

## **NPDES Permit No. NM0030520 Fact Sheet**

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

1. APPLICANT

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4. DATE PREPARED

May 8, 2014

5. PERMIT ACTION

This Fact Sheet is for the renewal of the permit for the Jicarilla Apache Utility Authority's (JAUA) Dulce Wastewater Treatment Plant (WWTP), which treats wastewater from the town of Dulce, New Mexico, located within the external boundaries of the Jicarilla Apache Nation. The WWTP is owned and operated by JAUA and is a separate sanitary sewer. As indicated in the permit application, the WWTP does not receive storm water or significant commercial or industrial wastewater.

The current permit was issued by the EPA National Pollutant Discharge Elimination System (NPDES) Permitting Division on March 31, 2009, with an effective date of April 1, 2009, and an expiration date of March 31, 2014. JAUA submitted the permit application to U.S. Environmental Protection Agency (EPA) on October 1, 2013. The EPA determined the application to be complete on November 25, 2013. In accordance with the Administrative Procedures Act, the permit was administratively continued. This administration continuance is automatic and provides authorization to discharge in accordance with the requirements and conditions of the extended permit until the renewal permit is issued and effective.

Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed in Title 40, Code of Federal Regulations, revised as of July 1, 2012.

6. DOCUMENT ABBREVIATIONS:

In the document that follows, various abbreviations may be used. They are as follows:

BAT - best available technology economically achievable

BMP – best management plan

BOD – five-day biochemical oxygen demand

BPJ - best professional judgment

CD – critical dilution

CFR – Code of Federal Regulations

cfs – cubic feet per second

cfu – colony forming units

CIU - Categorical Industrial User's

COD – chemical oxygen demand

COE – United States Corp of Engineers

CWA – Clean Water Act

DMR – discharge monitoring report

EPA – United States Environmental Protection Agency

ESA - Endangered Species Act

FC- fecal coliform

FR – Federal Register

FWS – United States Fish and Wildlife Service

mg/L – milligrams per liter

MGD – million gallons per day

mL – milliliter

NM – New Mexico

NMAC – New Mexico Administrative Code

NMED – New Mexico Environment Department

NMWQS - New Mexico State Standards for Interstate and Intrastate Surface Waters

NPDES – National Pollutant Discharge Elimination System

SQL - minimum quantification level

O&G – oil and grease

POTW – Publicly Owned Treatment Works

RP – reasonable potential

SIC - standard industrial classification

SIU - Significant Industrial User's

su – standard units

SWQB – Surface Water Quality Bureau

TDS – total dissolved solids

TMDL – total maximum daily load

TOC – total organic carbon

TRC – total residual chlorine

TSS – total suspended solids

UAA – use attainability analysis

WET - whole effluent toxicity

WQCC – New Mexico Water Quality Control Commission

WQS – water quality standards

WWTP – wastewater treatment plant

## 7. DISCHARGE LOCATION

As described in the application, the discharger is a publicly owned treatment works (POTW). The site is located at 290 Narrow Gauge Road, Dulce, Rio Arriba County, New Mexico. The facility is located in the Jicarilla Apache Nation and discharges within the tribal boundaries. The discharge is to Amargo Creek in the San Juan River Basin. The single outfall of the facility is to Amargo Creek at Outfall 001 located at Latitude 36° 52' 30" North, Longitude 106° 52' 30" West. Based on the communication with the Plant Manager on April 22, 2014, the POTW is currently treating an estimated 0.29 to 0.42 million gallons per day (MGD) of tribally generated wastewater.

## 8. RECEIVING STREAM STANDARDS

The discharge is within the exterior boundaries of Jicarilla Apache Nation. Effluent limitations for the JAUA WWTP were derived through a tiered process. The first tier includes a review of the Secondary Treatment Technology Standards found in 40 CFR Part 133 which are applicable to the WWTP. The secondary treatment technology-based standards and limitations define the minimum level of treatment that must be met by all facilities and establish a level of effluent quality attainable through the application of secondary or equivalent treatment. Because secondary treatment standards may be insufficient to protect all water quality parameters, the second tier includes a review of water quality standards (WQS) and the assimilative capacity of the receiving stream to establish limitations based on these WQS that ensure the receiving stream water quality is protected. The third tier includes the review of narrative standards that may be applicable to the facility to ensure the receiving stream water quality is protected.

The Jicarilla Apache Nation does not have EPA approved WQS. From correspondence with the Jicarilla Environmental Protection Office on April 16, 2014, it was confirmed that the Jicarilla Apache Nation does not have WQS; however, until such time as they are established, the Jicarilla Apache Nation adopts the State of New Mexico's WQS. Based on this communication and to protect waters of the tribe, the New Mexico (NM) WQS are applied to the discharge. The New Mexico general and specific stream standards are provided in "New Mexico State Standards for Interstate and Intrastate Surface Waters," (NM WQS), 20.6.4 NMAC, as amended through February 14, 2014.

The downstream receiving waters are located within the boundaries of the Southern Ute Tribe. At this time, the Southern Ute have established tribal WQS although not officially approved by EPA. They are working with EPA Region 8 to establish WQS and do not have an estimated timeframe for submittal and approval.

As a result, the effluent limitations are based on a combination of Secondary Treatment Technology Standards and NM water quality criteria.

## 9. APPLICANT ACTIVITY

Under the Standard Industrial Classification Code 4952, the applicant currently operates a domestic wastewater treatment facility. The Dulce wastewater treatment plant consists of headworks, two sequencing batch reactors, a flow-through ultraviolet (UV) system and an aerobic digester. Only air is added to the batch reactors. No additional chemicals are added by the facility during treatment. The facility has a design flow capacity of 0.6 MGD.

### 10. EFFLUENT CHARACTERISTICS

From 2009 through 2011, the facility submitted discharge monitoring reports (DMRs). However, at the time this permit draft was developed, the facility was noncompliant with the reporting requirement of the permit. DMRs for 2012 and 2013 had not been received. The facility submitted information in its application that describes the nature of the permitted discharge. Data were collected on September 4, 2013, and analyzed by Hall Environmental Analysis Laboratory, Inc. Tables 1 and 2 summarize the effluent characteristics as provided in the September 2013 laboratory report and the 2009 through 2011 DMRs. The quantities and concentrations listed are the maximum reported results over the 2009 through 2011 timeframe.

| <b>Table 1: September 2013 Data</b> |   |   |
|-------------------------------------|---|---|
| <b>Pollutant</b>                    | <b>Concentration<br/>(mg/L<sup>1</sup>)</b> | <b>Permit Limit</b>   |
| Total Phosphorous (P)               | <0.1 (non-detect)                           | No established permit limit for these parameters  |
| Total Kjeldahl Nitrogen (N)         | 8   |   |
| Ammonia, as N                       | 6.4   |   |
| Nitrite, as N                       | 1.1   |   |
| Nitrate, as N                       | 0.21  |   |
| Dissolved Oxygen (DO)               | Not Reported                                |   |
| Oil and Grease                      | Not Reported                                | There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life. |

<sup>1</sup> milligrams per liter

| <b>Table 2: 2013 Permit Application and 2009-2011 DMR Data Summary</b>      |   |                                       |                         |                         |                      |                      |
|---|---|---------------------------------------|-------------------------|-------------------------|----------------------|----------------------|
| <b>2013 Permit Application (based on last 2 years)</b>                      |   |                                       |                         |                         |                      |                      |
|   | <b>Permit Limit</b>                     | <b>Two years Ago (2011)</b>           | <b>Last year (2012)</b> | <b>This Year (2013)</b> |                      |                      |
| Flow, million gallons/day (MGD) average                                     | Report                                  | 0.3                                   | 0.5                     | 0.32                    |                      |                      |
| Flow, MGD, daily maximum  | Report                                  | 0.42                                  | 0.48                    | 0.5                     |                      |                      |
| <b>DMR Data (mg/l unless noted)</b>   |   |                                       |                         |                         |                      |                      |
| <b>Pollutant</b>  |   | <b>minimum, standard units (s.u.)</b> | <b>maximum, s.u.</b>    |                         |                      |                      |
| pH  | <b>Permit Limit:</b> Between 6.0 to 9.0 | 6.1                                   | 7.33                    |                         |                      |                      |
|   |   | <b>Quantity or Loading</b>            |                         | <b>Concentration</b>    |                      |                      |
| <b>Pollutant</b>  |   | <b>30-Day Average</b>                 | <b>7-Day Average</b>    | <b>30-Day Average</b>   | <b>7-Day Average</b> | <b>Daily Maximum</b> |
| <i>Escherichia coli</i> [colony forming units/100 milliliters (cfu/100 mL)] | Permit Limit                            |                                       |                         | <b>548</b>              |                      | <b>548</b>           |
|   | DMR Data                                |                                       |                         | 2,792.7                 |                      | 24,196               |
| Biochemical Oxygen Demand, 5-day (BOD <sub>5</sub> )                        | Permit Limit                            | <b>150</b>                            | <b>225</b>              | <b>30</b>               | <b>45</b>            |                      |
|   | DMR Data                                | 41.3                                  | 56.7                    | 14.6                    | 16                   |                      |
| Total Suspended Solids (TSS)  | Permit Limit                            | <b>150</b>                            | <b>225</b>              | <b>30</b>               | <b>45</b>            |                      |
|   | DMR Data                                | 67                                    | 81.8                    | 27.8                    | 32.6                 |                      |
| Total Dissolved Solids (TDS) - intake                                       | Permit Limit                            |                                       |                         | <b>Report</b>           |                      |                      |
|   | DMR Data                                |                                       |                         | 273                     |                      |                      |
| TDS - effluent  | Permit Limit                            |                                       |                         | <b>400<sup>1</sup></b>  |                      |                      |
|   | DMR Data                                |                                       |                         | 589                     |                      |                      |

Blank cells indicate that reporting is not applicable.

<sup>1</sup> Incremental increase in salinity shall be 400 mg/L or less. Net total dissolved solids incremental increases in salinity shall be 400 mg/l or less. The increase shall be difference between the TDS measured from Outfall 001 discharge and the TDS measured at the drinking water plant intake.

Note: The TDS intake and effluent values reported in the table are not representative of the same sample event and are provided for information purposes. A net increase of 400 mg/L was not identified for any sample event during DMR review.

Oil and Grease: There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

The data generated from the DMRs and the permit application were evaluated to determine the compliance history of the JAUA WWTP and identify pollutants of concern. Based on the data evaluation, it appears that the JAUA WWTP is maintaining compliance with the permit limitations for TSS, BOD<sub>5</sub>, TDS, and pH. However, it is noted that the sampling procedure used is not consistent with the permit monitoring requirements. The TSS and BOD<sub>5</sub> samples are to be 6-hour composite samples taken twice per month. The DMRs indicate that these were collected as grab samples. Review of the DMRs submitted indicates that facility periodically exceeds the 30-day average and daily maximum for *Escherichia coli*. Exceedances of the permit limits were noted for the following months: October 2009; May 2010; July and August 2010; December 2010; and February 2011. In addition, there has been no information provided regarding the presence of Oil and Grease although visual reporting is required under the permit.

In addition, the facility underwent a compliance evaluation inspection on March 20, 2012. During the inspection the following deficiencies were noted: (1) sample collection was inconsistent with the requirements of the permit; (2) equipment calibrations on plant and laboratory equipment is not properly maintained and has not been calibrated since 2005;(3) improper DMR calculations; (4) laboratory procedural errors; and (5) facility reporting is not current and is inconsistent with the requirements of the permit.

#### 11. DRAFT PERMIT RATIONALE AND PROPOSED PERMIT CONDITIONS

The proposed pollutant effluent limitations are based on regulations promulgated at 40 CFR § 122.44. The draft permit limits are based on either technology-based effluent limits pursuant to 40 CFR § 122.44(a), on BPJ in the absence of guidelines, NM WQS and/or requirements pursuant to 40 CFR § 122.44(d), whichever are more stringent.

##### a. Reason For Permit Issuance

It is proposed that the permit be issued for a 5-year term following regulations promulgated at 40 CFR § 122.46(a). The initial permit renewal application was received on October 1, 2013, and completed on November 25, 2013.

##### b. Operation and Reporting

###### 1) Regulatory Basis

The facility is required to meet the minimum level of effluent quality attainable by secondary treatment for domestic sewage found at 40 CFR § 133.102.

###### 2) Operation and Reporting

The applicant is required to operate the treatment facility at maximum efficiency at all times, to monitor the facility's discharge on a regular basis, and report the results quarterly. The monitoring results will be available to the public.

###### 3) Sewage Sludge Practices

Based on communication with the Dulce Wastewater Treatment Plant's manager on April 22, 2014, the sludge produced at the treatment plant is dewatered, dried, and then hauled to a landfill by Waste Management.

4) Waste Water Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The facility shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility.

5) Industrial Wastewater Contributions

Based on information provided by the applicant, the facility is a separate sanitary sewer that does not receive significant commercial or industrial wastewater; therefore, it does not appear that the WWTP services industrial facilities that would be categorized as categorical under Pretreatment Standards promulgated by EPA under 40 CFR Chapter I, Subchapter N, Parts 403-471. In addition, it does not appear that the WWTP services commercial or industrial facilities that would be considered Significant Industrial Users under the definition found in 40 CFR 403.3(v). The EPA has determined that the permittee will not be required to develop a full pretreatment program; however, general pretreatment provisions have been included in the permit.

c. Technology Based Effluent Limitations/Conditions

Regulations promulgated at 40 CFR § 122.44(a) require that technology-based effluent limitations be placed in NPDES permits based on effluent limitations guidelines where applicable, on BPJ in the absence of guidelines, or on a combination of the two.

Limitations on 5-day biochemical oxygen demand, (BOD<sub>5</sub>) or 5-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>) and total suspended solids (TSS) are in accordance with “secondary treatment requirements” established at 40 CFR §§ 133.102 (a) and 133.102 (b).

The following equation is used to calculate the mass load: Loading in pounds per day (lbs/day) = pollutant concentration in mg/l \* conversion factor \* design flow in MGD. The design flow is 0.6 MGD. The daily maximum and monthly average for BOD<sub>5</sub> or TSS load are calculated as:

|                      |   |
|----------------------|---|
| Conversion Factor    | $(1 \text{ lb}/45,3592.4 \text{ mg})(3.785412 \text{ L}/\text{gal}) = 8.345 \text{ lb-L}/\text{mg-gal}$             |
| Daily Maximum Load   | $45 \text{ mg/l} \times 0.6 \text{ MGD} \times 8.345 \text{ lb-L}/\text{mg-gal} = 225 \text{ lbs}/\text{day}$ , and |
| Monthly Average Load | $30 \text{ mg/l} \times 0.6 \text{ MGD} \times 8.345 \text{ lb-L}/\text{mg-gal} = 150 \text{ lbs}/\text{day}$ .     |

Effluent loads for both BOD<sub>5</sub> and TSS remain unchanged from the previous permit effluent limits. In accordance with the effluent guidelines provision at 40 CFR § 133.102 (a)(3) and (b)(3), 30-day average 85% percent removals for BOD<sub>5</sub> and TSS are added to the proposed permit.

d. Water Quality Based Limitations*Salinity Control*

The EPA required development of water quality standards for salinity in the Colorado River in 1972. The basin states formed the Colorado River Basin Salinity Control Forum (Forum) in 1973 to develop these standards including numeric salinity and a basin-wide plan of implementation for salinity control that EPA subsequently approved

(<http://www.nrcs.usda.gov/programs/salinity>). The developed standards include numeric salinity standards and a basin-wide plan of implementation for salinity control.

The San Juan Watershed is located within the upper basin of the Colorado River Watershed and is defined by the San Juan River and its tributaries. Previous permits required quarterly monitoring of total dissolved solids. Effluent total dissolved solids are to be measured at the Dulce Waste Water Treatment Plant Outfall 001. Intake water is to be measured at the drinking water plant. The net total dissolved solids incremental increase in salinity shall be 400 mg/l or less. The increase shall be difference between the TDS measured from Outfall 001 discharge and the TDS measured at the drinking water plant intake.

The objective of this monitoring requirement was to determine if the effluent contains a concentration of TDS in excess of 400 mg/L of the raw intake water, indicating a significant contribution of salinity to the watershed. Review of the DMRs for TDS did not indicate a significant contribution of salinity to the watershed; however, a monitoring requirement will remain in the permit to monitor compliance with the TDS WQS.

