NPDES PERMIT NO. NM0028355
FACT SHEET

FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

APPLICANT:	University of California Management Contractor for Operations Los Alamos National Laboratory Los Alamos, New Mexico 87545 and U.S. Department of Energy Los Alamos Area Office Los Alamos, NM 87544
ISSUING OFFICE:	U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, Texas 75202-2733
PREPARED BY:	Isaac Chen Environmental Engineer NPDES Permits Branch (6WQ-P) Water Quality Protection Division VOICE: 214-665-7364 FAX: 214-665-2191 EMAIL: chen.isaac@epa.gov
PERMIT ACTION:	Proposed reissuance of the current permit issued December 29, 2000, with an effective date of February 1, 2001 and an expiration date of January 31, 2005.
DATE PREPARED:	January 17, 2006

40CFR CITATIONS: Unless otherwise stated, citations to 40CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of October 1, 2005.

STATE CERTIFICATION: The permit is in the process of certification by the State agency following regulations promulgated at 40CFR124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish

and Wildlife Service; and to the National Marine Fisheries Service prior to the publication of that notice.

TRIBAL CERTIFICATION

Several Pueblos are located in the vicinity of Los Alamos National Laboratory. They include the following: San Ildefonso, Santa Clara, and Cochiti. The Santa Clara Pueblo has approved water quality standards (WQS); however, it is not adjacent to any stream where discharges are proposed to be authorized. Santa Clara is therefore not believed to be affected by the discharges proposed to be authorized by this permit. Neither San Ildefonso nor Cochiti Pueblo has submitted WQS for approval at this time; therefore, the only 401 certification is required from the State of New Mexico.

ENDANGERED SPECIES ACT

In accordance with requirements under section 7(a)(2) of the Endangered Species Act, EPA has reviewed this permit for its effect on listed threatened and endangered species and designated critical habitat. According to the most recent county listing of species, for the State of New Mexico revised as of 2004, the following species may be present in the county where the proposed NPDES discharge occurs: black-footed ferret (*Mustela nigripes*), southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), and Mexican spotted owl (*Strix occidentalis lucida*). No changes have been made to the US Fish and Wildlife list of threatened and endangered species and critical habitat designation in the area of the discharge since prior issuance of the permit.

During the prior issuance of this permit in 2000, EPA conducted informal consultation with the US Fish and Wildlife Service (Cons. #2-22-01-I-018). That consultation was concluded on December 7, 2000 with the Service concurring by letter with EPA's determination that the re-issuance of the NPDES permit for LANL would have "no effect" on Mexican spotted owl and "may affect, not likely to adversely affect" on the bald eagle and southwestern willow flycatcher. The Service also found that black-footed ferret were not present in the permit action area. After review, EPA has determined that the re-issuance of Permit No. NM0028355 will not alter the environmental baseline; therefore, this action has "no effect" on listed threatened and endangered species and it will not adversely modify designated critical habitat. EPA makes this determination based on the following analyses:

Bald eagles: In the 2000 consultation letter, FWS stated:

> "Bald eagles may roost overnight in ponderosa pine trees located in the lower portions of the tributary canyons near the Rio Grande, particularly near the mouths of Water, Ancho, Potrillo, and Chaquehui Canyons."
> "HI results indicate that no appreciable impact to the bald eagle is expected from contaminants at LANL, from soil ingestion and food consumption pathway."

> " The renewal of the LANL NPDES permit will not alter acceptable baseline environmental conditions on LANL. Preliminary ecorisk analyses did not identify any significant risk of contaminant effects to the bald eagle."

The action to renew the LANL NPDES permit will not alter the 2000 acceptable baseline on LANL. Four outfalls ceased discharges and are deleted from the proposed action. Any changes of water quality-based effluent limitations at existing outfalls are consistent with New Mexico WQS and its Implementation Guidance and will not result in an increase of waste loads from those authorized in the previously issued permit, dated December 29, 2000. Therefore, EPA determines that the re-issuance of the LANL NPDES permit will have "no effect" to bald eagle relative to the 2000 environmental baseline.

Southwestern willow flycatcher: FWS stated in their 2000 consultation letter:

> "Pajarito Canyon is the only location on LANL where southwestern willow flycatchers have been recorded."
> "There are no outfalls in Pajarito Canyon."
> "There are no NPDES outfalls upstream from the southwestern willow flycatcher AEI (areas of environmental interest)."
> "HI results indicate that no appreciable impact to the southwestern willow flycatcher is expected from contaminants at LANL, from soil ingestion and food consumption pathway."
> "The renewal of the LANL NPDES permit will not alter acceptable baseline environmental conditions on LANL. Preliminary ecorisk analyses did not identify any significant risk of contaminant effects to the southwestern willow flycatcher."

As stated above in evaluation of effect on bald eagles, EPA has determined that the re-issuance of the LANL NPDES permit will have "no effect" on the southwestern willow flycatcher relative to the 2000 environmental baseline.

Maxican spotted owl: FWS stated in the 2000 consultation letter:

> "Fourteen of the 21 NPDES outfalls are within four Mexican Spotted Owl Areas of Environmental Interest (AEIs). Ten of the outfalls are within AEI core and four are within buffer areas. The Mexican spotted owl is not as closely tied to the aquatic food chain as the bald eagle or southwestern willow flycatcher. Surveys identified very little prey-species habitat created or maintained by NPDES outfalls. Potential impacts due to contaminant transport from aquatic sources are assumed to be negligible."
> "HI results, including a measure of cumulative effects, indicated that there was not an unacceptable risk to the owl from soil ingestion and food consumption pathway. Since overall contaminant levels will generally decrease under the new NPDES Permit, future risk of contaminant exposure should be even less than current levels."

> "Current ongoing activities in Mexican Spotted Owl AEIs constitute a baseline condition and, according to the best available information, other than reductions in contaminant discharge, are proposed under the new NPDES Permit. A few outfalls increase habitat diversity and probably improve prey availability to the Mexican spotted owl."

