050	0.000096	No additional degradation analysis required.	Not applicable.	
Arsenic, dissolved	7440-38-2	9	0.009	0.000630262	0.0084	0.001467236	3.680	1.5805	9.1272	17.5078	Arsenic, dissolved	0.001770	0.003396	No additional degradation analysis required.	Not applicable.	
Boron, dissolved	7440-42-8	5000	5.00	0.023061003	4.9769	0.520754902	1306.043	57.8312	5427.0057	10,410.0822	Boron, dissolved	0.312313	0.599078	No additional degradation analysis required.	Not applicable.	
Cadmium, dissolved *	7440-43-9	3.42939	0.0034	0.000029450	0.0034	0.000369444	0.92656	0.0739	3.7074	7.1116	Cadmium, dissolved *	0.000055	0.000106	No additional degradation analysis required.	Pollutant is non-detect.	
Chloride	7782-50-5	230,000	230	91.268830000	138.7312	105.141947	263693.826	228879.3442	151367.3132	290,352.7802	Chloride	91.268834	175.071877	No additional degradation analysis required.	Not applicable.	
Chromium III, dissolved *	16065-83-1	152.1048248	0.152	0.001500000	0.1506	0.016560482	41.533	3.7616	164.2249	315.0162	Chromium III, dissolved *	0.001500	0.002877	No additional degradation analysis required.	Not applicable.	
Chromium VI, dissolved	18540-29-9	11	0.011	0.002101000	0.0089	0.0029909	7.501	5.2688	9.7058	18.6177	Chromium VI, dissolved	0.002101	0.004031	No additional degradation analysis required.	Not applicable.	
Chromium, dissolved	7440-47-3	1000	1.000	0.000017669	1.0000	0.100015902	250.838	0.0443	1090.4065	2,091.6178	Chromium, dissolved	0.001850	0.003549	No additional degradation analysis required.	Not applicable.	
Cobalt, dissolved	7440-48-4	1000	1.000	0.000007902	1.0000	0.100007111	250.816	0.0198	1090.4172	2,091.6382	Cobalt, dissolved	0.001650	0.003165	No additional degradation analysis required.	Pollutant is non-detect.	
Copper, dissolved *	7440-50-8	27.6432183	0.0276	0.000047779	0.0276	0.002807323	7.041	0.1198	30.0908	57.7202	Copper, dissolved *	0.000704	0.001350	No additional degradation analysis required.	Not applicable.	
Cyanide, total recoverable	57-12-5	5.2	0.005	0.001000000	0.0042	0.00142	3.561	2.5077	4.5808	8.7869	Cyanide, total recoverable	0.001000	0.001918	No additional degradation analysis required.	Pollutant is non-detect.	
Iron	7439-89-6	1,000	1.000	0.004600000	0.9954	0.10414	261.181	11.5356	1085.4144	2,082.0419	Iron	0.007984	0.015314	No additional degradation analysis required.	Not applicable.	
Lead, dissolved *		2.092598956	0.00209	0.000006149	0.0021	0.000214794	0.539	0.0154	2.2751	4.3641	Lead, dissolved *	0.000051	0.000098	No additional degradation analysis required.	Pollutant is non-detect.	
Manganese, dissolved *	7439-96-5	46.22565556	0.05	0.000014770	0.0462	0.004635859	11.627	0.0370	50.3896	96.6572	Manganese, dissolved *	0.000231	0.000444	No additional degradation analysis required.	Not applicable.	
Mercury	7439-97-6	0.77	0.001	0.000002220	0.0008	7.89978E-05	0.198	0.0056	0.8372	1.6059	Mercury	0.000040	0.000077	No additional degradation analysis required.	Below MDL	
Mercury, dissolved	7439-97-6	0.77	0.001	0.000002168	0.0008	7.89508E-05	0.198	0.0054	0.8373	1.6060	Mercury, dissolved	0.000040	0.000077	No additional degradation analysis required.	Not applicable.	
Molybdenum, total recoverable	7439-98-7	1,895	1.895	0.000740066	1.8943	0.19016606	476.933	1.8559	2065.5506	3,962.1392	Molybdenum, total recoverable	0.013958	0.026775	No additional degradation analysis required.	Not applicable.	