#### *Escherichia coli, Chlorine, and pH*

The Jicarilla Apache Nation does not have EPA approved WQS. From correspondence with the Jicarilla Apache Environmental Protection Office on April 16, 2014, it was confirmed that the Jicarilla Apache Nation does not have WQS; however, until such time as they are established, the Jicarilla Apache Nation adopts the State of New Mexico's WQS. Based on this communication and to protect waters of the tribe, the NM WQS are applied to the discharge. The New Mexico general and specific stream standards are provided in "New Mexico State Standards for Interstate and Intrastate Surface Waters," (NM WQS), 20.6.4 NMAC, as amended through February 14, 2014, and are available on the NMED's website at <http://www.nmenv.state.nm.us/swqb/Standards/>. The WQS have been approved by EPA in accordance with Section 303 of the CWA.

The Jicarilla Apache Nation has not identified a designated use for Amargo Creek. As such, this is considered an unclassified water. In accordance with NM WQS, an unclassified surface water is presumed to support the uses specified in Section 101(a)(2) of the federal Clean Water Act [NMAC 20.6.4.11]. Under Section 101(a)(2), the goal is to, wherever attainable, provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water unless it can be demonstrated that such uses are not attainable. During correspondence on April 16, 2014, with the Jicarilla Apache Environmental Protection Office, Amargo Creek does not go dry but flows slowly at times. Therefore, Amargo Creek is interpreted to be perennial based on the definition provided under NMAC 20.6.4.7.P(2). For perennial unclassified waters, the numeric criteria provided in NMAC 20.6.4.99 and 20.6.4.900 apply to protect for the designated uses of warmwater aquatic life, livestock watering, wildlife habitat and primary contact. (See Section 11.g and Table 3.)



e. Implementation

The NPDES permit contains 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 permit. State narrative and numerical water quality standards 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.

f. Reasonable Potential

All applicable facilities are required to fill out appropriate sections of the Form 2A, to apply for an NPDES permit or reissuance of an NPDES permit. The new form is applicable not only to Publicly Owned Treatment Works (POTW's), but also to facilities that are similar to POTW's, but which do not meet the regulatory definition of "publicly owned treatment works" (like private domestics, or similar facilities on Federal property). The forms were designed and promulgated to "make it easier for permit applicants to provide the necessary information with their applications and minimize the need for additional follow-up requests from permitting authorities," per the summary statement in the preamble to the Rule. These forms became effective December 1, 1999, after publication of the final rule on August 4, 1999, Volume 64, Number 149, pages 42433 through 42527 of the FR.

The amount of information required for minor facilities is limited to specific sections of these forms, because they are unlikely to discharge toxic pollutants in amounts that would impact state water quality standards. Supporting information for this decision was published as "Evaluation of the Presence of Priority Pollutants in the Discharges of Minor POTW's", June 1996, and was sent to all state NPDES coordinators by EPA Headquarters. In this study, EPA collected and evaluated data on the types and quantities of toxic pollutants discharged by minor POTW's of varying sizes from less than 0.1 MGD to just under 1 MGD. The Study consisted of a query of the EPA Permit Compliance System (PCS) database from 1990 to present, an evaluation of minor POTW data provided by the State agencies, and on-site monitoring for selected toxics at 86 minor facilities across the nation.

Assessing the limited information required by the application, the Agency has determined that no reasonable potential exists for this discharge to violate NM WQS for the protection of warmwater aquatic life, livestock watering, wildlife habitat and primary contact beyond pH, *Escherichia coli*, and the use of chlorine for disinfection or cleaning purpose.

*Dissolved Oxygen*

As part of the permitting process, EPA completed an evaluation of the permittee's impact on Amargo Creek's dissolved oxygen using a steady-state model (LA-QUAL) to evaluate the biochemical oxygen demand of the discharge. A complete characterization of Amargo Creek is not available. Discharge data as summarized in Section 10, are available and used in the model. Where data are not available, default values are used to estimate the flow, Amargo Creek hydrodynamic characteristics, and water quality parameters. The discharge

is modeled using data obtained from the application, permit limits and default values for unavailable discharge characterization data.

Where data are not available for Amargo Creek, assumptions are made for modeling purposes. The following summary provides the assumptions used to determine and/or calculate values used in the model to represent Amargo Creek and current conditions.

- Wasteload Input: Data for ammonia, nitrate, and DO are provided in the permit application.
- Elevation is estimated using GIS and BASINS. The average elevation for Amargo Creek is less than 7500 ft (2500m).
- The discharge location is estimated to be approximately 1653m downgradient of the confluence of Amargo Creek and Sawmill Canyon.
- Amargo Creek Segment Length is estimated using GIS to be approximately 6680m from the confluence with Sawmill Canyon to the confluence with Navajo River.
- The slope of Amargo Creek is estimated using GIS to be approximately 0.007485. The elevation estimate at the confluence with Sawmill Canyon (2075m) minus the elevation estimate at the confluence with the Navajo River (2025m), over an estimated distance between the two locations (6680m) equals the slope.
- With no water quality data available for Amargo Creek, the initial conditions are estimated by using default values. The default values are intended to function as a starting point for assessing impacts, and can be refined/adjusted as data become available for Amargo Creek.
- Flow data for Amargo Creek is not available; therefore, the critical low-flow condition is estimated using the Waltemeyer ungaged 4Q3 regression equation for non-mountainous areas. This equation is used to estimate the critical low-flow defined by NM as the minimum average four consecutive day flow that occurs with a frequency of once in three years (4Q3).
- The width of Amargo Creek is estimated using GIS as approximately 2.5m (7.5ft).
- The depth is estimated based on the description provided by the local WWTP Plant manager and Jicarilla Environmental Department as not being a 'swimming' area but rather a 'wading' area. The depth is estimated as 0.2m (0.5ft).
- The drainage area for Amargo Creek is estimated using BASINS. Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) is a multipurpose environmental analysis system designed to help regional, state, and local agencies perform watershed- and water quality-based studies. It was developed by the U.S. Environmental Protection Agency to assist in watershed management and total maximum daily load development by integrating environmental data, analysis tools, and watershed and water quality models. The drainage area for Amargo Creek is estimated to be 168 square miles.
- Using BASINS, the meteorological data was downloaded for a station located in Dulce, NM. This meteorological station is used as the representative station because the watershed is in the uppermost region of the basin and is located within the city through which the creek runs. The winter months used to calculate the average are October through April over a time period of 1945 to 2009. The average winter precipitation is estimated to be 9.2 inches.

The model evaluation demonstrated that the discharge will, at the secondary treatment technology standard, be sufficient to protect the receiving water dissolved oxygen in-stream standard of 5 mg/L. Therefore, the permit does not revise the BOD<sub>5</sub> limitation and does not require a minimum dissolved oxygen concentration of 5 mg/L. The output file and the calculations used are included in Attachment 1 to this fact sheet.

***EPA welcomes comment on the modeling parameters to refine the default values assumed in the model. In the event a commenter can substantiate the use of or provide refined values for the model, the evaluation will be revised to reflect the appropriate data which may or may not alter the results presented above and the conditions for the final permit.***

g. Final Effluent Limitations

Technology-based effluent limitations are established in the proposed permit for the following pollutants: BOD<sub>5</sub> and TSS. Water quality-based effluent limitations are established in the proposed permit for the following pollutants: TDS, pH, *Escherichia coli* and total residual chlorine (TRC). The facility uses UV to disinfect the treated wastewater prior to discharging; however, the proposed permit includes the TRC limit in the permit and applies only when chlorine content chemicals are used for system disinfection or any other purpose. All effluent limitations apply to the discharge water after the final treatment unit and prior to discharge into the receiving stream from Outfall 001.

| Table 3: Proposed Permit Limitations             |              |                                     |               |                     |               |  |
|--|--------------|-------------------------------------|---------------|---------------------|---------------|--|
| Pollutant  | Permit Limit | minimum, s.u.                       |               | maximum, SU         |               |  |
| pH   |              | 6.6                                 |               | 9.0                 |               |  |
|  |              | Quantity or Loading<br>(pounds/day) |               | Concentration       |               |  |
| Pollutant  |              | 30-Day Average                      | 7-Day Average | 30-Day Average      | 7-Day Average | Daily Maximum                                  |
| Flow, (MGD)                                      | Permit Limit | Report                              | Report        |                     |               |  |
| <i>Escherichia coli</i> cfu/100 mL <sup>1</sup>  | Permit Limit |                                     |               | 206 <sup>2</sup>    |               | 940  |
| BOD <sub>5</sub> (mg/L)                          | Permit Limit | 150                                 | 225           | 30                  | 45            |  |
| BOD <sub>5</sub> - Percent Removal               | Permit Limit | 85% Removal <sup>3</sup>            |               |                     |               |  |
| TSS (mg/L)                                       | Permit Limit | 150                                 | 225           | 30                  | 45            |  |
| TSS - Percent Removal                            | Permit Limit | 85% Removal <sup>3</sup>            |               |                     |               |  |
| TDS –Waste water treatment plant effluent (mg/L) | Permit Limit |                                     |               | Report <sup>4</sup> |               | Report <sup>4</sup>                            |
| TDS – Drinking water plant intake (mg/L)         | Permit Limit |                                     |               | Report <sup>4</sup> |               | Report <sup>4</sup>                            |
| TDS, Net Increase (mg/L)                         |              |                                     |               | 400 <sup>5</sup>    |               |  |
| Total Residual Chlorine (mg/L)                   | Permit Limit |                                     |               |                     |               | 0.011 <sup>6</sup><br>Instantaneous<br>Maximum |

Blank cells indicate that reporting is not applicable.

<sup>1</sup> Site-specific criterion [NMAC 20.6.4.99]

<sup>2</sup> Geometric monthly mean

<sup>3</sup> Percentage Removal Requirements (TSS and BOD<sub>5</sub> Limitation): In addition to the concentration limits for TSS and BOD<sub>5</sub> indicated above, the arithmetic mean of the concentration for effluent samples collected in a 30-day consecutive period shall not exceed 15% of the arithmetic mean of the concentration for influent samples collected at approximately the same times during the same period (85% removal).

<sup>4</sup> TDS effluent is measured at the Dulce Waste Water Treatment Plant Outfall 001. For permit compliance purposes, the TDS intake is measured at the intake of the drinking water plant. If one sample is collected, then it will be reported as the daily maximum and the 30-day average. If additional samples are collected, then the average of all samples will be reported as the 30-day average.

<sup>5</sup> Net TDS incremental increases in salinity shall be 400 mg/l or less. If one sample is collected, then the increase shall be the difference between the TDS measured from Outfall 001 and the TDS measured at the drinking water plant intake. If additional samples are collected, then the increase shall be the difference between the 30-day average TDS measured from Outfall 001 and the 30-day average TDS measured at the drinking water plant intake.

<sup>6</sup> Applies when chlorine is used in the process. Instantaneous maximum. After dechlorination and prior to final disposal, the effluent shall contain NO MEASURABLE total residual chlorine (TRC) at any time. NO MEASURABLE will be defined as no detectable concentration of TRC as determined by any approved method established in 40 CFR 136. The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

Oil and Grease: There shall be no discharge of oils, scum, grease and other floating materials that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.

h. Monitoring Frequency

Regulations require that permits establish monitoring requirements to yield data representative of the monitored activity [40 CFR § 122.48(b)] and to assure compliance with permit limitations [40 CFR § 122.44(i)(1)]. The monitoring frequencies are based on BPJ, taking into account the nature of the facility, its design flow, the previous permit, the performance data from DMRs, and the 2012 Plant Inspection report. Noncompliance with the *Escherichia coli* limit indicates that a higher monitoring frequency is necessary to evaluate the effectiveness of UV disinfection. The monitoring frequency in the current permit is revised for *Escherichia coli* from 2/month to 1/week. All other monitoring frequencies remain unchanged.

| <b>Table 4: Proposed Permit Limitation Monitoring Requirements</b> |                      |                          |
|--|----------------------|--------------------------|
| <b>Pollutant</b>   | <b>Frequency</b>     | <b>Sample Type</b>       |
| Flow, MGD, 30-Day Average  | 1/day                | Instantaneous            |
| Flow, MGD, 7-Day Average   | 1/day                | Instantaneous            |
| pH, su   | 1/day                | Grab                     |
| <i>Escherichia coli</i> cfu/100 mL                                 | 1/week               | Grab                     |
| BOD <sub>5</sub> (mg/L)  | 2/month <sup>1</sup> | 6-Hour Composite         |
| BOD <sub>5</sub> - Percent Removal                                 | 2/month              | Calculation <sup>2</sup> |
| TSS (mg/L)   | 2/month <sup>1</sup> | 6-Hour Composite         |
| TSS - Percent Removal  | 2/month              | Calculation <sup>2</sup> |
| TDS – Drinking water plant intake (mg/L)                           | 1/Quarter            | Grab                     |
| TDS – Waste water treatment plant effluent (mg/L)                  | 1/Quarter            | Grab                     |
| TDS – Net Increase (mg/L)  | 1/Quarter            | Grab                     |
| Total Residual Chlorine (mg/L)                                     | Daily <sup>3</sup>   | Grab                     |

<sup>1</sup> Includes a sample collected at the intake and effluent.

<sup>2</sup> % Removal = (Inflow Concentration – Effluent Concentration) / Inflow Concentration.

<sup>3</sup> Sample to be collected when chlorine is used.

i. Whole Effluent Toxicity (WET) Limit

Because the facility is unlikely to discharge toxic pollutants and TDS in amounts that would impact state water quality standards as discussed in Section 11.f above, WET testing is not proposed in the draft permit.

j. Significant Changes from the Existing Permit

There are proposed changes to permit conditions from the existing permit issued March 31, 2009, and expired March 31, 2014.

- 1) *Escherichia coli*: The effluent limits and monitoring frequency changed based on the WQS and facility performance.
- 2) Total Residual Chlorine: These limits are added in the event chlorine is used.
- 3) pH: The effluent limits changed based on WQS.
- 4) BOD<sub>5</sub> and TSS: Percent Removal calculations are added based on regulation requirement.

**12. 303(d) IMPAIRED WATERBODY LIST**

The receiving water, Amargo Creek, is located on tribal land and is not subject to state jurisdiction. As such, it is not identified as impaired and not included on the NM 303(d) lists of impaired waters. In addition, since the Jicarilla Apache Nation does not have EPA approved WQS, there is no tribal 303(d) list of impaired waters. No permit conditions are established to address impairment determinations; however, to protect waters of the tribe, permit conditions are established to meet the NM WQS. As noted in 11.d above, the NM WQS have been adopted by Jicarilla Apache Nation until such time as the tribal WQS are established.

**13. ANTIDEGRADATION AND ANTIBACKSLIDING**

The Jicarilla Apache Nation does not have EPA approved water quality standards or an antidegradation policy. The receiving stream, Amargo Creek, is located on tribal land and is not subject to state jurisdiction. The reissuance of this permit does not increase waste loads to the receiving stream. Monitoring requirements for pollutants established in the proposed permit will collect data for further analysis.

As noted in 11.d above, the NM WQS have been adopted by Jicarilla Apache Nation until such time as the tribal WQS are established. New Mexico's NMAC, Section 20.6.4.8 "Antidegradation Policy and Implementation Plan" is used as the surrogate to set forth the requirements to protect designated uses through implementation. The limitations and monitoring requirements set forth in the proposed permit are developed from the NM WQS and are protective.

There are no reductions of effluent limitations; therefore, antibacksliding policy requirements are not applicable.

**14. ENDANGERED SPECIES CONSIDERATIONS**

Eight species in Rio Arriba County are listed as Endangered, Threatened, proposed, or candidate according to the U.S. Fish & Wildlife Service's (USFWS) Endangered Species website (See table below). [<http://www.fws.gov/endangered/>]

| <b>Group</b> | <b>Name</b>                     | <b>Status</b>       | <b>Year Listed</b> |
|--------------|---------------------------------|---------------------|--------------------|
| Amphibian    | Jemez mountains salamander      | Endangered          | 2013               |
| Bird         | Mexican spotted owl             | Threatened          | 1993               |
| Bird         | Least tern                      | Endangered          | 1985               |
| Bird         | Southwestern willow flycatcher  | Endangered          | 1995               |
| Bird         | Yellow-billed Cuckoo            | Proposed Threatened |                    |
| Mammal       | Canada lynx                     | Proposed Threatened |                    |
| Mammal       | New Mexico meadow jumping mouse | Proposed Endangered |                    |
| Fish         | Rio Grande cutthroat trout      | Candidate           |                    |

When EPA reissued the permit in 2009, EPA evaluated all three species listed prior to 2009 and determined that the reissuance of the permit had no effect on these species. The EPA determined the environmental baseline has not been changed, and based on the information available to EPA, the reissuance of this permit will have *no effect* on these federally listed threatened or endangered species.