The renewal of the LANL permit action will not increase the discharge of contaminants from the 2000 environmental baseline. EPA determines that the re-issuance of the LANL NPDES permit will have "no effect" on Mexican spotted owls relative to the 2000 environmental baseline.

The FWS concluded in the 2000 consultation letter: "Based on information in the BE, the Service believes that the reissued permit should slightly improve effluent water quality at LANL over the 5-year permit. In addition, re-issuance of the NPDES permit will not measurably alter stream morphology, flow patterns, temperatures, water chemistry, or slit loads in any of the affected intermittent tributaries or the Rio Grande. Therefore, the Service concurs with the EPA determination that the re-issuance of the NPDES permit for LANL will have "no effect" on the Mexican spotted owl, and "may affect, not likely to adversely affect" the bald eagle and southwestern willow flycatcher."

EPA believes that the conclusion statements made by the FWS are still true for this NPDES permit renewal action. There are changes of permit conditions and those changes are either because of the revision of State WQS or because of no reasonable potential of existing discharges to cause exceedances of WQS. Information available does not indicate significant changes of effluent characteristics. EPA determines that this action results in no change to the environmental baseline established by the consultation conducted during previous issuance of the permit; therefore, EPA concludes that this re-issuance of the permit will have "no effect" on the 2000 consultation and environmental baseline.

FINAL DETERMINATION: The public notice describes the procedures for the formulation of final determinations.

I. PROPOSED CHANGES FROM PREVIOUS PERMIT

It is proposed that the current permit be reissued for a 5-year term.

The changes from the current permit are:

(A) Cooling water discharges at Outfall(s) 03A024, 03A047, 03A049, and discharges from high explosive waste water area at 05A097 were deleted;

(B) Water quality-based effluent limitations and monitoring requirements which have no reasonable potential to be exceeded were deleted as follows:

Outfall 001: arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, and vanadium.

Outfall 02A: aluminum, arsenic, boron, cadmium, chromium, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 03A: aluminum, arsenic, boron, cadmium, chromium, cobalt, copper, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 05A: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 051: aluminum, arsenic, boron, cobalt, Radium 226+228, selenium, and vanadium.

Outfall 13S: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, and vanadium.

(C) Effluent limitations and monitoring requirements for total cyanide were established at Outfalls 03A130 and 03A185;

(D) Effluent limitations and monitoring requirements for temperature, aluminum and zinc based on 2005 WQS were established at Outfall 001;

(E) Whole Effluent Toxicity test requirements were established at all outfalls;

(F) Effluent limitations and monitoring requirements for copper based on 2005 WQS were established at Outfall 02A129;

(G) Effluent limitations and monitoring requirements for arsenic based on 2005 WQS were established at Outfall 03A048;

(H) Effluent limitations and monitoring requirements for copper based on new WQS were established at Outfall 03A022, 03A028, 03A048, 03A130, 03A158, and 03A160;

(I) Effluent limitations and monitoring requirements for zinc based on 2005 WQS were established at Outfalls 03A021, 03A130, 03A158, 03A160;

(J) Effluent limitations and monitoring requirements for copper based on 2005 WQS were established at Outfall 051;

(K) Effluent limitations and monitoring requirements for zinc and *E. coli* based on 2005 WQS were added at Outfall 13S.

(L) Water quality-based pH limitations were established at Outfalls 001, 03A027, 03A199, and 13S based on 2005 WQS.

The specific effluent limitations and/or conditions will be found in the draft permit.

II. APPLICANT ACTIVITY

Under the Standard Industrial Classification (SIC) Codes 9922, 9711, 9661, and 9611, the applicant currently operates a large multi-disciplinary facility which conducts national defense research and development, scientific research, space research and technology development, and energy development.

III. DISCHARGE LOCATION

As described in the application, the plant site is located in Los Alamos County, New Mexico. The discharges are to receiving waters consisting of various ephemeral tributaries in Waterbody Segment Code No. 20.6.4.126 and 20.6.4.128, thence to the Rio Grande in Waterbody Segment Code No. 20.6.4.114 of the Rio Grande Basin. Those discharges are:

Tech. Area	**Outfall Number**	**Receiving Stream**
3-22	001	Sandia Canyon
21-357	02A129	Los Alamos Canyon
3-29	03A021	Mortandad Canyon
3-66	03A022	Mortandad Canyon
3-285, -2327	03A027	Sandia Canyon
15-185,-202	03A028	Water Canyon
53-964, -979	03A048	Los Alamos Canyon
53-293, 294, 952, 1032 & 1038	03A113	Sandia Canyon
11-30	03A130	Water Canyon
21-209	03A158	Los Alamos Canyon
35-124	03A160	Ten Site Canyon
55-6	03A181	Mortandad Canyon
15-625, -626	03A185	Water Canyon
3-1837	03A199	Sandia Canyon

16-1508	05A055	Canon de Valle
50-1	051	Mortandad Canyon
46-347	13S	Sandia Canyon or Canada del Buey

Outfall Type	Category (detailed descriptions of sources of discharges are provided in the application)
001	Power Plant Discharge and re-used Treated Sanitary Wastewater
02A	Neutralized demineralizer regeneration brine and boiler blowdown
03A	Cooling tower blowdown, evaporative coolers, chillers, condensers, and air washer blowdown
05A	High explosive waste water discharge
13S	Sanitary wastewater
051	Industrial and radioactive wastewater treatment plant

IV. STREAM STANDARDS

The general and specific stream standards are provided in "State of New Mexico Standards for Interstate and Intrastate Surface Waters," (20.6.4 NMAC) New Mexico Water Quality Control Commission (WQCC). EPA approved the WQS amended as October 11, 2002. The NM WQCC adopted new WQS, as amended through July 17, 2005, for the State of New Mexico. In accordance with State law, the WQS were properly filed with the State Records Center and publicly noticed in the NM Register May 13, 2005. The revised WQS became effective under State law on May 23, 2005 and Standards were amended through July 17, 2005. EPA has not approved the 2005 WQS. The New Mexico Environment Department (NMED) has informed EPA in a letter dated August, 16, 2005, that the state certification for this proposed permit will be based on the State approved 2005 WQS.