Nickel, dissolved *	7440-02-0	123.109136	0.123	0.000035712	0.1231	0.012343054	30.956	0.0896	134.2025	257.4272	Nickel, dissolved *	0.001250	0.002398	No additional degradation analysis required.	Pollutant is non-detect.	
Selenium, dissolved **	7782-49-2	50	0.13	0.000176412	0.1298	0.013158771	33.002	0.4424	141.5632	271.5465	Selenium, dissolved **	0.000460	0.000882	No additional degradation analysis required.	Not applicable.	
Selenium, total recoverable	7782-49-2	5	0.005	0.000171707	0.0048	0.000654536	1.642	0.4306	5.2651	10.0995	Selenium, total recoverable	0.000533	0.001021	No additional degradation analysis required.	Not applicable.	
Silver, total *	7440-22-4	18.88904052	0.019	0.000005957	0.0189	0.001894265	4.751	0.0149	20.5906	39.4969	Silver, total *	0.002018	0.003870	No additional degradation analysis required.	Not applicable.	
Thallium, dissolved	7440-28-0	0.47	0.000	0.000005685	0.0005	5.21165E-05	0.131	0.0143	0.5063	0.9712	Thallium, dissolved	0.000110	0.000211	No additional degradation analysis required.	Not applicable.	
Vanadium, dissolved	7440-62-2	100	0.100	0.002321396	0.0977	0.012089256	30.320	5.8215	106.5136	204.3144	Vanadium, dissolved	0.002897	0.005557	No additional degradation analysis required.	Not applicable.	
Zinc, total *	7440-66-6	292	0.292	0.000173843	0.2918	0.029357802	73.629	0.4360	318.2296	610.4280	Zinc, total *	0.022000	0.042200	No additional degradation analysis required.	Not applicable.	
Anthracene	120-12-7	400	0.400	0.419523539	-0.0195	0.417571185	1047.260	1261.7626	-932.6207	(1,788.9530)	Anthracene	0.000047	0.000090	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Benzene	71-43-2	160	0.160	0.06363961	0.0964	0.073275649	183.774	191.4030	-33.1706	(63.6278)	Benzene	0.000346	0.000663	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.

NM0031235 Eastern New Mexico Water Utility Authority
Pilot Project, Water Treatment Plant Antidegradation Analysis

Analysis, shaft discharge (effluent data revisions):

Pollutant	CAS	20.6.4 NMAC Water Quality Standard (Cwqs), ug/L	20.6.4 NMAC Water Quality Standard (Cwqs), mg/L	Baseline Concentration (Cbwq) In-Stream, mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq), mg/L	Significant degradation (Cbwq+10% AC), mg/L	Mixing Calculation		Loading Calculation		Antidegradation Analysis					
							Calculated Effluent Concentration (Cd) ((Cwqs Cbwq) x 0.1 + Cbwq) x (Qd + Qs), mg/L	Cs*Qs	Calculated Effluent Concentration @ 10% of AC Daily Max (Cd ₁₀), mg/L	Allowable Effluent Load @ 10% of AC Daily Max, lbs/D	Pollutant	Average (Geomean) Effluent Data, mg/L	Proposed discharge based on current effluent data, lbs/ day	Proposed Discharge: if > Allowable Effluent Load @ 10% of AC Daily, then Further Degradation Analysis Required	Pollutants reported as below MDL (non-detect)	Flagging Pollutants Reported at MDL, all others No Additional Degradation Analysis
Benzo(a)anthracene	56-55-3	0.013	0.000013	0.118321596	-0.118309	0.106490736	267.077	355.8651	-386.0370	(740.4961)	Benzo(a)anthracene	0.000005	0.000009	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Benzo(a)pyrene	50-32-8	0.0013	0.000013	0.224777668	-0.2247764	0.202300031	507.364	676.0433	-733.3869	(1,406.7827)	Benzo(a)pyrene	0.000055	0.000106	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Benzo(b)fluoranthene	205-99-2	0.013	0.000013	0.419523539	-0.419511	0.377572485	946.944	1261.7626	-1368.7768	(2,625.5877)	Benzo(b)fluoranthene	0.000285	0.000547	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Benzo(k)fluoranthene	207-08-9	0.13	0.00013	0.257875939	-0.2577	0.232101345	582.105	775.5899	-841.2372	(1,613.6611)	Benzo(k)fluoranthene	0.000285	0.000547	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Chrysene	218-01-9	1.3	0.0013	0.13	-0.1287	0.11713	293.760	775.5899	-2094.9144	(4,018.4647)	Chrysene	0.000041	0.000078	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Dibenzo(a,h)anthracene	53-70-3	0.0013	0.000013	0.077459667	-0.07746	0.06971383	174.841	0.0000	760.1776	1,458.1726	Dibenzo(a,h)anthracene	0.025500	0.048914	No additional degradation analysis required.	Pollutant is non-detect.	