Since the issuance of the 2009 permit, only one new species, the Jemez Mountains salamander has been listed. This is a terrestrial species primarily restricted to areas in the Jemez Mountains around the rim of a large volcanic crater. The facility discharge does not impact this area. Review of the species status information indicates that “loss of habitat” is the primary threat for this species. In addition, “loss of habitat” is identified as the primary threat for all species listed in Table 5.

The EPA determines that this permitting action is expected to have no effect on federally listed endangered and threatened species based on the following: 1) only one new terrestrial species was added to the federal list of endangered species since the issuance of the 2009 permit and is not located within the area affected by the discharge, 2) there is no significant change of the proposed permit from the 2009 issued permit, and 3) there is no new information available which warrants a change of EPA’s previous determination.

#### 15. HISTORICAL AND ARCHEOLOGICAL PRESERVATION CONSIDERATIONS

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The EPA has evaluated its planned reissuance of the NPDES permit for the JAUW WWTP to assess this action’s potential effects on any listed or eligible historic properties or cultural resources. The EPA does not anticipate any impacts on listed/eligible historic or cultural properties because this permit is a renewal and will not be associated with any new ground disturbance or changes to the volume or point of discharge.

#### 16. CERTIFICATION

The EPA has the jurisdiction to certify this permit because the discharge occurs in Indian Country. 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.

#### 17. FINAL DETERMINATION

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

#### 18. ADMINISTRATIVE RECORD

The following information was used to develop the proposed permit:

a. Application(s)

The EPA Application Form 2A was received on October 1, 2013.

b. State References

New Mexico State Standards for Interstate and Intrastate Surface Water, 20.6.4 NMAC, as amended through February 14, 2013.

Procedures for Implementing National Pollutant Discharge Elimination System Permits In New Mexico – NMIP, March 15, 2012.

c. Communication(s)

April 16, 2014: Phone conversation with the Jicarilla Apache Environmental Protection Office.

April 22, 2014: Phone conversation with the Jicarilla Apache Utility Authority Dulce Wastewater Treatment Plant Manager.



## Attachment 1: Dissolved oxygen model output

### Calculations for Flow

In the case of ungaged streams an analysis method developed by Waltemeyer (2002) can be used to estimate flow in New Mexico. In Waltemeyer's analysis, two regression equations for estimating 4Q3 were developed based on physiographic regions of NM (i.e., statewide and mountainous regions above 7,500 feet in elevation). The decision to use the statewide versus the mountainous equation is based on the average elevation of the assessment unit. The 4Q3 for Amargo Creek are estimated using the statewide regression equation regions because the mean elevation for the assessment unit is less than 7,500 feet in elevation. The following statewide regression equation is used (Waltemeyer 2002).

$$4Q3 = (1.2856E-4)(DA^{0.42})(Pw^{3.16})$$

Where,

4Q3 = Four-day, three-year low-flow frequency (cfs) is estimated to be 1.23 cfs.

DA = Drainage area (mi<sup>2</sup>) is estimated to be 168 mi<sup>2</sup>.

P<sub>w</sub> = Average basin mean winter precipitation (inches) is estimated to be 9.2 inches.

The 4Q3 is converted to cubic meters per second by dividing 1.23 ft<sup>3</sup>/s by 35.315 ft<sup>3</sup>. The 4Q3 is estimated to be 0.0348 m<sup>3</sup>/s.

For a model to be representative, the hydraulics must be evaluated using instream flow data. LAQUAL allows the use of either the velocity-depth method or the width and depth method. Use of either method depends on data availability and representativeness. The width and depth method is preferable due to the ease of data collection for those parameters.

*Width and Depth Method*       $W = a * Q^b + c$  and  $D = d * Q^e + f$

Where:

W is surface width in m or ft and is estimated to be 2.5m.

D is average depth in m or ft and is estimated to be 0.2m.

Q is flow in m<sup>3</sup>/s and is estimated to be 0.0348 m<sup>3</sup>/s.

a is a width coefficient and is calculated to be 11.3327.

b is a width exponent and is a default value of 0.45.

c is a width constant and is a default value of 0.

d is a depth coefficient and is calculated to be 0.9067.

e is a depth exponent and is a default value of 0.45.

f is a depth constant and is a default value of 0.

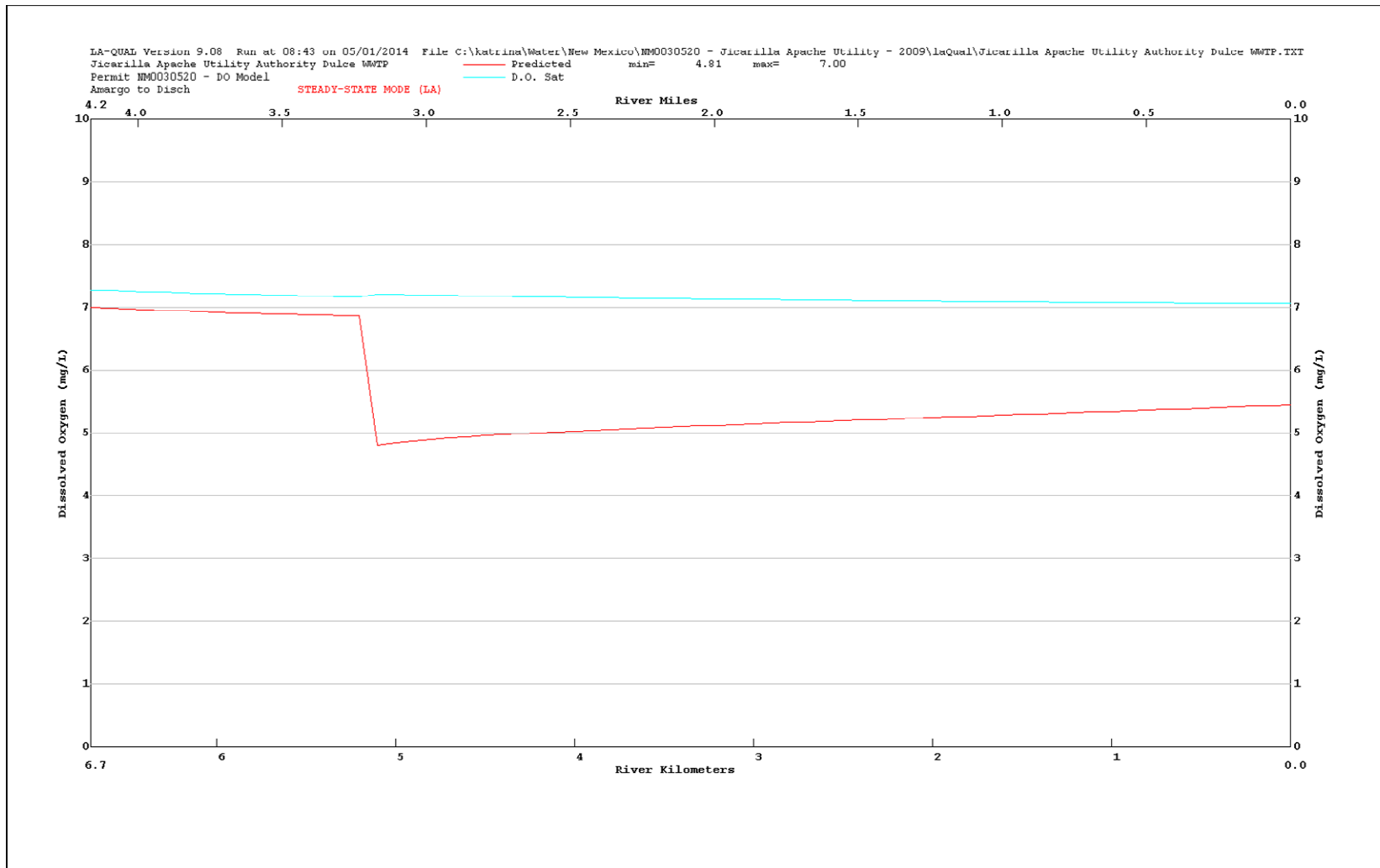


Figure 1: Dissolved oxygen model output for Jicarilla - Dulce Wastewater Treatment Plant, New Mexico.

Dulce WWTP - DO Model Output

LA-QUAL Version 9.08  
Louisiana Department of Environmental Quality

Input file is C:\katrina\Water\New Mexico\NM0030520 - Jicarilla Apache Utility - 2009\laQual\Jicarilla Apache Utility Authority Dulce WWTP.TXT  
Running in steady-state mode using LA defaults  
Output produced at 13:17 on 05/01/2014

\$\$\$ DATA TYPE 1 (TITLES AND CONTROL CARDS) \$\$\$

| CARD TYPE   | CONTROL TITLES                                |
|-------------|---|
| TITLE01     | Jicarilla Apache Utility Authority Dulce WWTP |
| TITLE02     | Permit NM0030520 - DO Model                   |
| CONTROL YES | METRIC UNITS                                  |
| CONTROL YES | USE EFFECTIVE                                 |
| ENDATA01    |   |

\$\$\$ DATA TYPE 2 (MODEL OPTIONS) \$\$\$

| CARD TYPE  | MODEL OPTION                     |
|------------|----------------------------------|
| MODEPT YES | TEMPERATURE                      |
| MODEPT NO  | SALINITY                         |
| MODEPT NO  | CONSERVATIVE MATERIAL #1         |
| MODEPT NO  | CONSERVATIVE MATERIAL #2         |
| MODEPT NO  | COLIFORM                         |
| MODEPT YES | DISSOLVED OXYGEN                 |
| MODEPT YES | BOD1 BIOCHEMICAL OXYGEN DEMAND   |
| MODEPT YES | BOD2 BIOCHEMICAL OXYGEN DEMAND   |
| MODEPT YES | NITROGEN                         |
| MODEPT YES | PHOSPHORUS                       |
| MODEPT YES | PHYTOPLANKTON (AS CHLOROPHYLL A) |
| MODEPT NO  | PERIPHYTON                       |
| ENDATA02   |                                  |

\$\$\$ DATA TYPE 3 (PROGRAM CONSTANTS) \$\$\$

| CARD TYPE | DESCRIPTION OF CONSTANT      | VALUE                               |
|-----------|------------------------------|-------------------------------------|
| PROGRAM   | HYDRAULIC CALCULATION METHOD | = 2.00000 (widths and depths)       |
| PROGRAM   | MAXIMUM ITERATION LIMIT      | = 3000.00000                        |
| PROGRAM   | KL MINIMUM                   | = 0.70000 meters/day                |
| PROGRAM   | K2 MAXIMUM                   | = 10.00000 per day                  |
| PROGRAM   | BOD1 OXYGEN UPTAKE RATE      | = 2.30000 mg O/mg BOD               |
| PROGRAM   | BOD2 OXYGEN UPTAKE RATE      | = 1.00000 mg O/mg BOD2              |
| PROGRAM   | SETTLING                     | = 1.00000 (values entered as m/day) |
| ENDATA03  |                              |                                     |

\$\$\$ DATA TYPE 4 (TEMPERATURE CORRECTION CONSTANTS FOR RATE COEFFICIENTS) \$\$\$

| CARD TYPE | RATE CODE | THETA VALUE |
|-----------|-----------|-------------|
|-----------|-----------|-------------|

Dulce WWTP - DO Model Output

ENDATA04

\$\$\$ CONSTANTS TYPE 5 (TEMPERATURE DATA) \$\$\$

| CARD TYPE | DESCRIPTION OF CONSTANT | VALUE                         |
|-----------|-------------------------|-------------------------------|
| TEMP      | LATITUDE                | = 36.52300 degrees            |
| TEMP      | LONGITUDE               | = 106.52300 degrees           |
| TEMP      | ELEVATION               | = 2075.00000 meters above MSL |

ENDATA05

\$\$\$ DATA TYPE 6 (PHYTOPLANKTON CONSTANTS) \$\$\$

| CARD TYPE | DESCRIPTION OF CONSTANT | VALUE |
|-----------|-------------------------|-------|
|-----------|-------------------------|-------|

ENDATA06

\$\$\$ DATA TYPE 7 (PERI PHYTON CONSTANTS) \$\$\$

| CARD TYPE | DESCRIPTION OF CONSTANT | VALUE |
|-----------|-------------------------|-------|
|-----------|-------------------------|-------|

ENDATA07

\$\$\$ DATA TYPE 8 (REACH IDENTIFICATION DATA) \$\$\$

| CARD TYPE | REACH ID | NAME         | BEGIN REACH km | END REACH km | ELEM LENGTH km | REACH LENGTH km | ELEMS PER RCH | BEGIN ELEM NUM | END ELEM NUM |
|-----------|----------|--------------|----------------|--------------|----------------|-----------------|---------------|----------------|--------------|
| REACH ID  | 1 R1     | Amargo Creek | 6.70           | 70.00        | 0.1000         | 6.70            | 67            | 1              | 67           |

\$\$\$ DATA TYPE 9 (ADVECTIVE HYDRAULIC COEFFICIENTS) \$\$\$

| CARD TYPE | REACH ID | WIDTH "A" | WIDTH "B" | WIDTH "C" | DEPTH "D" | DEPTH "E" | DEPTH "F" | SLOPE   | MANNINGS "N" |
|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|--------------|
| HYDR-1    | 1 R1     | 11.330    | 0.450     | 0.000     | 0.907     | 0.450     | 0.000     | 0.00748 | 0.000        |

ENDATA09

\$\$\$ DATA TYPE 10 (DISPERSIVE HYDRAULIC COEFFICIENTS) \$\$\$

| CARD TYPE | REACH ID | TIDAL RANGE | DISPERSION "A" | DISPERSION "B" | DISPERSION "C" | DISPERSION "D" |
|-----------|----------|-------------|----------------|----------------|----------------|----------------|
|-----------|----------|-------------|----------------|----------------|----------------|----------------|

ENDATA10

\$\$\$ DATA TYPE 11 (INITIAL CONDITIONS) \$\$\$

| CARD TYPE | REACH ID | TEMP CM-1 deg C | SALIN CM-2 ppt | DO mg/L | NH3-N mg/L | NO3-N mg/L | P04-P mg/L | CHL A µg/L | PERIP g/m² | BOD1 mg/L | BOD2 mg/L | ORG-N mg/L |
|-----------|----------|-----------------|----------------|---------|------------|------------|------------|------------|------------|-----------|-----------|------------|
| ORG-P     | COLI     | NCM             |                |         |            |            |            |            |            |           |           |            |
| mg/L      | #/100mL  |                 |                |         |            |            |            |            |            |           |           |            |

INITIAL 1.00 0.00 1 R1 0.00 32.20 0.00 0.00 Dulce WWTP - DO Model Output 7.00 0.10 1.00 1.00 0.00 0.00 5.00 6.50 5.00  
 ENDATA11

\$\$\$ DATA TYPE 12 (REAERATION, SEDIMENT OXYGEN DEMAND, BOD COEFFICIENTS) \$\$\$

| CARD TYPE | REACH | ID | ANAER   | BOD2         | K2    | K2    | K2    | BKGRND              | BOD     | BOD   | SOD   | BOD     | BOD2    |
|-----------|-------|----|---------|--------------|-------|-------|-------|---------------------|---------|-------|-------|---------|---------|
| SETT      | NUM   | ID | OPT     | HYDR TO      | "A"   | "B"   | "C"   | SOD                 | DECAY   | SETT  | AVAIL | DECAY   | DECAY   |
| m/d       |       |    | per day | per day      |       |       |       | g/m <sup>2</sup> /d | per day | m/d   | frac  | per day | per day |
| COEF-1    | 1     | R1 | 3       | OCONNER-DOBB | 0.000 | 0.000 | 0.000 | 0.100               | 0.100   | 0.050 | 0.100 | 0.050   | 0.050   |
| 0.000     |       |    |         | 0.000 0.000  |       |       |       |                     |         |       |       |         |         |
| ENDATA12  |       |    |         |              |       |       |       |                     |         |       |       |         |         |