The agency is constrained by the "Alaska Rule" [Alaska Clean Water Alliance v. Clark, No. C96-1762R (W.D. Wash.)] in implementing the new NM WQS, until such time as the revised NM WQS are fully approved by EPA pursuant to Section 303 of the Clean Water Act. However, according to EPA memorandum from Geoffrey H. Grubbs, Director Office of Science and Technology dated September 15, 2000, if a State or tribe bases a section 401 certification on the more stringent state requirement, as allowed under CWA section 401(d), EPA would include the more stringent effluent limitations specified in the certification into an EPA-issued permit.

In light of the above statements and the general certification letter (August 16, 2005), the Region will use the more stringent effluent limitation specified in the current Standards or State approved WQS. In addition, if the Region is required under a 401 certification to replace an effluent limitation of a pollutant for another effluent limitation of similar nature, the agency would include effluent limitations of both pollutants until the agency approves the revised Standards.

V. RECEIVING WATER USES

According to the revised WQS, discharges from LANL reach to two newly defined segments as below:

20.6.4.126 Rio Grande Basin - Perennial portion of ... Sandia canyon from Sigma canyon upstream to LANL NPDES outfall 001, ...

(A) Designated Uses: coldwater aquatic life, livestock watering, wildlife habitat and secondary contact.

and,

20.6.4.128 Rio Grande Basin - Ephemeral and intermitten portions of watercourses within lands managed by U.S. department of energy (DOE) within LANL, including but not limited to : Mortandad canyon, Canada del Buey, Ancho canyon, Chaquehui canyon, Indio canyon, Fence canyon, Potrillo canyon and portions of Canon de Valle, Los Alamos canyon, Sandia canyon, Pajarito canyon and Water canyon not specifically identified in 20.6.4.126 NMAC.

A. Designated Uses: livestock watering, wildlife habitat, limited aquatic life and secondary contact.

VI. DISCHARGE DESCRIPTION

A quantitative description of each discharge is presented in the EPA Permit Application Forms 1 and 2C dated July 30, 2004. Additional pH, 4,4'-DDT and cyanide data were submitted via e-mails dated March 17, 24, and 28, 2005, respectively.

VII. TENTATIVE DETERMINATION

On the basis of preliminary staff review and after consultation with the State of New Mexico, the Environmental Protection Agency has made a tentative determination to reissue a permit for the discharge described in the application.

VIII. DRAFT PERMIT RATIONALE

The following section sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other necessary explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guideline or performance standard provisions as required under 40CFR122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

A. TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Following regulations promulgated at 40CFR122.44(l)(2)(ii), the draft permit limits are based on either technology-based effluent limits pursuant to 40CFR122.44(a) or on State WQS and requirements pursuant to 40CFR122.44(d), whichever are more stringent.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

Regulations promulgated at 40CFR122.44(a) require technology-based effluent limitations to be placed in NPDES permits based on effluent limitations guidelines where applicable, on BPJ (best professional judgment) in the absence of guidelines, or on a combination of the two.

For most outfalls, the technology based effluent limitations from the current permit are retained in the proposed permit. Following are the summary of the technology-based limitations:

Outfall 001 (Power Plant Effluent and re-used Treated Sanitary Wastewater)

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
pH range:	6.0 to 9.0 standard units (WQ-based pH is more stringent)	

Although the facility is not subject to the effluent guidelines for steam electric power generating point source (40CFR423), BPJ-based conditions are proposed to control PCBs. The proposed permit prohibits power plant contributions of PCBs such as those commonly used for transformer fluid to Outfall 001 because the receiving stream, Sandia Canyon, was listed as impaired for PCBs in 2004.

Outfall 02A129 (neutralized regeneration brine and boiler blowdown)

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Total Iron	10 mg/l	40 mg/l
Total Phosphorus	20 mg/l	40 mg/l
Sulfite (as SO_3)	35 mg/l	70 mg/l
pH range:	6.0 to 9.0 standard units	

Outfall Type 03A (Treated Cooling Water)

Includes Outfalls: 03A021, 03A022, 03A027, 03A028, 03A048, 03A113, 03A130, 03A158, 03A160, 03A181, 03A185, and 03A199

		Monthly Average	Daily Maximum	
Total Suspended Solids		30 mg/l	100 mg/l	
Total Phosphorus		20 mg/l	40 mg/l	
pH range:	6.0 to 9.0 standard units			(More stringent WQ-based pH applies to 027 and 199)

Outfall 05A055 (High Explosives Waste Water)

		Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l	
Total Suspended Solids		30 mg/l	45 mg/l
Oil & Grease		15 mg/l	15 mg/l
Total Toxic Organics		1.0 mg/l	1.0 mg/l
Trinitrotoluene		20 ug/l	Report
Total RDX		200 ug/l	660 ug/l
Perchlorate		Report	Report
pH range:	6.0 to 9.0 standard units		

Outfall 051 (Radioactive and Industrial Waste Water)

		Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l	
Total Suspended Solids		30 mg/l	45 mg/l
Total Toxic Organics		1.0 mg/l	1.0 mg/l
Total Chromium		1.34 mg/l	2.68 mg/l
Total Lead		0.423 mg/l	0.524 mg/l
Total Zinc		4.37 mg/l	8.75 mg/l
Perchlorate		Report	Report
pH range:	6.0 to 9.0 standard units		

Outfall 13S (Sanitary Waste Water)

	Monthly Average	Daily Maximum
Biochemical Oxygen Demand (5-day)	30 mg/l	45 mg/l

Total Suspended Solids	30 mg/l	45 mg/l
pH range:	6.0 to 9.0 standard units	

The current permit contained mass limits at Outfalls 13S based on projected flow rates of 0.2883 MGD, 0.3083 MGD, and 0.3183 MGD, after collection of additional sewer lines from adjacent buildings. The permittee has completed the connection of new Research Park office building to the treatment facility as part of the facility's outfall reduction program. New mass limits for Outfall 13S were calculated based on the long term average flow of 0.298 MGD reported during the period of November 1997 to December 2003. The new limits were calculated as follows:

Biochemical Oxygen Demand

Monthly Avg.	= 0.298 MGD * 8.34 * 30 mg/l	=	75 lbs/day
Daily Max.	= 0.298 MGD * 8.34 * 45 mg/l	=	112 lbs/day

Total Suspended Solids

Monthly Avg.	= 0.298 MGD * 8.34 * 30 mg/l	=	75 lbs/day
Daily Max.	= 0.298 MGD * 8.34 * 45 mg/l	=	112 lbs/day

Loads based on a projected flow of 0.318 MGD after the sewer line tie-in of a residential subdivision located in Los Alamos County are also included in the permit.