Ideno(1,2,3-cd)pyrene	193-39-5	0.013	0.000	0.307083051	-0.30707	0.276376046	693.145	0.0000	3013.6757	5,780.8326	Ideno(1,2,3-cd)pyrene	0.000050	0.000095	No additional degradation analysis required.	Pollutant is non-detect.	
2,4-Dimethylphenol	105-67-9	3,000	3.000	0.193971647	2.8060	0.474574483	1190.223	486.4323	3059.9596	5,869.6146	2,4-Dimethylphenol		0.000000	No additional degradation analysis required.	Pollutant is non-detect.	
2,4-Dinitrophenol	51-28-5	300	0.300	0.248897569	0.0511	0.254007812	637.046	624.1727	55.9723	107.3661	2,4-Dinitrophenol	0.000154	0.000296	No additional degradation analysis required.	Pollutant is non-detect.	
2,4-Dinitrotoluene	121-14-2	17	0.017	0.009000000	0.0080	0.0098	24.578	22.5697	8.7324	16.7505	2,4-Dinitrotoluene	0.000007	0.000013	No additional degradation analysis required.	Pollutant is non-detect.	
Ethylbenzene	100-41-4	130	0.130	0.083666003	0.0463	0.088299402	221.453	209.8134	50.6075	97.0752	Ethylbenzene	0.000195	0.000374	No additional degradation analysis required.	Pollutant is non-detect.	
Fluoranthene	206-44-0	20	0.020	0.080000000	-0.0600	0.074	185.590	200.6199	-65.3455	(125.3458)	Fluoranthene	0.000003	0.000006	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Fluorene	86-73-7	70	0.070	0.000198997	0.0698	0.007179098	18.005	0.4990	76.1130	146.0000	Fluorene	0.000003	0.000006	No additional degradation analysis required.	Not applicable	
Hexachlorobenzene	118-74-1	0.00079	0.0000079	0.115000000	-0.11500	0.103500079	259.576	288.3912	-125.2831	(240.3180)	Hexachlorobenzene	0.000049	0.000094	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Hexachlorobutadiene	87-68-3	0.1	0.0001	0.125618356	-0.1255	0.113066521	283.568	315.0193	-136.7428	(262.3001)	Hexachlorobutadiene	0.000003	0.000006	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Hexachlorocyclo-pentadiene	77-47-4	4	0.004	0.187616630	-0.1836	0.169254967	424.488	470.4955	-200.0327	(383.7027)	Hexachlorocyclo-pentadiene	0.000026	0.000049	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Hexachloroethane	67-72-1	33	0.033	0.282842712	-0.2498	0.257858441	646.704	709.2986	-272.1521	(522.0421)	Hexachloroethane	0.000050	0.000096	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Methylene chloride	75-09-2	10,000	10	0.146969385	9.8530	1.132272446	2839.716	368.5624	10744.1456	20,609.4200	Methylene chloride	0.000850	0.001630	No additional degradation analysis required.	Pollutant is non-detect.	