\$\$\$ DATA TYPE 13 (NITROGEN AND PHOSPHORUS COEFFICIENTS) \$\$\$

| CARD TYPE | REACH | ID | ORG-N DECA | ORG-N SETT | SETTLD ORGN AVAIL | NH3 DECA | BKGRND NH3 SRCE     | BKGRND PO4 SRCE     | DENIT RATE | ORGP DECA | ORGP SETT | SETTLD ORGP AVAIL |
|-----------|-------|----|------------|------------|-------------------|----------|---------------------|---------------------|------------|-----------|-----------|-------------------|
|           |       |    | per day    | m/d        | frac              | per day  | g/m <sup>2</sup> /d | g/m <sup>2</sup> /d | per day    | per day   | m/d       | frac              |
| COEF-2    | 1     | R1 | 0.100      | 0.000      | 0.500             | 0.300    | 0.000               | 0.010               | 0.020      | 0.050     | 0.100     | 0.500             |
| ENDATA13  |       |    |            |            |                   |          |                     |                     |            |           |           |                   |

\$\$\$ DATA TYPE 14 (ALGAE PHYTOPLANKTON AND PERI PHYTON COEFFICIENTS) \$\$\$

| CARD TYPE | REACH | ID | SECCHI DEPTH | CHL A: ALGAE | PHYTO SETT | PHYTO DEATH | MAX PHYTO GROW | PHYTO RESP | PERI P DEATH | MAX PERI P GROW | PERI P RESP | BANK SHADING |
|-----------|-------|----|--------------|--------------|------------|-------------|----------------|------------|--------------|-----------------|-------------|--------------|
|           |       |    | m            | frac         | m/d        | per day     | per day        | per day    | per day      | per day         | per day     | frac         |
| COEF-3    | 1     | R1 | 1.000        | 0.010        | 0.050      | 0.100       | 2.000          | 0.200      | 0.100        | 1.000           | 0.100       | 0.020        |
| ENDATA14  |       |    |              |              |            |             |                |            |              |                 |             |              |

\$\$\$ DATA TYPE 15 (COLIFORM AND NONCONSERVATIVE COEFFICIENTS) \$\$\$

| CARD TYPE | REACH | ID | COLIFORM DIE-OFF | NCM DECA | NCM SETT |
|-----------|-------|----|------------------|----------|----------|
|           |       |    | per day          | per day  | m/d      |
| COLIFORM  | 1     | R1 | 2.000            | 0.000    | 0.000    |
| ENDATA15  |       |    |                  |          |          |

\$\$\$ DATA TYPE 16 (INCREMENTAL DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

| CARD TYPE | REACH | ID | OUTFLOW           | INFLOW            | TEMP  | SALIN | CM-1 | CM-2 | IN/DIST | OUT/DIST |
|-----------|-------|----|-------------------|-------------------|-------|-------|------|------|---------|----------|
|           |       |    | m <sup>3</sup> /s | m <sup>3</sup> /s | deg C | ppt   |      |      |         |          |
| ENDATA16  |       |    |                   |                   |       |       |      |      |         |          |

\$\$\$ DATA TYPE 17 (INCREMENTAL DATA FOR DO, BOD, AND NITROGEN) \$\$\$

Dulce WWTP - DO Model Output

| CARD TYPE | REACH ID | DO<br>mg/L | BOD1<br>mg/L | ORG-N<br>mg/L | NH3-N<br>mg/L | NO3-N<br>mg/L | BOD2<br>mg/L |
|-----------|----------|------------|--------------|---------------|---------------|---------------|--------------|
|-----------|----------|------------|--------------|---------------|---------------|---------------|--------------|

ENDATA17

\$\$\$ DATA TYPE 18 (INCREMENTAL DATA FOR PHOSPHORUS, PHYTOPLANKTON, COLIFORM, AND NONCONSERVATIVES) \$\$\$

| CARD TYPE | REACH ID | PO4<br>mg/L | PHYTO<br>CHL A<br>µg/L | COLI<br>#/100mL | NCM | ORGP<br>mg/L |
|-----------|----------|-------------|------------------------|-----------------|-----|--------------|
|-----------|----------|-------------|------------------------|-----------------|-----|--------------|

ENDATA18

\$\$\$ DATA TYPE 19 (NONPOINT SOURCE DATA) \$\$\$

| CARD TYPE | REACH ID | BOD1<br>kg/d | ORG-N<br>kg/d | COLI<br>#/day | NCM | DO<br>kg/d | BOD2<br>kg/d | ORG-P<br>kg/d |
|-----------|----------|--------------|---------------|---------------|-----|------------|--------------|---------------|
|-----------|----------|--------------|---------------|---------------|-----|------------|--------------|---------------|

ENDATA19

\$\$\$ DATA TYPE 20 (HEADWATER FOR FLOW, TEMPERATURE, SALINITY AND CONSERVATIVES) \$\$\$

| CARD TYPE           | ELEMENT | NAME            | UNIT | FLOW<br>m³/s | FLOW<br>cfs | TEMP<br>deg C | SALIN<br>ppt | CM-1  | CM-2  | HDW DISP<br>EXCHG<br>frac |
|---------------------|---------|-----------------|------|--------------|-------------|---------------|--------------|-------|-------|---------------------------|
| HDWTR-1<br>ENDATA20 | 1       | Amargo to Disch | 0    | 0.03478      | 1.22811     | 32.20         | 0.00         | 0.000 | 0.000 | 0.000                     |

\$\$\$ DATA TYPE 21 (HEADWATER DATA FOR DO, BOD, AND NITROGEN) \$\$\$

| CARD TYPE           | ELEMENT | NAME            | DO<br>mg/L | BOD#1<br>mg/L | ORG-N<br>mg/L | NH3-N<br>mg/L | NO3-N<br>mg/L | BOD2<br>mg/L |
|---------------------|---------|-----------------|------------|---------------|---------------|---------------|---------------|--------------|
| HDWTR-2<br>ENDATA21 | 1       | Amargo to Disch | 7.00       | 5.00          | 0.00          | 0.10          | 1.00          | 6.50         |

\$\$\$ DATA TYPE 22 (HEADWATER DATA FOR PHOSPHORUS, PHYTOPLANKTON, COLIFORM, AND NONCONSERVATIVES) \$\$\$

| CARD TYPE           | ELEMENT | NAME            | P04-P<br>mg/L | PHYTO<br>CHL A<br>µg/L | COLI<br>#/100mL | NCM  | ORG-P<br>mg/L |
|---------------------|---------|-----------------|---------------|------------------------|-----------------|------|---------------|
| HDWTR-3<br>ENDATA22 | 1       | Amargo to Disch | 1.00          | 0.00                   | 0.00            | 0.00 | 1.00          |

\$\$\$ DATA TYPE 23 (JUNCTION DATA) \$\$\$

| CARD TYPE | JUNCTION<br>ELEMENT | UPSTRM<br>ELEMENT | RIVER<br>KILOM | NAME |
|-----------|---------------------|-------------------|----------------|------|
|-----------|---------------------|-------------------|----------------|------|

ENDATA23

\$\$\$ DATA TYPE 24 (WASTELOAD DATA FOR FLOW, TEMPERATURE, SALINITY, AND CONSERVATIVES) \$\$\$

| CARD TYPE           | ELEMENT | RK I LO | NAME   | Dul ce<br>FLOW<br>m <sup>3</sup> /s | WWTP - DO<br>FLOW<br>cfs | Model<br>FLOW<br>MGD | Output<br>FLOW<br>MGD | TEMP<br>deg C | SALI N<br>ppt | CM-1  | CM-2 |
|---------------------|---------|---------|--------|-------------------------------------|--------------------------|----------------------|-----------------------|---------------|---------------|-------|------|
| WSTLD-1<br>ENDATA24 | 16      | 5.20    | Dul ce | 0.02629                             | 0.92825                  | 0.600                | 32.20                 | 0.00          | 0.000         | 0.000 |      |

\$\$\$ DATA TYPE 25 (WASTELOAD DATA FOR DO, BOD, AND NITROGEN) \$\$\$

| CARD TYPE           | ELEMENT | NAME   | DO<br>mg/L | BOD<br>mg/L | % BOD<br>RMVL | ORG-N<br>mg/L | NH3-N<br>mg/L | %<br>NI TRI F | NO3-N<br>mg/L | BOD2<br>mg/L |
|---------------------|---------|--------|------------|-------------|---------------|---------------|---------------|---------------|---------------|--------------|
| WSTLD-2<br>ENDATA25 | 16      | Dul ce | 2.00       | 45.00       | 0.00          | 4.00          | 6.40          | 0.00          | 0.21          | 58.00        |

\$\$\$ DATA TYPE 26 (WASTELOAD DATA FOR PHOSPHORUS, PHYTOPLANTON, COLI FORM, AND NONCONSERVATIVES) \$\$\$

| CARD TYPE           | ELEMENT | NAME   | PO4-P<br>mg/L | PHYTO<br>CHL A<br>µg/L | COLI<br>#/100mL | NCM  | ORG-P<br>mg/L |
|---------------------|---------|--------|---------------|------------------------|-----------------|------|---------------|
| WSTLD-3<br>ENDATA26 | 16      | Dul ce | 1.10          | 0.00                   | 548.00          | 0.00 | 1.00          |

\$\$\$ DATA TYPE 27 (LOWER BOUNDARY CONDITIONS) \$\$\$

| CARD TYPE | CONSTITUENT | CONCENTRATI ON |
|-----------|-------------|----------------|
| ENDATA27  |             |                |

\$\$\$ DATA TYPE 28 (DAM DATA) \$\$\$

| CARD TYPE | ELEMENT | NAME | EQN | "A" | "B" | "H" |
|-----------|---------|------|-----|-----|-----|-----|
| ENDATA28  |         |      |     |     |     |     |

\$\$\$ DATA TYPE 29 (SENSITIVITY ANALYSIS DATA) \$\$\$

| CARD TYPE | PARAMETER | COL 1 | COL 2 | COL 3 | COL 4 | COL 5 | COL 6 | COL 7 | COL 8 |
|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| SENSITIV  | BOD1 DEC  | -40.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| SENSITIV  | BOD2 DEC  | -40.0 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| ENDATA29  |           |       |       |       |       |       |       |       |       |

\$\$\$ DATA TYPE 30 (PLOT CONTROL CARDS) \$\$\$

PLOT1  
RCH 1  
ENDATA30

\$\$\$ DATA TYPE 31 (OVERLAY PLOT DATA) \$\$\$

ENDATA313: 07 PM 4/29/2014

Dulce WWTP - DO Model Output

.....NO ERRORS DETECTED IN INPUT DATA  
 .....HYDRAULIC CALCULATIONS COMPLETED  
 .....TRI DIAGONAL MATRIX TERMS INITIALIZED  
 .....TEMPERATURE CONVERGENT IN 2 ITERATIONS

DAY OF YEAR = July \*\*  
 SUNRISE (add 1 hr if DLS in effect) = 05:51a  
 SUNSET (add 1 hr if DLS in effect) = 08:28p  
 NUMBER OF DAYLIGHT HOURS = 14.62 HOURS  
 DRY BULB TEMPERATURE = 20.0 DEG C ( 68.0 DEG F)  
 WET BULB TEMPERATURE = 20.0 DEG C ( 68.0 DEG F)  
 DEWPOINT = 20.0 DEG C ( 68.0 DEG F)  
 HUMIDITY = 100.0 PERCENT  
 WIND VELOCITY = 0.00 METERS/SEC  
 ELEVATION = 2075.00 METERS ( 6808.1 FEET)  
 ATMOSPHERIC PRESSURE = 1013.25 MILLI BARS  
 ATMOSPHERIC VAPOR PRESSURE = 23.38 MILLI BARS  
 SAT VAPOR PRESSURE AT DRY BULB TEMP = 23.38 MILLI BARS  
 SAT VAPOR PRESSURE AT WET BULB TEMP = 23.38 MILLI BARS  
 SAT VAPOR PRESSURE AT WATER TEMP = 48.30 TO 53.27 MILLI BARS  
 WATER DENSITY = 994.30 TO 994.93 KI LOGRAMS/CUBIC METER  
 LATENT HEAT OF VAPORIZATION = 577.36 TO 578.31 KI LOCALORIS/KI LOGRAM  
 WATER TEMPERATURE = 32.3 TO 34.0 DEGREES C

SOLAR CONSTANT = 2851.2 LANGLEYS/DAY  
 SOLAR RADIATION AT TOP OF ATMOSPHERE = 41128.0 LANGLEYS/DAY  
 NET SOLAR RADIATION BEFORE SHADING = 696.4 LANGLEYS/DAY

NET SOLAR RADIATION AFTER SHADING = 682.5 TO 682.5 LANGLEYS/DAY  
 NET ATMOSPHERIC RADIATION = 674.9 LANGLEYS/DAY  
 BACK RADIATION FROM WATER SURFACE = -1008.8 TO -986.0 LANGLEYS/DAY  
 EVAPORATIVE HEAT EXCHANGE = -252.2 TO -210.8 LANGLEYS/DAY  
 CONDUCTIVE HEAT EXCHANGE = -73.1 TO -64.2 LANGLEYS/DAY  
 TOTAL NET FLUX AT AIR-WATER INTERFACE = 23.2 TO 96.4 LANGLEYS/DAY

.....PHOTOSYNTHETIC RATES CONVERGENT IN 91 ITERATIONS  
 .....OXYGEN DEPENDENT RATES CONVERGENT IN 1 ITERATIONS  
 .....CONSTITUENT CALCULATIONS COMPLETED  
 .....GRAPHICS DATA FOR PLOT 1 WRITTEN TO UNIT 11

INTERMEDIATE REPORT  
 Dissolved Oxygen  
 mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
 Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 6.99 | 6.97 | 6.96 | 6.95 | 6.94 | 6.93 | 6.92 | 6.91 | 6.90 | 6.90 |
| R1 | 1   | 11   | 6.89 | 6.88 | 6.88 | 6.87 | 6.86 | 4.80 | 4.83 | 4.85 | 4.88 | 4.90 |
| R1 | 1   | 21   | 4.92 | 4.93 | 4.95 | 4.96 | 4.98 | 4.99 | 5.00 | 5.01 | 5.03 | 5.04 |



Dulce WWTP - DO Model Output

|    |   |    |      |      |      |      |      |      |      |      |      |      |
|----|---|----|------|------|------|------|------|------|------|------|------|------|
| R1 | 1 | 31 | 5.05 | 5.06 | 5.07 | 5.08 | 5.09 | 5.10 | 5.11 | 5.12 | 5.13 | 5.14 |
| R1 | 1 | 41 | 5.15 | 5.16 | 5.17 | 5.18 | 5.19 | 5.20 | 5.21 | 5.21 | 5.22 | 5.23 |
| R1 | 1 | 51 | 5.24 | 5.25 | 5.26 | 5.27 | 5.28 | 5.29 | 5.30 | 5.31 | 5.32 | 5.33 |
| R1 | 1 | 61 | 5.34 | 5.35 | 5.36 | 5.37 | 5.38 | 5.39 | 5.40 |      |      |      |

INTERMEDIATE REPORT  
Effective BOD1  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0    | +1    | +2    | +3    | +4    | +5    | +6    | +7    | +8    | +9    |
|----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R1 | 1   | 1    | 4.96  | 4.92  | 4.87  | 4.83  | 4.79  | 4.75  | 4.71  | 4.67  | 4.63  | 4.59  |
| R1 | 1   | 11   | 4.55  | 4.51  | 4.47  | 4.43  | 4.40  | 21.72 | 21.57 | 21.42 | 21.28 | 21.13 |
| R1 | 1   | 21   | 20.98 | 20.83 | 20.69 | 20.54 | 20.40 | 20.26 | 20.12 | 19.98 | 19.84 | 19.70 |
| R1 | 1   | 31   | 19.56 | 19.42 | 19.28 | 19.15 | 19.01 | 18.88 | 18.74 | 18.61 | 18.48 | 18.35 |
| R1 | 1   | 41   | 18.22 | 18.09 | 17.96 | 17.83 | 17.71 | 17.58 | 17.45 | 17.33 | 17.21 | 17.08 |
| R1 | 1   | 51   | 16.96 | 16.84 | 16.72 | 16.60 | 16.48 | 16.36 | 16.25 | 16.13 | 16.01 | 15.90 |
| R1 | 1   | 61   | 15.78 | 15.67 | 15.56 | 15.45 | 15.34 | 15.23 | 15.12 |       |       |       |