C. WATER QUALITY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

Effluent limitations and/or conditions established in the draft permit are in compliance with State WQS and the applicable water quality management plan.

2. POST THIRD ROUND POLICY AND STRATEGY

Section 101 of the Clean Water Act (CWA) states that "...it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited..." To insure that the CWA's prohibitions on toxic discharges are met, EPA has issued a "Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants (49 FR 9016-9019, 3/9/84)." In support of the national policy, Region 6 adopted the "Policy for Post Third Round NPDES Permitting" and the "Post Third Round NPDES Permit Implementation Strategy" on October 1, 1992. The Regional policy and strategy are designed to insure that no source will be allowed to discharge any wastewater which (1) results in instream aquatic toxicity; (2) causes a violation of an applicable narrative or numerical State water quality standard resulting in nonconformance with the provisions of 40CFR122.44(d); (3) results in the endangerment of a drinking water supply; or (4) results in aquatic bioaccumulation which threatens human health.

3. IMPLEMENTATION

The Region is currently implementing its post third round policy in conformance with the Regional strategy. The 5-year NPDES permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the NPDES permits. State narrative and numerical WQS are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

4. STATE WATER QUALITY NUMERICAL STANDARDS

a. GENERAL COMMENTS

As described earlier in this Fact Sheet, Los Alamos National Laboratory discharges to Sandia Canyon, Los Alamos Canyon, Mortandad Canyon, Water Canyon, Canon de Valle, Ten Site Canyon, and Canada del Buey. The facility's discharges, most of which are intermittent in nature, are located from 6.9 to 10.4 miles from the Rio Grande. All of the receiving streams are ephemeral or intermittent in nature and do not generally reach the Rio Grande, except as the result of precipitation events. The newly adopted State of New Mexico WQS, 20.6.4 NMAC as amended through May 23, 2005, designate "limited aquatic life" use to ephemeral and intermittent waters and "aquatic life" to perennial waters. Therefore, acute aquatic life criteria apply to all receiving streams in LANL. Because of this, the State standards for livestock watering, wildlife habitat, acute aquatic life and general WQS apply to the proposed discharges. Chronic aquatic life criteria also apply at Outfall 001 because the effluent creates a perennial portion within Sandia Canyon which is designated also for cold aquatic life use. Discharges from Outfalls 03A027 and 03A199 will reach the perennial portion of Sandia Canyon. Because all receiving streams are either ephemeral or intermittent in nature, or dominated by effluent (i.e.,Outfall 001), no in-stream dilution, except for Outfalls 03A027 and 03A199, was used to calculate either the instream waste concentrations (IWCs) or the proposed limits. All limits, except for Outfalls 03A027 and 03A199, were calculated based on 100% effluent. The long-term average effluent flow at Outfall 001 was used to calculate critical dilution for discharges from Outfalls 03A027 and 03A199 against chronic criteria. A statistical multiplier of 2.13, pursuant to NM Implementation Guidance, was applied to effluent data and the data were screened against water quality criteria to determine whether the discharge has a reasonable potential to exceed the water quality criteria. An average hardness concentration of 41 mg/l from three (3) wells consist of 76 data was used to calculate hardness-dependent water quality criteria. These wells supply water to LANL and the NPDES permitted industrial processes.

Both 2002 and 2005 State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC) were used to re-evaluate the reasonable potential contributed by the discharges.

b. PERMIT ACTION

Water quality criteria and specific limits based on the dissolved to total fraction for Arsenic, Chromium, Copper, Lead, and Zinc were calculated using long term average effluent Total Suspended Solids (TSS) data included in the DMR summary. Effluent data from each outfall reported in Form 2C were screened against both the current and recently adopted NM WQS. An example of spread sheets used to calculate the reasonable potential can be found in Appendix B of this Fact Sheet. The initial screening results show the following reasonable potential to exceed the WQS:

Outfall No.	Parameters based on 2002 WQS
13S	Total Residual Chlorine (TRC)
03A021	TRC
03A027	TRC
03A130	Cyanide and DDT
03A158	DDT and reactor-produced tritium
03A185	Cyanide
051	TRC, DDT, and reactor-produced tritium

Effluent limitations and monitoring requirements for TRC are proposed at Outfalls 13S and 051 because those discharges have the reasonable potential to exceed water quality criteria. Total residual chlorine results reported at Outfalls 03A021 and 027 were 0.03 mg/l which was below EPA Region 6's minimum quantification level (MQL) of 0.1 mg/l for chlorine. Effluent limitations and monitoring requirements for TRC are established at all 02A and 03A outfalls because chlorination may apply to the cooling system. Because waste water from the sanitary waste water treatment plant is typically reused at the power plant, the TRC only applies to Outfall 13S when discharge is made directly to Canada del Buey through the alternate discharge point.