Nitrobenzene	98-95-3	600	0.600	0.745230700	-0.1452	0.73070763	1832.600	1868.8518	-157.6181	(302.3430)	Nitrobenzene	0.000037	0.000070	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
N-Nitrosodimethylamine	62-75-9	30	0.030	0.268328157	-0.2383	0.244495342	613.189	672.8997	-259.6108	(497.9855)	N-Nitrosodimethylamine	0.000050	0.000095	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
N-Nitrosodi-n-propylamine	621-64-7	5.1	0.0051	0.240831892	-0.2357	0.217258702	544.880	603.9460	-256.8073	(492.6078)	N-Nitrosodi-n-propylamine	0.000060	0.000115	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
N-Nitrosodiphenylamine	86-30-6	60	0.060	0.157480157	-0.0975	0.147732142	370.509	394.9208	-106.1374	(203.5928)	N-Nitrosodiphenylamine	0.000070	0.000134	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Pentachlorophenol	87-86-5	0.4	0.0004	0.307408523	-0.3070	0.276707671	693.977	770.9035	-334.4626	(641.5662)	Pentachlorophenol	0.000500	0.000959	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Phenol	108-95-2	300,000	300.000	0.338452360	299.6615	30.30460712	76003.327	848.7537	326759.0155	626,789.1436	Phenol	0.000040	0.000077	No additional degradation analysis required.	Pollutant is non-detect.	
Pyrene	129-00-0	30	0.030	0.116833214	-0.0868	0.108149893	271.238	292.9884	-94.5683	(181.4010)	Pyrene	0.000042	0.000081	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
1,1,2,2-Tetrachloroethane	79-34-5	30	0.030	0.067082039	-0.0371	0.063373835	158.940	168.2249	-40.3681	(77.4341)	1,1,2,2-Tetrachloroethane	0.000235	0.000451	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
Toluene	108-88-3	520	0.520	0.072284161	0.4477	0.117055745	293.573	181.2706	488.2732	936.6056	Toluene	0.000215	0.000413	No additional degradation analysis required.	Pollutant is non-detect.	

NM0031235 Eastern New Mexico Water Utility Authority
Pilot Project, Water Treatment Plant Antidegradation Analysis

Analysis, shaft discharge (effluent data revisions):

Pollutant	CAS	20.6.4 NMAC Water Quality Standard (Cwqs), ug/L	20.6.4 NMAC Water Quality Standard (Cwqs), mg/L	Baseline Concentration (Cbwq) In-Stream, mg/L	Assimilative Capacity (AC) (Cwqs-Cbwq), mg/L	Significant degradation (Cbwq+10% AC), mg/L	Mixing Calculation		Loading Calculation		Pollutant	Average (Geomean) Effluent Data, mg/L	Proposed discharge based on current effluent data, lbs/ day	Antidegradation Analysis		
							Calculated Effluent Concentration (Cd) ((Cwqs-Cbwq) x 0.1 + Cbwq) x (Qd + Qs), mg/L	Cs*Qs	Calculated Effluent Concentration @ 10% of AC Daily Max (Cd ₁₀), mg/L	Allowable Effluent Load @ 10% of AC Daily Max, lbs/ day				Proposed Discharge: if > Allowable Effluent Load @ 10% of AC Daily, then Further Degradation Analysis Required	Pollutants reported as below MDL (non-detect)	Flagging Pollutants Reported at MDL, all others No Additional Degradation Analysis
1,2,4-Trichlorobenzene	120-82-1	0.76	0.00076	0.129160369	-0.1284	0.116320332	291.729	323.9018	-139.8819	(268.3215)	1,2,4-Trichlorobenzene	0.002791	0.005353	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.
1,1,1-Trichloroethane	71-55-6	200,000	200	0.098994949	199.9010	20.08909545	50383.035	248.2545	217977.3085	418,124.0732	1,1,1-Trichloroethane	0.000212	0.000406	No additional degradation analysis required.	Pollutant is non-detect.	
1,1,2-Trichloroethane	79-00-5	89	0.089	0.083666003	0.0053	0.084199402	211.170	209.8134	5.9000	11.3174	1,1,2-Trichloroethane	0.000205	0.000393	No additional degradation analysis required.	Pollutant is non-detect.	
2,4,5-Trichlorophenol	95-95-4	600	0.600	0.227870577	0.3721	0.26508352	664.824	571.4423	406.0074	778.8034	2,4,5-Trichlorophenol	0.000090	0.000172	No additional degradation analysis required.	Pollutant is non-detect.	
Vinyl chloride	75-01-4	16	0.016	0.073484692	-0.0575	0.067736223	169.881	184.2812	-62.6093	(120.0972)	Vinyl chloride	0.000262	0.000502	Further degradation analysis needed.	Pollutant is non-detect.	Pollutant is not present in the effluent. No additional degradation analysis required.