INTERMEDIATE REPORT  
Biochemical Oxygen Demand  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0    | +1    | +2    | +3    | +4    | +5    | +6    | +7    | +8    | +9    |
|----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R1 | 1   | 1    | 4.96  | 4.92  | 4.87  | 4.83  | 4.79  | 4.75  | 4.71  | 4.67  | 4.63  | 4.59  |
| R1 | 1   | 11   | 4.55  | 4.51  | 4.47  | 4.43  | 4.40  | 21.72 | 21.57 | 21.42 | 21.28 | 21.13 |
| R1 | 1   | 21   | 20.98 | 20.83 | 20.69 | 20.54 | 20.40 | 20.26 | 20.12 | 19.98 | 19.84 | 19.70 |
| R1 | 1   | 31   | 19.56 | 19.42 | 19.28 | 19.15 | 19.01 | 18.88 | 18.74 | 18.61 | 18.48 | 18.35 |
| R1 | 1   | 41   | 18.22 | 18.09 | 17.96 | 17.83 | 17.71 | 17.58 | 17.45 | 17.33 | 17.21 | 17.08 |
| R1 | 1   | 51   | 16.96 | 16.84 | 16.72 | 16.60 | 16.48 | 16.36 | 16.25 | 16.13 | 16.01 | 15.90 |
| R1 | 1   | 61   | 15.78 | 15.67 | 15.56 | 15.45 | 15.34 | 15.23 | 15.12 |       |       |       |

INTERMEDIATE REPORT  
Biochemical Oxygen Demand #2  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0    | +1    | +2    | +3    | +4    | +5    | +6    | +7    | +8    | +9    |
|----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R1 | 1   | 1    | 6.49  | 6.48  | 6.47  | 6.46  | 6.45  | 6.44  | 6.43  | 6.42  | 6.41  | 6.40  |
| R1 | 1   | 11   | 6.39  | 6.39  | 6.38  | 6.37  | 6.36  | 28.55 | 28.51 | 28.47 | 28.43 | 28.39 |
| R1 | 1   | 21   | 28.34 | 28.30 | 28.26 | 28.22 | 28.18 | 28.14 | 28.10 | 28.06 | 28.02 | 27.98 |
| R1 | 1   | 31   | 27.94 | 27.90 | 27.86 | 27.82 | 27.78 | 27.74 | 27.70 | 27.66 | 27.62 | 27.58 |
| R1 | 1   | 41   | 27.54 | 27.49 | 27.45 | 27.41 | 27.37 | 27.33 | 27.29 | 27.25 | 27.21 | 27.17 |
| R1 | 1   | 51   | 27.13 | 27.09 | 27.05 | 27.01 | 26.97 | 26.93 | 26.89 | 26.85 | 26.81 | 26.77 |
| R1 | 1   | 61   | 26.73 | 26.69 | 26.65 | 26.61 | 26.57 | 26.53 | 26.49 |       |       |       |

Dulce WWTP - DO Model Output

INTERMEDIATE REPORT  
Effective BOD2  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0    | +1    | +2    | +3    | +4    | +5    | +6    | +7    | +8    | +9    |
|----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R1 | 1   | 1    | 6.49  | 6.48  | 6.47  | 6.46  | 6.45  | 6.44  | 6.43  | 6.42  | 6.41  | 6.40  |
| R1 | 1   | 11   | 6.39  | 6.39  | 6.38  | 6.37  | 6.36  | 28.55 | 28.51 | 28.47 | 28.43 | 28.39 |
| R1 | 1   | 21   | 28.34 | 28.30 | 28.26 | 28.22 | 28.18 | 28.14 | 28.10 | 28.06 | 28.02 | 27.98 |
| R1 | 1   | 31   | 27.94 | 27.90 | 27.86 | 27.82 | 27.78 | 27.74 | 27.70 | 27.66 | 27.62 | 27.58 |
| R1 | 1   | 41   | 27.54 | 27.49 | 27.45 | 27.41 | 27.37 | 27.33 | 27.29 | 27.25 | 27.21 | 27.17 |
| R1 | 1   | 51   | 27.13 | 27.09 | 27.05 | 27.01 | 26.97 | 26.93 | 26.89 | 26.85 | 26.81 | 26.77 |
| R1 | 1   | 61   | 26.73 | 26.69 | 26.65 | 26.61 | 26.57 | 26.53 | 26.49 |       |       |       |

INTERMEDIATE REPORT  
Organic Nitrogen  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 11   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.72 | 1.71 | 1.71 | 1.71 | 1.70 |
| R1 | 1   | 21   | 1.70 | 1.70 | 1.69 | 1.69 | 1.69 | 1.68 | 1.68 | 1.68 | 1.67 | 1.67 |
| R1 | 1   | 31   | 1.67 | 1.66 | 1.66 | 1.66 | 1.65 | 1.65 | 1.65 | 1.64 | 1.64 | 1.64 |
| R1 | 1   | 41   | 1.63 | 1.63 | 1.63 | 1.62 | 1.62 | 1.62 | 1.61 | 1.61 | 1.61 | 1.60 |
| R1 | 1   | 51   | 1.60 | 1.60 | 1.59 | 1.59 | 1.59 | 1.58 | 1.58 | 1.58 | 1.57 | 1.57 |
| R1 | 1   | 61   | 1.57 | 1.56 | 1.56 | 1.56 | 1.55 | 1.55 | 1.55 |      |      |      |

INTERMEDIATE REPORT  
Effective Organic Nitrogen  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 11   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.72 | 1.71 | 1.71 | 1.71 | 1.70 |
| R1 | 1   | 21   | 1.70 | 1.70 | 1.69 | 1.69 | 1.69 | 1.68 | 1.68 | 1.68 | 1.67 | 1.67 |
| R1 | 1   | 31   | 1.67 | 1.66 | 1.66 | 1.66 | 1.65 | 1.65 | 1.65 | 1.64 | 1.64 | 1.64 |
| R1 | 1   | 41   | 1.63 | 1.63 | 1.63 | 1.62 | 1.62 | 1.62 | 1.61 | 1.61 | 1.61 | 1.60 |
| R1 | 1   | 51   | 1.60 | 1.60 | 1.59 | 1.59 | 1.59 | 1.58 | 1.58 | 1.58 | 1.57 | 1.57 |
| R1 | 1   | 61   | 1.57 | 1.56 | 1.56 | 1.56 | 1.55 | 1.55 | 1.55 |      |      |      |

INTERMEDIATE REPORT  
Ammonia Nitrogen  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

Dulce WWTP - DO Model Output

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.10 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| R1 | 1   | 11   | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 2.77 | 2.74 | 2.71 | 2.69 | 2.66 |
| R1 | 1   | 21   | 2.63 | 2.60 | 2.57 | 2.54 | 2.52 | 2.49 | 2.46 | 2.44 | 2.41 | 2.38 |
| R1 | 1   | 31   | 2.36 | 2.33 | 2.31 | 2.28 | 2.26 | 2.23 | 2.21 | 2.18 | 2.16 | 2.13 |
| R1 | 1   | 41   | 2.11 | 2.09 | 2.06 | 2.04 | 2.02 | 1.99 | 1.97 | 1.95 | 1.93 | 1.91 |
| R1 | 1   | 51   | 1.89 | 1.86 | 1.84 | 1.82 | 1.80 | 1.78 | 1.76 | 1.74 | 1.72 | 1.70 |
| R1 | 1   | 61   | 1.68 | 1.66 | 1.65 | 1.63 | 1.61 | 1.59 | 1.57 |      |      |      |

INTERMEDIATE REPORT

Ni trate+Ni tri te Ni trogen  
mg/L

Ji cari lla Apache Utili ty Authori ty Dul ce WWTP  
Permi t NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 1.00 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| R1 | 1   | 11   | 1.01 | 1.01 | 1.02 | 1.02 | 1.02 | 0.70 | 0.74 | 0.77 | 0.80 | 0.83 |
| R1 | 1   | 21   | 0.86 | 0.90 | 0.93 | 0.96 | 0.99 | 1.02 | 1.05 | 1.08 | 1.11 | 1.14 |
| R1 | 1   | 31   | 1.17 | 1.20 | 1.23 | 1.26 | 1.29 | 1.31 | 1.34 | 1.37 | 1.40 | 1.42 |
| R1 | 1   | 41   | 1.45 | 1.48 | 1.50 | 1.53 | 1.56 | 1.58 | 1.61 | 1.63 | 1.66 | 1.68 |
| R1 | 1   | 51   | 1.71 | 1.73 | 1.76 | 1.78 | 1.81 | 1.83 | 1.85 | 1.88 | 1.90 | 1.92 |
| R1 | 1   | 61   | 1.94 | 1.97 | 1.99 | 2.01 | 2.03 | 2.05 | 2.07 |      |      |      |

INTERMEDIATE REPORT

Total Ni trogen  
mg/L

Ji cari lla Apache Utili ty Authori ty Dul ce WWTP  
Permi t NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| R1 | 1   | 11   | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1   | 21   | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1   | 31   | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1   | 41   | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1   | 51   | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1   | 61   | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |      |      |      |

INTERMEDIATE REPORT

Effecti ve Total Ni trogen  
mg/L

Ji cari lla Apache Utili ty Authori ty Dul ce WWTP  
Permi t NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| R1 | 1   | 11   | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |

Dulce WWTP - DO Model Output

|    |   |    |      |      |      |      |      |      |      |      |      |      |      |
|----|---|----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1 | 21 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1 | 31 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1 | 41 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1 | 51 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |
| R1 | 1 | 61 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 | 5.19 |

INTERMEDIATE REPORT

Organic Phosphorus  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.99 | 0.98 | 0.96 | 0.95 | 0.94 | 0.93 | 0.92 | 0.91 | 0.90 | 0.89 |
| R1 | 1   | 11   | 0.87 | 0.86 | 0.85 | 0.84 | 0.83 | 0.90 | 0.89 | 0.88 | 0.87 | 0.86 |
| R1 | 1   | 21   | 0.86 | 0.85 | 0.84 | 0.83 | 0.82 | 0.82 | 0.81 | 0.80 | 0.79 | 0.79 |
| R1 | 1   | 31   | 0.78 | 0.77 | 0.77 | 0.76 | 0.75 | 0.74 | 0.74 | 0.73 | 0.72 | 0.72 |
| R1 | 1   | 41   | 0.71 | 0.70 | 0.70 | 0.69 | 0.68 | 0.68 | 0.67 | 0.66 | 0.66 | 0.65 |
| R1 | 1   | 51   | 0.65 | 0.64 | 0.63 | 0.63 | 0.62 | 0.62 | 0.61 | 0.60 | 0.60 | 0.59 |
| R1 | 1   | 61   | 0.59 | 0.58 | 0.58 | 0.57 | 0.57 | 0.56 | 0.55 |      |      |      |

INTERMEDIATE REPORT

Effective Organic Phosphorus  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.99 | 0.98 | 0.96 | 0.95 | 0.94 | 0.93 | 0.92 | 0.91 | 0.90 | 0.89 |
| R1 | 1   | 11   | 0.87 | 0.86 | 0.85 | 0.84 | 0.83 | 0.90 | 0.89 | 0.88 | 0.87 | 0.86 |
| R1 | 1   | 21   | 0.86 | 0.85 | 0.84 | 0.83 | 0.82 | 0.82 | 0.81 | 0.80 | 0.79 | 0.79 |
| R1 | 1   | 31   | 0.78 | 0.77 | 0.77 | 0.76 | 0.75 | 0.74 | 0.74 | 0.73 | 0.72 | 0.72 |
| R1 | 1   | 41   | 0.71 | 0.70 | 0.70 | 0.69 | 0.68 | 0.68 | 0.67 | 0.66 | 0.66 | 0.65 |
| R1 | 1   | 51   | 0.65 | 0.64 | 0.63 | 0.63 | 0.62 | 0.62 | 0.61 | 0.60 | 0.60 | 0.59 |
| R1 | 1   | 61   | 0.59 | 0.58 | 0.58 | 0.57 | 0.57 | 0.56 | 0.55 |      |      |      |

INTERMEDIATE REPORT

Dissolved Inorganic Phosphorus  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 1.01 | 1.02 | 1.02 | 1.03 | 1.04 | 1.05 | 1.06 | 1.07 | 1.07 | 1.08 |
| R1 | 1   | 11   | 1.09 | 1.10 | 1.10 | 1.11 | 1.12 | 1.12 | 1.12 | 1.13 | 1.13 | 1.14 |
| R1 | 1   | 21   | 1.15 | 1.15 | 1.16 | 1.16 | 1.17 | 1.17 | 1.18 | 1.19 | 1.19 | 1.20 |
| R1 | 1   | 31   | 1.20 | 1.21 | 1.21 | 1.22 | 1.22 | 1.23 | 1.23 | 1.24 | 1.24 | 1.25 |
| R1 | 1   | 41   | 1.26 | 1.26 | 1.27 | 1.27 | 1.28 | 1.28 | 1.29 | 1.29 | 1.30 | 1.30 |
| R1 | 1   | 51   | 1.31 | 1.31 | 1.31 | 1.32 | 1.32 | 1.33 | 1.33 | 1.34 | 1.34 | 1.35 |
| R1 | 1   | 61   | 1.35 | 1.36 | 1.36 | 1.37 | 1.37 | 1.37 | 1.38 |      |      |      |

Dulce WWTP - DO Model Output

INTERMEDIATE REPORT

Total Phosphorus  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 2.00 | 1.99 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 |
| R1 | 1   | 11   | 1.96 | 1.96 | 1.96 | 1.95 | 1.95 | 2.01 | 2.01 | 2.01 | 2.01 | 2.00 |
| R1 | 1   | 21   | 2.00 | 2.00 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 1.99 | 1.99 | 1.98 |
| R1 | 1   | 31   | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 |
| R1 | 1   | 41   | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.95 | 1.95 | 1.95 |
| R1 | 1   | 51   | 1.95 | 1.95 | 1.95 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 |
| R1 | 1   | 61   | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.93 |      |      |      |

INTERMEDIATE REPORT

Effective Total Phosphorus  
mg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 2.00 | 1.99 | 1.99 | 1.99 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 |
| R1 | 1   | 11   | 1.96 | 1.96 | 1.96 | 1.95 | 1.95 | 2.01 | 2.01 | 2.01 | 2.01 | 2.00 |
| R1 | 1   | 21   | 2.00 | 2.00 | 2.00 | 2.00 | 1.99 | 1.99 | 1.99 | 1.99 | 1.99 | 1.98 |
| R1 | 1   | 31   | 1.98 | 1.98 | 1.98 | 1.98 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 | 1.97 |
| R1 | 1   | 41   | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.96 | 1.95 | 1.95 | 1.95 |
| R1 | 1   | 51   | 1.95 | 1.95 | 1.95 | 1.95 | 1.95 | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 |
| R1 | 1   | 61   | 1.94 | 1.94 | 1.94 | 1.94 | 1.94 | 1.93 | 1.93 |      |      |      |

INTERMEDIATE REPORT

Chlorophyll a  
µg/L

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0   | +1   | +2   | +3   | +4   | +5   | +6   | +7   | +8   | +9   |
|----|-----|------|------|------|------|------|------|------|------|------|------|------|
| R1 | 1   | 1    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 11   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 21   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 31   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 41   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 51   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| R1 | 1   | 61   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |      |      |      |

INTERMEDIATE REPORT

Temperature  
deg C

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

Dulce WWTP - DO Model Output

| ID | RCH | ELEM | +0    | +1    | +2    | +3    | +4    | +5    | +6    | +7    | +8    | +9    |
|----|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| R1 | 1   | 1    | 32.28 | 32.35 | 32.42 | 32.49 | 32.56 | 32.62 | 32.69 | 32.75 | 32.81 | 32.86 |
| R1 | 1   | 11   | 32.92 | 32.97 | 33.02 | 33.07 | 33.12 | 32.77 | 32.81 | 32.85 | 32.89 | 32.93 |
| R1 | 1   | 21   | 32.97 | 33.01 | 33.05 | 33.08 | 33.12 | 33.15 | 33.19 | 33.22 | 33.25 | 33.28 |
| R1 | 1   | 31   | 33.31 | 33.34 | 33.37 | 33.40 | 33.43 | 33.45 | 33.48 | 33.50 | 33.53 | 33.55 |
| R1 | 1   | 41   | 33.58 | 33.60 | 33.62 | 33.64 | 33.67 | 33.69 | 33.71 | 33.73 | 33.75 | 33.77 |
| R1 | 1   | 51   | 33.78 | 33.80 | 33.82 | 33.84 | 33.85 | 33.87 | 33.89 | 33.90 | 33.92 | 33.93 |
| R1 | 1   | 61   | 33.94 | 33.96 | 33.97 | 33.99 | 34.00 | 34.01 | 34.02 |       |       |       |