Although DDT was reported in the application, information provided by the permittee indicates that the facility does not use DDT and the DDT that was found in samples was a result of laboratory cross contamination from high-level waste samples. Additional analytical results also show that DDT was not detected at Outfall 051. It is unlikely that DDT would be present in cooling tower blowdown. Therefore, effluent limitations and monitoring requirements for DDT are not established. Additional analytical results of total cyanide and weak acid dissociable cyanide from Outfalls 03A027, 048, 113, 130, and 185 were reported. The total cyanide concentration (while weak acid dissociable data was not available) at Outfall 03A130 effluent and weak acid dissociable cyanide concentrations at Outfall 03A185 effluent showed reasonable potential to exceed State Water Quality Criteria. Effluent limitations and monitoring requirements for cyanide are proposed at Outfalls 03A130, and 03A185. Effluent limitations and monitoring requirements for cyanide are not proposed at Outfall 03A027 because the discharge is to a perennial stream and the in-stream concentration showed no reasonable potential. Effluent limitations and monitoring requirements for tritium are established at Outfalls

03A158 and Outfall 051 to monitor accelerator-produced tritium. Effluent limitations and monitoring requirements for Ra-226 + 228 at Outfall 051 are retained from the existing permit.

NMED conducted a Compliance Evaluation Inspection at TA-50 on May 24, 2005. NMED inspector, Mr. Bret Lucas expressed a concern regarding LANL's statement which said, *Tritium has been reported in the DMRs for each outfall although the source, "accelerator-produced" or "reactor-produced", has not been evaluated*, in his Compliance Evaluation Inspection Report dated August 18, 2005. To address the issue, the proposed permit adds, "If tritium is detected above 20,000 pCi/L at effluent, the permittee shall provide sufficient information to quantify the tritium sources if it intents to claim that tritium detected in the effluent is reactor-produced, but not accelerator-produced."

The fact sheet, dated December 20, 1999, for the last issuance of the permit stated that " *The expired permit required monitoring for water quality standards-based limits at a frequency of once per year at all outfalls. Effluent data show that at most outfalls the concentrations of those pollutants are far below the levels required by State water quality standards. Therefore, the current level of monitoring is appropriate*." For those discharges that have not shown to have reasonable potential to cause or contribute to a violation of NM 2002 WQS based on monitoring results since the permit was issued in 2000, (i.e., monitor of 1/year for water quality-based limits) the monitoring requirements and effluent limitations are proposed to be removed from this permit re-issuance. Water quality-based limitations proposed to be removed from the current permit include:

Outfall 001: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 02A: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 03A: aluminum, arsenic, boron, cadmium, chromium, cobalt, copper, lead, mercury, Radium 226+228, selenium (except for 027), tritium (except for 158), vanadium, and zinc.

Outfall 05A: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

Outfall 051: aluminum, arsenic, boron, cobalt, Radium 226+228, selenium, and vanadium.

Outfall 13S: aluminum, arsenic, boron, cadmium, chromium, copper, cobalt, lead, mercury, Radium 226+228, selenium, tritium, vanadium, and zinc.

If pollutants were determined to have reasonable potential in 2000, but new effluent data have demonstrated no reasonable potential to exceed the current WQS, monitoring and reporting only

requirements for those parameters are proposed in this reissued permit to collect more data to further verify the no reasonable potential. The affected parameters include:

Outfall 051: cadmium, copper, mercury, and nickel.
Outfall 03A027, 028, and 048: copper.

If the permittee can demonstrate that the compliance of the above parameters was the result of modification or improvement of treatment and/or operation process, EPA may consider removing the monitoring requirements in the final permit decision unless they show reasonable potential to exceed the newly adopted 2005 WQS, as discussed below.

The following outfalls may have shown reasonable potential, based on total metal data, to cause or contribute to a violation of 2005 water quality criteria:

Outfall No.	Parameters based on 2005 WQS
001	Aluminum and Zinc
02A129	Copper
03A022	Copper
03A028	Copper
03A048	Copper and Arsenic (HHC)
03A130	Copper and Zinc
03A158	Copper
03A160	Copper and Zinc
051	Copper
13S	Zinc and *E. coli* bacteria

EPA does not consider the new Standards to be "applicable standards" prior to EPA's approval. However, based on a general certification received from NMED and consistent with EPA memorandum from Geoffrey H. Grubbs, more stringent water quality-based effluent limitations for the above parameters are included in the proposed permit. The calculated effluent limitations for copper and zinc at Outfall 03A130 are also applied to Outfalls 03A022, 028, 048, 158, and 160. Because the effluent data submitted with the application are total metals and the State criteria were developed in the dissolved form, the preliminary reasonable potential screening was based on the assumption that the ratio of total to dissolved is 1.0. If the permittee can demonstrate that discharges will have no reasonable potential by providing two sets of effluent dissolved metal and hardness data at different discharging dates during the public notice comment period, EPA may reevaluate the reasonable potential screening based on dissolved data for aluminum at Outfall 001. A three-year compliance schedule for metals is established. The permit also gives a six-month compliance period for the permittee to meet *E. coli* limitations.

For those discharges to an ephemeral or intermittent receiving streams, WQ criteria are applied directly at the end-of-pipe as daily maximum limitations. Monthly average limitations equal to Daily Maximum/1.5 in accordance with the Implementation Guidance. If the permittee can demonstrate that the frequency of a discharge at certain outfall is once per month or less, EPA will consider changing the Monthly Average limit to be the same as the Daily Maximum limit.

Because the effluent of Outfall 001 forms a perennial stream within Sandia Canyon, Segment 20.6.4.126, site-specific pH and temperature criteria are established in the proposed permit. The facility has six months to comply with the pH limitation and three years to comply with the temperature limitation. Effluent from Outfalls 03A027 and 03A199 were screened against all applicable criteria, including chronic aquatic life criteria, because they reach the perennial portion of Sandia Canyon. The long term flow reported at Outfall 001 was used as the 4Q3 low flow and harmonic mean flow of the receiving stream for screening purposes. There are no reasonable potential for these two discharges to cause exceedance of chronic criteria. Site-specific pH limitations are proposed for these discharges.

In the previously referenced inspection, the NMED inspector also found that written guidance for sampling of Outfall 051 requires a 15-minute purge prior to sampling. A visual inspection of the first-flush suggests that contamination may be introduced by leaching of residue into the line prior to the sample port. According to information provided by LANL, there is no potential of cross contamination after a corrective action taken about two years ago. The wastewater flow schematic also indicates no potential of cross contamination. Because the first flush is returned to the treatment system instead of being discharged, a sample collected after the first flush should be representative of the effluent which is discharged to Mortandad Canyon.

A six-month compliance period is assigned for the facility to meet the newly established WQ-based limitations for pH and *E. coli* because EPA believes that a major process modification is not required to comply with those limitations. However, EPA proposes a three-year compliance schedule for the facility to meet metals and temperature limitations because a major process modification may be needed to comply with those new limitations.

5. AQUATIC TOXICITY TESTING

The Environmental Protection Agency's approach has been and continues to be that whole effluent toxicity (WET) testing, or biomonitoring, will be used to ensure compliance with State narrative criteria for the protection of aquatic life in the State of New Mexico. Biomonitoring requirements will be applied to all major dischargers and those minor dischargers with known or potential problems, which cause or contribute to exceedences of applicable NMWQS numeric or narrative water quality criteria in waters with existing or designated aquatic life uses.

Because the State 2005 WQS adopts aquatic life use for intermittent waters and limited aquatic life use for ephemeral waters, the NMED developed a "Narrative Toxics Implementation Guidance- Whole

Effluent Toxicity, State of New Mexico", dated December 16, 2005, to address the New Mexico NPDES Permit baseline WET testing requirements for all types of dischargers. The WET testing requirement proposed in this permit at each outfall is based on the above guidance.

The discharge at Outfall 001 is continuous and has a reasonable potential to exceed the state adopted 2005 chronic aquatic life criteria for aluminum and acute aquatic life criteria for zinc. The effluent at Outfall 001 is composed of treated sanitary waste and power utility water, chronic toxicity testing at a critical dilution of 100%, once per 12 months, is proposed for Outfall 001 based on the baseline WET requirement for minor sanitary waste to perennial waters with a critical dilution greater than 10%.

Acute testing at 100% for Daphnia pulex, once per 2 years, is proposed at Outfall 13S if it discharges directly to Canada del Buey. Acute testing at 100% for Daphnia pulex, once per 5 years, is proposed at Outfall 02A129 and Outfall 05A055, respectively in accordance with the baseline WET testing requirement assigned to "other" minor industrial to ephemeral waters. Acute testing at 100% for Daphnia pulex, once per 3 months, is proposed at Outfall 051 because of the nature of discharge and EPA considers such discharge as major.

Discharges from Outfalls 03A027 and 03A199 are to the perennial portion of Sandia Canyon with the critical dilution of 7.72% and 35.38%, respectively. The long-term average flow at Outfall 001 is used as the 4Q3 low flow because the perennial portion of Sandia Canyon is formed by Outfall 001 effluent. So, acute WET testing with a critical dilution of 8%, once per 5 years, is proposed at Outfall 03A027, and chronic WET testing with a critical dilution of 35%, once per 5 years, is proposed at Outfall 03A199. Acute testing at 100% for Daphnia pulex, once per 5 years, is proposed at all 03A outfalls. Because of the similar nature of operations and discharges at 03A outfalls, the permit allows one representative WET testing at Outfall 03A130 to be reported for all other 03A outfalls, if the permittee certifies and maintains the similarity in operation and treatment processes of each cooling tower blowdown.

G. MINIMUM QUANTIFICATION LEVELS (MQLs)

EPA Region 6, has procedures for the development of the Minimum Quantification Level (The Use of Minimum Quantification Levels (MQLs) in Water Quality-based Permits, July 29, 1992). This procedure is used to determine the compliance with effluent limitations. In this procedure, Region 6 defines MQL as, "the lowest concentration at which a particular substance can be quantitatively measured." These MQLs were chosen to be appropriate for a scan of all pollutants present in a discharge and may not necessarily represent the most sensitive analysis that may be achieved. If more sensitive methods are available, permittees may use those more sensitive methods. However, MQLs may be utilized by the permittee for reporting requirements.

If any individual analytical test result is less than the minimum quantification level listed below, a value of zero (0) may be used for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

Pollutant	MQL (µg/L)	Pollutant	MQL (µg/L)
Arsenic	10	Cadmium	1
Chromium	10	Copper	10
Lead	5	Mercury	0.2
Selenium	5	Zinc	20
Cyanide	10	PCBs	1

H. MONITORING FREQUENCIES FOR LIMITED PARAMETERS

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity [40CFR122.48(b)] and to assure compliance with permit limitations [40CFR122.44(i)(1)].

The proposed permit establishes the monitoring frequency based on the type of discharge and the reasonable potential of violation as below:

	Continuous	Non-continuous
Flow	Continuous	1/Day
pH, TRC	1/Week	1/Week
Tech-based	1/Month or less	1/Quarter or less (except RDX)
BPJ-based	1/Year	1/Year
(or Tech-based with no reasonable potential)		
WQ-based	1/Month	1/Month
Monitoring only	1/Year	1/Year

IX. SECTION 303(d) - IMPAIRED WATER BODIES

Los Alamos Canyon, Mortandad Canyon, and Water Canyon, which are tributaries of the Rio Grande in Water Body Segment Code 20.6.4.114 of the Rio Grande Basin, (listed as new Segment Code 20.6.4.128) were listed as impaired for selenium and total gross alpha in 2002. Sandia Canyon in Water Body Segment Code 20.6.4.114 of the Rio Grande Basin (listed as new Segment Code 20.6.4.126) was listed as impaired for PCBs in 2004. An evaluation has been made to determine if the discharge will cause or contribute to a violation of WQS for those pollutants of concern. Effluent data indicate that discharges to these streams have no reasonable potential to exceed gross alpha or PCBs standards at the end of pipe. Thus, no additional monitoring requirements or conditions to monitor gross alpha or PCBs are established in the permit for those discharges. A narrative restriction to

prohibit discharge of PCB at power plant Outfall 001 is proposed. Water quality screening indicated that discharges from Outfall 03A027 may have reasonable potential to exceed selenium criteria at the point of discharge and effluent limitation and monitoring requirement for selenium are established, accordingly. Discharges from Outfall 03A027 are to Sandia Canyon, and Sandia Canyon is not impaired for selenium. Therefore, no additional condition is established at Outfall 03A027 to address 303(d) impairment. This permit may be reopened to include new effluent limitations at outfalls discharging to impaired waterbodies if NMED develops wasteload allocation and total maximum daily loads (WLA/TMDL) for those discharges.