INTERMEDIATE REPORT

River Distance  
km

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 7. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. | 6. |
| R1 | 1   | 11   | 6. | 6. | 5. | 5. | 5. | 5. | 5. | 5. | 5. | 5. |
| R1 | 1   | 21   | 5. | 5. | 4. | 4. | 4. | 4. | 4. | 4. | 4. | 4. |
| R1 | 1   | 31   | 4. | 4. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. |
| R1 | 1   | 41   | 3. | 3. | 2. | 2. | 2. | 2. | 2. | 2. | 2. | 2. |
| R1 | 1   | 51   | 2. | 2. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 61   | 1. | 1. | 0. | 0. | 0. | 0. | 0. |    |    |    |

INTERMEDIATE REPORT

Flow  
m<sup>3</sup>/s

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1   | 11   | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 21   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 31   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 41   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 51   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 61   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |     |     |     |

INTERMEDIATE REPORT

Dispersion  
m<sup>2</sup>/s

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Dulce WWTP - DO Model Output

|    |   |    |     |     |     |     |     |     |     |     |     |     |     |
|----|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1 | 11 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1 | 21 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1 | 31 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1 | 41 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1 | 51 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| R1 | 1 | 61 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

INTERMEDIATE REPORT

Depth  
m

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| R1 | 1   | 11   | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| R1 | 1   | 21   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| R1 | 1   | 31   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| R1 | 1   | 41   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| R1 | 1   | 51   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| R1 | 1   | 61   | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |

INTERMEDIATE REPORT

Width  
m

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| R1 | 1   | 11   | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| R1 | 1   | 21   | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| R1 | 1   | 31   | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| R1 | 1   | 41   | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| R1 | 1   | 51   | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| R1 | 1   | 61   | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |

INTERMEDIATE REPORT

Advective Velocity  
m/s

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 11   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 21   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 31   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 41   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 51   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

Dulce WWTP - DO Model Output

R1 1 61 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

INTERMEDIATE REPORT

Mean Velocity  
m/s

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 11   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 21   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 31   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 41   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 51   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| R1 | 1   | 61   | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

INTERMEDIATE REPORT

Cross-Sectional Area  
m<sup>2</sup>

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0  | +1  | +2  | +3  | +4  | +5  | +6  | +7  | +8  | +9  |
|----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R1 | 1   | 1    | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| R1 | 1   | 11   | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| R1 | 1   | 21   | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| R1 | 1   | 31   | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| R1 | 1   | 41   | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| R1 | 1   | 51   | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| R1 | 1   | 61   | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |

INTERMEDIATE REPORT

Reaeration Rate  
per day

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0     | +1     | +2     | +3     | +4     | +5     | +6     | +7     | +8     | +9     |
|----|-----|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| R1 | 1   | 1    | 12.505 | 12.520 | 12.536 | 12.550 | 12.565 | 12.578 | 12.592 | 12.605 | 12.617 | 12.628 |
| R1 | 1   | 11   | 12.641 | 12.651 | 12.663 | 12.673 | 12.683 | 10.276 | 10.284 | 10.290 | 10.297 | 10.304 |
| R1 | 1   | 21   | 10.311 | 10.318 | 10.323 | 10.330 | 10.337 | 10.342 | 10.348 | 10.354 | 10.359 | 10.365 |
| R1 | 1   | 31   | 10.370 | 10.375 | 10.379 | 10.385 | 10.390 | 10.394 | 10.399 | 10.402 | 10.407 | 10.411 |
| R1 | 1   | 41   | 10.415 | 10.420 | 10.424 | 10.427 | 10.432 | 10.434 | 10.437 | 10.441 | 10.444 | 10.448 |
| R1 | 1   | 51   | 10.451 | 10.454 | 10.458 | 10.461 | 10.463 | 10.466 | 10.468 | 10.472 | 10.474 | 10.477 |
| R1 | 1   | 61   | 10.480 | 10.482 | 10.484 | 10.487 | 10.489 | 10.491 | 10.493 |        |        |        |

INTERMEDIATE REPORT

BOD1 Decay Rate

Jicarilla Apache Utility Authority Dulce WWTP



Dulce WWTP - DO Model Output  
Permit NM0030520 - DO Model

per day

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 11   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 21   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 31   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 41   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 51   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 61   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |

INTERMEDIATE REPORT  
BOD1 Settling Rate  
m/d

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 11   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 21   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 31   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 41   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 51   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 61   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |

INTERMEDIATE REPORT  
BOD2 Decay Rate  
per day

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 11   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 21   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 31   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 41   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 51   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 61   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |

INTERMEDIATE REPORT  
BOD2 Settling Rate  
m/d

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
|----|-----|------|----|----|----|----|----|----|----|----|----|----|

Dulce WWTP - DO Model Output

|    |   |    |    |    |    |    |    |    |    |    |    |    |    |
|----|---|----|----|----|----|----|----|----|----|----|----|----|----|
| R1 | 1 | 1  | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 11 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 21 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 31 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 41 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 51 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1 | 61 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |

INTERMEDIATE REPORT

Ammonia Nitrogen Decay Rate per day

Jicarilla Apache Utility Authority Dulce WWTP Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 11   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 21   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 31   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 41   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 51   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 61   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |

INTERMEDIATE REPORT

Sediment Oxygen Demand g/m<sup>2</sup>/d

Jicarilla Apache Utility Authority Dulce WWTP Permit NM0030520 - DO Model

| ID | RCH | ELEM | +0 | +1 | +2 | +3 | +4 | +5 | +6 | +7 | +8 | +9 |
|----|-----|------|----|----|----|----|----|----|----|----|----|----|
| R1 | 1   | 1    | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| R1 | 1   | 11   | 0. | 0. | 0. | 0. | 0. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 21   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 31   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 41   | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| R1 | 1   | 51   | 1. | 1. | 1. | 1. | 1. | 1. | 0. | 0. | 0. | 0. |
| R1 | 1   | 61   | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |

♀ CAPSULE SUMMARY FOR Amargo to Disch

|           |       |        |       |       |       |      |      |                     |      |       |       |       |       |       |       |       | ADVEC             |       |       |       |      |      |       |       |      |
|-----------|-------|--------|-------|-------|-------|------|------|---------------------|------|-------|-------|-------|-------|-------|-------|-------|-------------------|-------|-------|-------|------|------|-------|-------|------|
| MEAN      | DO    | REAER  | BOD1  | BOD1  | BOD2  | BOD2 | NH3  |                     |      |       |       |       | BOD1  | BOD2  | ORG-N | NH3-N | NO3-N             | TOT-N | ORG-P | PO4-P | CHLA | DISP | DEPTH | WIDTH | VELO |
| FOR REACH | SAT   | DIST   | FLOW  | TEMP  | SALN  | DO   | DO   | BOD1                | BOD2 | ORG-N | NH3-N | NO3-N | TOT-N | ORG-P | PO4-P | CHLA  | DISP              | DEPTH | WIDTH | VELO  |      |      |       |       |      |
| VELO      | SAT   | RATE   | DECA  | SETT  | DECA  | SETT | DECA | SOD                 | BOD2 | mg/L  | mg/L  | mg/L  | mg/L  | mg/L  | mg/L  | µg/L  | m <sup>2</sup> /s | m     | m     | m/s   |      |      |       |       |      |
| m/s       | mg/L  | 1/da   | 1/da  | 1/da  | 1/da  | 1/da | 1/da | g/m <sup>2</sup> /d | mg/L | mg/L  | mg/L  | mg/L  | mg/L  | mg/L  | mg/L  | µg/L  | m <sup>2</sup> /s | m     | m     | m/s   |      |      |       |       |      |
| 1         | R1    | 1      | HDWTR | 0.035 | 32.20 | 0.0  | 7.00 | 5.00                | 6.50 | 0.00  | 0.10  | 1.00  | 1.10  | 1.00  | 1.00  | 0.0   |                   |       |       |       |      |      |       |       |      |
| 0.070     | 7.271 | 12.505 | 0.18  | 0.33  | 0.09  | 0.00 | 0.78 | 0.29                | 6.49 | 0.00  | 0.10  | 1.00  | 1.10  | 0.99  | 1.01  | 0.0   | 0.0               | 0.20  | 2.5   | 0.070 |      |      |       |       |      |
| 2         | R1    | 1      | 6.50  | 0.035 | 32.35 | 0.0  | 6.97 | 4.92                | 6.48 | 0.00  | 0.10  | 1.00  | 1.10  | 0.98  | 1.02  | 0.0   | 0.0               | 0.20  | 2.5   | 0.070 |      |      |       |       |      |
| 0.070     | 7.262 | 12.520 | 0.18  | 0.33  | 0.09  | 0.00 | 0.79 | 0.29                |      |       |       |       |       |       |       |       |                   |       |       |       |      |      |       |       |      |

|                                      |       |        |       |       |      |      |       | Dul ce WWTP - DO Model Output |      |      |      |      |      |      |     |     |      |     |       |  |
|--------------------------------------|-------|--------|-------|-------|------|------|-------|-------------------------------|------|------|------|------|------|------|-----|-----|------|-----|-------|--|
| 3 R1                                 | 1     | 6.40   | 0.035 | 32.42 | 0.0  | 6.96 | 4.87  | 6.47                          | 0.00 | 0.10 | 1.00 | 1.10 | 0.96 | 1.02 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.252 | 12.536 | 0.18  | 0.34  | 0.09 | 0.00 | 0.79  | 0.29                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 4 R1                                 | 1     | 6.30   | 0.035 | 32.49 | 0.0  | 6.95 | 4.83  | 6.46                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.95 | 1.03 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.244 | 12.550 | 0.18  | 0.34  | 0.09 | 0.00 | 0.80  | 0.29                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 5 R1                                 | 1     | 6.20   | 0.035 | 32.56 | 0.0  | 6.94 | 4.79  | 6.45                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.94 | 1.04 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.236 | 12.565 | 0.18  | 0.34  | 0.09 | 0.00 | 0.80  | 0.29                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 6 R1                                 | 1     | 6.10   | 0.035 | 32.62 | 0.0  | 6.93 | 4.75  | 6.44                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.93 | 1.05 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.228 | 12.578 | 0.18  | 0.34  | 0.09 | 0.00 | 0.80  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 7 R1                                 | 1     | 6.00   | 0.035 | 32.69 | 0.0  | 6.92 | 4.71  | 6.43                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.92 | 1.06 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.221 | 12.592 | 0.18  | 0.34  | 0.09 | 0.00 | 0.81  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 8 R1                                 | 1     | 5.90   | 0.035 | 32.75 | 0.0  | 6.91 | 4.67  | 6.42                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.91 | 1.07 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.213 | 12.605 | 0.18  | 0.34  | 0.09 | 0.00 | 0.81  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 9 R1                                 | 1     | 5.80   | 0.035 | 32.81 | 0.0  | 6.90 | 4.63  | 6.41                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.90 | 1.07 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.206 | 12.617 | 0.18  | 0.34  | 0.09 | 0.00 | 0.82  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 10 R1                                | 1     | 5.70   | 0.035 | 32.86 | 0.0  | 6.90 | 4.59  | 6.40                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.89 | 1.08 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.200 | 12.628 | 0.18  | 0.34  | 0.09 | 0.00 | 0.82  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 11 R1                                | 1     | 5.60   | 0.035 | 32.92 | 0.0  | 6.89 | 4.55  | 6.39                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.87 | 1.09 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.193 | 12.641 | 0.18  | 0.34  | 0.09 | 0.00 | 0.82  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 12 R1                                | 1     | 5.50   | 0.035 | 32.97 | 0.0  | 6.88 | 4.51  | 6.39                          | 0.00 | 0.09 | 1.01 | 1.10 | 0.86 | 1.10 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.187 | 12.651 | 0.18  | 0.34  | 0.09 | 0.00 | 0.83  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 13 R1                                | 1     | 5.40   | 0.035 | 33.02 | 0.0  | 6.88 | 4.47  | 6.38                          | 0.00 | 0.08 | 1.02 | 1.10 | 0.85 | 1.10 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.180 | 12.663 | 0.18  | 0.34  | 0.09 | 0.00 | 0.83  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 14 R1                                | 1     | 5.30   | 0.035 | 33.07 | 0.0  | 6.87 | 4.43  | 6.37                          | 0.00 | 0.08 | 1.02 | 1.10 | 0.84 | 1.11 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.175 | 12.673 | 0.18  | 0.34  | 0.09 | 0.00 | 0.83  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 15 R1                                | 1     | 5.20   | 0.035 | 33.12 | 0.0  | 6.86 | 4.40  | 6.36                          | 0.00 | 0.08 | 1.02 | 1.10 | 0.83 | 1.12 | 0.0 | 0.0 | 0.20 | 2.5 | 0.070 |  |
| 0.070                                | 7.169 | 12.683 | 0.18  | 0.34  | 0.09 | 0.00 | 0.84  | 0.30                          |      |      |      |      |      |      |     |     |      |     |       |  |
| WASTELOAD # 016 (Dul ce) ENTERS HERE |       |        |       |       |      |      |       |                               |      |      |      |      |      |      |     |     |      |     |       |  |
| 16 R1                                | 1     | 5.10   | 0.061 | 32.77 | 0.0  | 4.80 | 21.72 | 28.55                         | 1.72 | 2.77 | 0.70 | 5.19 | 0.90 | 1.12 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.211 | 10.276 | 0.18  | 0.26  | 0.09 | 0.00 | 0.75  | 0.56                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 17 R1                                | 1     | 5.00   | 0.061 | 32.81 | 0.0  | 4.83 | 21.57 | 28.51                         | 1.71 | 2.74 | 0.74 | 5.19 | 0.89 | 1.12 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.206 | 10.284 | 0.18  | 0.26  | 0.09 | 0.00 | 0.76  | 0.56                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 18 R1                                | 1     | 4.90   | 0.061 | 32.85 | 0.0  | 4.85 | 21.42 | 28.47                         | 1.71 | 2.71 | 0.77 | 5.19 | 0.88 | 1.13 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.201 | 10.290 | 0.18  | 0.26  | 0.09 | 0.00 | 0.76  | 0.56                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 19 R1                                | 1     | 4.80   | 0.061 | 32.89 | 0.0  | 4.88 | 21.28 | 28.43                         | 1.71 | 2.69 | 0.80 | 5.19 | 0.87 | 1.13 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.196 | 10.297 | 0.18  | 0.26  | 0.09 | 0.00 | 0.76  | 0.56                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 20 R1                                | 1     | 4.70   | 0.061 | 32.93 | 0.0  | 4.90 | 21.13 | 28.39                         | 1.70 | 2.66 | 0.83 | 5.19 | 0.86 | 1.14 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.191 | 10.304 | 0.18  | 0.26  | 0.09 | 0.00 | 0.77  | 0.56                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 21 R1                                | 1     | 4.60   | 0.061 | 32.97 | 0.0  | 4.92 | 20.98 | 28.34                         | 1.70 | 2.63 | 0.86 | 5.19 | 0.86 | 1.15 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.186 | 10.311 | 0.18  | 0.26  | 0.09 | 0.00 | 0.77  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 22 R1                                | 1     | 4.50   | 0.061 | 33.01 | 0.0  | 4.93 | 20.83 | 28.30                         | 1.70 | 2.60 | 0.90 | 5.19 | 0.85 | 1.15 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.182 | 10.318 | 0.18  | 0.26  | 0.09 | 0.00 | 0.77  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 23 R1                                | 1     | 4.40   | 0.061 | 33.05 | 0.0  | 4.95 | 20.69 | 28.26                         | 1.69 | 2.57 | 0.93 | 5.19 | 0.84 | 1.16 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.178 | 10.323 | 0.18  | 0.26  | 0.09 | 0.00 | 0.77  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 24 R1                                | 1     | 4.30   | 0.061 | 33.08 | 0.0  | 4.96 | 20.54 | 28.22                         | 1.69 | 2.54 | 0.96 | 5.19 | 0.83 | 1.16 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.173 | 10.330 | 0.18  | 0.26  | 0.09 | 0.00 | 0.78  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 25 R1                                | 1     | 4.20   | 0.061 | 33.12 | 0.0  | 4.98 | 20.40 | 28.18                         | 1.69 | 2.52 | 0.99 | 5.19 | 0.82 | 1.17 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.168 | 10.337 | 0.18  | 0.26  | 0.09 | 0.00 | 0.78  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 26 R1                                | 1     | 4.10   | 0.061 | 33.15 | 0.0  | 4.99 | 20.26 | 28.14                         | 1.68 | 2.49 | 1.02 | 5.19 | 0.82 | 1.17 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.165 | 10.342 | 0.18  | 0.26  | 0.09 | 0.00 | 0.78  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 27 R1                                | 1     | 4.00   | 0.061 | 33.19 | 0.0  | 5.00 | 20.12 | 28.10                         | 1.68 | 2.46 | 1.05 | 5.19 | 0.81 | 1.18 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.161 | 10.348 | 0.18  | 0.27  | 0.09 | 0.00 | 0.79  | 0.55                          |      |      |      |      |      |      |     |     |      |     |       |  |
| 28 R1                                | 1     | 3.90   | 0.061 | 33.22 | 0.0  | 5.01 | 19.98 | 28.06                         | 1.68 | 2.44 | 1.08 | 5.19 | 0.80 | 1.19 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |  |
| 0.074                                | 7.157 | 10.354 | 0.18  | 0.27  | 0.09 | 0.00 | 0.79  | 0.54                          |      |      |      |      |      |      |     |     |      |     |       |  |

|       |       | Dul ce WWTP - DO Model |       |       |      |      |       |       |      |      |      | Output |      |      |     |     |      |     |       |
|-------|-------|------------------------|-------|-------|------|------|-------|-------|------|------|------|--------|------|------|-----|-----|------|-----|-------|
| 29 R1 | 1     | 3.80                   | 0.061 | 33.25 | 0.0  | 5.03 | 19.84 | 28.02 | 1.67 | 2.41 | 1.11 | 5.19   | 0.79 | 1.19 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.153 | 10.359                 | 0.18  | 0.27  | 0.09 | 0.00 | 0.79  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 30 R1 | 1     | 3.70                   | 0.061 | 33.28 | 0.0  | 5.04 | 19.70 | 27.98 | 1.67 | 2.38 | 1.14 | 5.19   | 0.79 | 1.20 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.149 | 10.365                 | 0.18  | 0.27  | 0.09 | 0.00 | 0.79  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 31 R1 | 1     | 3.60                   | 0.061 | 33.31 | 0.0  | 5.05 | 19.56 | 27.94 | 1.67 | 2.36 | 1.17 | 5.19   | 0.78 | 1.20 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.145 | 10.370                 | 0.18  | 0.27  | 0.09 | 0.00 | 0.79  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 32 R1 | 1     | 3.50                   | 0.061 | 33.34 | 0.0  | 5.06 | 19.42 | 27.90 | 1.66 | 2.33 | 1.20 | 5.19   | 0.77 | 1.21 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.142 | 10.375                 | 0.18  | 0.27  | 0.09 | 0.00 | 0.80  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 33 R1 | 1     | 3.40                   | 0.061 | 33.37 | 0.0  | 5.07 | 19.28 | 27.86 | 1.66 | 2.31 | 1.23 | 5.19   | 0.77 | 1.21 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.139 | 10.379                 | 0.18  | 0.27  | 0.09 | 0.00 | 0.80  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 34 R1 | 1     | 3.30                   | 0.061 | 33.40 | 0.0  | 5.08 | 19.15 | 27.82 | 1.66 | 2.28 | 1.26 | 5.19   | 0.76 | 1.22 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.135 | 10.385                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.80  | 0.54  |      |      |      |        |      |      |     |     |      |     |       |
| 35 R1 | 1     | 3.20                   | 0.061 | 33.43 | 0.0  | 5.09 | 19.01 | 27.78 | 1.65 | 2.26 | 1.29 | 5.19   | 0.75 | 1.22 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.132 | 10.390                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.80  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 36 R1 | 1     | 3.10                   | 0.061 | 33.45 | 0.0  | 5.10 | 18.88 | 27.74 | 1.65 | 2.23 | 1.31 | 5.19   | 0.74 | 1.23 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.129 | 10.394                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.81  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 37 R1 | 1     | 3.00                   | 0.061 | 33.48 | 0.0  | 5.11 | 18.74 | 27.70 | 1.65 | 2.21 | 1.34 | 5.19   | 0.74 | 1.23 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.125 | 10.399                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.81  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 38 R1 | 1     | 2.90                   | 0.061 | 33.50 | 0.0  | 5.12 | 18.61 | 27.66 | 1.64 | 2.18 | 1.37 | 5.19   | 0.73 | 1.24 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.123 | 10.402                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.81  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 39 R1 | 1     | 2.80                   | 0.061 | 33.53 | 0.0  | 5.13 | 18.48 | 27.62 | 1.64 | 2.16 | 1.40 | 5.19   | 0.72 | 1.24 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.120 | 10.407                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.81  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 40 R1 | 1     | 2.70                   | 0.061 | 33.55 | 0.0  | 5.14 | 18.35 | 27.58 | 1.64 | 2.13 | 1.42 | 5.19   | 0.72 | 1.25 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.117 | 10.411                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.81  | 0.53  |      |      |      |        |      |      |     |     |      |     |       |
| 41 R1 | 1     | 2.60                   | 0.061 | 33.58 | 0.0  | 5.15 | 18.22 | 27.54 | 1.63 | 2.11 | 1.45 | 5.19   | 0.71 | 1.26 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.114 | 10.415                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 42 R1 | 1     | 2.50                   | 0.061 | 33.60 | 0.0  | 5.16 | 18.09 | 27.49 | 1.63 | 2.09 | 1.48 | 5.19   | 0.70 | 1.26 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.111 | 10.420                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 43 R1 | 1     | 2.40                   | 0.061 | 33.62 | 0.0  | 5.17 | 17.96 | 27.45 | 1.63 | 2.06 | 1.50 | 5.19   | 0.70 | 1.27 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.108 | 10.424                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 44 R1 | 1     | 2.30                   | 0.061 | 33.64 | 0.0  | 5.18 | 17.83 | 27.41 | 1.62 | 2.04 | 1.53 | 5.19   | 0.69 | 1.27 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.106 | 10.427                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 45 R1 | 1     | 2.20                   | 0.061 | 33.67 | 0.0  | 5.19 | 17.71 | 27.37 | 1.62 | 2.02 | 1.56 | 5.19   | 0.68 | 1.28 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.103 | 10.432                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 46 R1 | 1     | 2.10                   | 0.061 | 33.69 | 0.0  | 5.20 | 17.58 | 27.33 | 1.62 | 1.99 | 1.58 | 5.19   | 0.68 | 1.28 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.101 | 10.434                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.82  | 0.52  |      |      |      |        |      |      |     |     |      |     |       |
| 47 R1 | 1     | 2.00                   | 0.061 | 33.71 | 0.0  | 5.21 | 17.45 | 27.29 | 1.61 | 1.97 | 1.61 | 5.19   | 0.67 | 1.29 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.099 | 10.437                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 48 R1 | 1     | 1.90                   | 0.061 | 33.73 | 0.0  | 5.21 | 17.33 | 27.25 | 1.61 | 1.95 | 1.63 | 5.19   | 0.66 | 1.29 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.097 | 10.441                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 49 R1 | 1     | 1.80                   | 0.061 | 33.75 | 0.0  | 5.22 | 17.21 | 27.21 | 1.61 | 1.93 | 1.66 | 5.19   | 0.66 | 1.30 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.095 | 10.444                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 50 R1 | 1     | 1.70                   | 0.061 | 33.77 | 0.0  | 5.23 | 17.08 | 27.17 | 1.60 | 1.91 | 1.68 | 5.19   | 0.65 | 1.30 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.092 | 10.448                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 51 R1 | 1     | 1.60                   | 0.061 | 33.78 | 0.0  | 5.24 | 16.96 | 27.13 | 1.60 | 1.89 | 1.71 | 5.19   | 0.65 | 1.31 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.090 | 10.451                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 52 R1 | 1     | 1.50                   | 0.061 | 33.80 | 0.0  | 5.25 | 16.84 | 27.09 | 1.60 | 1.86 | 1.73 | 5.19   | 0.64 | 1.31 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.088 | 10.454                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.83  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 53 R1 | 1     | 1.40                   | 0.061 | 33.82 | 0.0  | 5.26 | 16.72 | 27.05 | 1.59 | 1.84 | 1.76 | 5.19   | 0.63 | 1.31 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.085 | 10.458                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.51  |      |      |      |        |      |      |     |     |      |     |       |
| 54 R1 | 1     | 1.30                   | 0.061 | 33.84 | 0.0  | 5.27 | 16.60 | 27.01 | 1.59 | 1.82 | 1.78 | 5.19   | 0.63 | 1.32 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 0.074 | 7.084 | 10.461                 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50  |      |      |      |        |      |      |     |     |      |     |       |
| 55 R1 | 1     | 1.20                   | 0.061 | 33.85 | 0.0  | 5.28 | 16.48 | 26.97 | 1.59 | 1.80 | 1.81 | 5.19   | 0.62 | 1.32 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |

|       |       |        |       |       |      |      |       |      |  | Dulce WWTP - DO Model Output |      |      |      |      |      |      |     |     |      |     |       |
|-------|-------|--------|-------|-------|------|------|-------|------|--|------------------------------|------|------|------|------|------|------|-----|-----|------|-----|-------|
| 0.074 | 7.082 | 10.463 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50 |  | 26.93                        | 1.58 | 1.78 | 1.83 | 5.19 | 0.62 | 1.33 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 56 R1 | 1     | 1.10   | 0.061 | 33.87 | 0.0  | 5.29 | 16.36 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.080 | 10.466 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50 |  | 26.89                        | 1.58 | 1.76 | 1.85 | 5.19 | 0.61 | 1.33 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 57 R1 | 1     | 1.00   | 0.061 | 33.89 | 0.0  | 5.30 | 16.25 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.078 | 10.468 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50 |  | 26.85                        | 1.58 | 1.74 | 1.88 | 5.19 | 0.60 | 1.34 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 58 R1 | 1     | 0.90   | 0.061 | 33.90 | 0.0  | 5.31 | 16.13 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.076 | 10.472 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50 |  | 26.81                        | 1.57 | 1.72 | 1.90 | 5.19 | 0.60 | 1.34 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 59 R1 | 1     | 0.80   | 0.061 | 33.92 | 0.0  | 5.32 | 16.01 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.074 | 10.474 | 0.19  | 0.27  | 0.09 | 0.00 | 0.84  | 0.50 |  | 26.77                        | 1.57 | 1.70 | 1.92 | 5.19 | 0.59 | 1.35 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 60 R1 | 1     | 0.70   | 0.061 | 33.93 | 0.0  | 5.33 | 15.90 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.072 | 10.477 | 0.19  | 0.27  | 0.09 | 0.00 | 0.85  | 0.49 |  | 26.73                        | 1.57 | 1.68 | 1.94 | 5.19 | 0.59 | 1.35 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 61 R1 | 1     | 0.60   | 0.061 | 33.94 | 0.0  | 5.34 | 15.78 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.071 | 10.480 | 0.19  | 0.27  | 0.09 | 0.00 | 0.85  | 0.49 |  | 26.69                        | 1.56 | 1.66 | 1.97 | 5.19 | 0.58 | 1.36 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 62 R1 | 1     | 0.50   | 0.061 | 33.96 | 0.0  | 5.35 | 15.67 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.069 | 10.482 | 0.19  | 0.27  | 0.09 | 0.00 | 0.85  | 0.49 |  | 26.65                        | 1.56 | 1.65 | 1.99 | 5.19 | 0.58 | 1.36 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 63 R1 | 1     | 0.40   | 0.061 | 33.97 | 0.0  | 5.36 | 15.56 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.068 | 10.484 | 0.19  | 0.27  | 0.09 | 0.00 | 0.85  | 0.49 |  | 26.61                        | 1.56 | 1.63 | 2.01 | 5.19 | 0.57 | 1.37 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 64 R1 | 1     | 0.30   | 0.061 | 33.99 | 0.0  | 5.37 | 15.45 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.066 | 10.487 | 0.19  | 0.27  | 0.10 | 0.00 | 0.85  | 0.49 |  | 26.57                        | 1.55 | 1.61 | 2.03 | 5.19 | 0.57 | 1.37 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 65 R1 | 1     | 0.20   | 0.061 | 34.00 | 0.0  | 5.38 | 15.34 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.064 | 10.489 | 0.19  | 0.27  | 0.10 | 0.00 | 0.85  | 0.49 |  | 26.53                        | 1.55 | 1.59 | 2.05 | 5.19 | 0.56 | 1.37 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 66 R1 | 1     | 0.10   | 0.061 | 34.01 | 0.0  | 5.39 | 15.23 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.063 | 10.491 | 0.19  | 0.27  | 0.10 | 0.00 | 0.85  | 0.49 |  | 26.49                        | 1.55 | 1.57 | 2.07 | 5.19 | 0.55 | 1.38 | 0.0 | 0.0 | 0.26 | 3.2 | 0.074 |
| 67 R1 | 1     | 0.00   | 0.061 | 34.02 | 0.0  | 5.40 | 15.12 |      |  |                              |      |      |      |      |      |      |     |     |      |     |       |
| 0.074 | 7.062 | 10.493 | 0.19  | 0.27  | 0.10 | 0.00 | 0.85  | 0.48 |  |                              |      |      |      |      |      |      |     |     |      |     |       |

FINAL REPORT Amargo to Disch  
REACH NO. 1 Amargo Creek

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

\*\*\*\*\* REACH INPUTS \*\*\*\*\*

| ELEM CHL A NO. | TYPE COLI #/100mL | FLOW NCM | TEMP deg C | SALN ppt | CM-1 | CM-2 | DO mg/L | BOD1 mg/L | BOD2 mg/L | EBOD1 mg/L | EBOD2 mg/L | ORG-N mg/L | NH3-N mg/L | NO3-N mg/L | P04-P mg/L |
|----------------|-------------------|----------|------------|----------|------|------|---------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| 1              | HDWTR             | 0.03478  | 32.20      | 0.00     | 0.00 | 0.00 | 7.00    | 5.00      | 6.50      | 5.00       | 6.50       | 0.00       | 0.10       | 1.00       | 1.00       |
| 0.00           | 0.00              | 0.00     |            |          |      |      |         |           |           |            |            |            |            |            |            |
| 16             | WSTLD             | 0.02629  | 32.20      | 0.00     | 0.00 | 0.00 | 2.00    | 45.00     | 58.00     | 45.00      | 58.00      | 4.00       | 6.40       | 0.21       | 1.10       |
| 0.00           | 548.00            | 0.00     |            |          |      |      |         |           |           |            |            |            |            |            |            |

\*\*\*\*\* HYDRAULIC PARAMETER VALUES \*\*\*\*\*

| ELEM TIDAL NO. VELO | BEGIN DI SPRSN DI ST km | ENDI NG MEAN DI ST VELO km | FLOW m³/s | PCT EFF | ADVCTV VELO m/s | TRAVEL TIME days | CUM TIME days | DEPTH m | WIDTH m | VOLUME m³ | SURFACE AREA m² | X-SECT AREA m² | TIDAL PRI SM m³ |
|---------------------|-------------------------|----------------------------|-----------|---------|-----------------|------------------|---------------|---------|---------|-----------|-----------------|----------------|-----------------|
|                     |                         |                            |           |         |                 |                  |               |         |         |           |                 |                |                 |