X. ANTI-BACKSLIDING AND ANTI-DEGRADATION POLICY

The New Mexico 20.6.4 NMAC, Section 20.6.4.8 "Antidegradation Policy and Implementation Plan" sets forth the requirements to protect designated uses through implementation of the State WQS. The limitations and monitoring requirements set forth in the proposed permit are developed from the State WQS and are protective of those designated uses.

Removal of water quality-based effluent limitations from the previous permit, as proposed is allowed in accordance with the Clean Water Act Section 303(d)(4)(B) because the receiving streams meet the State WQS for those monitored parameters. Relaxation of those limits is consistent with State anti-degradation policy because discharges would neither have reasonable potential to exceed WQS of those parameters nor have potential to degrade the designated uses by not monitoring those parameters. The proposed permit does not authorize new or increased discharges into the environment.

Relaxation of those water quality-based effluent limitations, as proposed, is also compliant with the anti-backsliding requirements in section 402(o)(2) of the Clean Water Act and the associated regulations found at 40 CFR Prat 122.44(l)(2)(i); because, the changes are based on new information and the receiving streams and discharges comply with the associated State Water Quality Criteria.

XI. VARIANCE REQUESTS

No variance requests have been received.

XII. ADMINISTRATIVE RECORD

The following section is a list of the fact sheet citations to applicable statutory or regulatory provisions and appropriate supporting references to the administrative record required by 40CFR124.9:

A. PERMIT(S)

NPDES Permit No. NM0028355 issued December 29, 2000, with an effective date of February 1, 2001, and an expiration date of January 31, 2005.

B. APPLICATION(S)

EPA Application Forms 1 and 2C received by EPA dated August 3, 2004.

C. CORRESPONDENCE

Supplemental information from Kenneth M. Hargis (LANL) to James R. Brown (EPA), received September 7, 2005.

E-mail from Bret Lucas (NMED) to Isaac Chen (EPA), dated January 10, 2005.

D. STATE WATER QUALITY REFERENCES

The general and specific stream standards are provided in "The State of New Mexico Standards for Interstate and Intrastate Surface Waters 20.6.4 NMAC" (20.6.4 NMAC, effective October 11, 2002 and July 17, 2005, respectively)

Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Stream, May 5, 1995.

Narrative Toxics Implementation Guidance- Whole Effluent Toxicity, State of New Mexico, December 16, 2005.

APPENDIX A

EFFLUENT CHARACTERISTICS

The following Tables show pollutants detected in the effluents. Effluent data were used to calculate In-stream Waste Concentrations and water quality-based effluent limitations. The hardness of 41 mg/l was used to calculate hardness-dependent water quality criteria.

Pollutants	**Outfall #**	**001**	**02A129**	**051**	**05A055**	**13S**
TSS, mg/l		6.4	1.4	1.9	2.5	2.6
Radioactivity, Nutrients, and Chlorine						
(Unit is ug/l, unless stated)						
Aluminum		61.7	0	0	0	39.7
Barium		17.4	54.1	0	0	8.8
Boron		97.6	64.6	106	921	86.7
Cobalt		0	2.2	0	0	0
Molybdenum		6.7	1050	1.8	3.9	27.6
Vanadium		9	10	10	10	10
Ra-226 and Ra-228 (pCi/l)		2	1.6	0.07	2.2	1.2
Tritium (pCi/l)		102	104	36053	859	79
Gross Appha (pCi/l)		0.19	1.2	6.24	0	0
Total Residual Chlorine		5	0	30		1360
Nitrite + Nitrate (mg/l)		0.92	0.45	12.8	0.81	1.76
METALS AND CYANIDE (ug/l)						
Antimony		0	0	0	0	0.4
Arsenic		0	1	0	0	1
Beryllium		0	0	0	0	0
Cadmium		0	0	0	0	0
Chromium		0	0	0	0	1.9
Copper		4.2	15.7	29.7	0	3.1
Lead		0	0	0	0	0.5
Mercury		0	0	0	0	0
Nickel		0	0	2.5	0	1.1
Selenium		0	0	0	0	0
Silver		0	0	0	0	0
Thallium		0	0	0	0	0.4
Zinc		88.8	10.7	13.4	0	87.4
Cyanide		27.9	0	0	0	0
Other Pollutants						
Chloriform		0	0	0.5	0	0

Pollutants	Outfall #	03A021	03A022	03A027	03A028	03A048
TSS, mg/l		0.8	3.9	2.6	2.8	2
Radioactivity, Nutrients, and Chlorine						
(Unit is ug/l, unless stated)						
Aluminum		17.2	0	10.2	8	0
Barium		37.6	22.4	80	63.3	89.5
Boron		29.3	20.5	52.5	47.1	83.9
Cobalt		0	0	0	0.2	0
Molybdenum		12.2	1.2	3.5	27.4	5.6
Vanadium		10	10	10	23	10
Ra-226 and Ra-228 (pCi/l)		1	2	2.3	3	2.1
Tritium (pCi/l)		327	105	108	147	153
Gross Appha (pCi/l)		0.344	0.551	0.771	0.816	0
Total Residual Chlorine (ug/l)		30	5	30	0	0
Nitrite + Nitrate (mg/l)		0.62	0.31	0.96	1.5	1.39
METALS AND CYANIDE (ug/l)						
Antimony		0	0	0	2.1	0
Arsenic		0	0	3.1	3.6	6.8
Beryllium		0	0	0	0	0
Cadmium		0	0	0	0.3	0
Chromium		6.1	0.92	13	10.5	17.5
Copper		2.5	8.7	2.7	41.8	57
Lead		0	0	0.1	1.8	0
Mercury		0	0	0.073	0.067	0
Nickel		0	0	0.4	1.7	0
Selenium		0	0	3.3	1.9	0
Silver		0	0	0	0	0
Thalllium		0	0	0	0.3	0
Zinc		33.5	10.28	15	35.1	0
Cyanide		0	0	2.1	0	1.8
Other Pollutants						
Clorodibromomethane		0	0.4	0	0	0
Dimethyl Phthalate		0	0	0	0	1.1
Endrin Aldehyde		0	0.0178	0	0	0

Pollutants	Outfall #	03A0113	03A0130	03A158	03A160	03A181
TSS, mg/l		2.8	1.4	2.1	7	1
Radioactivity, Nutrients, and Chlorine						
(Unit is ug/l, unless stated)						
Aluminum		0	0	266	274	0
Barium		70.5	32.7	39.5	44.1	69.3
Boron		54.6	52	76.4	32.7	42.4
Cobalt		0	0	0	0	0
Molybdenum		348	23.2	1.4	3.7	3.3
Vanadium		10	10	10	20	20
Ra-226 and Ra-228 (pCi/l)		1.9	2.5	1.7	2.2	2
Tritium (pCi/l)		221	181	11409	227	176
Gross Appha (pCi/l)		0.335	0	0	0.578	0
Total Residual Chlorine (ug/l)		0	0	0	0	3
Nitrite + Nitrate (mg/l)		0.84	0.01	0.77	1.57	0.46
METALS AND CYANIDE (ug/l)						
Antimony		0	0	0	0	0
Arsenic		0	3.3	0	0	0
Beryllium		0	0	0	0	0
Cadmium		0	0	0	0	0
Chromium		13.5	15.7	3.9	8.5	11.5
Copper		1.7	51	12.1	19.3	0
Lead		0	4.8	3.8	2.2	0
Mercury		0	0	0	0	0
Nickel		0	0	0	0	0
Selenium		0	0	0	0	0
Silver		0	0	0	0	0
Thalllium		0	0	0	0	0
Zinc		15.4	85.2	38.1	108	3.9
Cyanide		1.7	3.8	0	0	0
Other Pollutants		All are Non-detected				

Pollutants	Outfall #	03A0185	03A0199
TSS, mg/l		2.4	3.2
Radioactivity (ug/l), Nutrients, and Chlorine			
Aluminum		45.1	35
Barium		42.7	67.2
Boron		47.6	42.7
Cobalt		0	0.048
Molybdenum		1.9	2.9
Vanadium		20	0
Ra-226 and Ra-228 (pCi/l)		3.9	0.653
Tritium (pCi/l)		68	0
Gross Appha (pCi/l)		0	0.449
Total Residual Chlorine (ug/l)		2	1.2
Nitrite + Nitrate (mg/l)		0.58	0.874
METALS AND CYANIDE (ug/l)			
Antimony		0	0
Arsenic		0	2.7
Beryllium		0	0
Cadmium		0	0
Chromium		7.7	11.2
Copper		3.1	5.3
Lead		0	0.55
Mercury		0	0
Nickel		0	0.4
Selenium		0	0
Silver		0	0
Thalllium		0	0.33
Zinc		19.3	2.1
Cyanide		8.3	0
Other Pollutants	All are Non-detected		

APPENDIX B

PROCEDURES

TO DEVELOP

EFFLUENT LIMITATIONS

Determination of Reasonable Potential

The following equation was used to calculate the Instream Waste Concentration (Cd)

Cd = [(F*Qa*Ca) + (Qe*2.13*Ce)] / (F*Qa + Qe)

Where:
Cd = Instream Waste Concentration
F = Fraction of stream allowed for mixing (see NM Implementation Guidance)
Ce = Reported concentration in effluent
Ca = Ambient stream concentration upstream of discharge
Qe = Plant effluent flow
Qa = Critical low flow of stream at discharge point expressed as the 4Q3

Partition Coefficients for Metals

Effluent limitations for metals were converted from the dissolved fraction specified in New Mexico's WQS using the following equations which can also be found in the Region 6 Implementation Guidance for State of New Mexico Standards for Interstate and Intrastate Streams.

$$K_p = K_{po} * TSS^{\alpha}$$

$$\frac{C}{C_t} = \frac{1}{1 + (K_p)(TSS)(10^{-6})}$$

$$\text{Total Metal Limit} = \frac{C_r}{C/C_t}$$

where:

K_p	=	Linear partition coefficient
K_{po}	=	found in table below
α	=	found in table below
TSS	=	total suspended solids concentration found in receiving stream or approximation thereof, geometric mean, unit of mg/l
C/C_t	=	Dissolved fraction of metal
C_r	=	Dissolved criteria value from WQS

Linear Partition Coefficients for Priority Metals in Streams

Metal	K_{po}	α
Arsenic	$0.48 * 10^6$	- 0.73
Chromium	$3.36 * 10^6$	- 0.93
Copper	$1.04 * 10^6$	- 0.74
Lead	$2.80 * 10^6$	- 0.80
Nickel	$0.49 * 10^6$	- 0.57
Zinc	$1.25 * 10^6$	- 0.70

Development of Water Quality-based Effluent Limitations

The following equation was used to calculate the WQ-based limits:

$$Ce = [Cs*(F*Qa + Qe) - (F*Qa*Ca)] / Qe$$

Where:
Ce = Allowable daily maximum effluent limitation
F = Fraction of stream allowed for mixing (see NM Implementation Guidance)
Cs = Applicable water quality criteria
Ca = Ambient stream concentration upstream of discharge
Qe = Plant effluent flow
Qa = Critical low flow of stream at discharge point expressed as the 4Q3

A spread sheet which shows the calculation for Outfall 001 is attached.