Dul ce WWTP - DO Model Output

| m/s   | m <sup>2</sup> /s | m/s   |         |      |         |      |      |      |      |       |        |      |      |
|-------|-------------------|-------|---------|------|---------|------|------|------|------|-------|--------|------|------|
| 1     | 6.70              | 6.60  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.02 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 2     | 6.60              | 6.50  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.03 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 3     | 6.50              | 6.40  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.05 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 4     | 6.40              | 6.30  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.07 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 5     | 6.30              | 6.20  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.08 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 6     | 6.20              | 6.10  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.10 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 7     | 6.10              | 6.00  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.12 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 8     | 6.00              | 5.90  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.13 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 9     | 5.90              | 5.80  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.15 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 10    | 5.80              | 5.70  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.17 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 11    | 5.70              | 5.60  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.18 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 12    | 5.60              | 5.50  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.20 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 13    | 5.50              | 5.40  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.22 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 14    | 5.40              | 5.30  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.23 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 15    | 5.30              | 5.20  | 0.03478 | 0.0  | 0.06955 | 0.02 | 0.25 | 0.20 | 2.50 | 50.01 | 249.94 | 0.50 | 0.00 |
| 0.000 | 0.000             | 0.070 |         |      |         |      |      |      |      |       |        |      |      |
| 16    | 5.20              | 5.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.27 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 17    | 5.10              | 5.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.28 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 18    | 5.00              | 4.90  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.30 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 19    | 4.90              | 4.80  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.31 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 20    | 4.80              | 4.70  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.33 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 21    | 4.70              | 4.60  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.34 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 22    | 4.60              | 4.50  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.36 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 23    | 4.50              | 4.40  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.38 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 24    | 4.40              | 4.30  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.39 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 25    | 4.30              | 4.20  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.41 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000             | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 26    | 4.20              | 4.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.42 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |

Dul ce WWTP - DO Model Output

|       |       |       |         |      |         |      |      |      |      |       |        |      |      |
|-------|-------|-------|---------|------|---------|------|------|------|------|-------|--------|------|------|
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 27    | 4.10  | 4.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.44 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 28    | 4.00  | 3.90  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.45 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 29    | 3.90  | 3.80  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.47 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 30    | 3.80  | 3.70  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.49 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 31    | 3.70  | 3.60  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.50 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 32    | 3.60  | 3.50  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.52 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 33    | 3.50  | 3.40  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.53 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 34    | 3.40  | 3.30  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.55 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 35    | 3.30  | 3.20  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.56 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 36    | 3.20  | 3.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.58 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 37    | 3.10  | 3.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.60 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 38    | 3.00  | 2.90  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.61 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 39    | 2.90  | 2.80  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.63 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 40    | 2.80  | 2.70  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.64 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 41    | 2.70  | 2.60  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.66 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 42    | 2.60  | 2.50  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.67 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 43    | 2.50  | 2.40  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.69 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 44    | 2.40  | 2.30  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.71 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 45    | 2.30  | 2.20  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.72 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 46    | 2.20  | 2.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.74 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 47    | 2.10  | 2.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.75 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 48    | 2.00  | 1.90  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.77 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 49    | 1.90  | 1.80  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.78 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 50    | 1.80  | 1.70  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.80 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 51    | 1.70  | 1.60  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.82 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |
| 52    | 1.60  | 1.50  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.83 | 0.26 | 3.22 | 83.00 | 321.99 | 0.83 | 0.00 |
| 0.000 | 0.000 | 0.074 |         |      |         |      |      |      |      |       |        |      |      |

| Dul ce WWTP - DO Model Output |       |       |         |      |         |      |      |      |      |         |          |      |      |
|-------------------------------|-------|-------|---------|------|---------|------|------|------|------|---------|----------|------|------|
| 53                            | 1.50  | 1.40  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.85 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 54                            | 1.40  | 1.30  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.86 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 55                            | 1.30  | 1.20  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.88 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 56                            | 1.20  | 1.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.89 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 57                            | 1.10  | 1.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.91 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 58                            | 1.00  | 0.90  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.93 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 59                            | 0.90  | 0.80  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.94 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 60                            | 0.80  | 0.70  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.96 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 61                            | 0.70  | 0.60  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.97 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 62                            | 0.60  | 0.50  | 0.06107 | 43.0 | 0.07358 | 0.02 | 0.99 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 63                            | 0.50  | 0.40  | 0.06107 | 43.0 | 0.07358 | 0.02 | 1.00 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 64                            | 0.40  | 0.30  | 0.06107 | 43.0 | 0.07358 | 0.02 | 1.02 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 65                            | 0.30  | 0.20  | 0.06107 | 43.0 | 0.07358 | 0.02 | 1.04 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 66                            | 0.20  | 0.10  | 0.06107 | 43.0 | 0.07358 | 0.02 | 1.05 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| 67                            | 0.10  | 0.00  | 0.06107 | 43.0 | 0.07358 | 0.02 | 1.07 | 0.26 | 3.22 | 83.00   | 321.99   | 0.83 | 0.00 |
| 0.000                         | 0.000 | 0.074 |         |      |         |      |      |      |      |         |          |      |      |
| TOT                           |       |       |         |      |         | 1.07 |      |      |      | 5066.03 | 20492.66 |      |      |
| AVG                           |       |       |         |      | 0.0726  |      |      | 0.24 | 3.06 |         |          | 0.76 |      |

\*\*\*\*\* BIOLOGICAL AND PHYSICAL COEFFICIENTS \*\*\*\*\*

| ELEM  | ENDING | SAT   | REAER | BOD1  | BOD1  | ABOD1 | BOD1 | BOD2  | BOD2 | ABOD2 | BKGD | FULL | CORR | ORG-N | ORG-N | NH3-N | NH3-N | DENIT | ORG-P |
|-------|--------|-------|-------|-------|-------|-------|------|-------|------|-------|------|------|------|-------|-------|-------|-------|-------|-------|
| ORG-P | PO4    | PHYTO | PERIP | COLI  | NCM   | NCM   | HYDR | DECAY | SETT | DECAY | SOD  | SOD  | SOD  | HYDR  | SETT  | DECAY | SRCE  | RATE  | HYDR  |
| NO.   | DIST   | D.O.  | RATE  | DECAY | SETT  | DECAY | 1/da | 1/da  | 1/da | 1/da  | *    | *    | *    | 1/da  | 1/da  | 1/da  | *     | 1/da  | 1/da  |
| SETT  | SRCE   | PROD  | PROD  | DECAY | DECAY | SETT  | 1/da | 1/da  | 1/da | 1/da  |      |      |      |       |       |       |       |       |       |
| 1/da  | *      | **    | **    | 1/da  | 1/da  | 1/da  |      |       |      |       |      |      |      |       |       |       |       |       |       |
| 1     | 6.600  | 7.27  | 12.51 | 0.18  | 0.33  | 0.00  | 0.00 | 0.09  | 0.00 | 0.00  | 0.22 | 0.29 | 0.29 | 0.13  | 0.00  | 0.78  | 0.00  | 0.00  | 0.06  |
| 0.67  | 0.09   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |      |       |      |       |      |      |      |       |       |       |       |       |       |
| 2     | 6.500  | 7.26  | 12.52 | 0.18  | 0.33  | 0.00  | 0.00 | 0.09  | 0.00 | 0.00  | 0.22 | 0.29 | 0.29 | 0.13  | 0.00  | 0.79  | 0.00  | 0.00  | 0.06  |
| 0.67  | 0.09   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |      |       |      |       |      |      |      |       |       |       |       |       |       |
| 3     | 6.400  | 7.25  | 12.54 | 0.18  | 0.34  | 0.00  | 0.00 | 0.09  | 0.00 | 0.00  | 0.22 | 0.29 | 0.29 | 0.13  | 0.00  | 0.79  | 0.00  | 0.00  | 0.06  |
| 0.67  | 0.09   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |      |       |      |       |      |      |      |       |       |       |       |       |       |
| 4     | 6.300  | 7.24  | 12.55 | 0.18  | 0.34  | 0.00  | 0.00 | 0.09  | 0.00 | 0.00  | 0.22 | 0.29 | 0.29 | 0.13  | 0.00  | 0.80  | 0.00  | 0.00  | 0.06  |
| 0.67  | 0.09   | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |      |       |      |       |      |      |      |       |       |       |       |       |       |



|    |      | Dul ce WWTP - DO Model Output |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----|------|-------------------------------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 5  | 0.67 | 6.200                         | 7.24 | 12.57 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.29 | 0.29 | 0.13 | 0.00 | 0.80 | 0.00 | 0.00 | 0.06 |
| 6  | 0.67 | 6.100                         | 7.23 | 12.58 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.30 | 0.30 | 0.13 | 0.00 | 0.80 | 0.00 | 0.00 | 0.06 |
| 7  | 0.68 | 6.000                         | 7.22 | 12.59 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.30 | 0.30 | 0.13 | 0.00 | 0.81 | 0.00 | 0.00 | 0.06 |
| 8  | 0.68 | 5.900                         | 7.21 | 12.60 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.30 | 0.30 | 0.13 | 0.00 | 0.81 | 0.00 | 0.00 | 0.06 |
| 9  | 0.68 | 5.800                         | 7.21 | 12.62 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.30 | 0.30 | 0.13 | 0.00 | 0.82 | 0.00 | 0.00 | 0.06 |
| 10 | 0.68 | 5.700                         | 7.20 | 12.63 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.30 | 0.30 | 0.13 | 0.00 | 0.82 | 0.00 | 0.00 | 0.06 |
| 11 | 0.68 | 5.600                         | 7.19 | 12.64 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.30 | 0.30 | 0.13 | 0.00 | 0.82 | 0.00 | 0.00 | 0.06 |
| 12 | 0.68 | 5.500                         | 7.19 | 12.65 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.30 | 0.30 | 0.13 | 0.00 | 0.83 | 0.00 | 0.00 | 0.06 |
| 13 | 0.68 | 5.400                         | 7.18 | 12.66 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.30 | 0.30 | 0.13 | 0.00 | 0.83 | 0.00 | 0.00 | 0.06 |
| 14 | 0.68 | 5.300                         | 7.17 | 12.67 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.30 | 0.30 | 0.13 | 0.00 | 0.83 | 0.00 | 0.00 | 0.06 |
| 15 | 0.68 | 5.200                         | 7.17 | 12.68 | 0.18 | 0.34 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.30 | 0.30 | 0.13 | 0.00 | 0.84 | 0.00 | 0.00 | 0.06 |
| 16 | 0.53 | 5.100                         | 7.21 | 10.28 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.56 | 0.56 | 0.13 | 0.00 | 0.75 | 0.00 | 0.00 | 0.06 |
| 17 | 0.53 | 5.000                         | 7.21 | 10.28 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.56 | 0.56 | 0.13 | 0.00 | 0.76 | 0.00 | 0.00 | 0.06 |
| 18 | 0.53 | 4.900                         | 7.20 | 10.29 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.22 | 0.56 | 0.56 | 0.13 | 0.00 | 0.76 | 0.00 | 0.00 | 0.06 |
| 19 | 0.53 | 4.800                         | 7.20 | 10.30 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.56 | 0.56 | 0.13 | 0.00 | 0.76 | 0.00 | 0.00 | 0.06 |
| 20 | 0.53 | 4.700                         | 7.19 | 10.30 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.56 | 0.56 | 0.13 | 0.00 | 0.77 | 0.00 | 0.00 | 0.06 |
| 21 | 0.53 | 4.600                         | 7.19 | 10.31 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.77 | 0.00 | 0.00 | 0.06 |
| 22 | 0.53 | 4.500                         | 7.18 | 10.32 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.77 | 0.00 | 0.00 | 0.06 |
| 23 | 0.53 | 4.400                         | 7.18 | 10.32 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.77 | 0.00 | 0.00 | 0.06 |
| 24 | 0.53 | 4.300                         | 7.17 | 10.33 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.78 | 0.00 | 0.00 | 0.06 |
| 25 | 0.53 | 4.200                         | 7.17 | 10.34 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.78 | 0.00 | 0.00 | 0.06 |
| 26 | 0.53 | 4.100                         | 7.16 | 10.34 | 0.18 | 0.26 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.78 | 0.00 | 0.00 | 0.06 |
| 27 | 0.53 | 4.000                         | 7.16 | 10.35 | 0.18 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.55 | 0.55 | 0.13 | 0.00 | 0.79 | 0.00 | 0.00 | 0.06 |
| 28 | 0.53 | 3.900                         | 7.16 | 10.35 | 0.18 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.54 | 0.54 | 0.13 | 0.00 | 0.79 | 0.00 | 0.00 | 0.06 |
| 29 | 0.53 | 3.800                         | 7.15 | 10.36 | 0.18 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.54 | 0.54 | 0.13 | 0.00 | 0.79 | 0.00 | 0.00 | 0.07 |
| 30 | 0.53 | 3.700                         | 7.15 | 10.36 | 0.18 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.54 | 0.54 | 0.13 | 0.00 | 0.79 | 0.00 | 0.00 | 0.07 |
| 31 |      | 3.600                         | 7.15 | 10.37 | 0.18 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.23 | 0.54 | 0.54 | 0.13 | 0.00 | 0.79 | 0.00 | 0.00 | 0.07 |



Dul ce WWTP - DO Model Output

|      |       |      |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|-------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 58   | 0.900 | 7.08 | 10.47 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.50 | 0.50 | 0.13 | 0.00 | 0.84 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.07  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.50 | 0.50 | 0.13 | 0.00 | 0.84 | 0.00 | 0.00 | 0.07 |
| 59   | 0.800 | 7.07 | 10.47 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.50 | 0.50 | 0.13 | 0.00 | 0.84 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.07  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.50 | 0.50 | 0.13 | 0.00 | 0.84 | 0.00 | 0.00 | 0.07 |
| 60   | 0.700 | 7.07 | 10.48 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.07  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 61   | 0.600 | 7.07 | 10.48 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 62   | 0.500 | 7.07 | 10.48 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 63   | 0.400 | 7.07 | 10.48 | 0.19 | 0.27 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 64   | 0.300 | 7.07 | 10.49 | 0.19 | 0.27 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 65   | 0.200 | 7.06 | 10.49 | 0.19 | 0.27 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 66   | 0.100 | 7.06 | 10.49 | 0.19 | 0.27 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.49 | 0.49 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.48 | 0.48 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 67   | 0.000 | 7.06 | 10.49 | 0.19 | 0.27 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.48 | 0.48 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |
| 0.54 | 0.06  | 0.00 | 0.00  | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.24 | 0.48 | 0.48 | 0.13 | 0.00 | 0.85 | 0.00 | 0.00 | 0.07 |

|      |      |     |   |      |      |      |      |      |      |      |      |      |      |  |  |      |      |      |      |      |      |
|------|------|-----|---|------|------|------|------|------|------|------|------|------|------|--|--|------|------|------|------|------|------|
| AVG  | 20   | DEG | C | RATE | 8.56 | 0.10 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.00 | 0.10 |  |  | 0.10 | 0.00 | 0.30 | 0.00 | 0.02 | 0.05 |
| 0.01 | 0.01 |     |   |      | 2.00 | 0.00 | 0.00 |      |      |      |      |      |      |  |  |      |      |      |      |      |      |

\* g/m<sup>2</sup>/d                      \*\* mg/L/day

\*\*\*\*\* WATER QUALITY CONSTITUENT VALUES \*\*\*\*\*

| ELEM<br>ORG-P<br>NO. | ENDING<br>P04-P<br>DI ST<br>mg/L | TEMP<br>TOT-P<br>deg C<br>mg/L | SALN<br>EORG-P<br>ppt<br>mg/L | CM-1<br>ETOT-P<br>mg/L | CM-2<br>CHL A<br>µg/L | DO<br>PERIP<br>mg/L<br>g/m <sup>2</sup> | BOD1<br>COLI<br>mg/L | BOD2<br>NCM<br>mg/L | EBOD1<br>mg/L | EBOD2<br>mg/L | ORG-N<br>mg/L | NH3-N<br>mg/L | N03-N<br>mg/L | TOT-N<br>mg/L | EORG-N<br>mg/L | ETOT-N<br>mg/L |
|----------------------|----------------------------------|--------------------------------|-------------------------------|------------------------|-----------------------|---|----------------------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|
| 1                    | 6.600                            | 32.28                          | 0.00                          | 1.00                   | 0.00                  | 6.99                                    | 4.96                 | 6.49                | 4.96          | 6.49          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 0.99                 | 1.01                             | 2.00                           | 0.99                          | 2.00                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 2                    | 6.500                            | 32.35                          | 0.00                          | 1.00                   | 0.00                  | 6.97                                    | 4.92                 | 6.48                | 4.92          | 6.48          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 0.98                 | 1.02                             | 1.99                           | 0.98                          | 1.99                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 3                    | 6.400                            | 32.42                          | 0.00                          | 1.00                   | 0.00                  | 6.96                                    | 4.87                 | 6.47                | 4.87          | 6.47          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 0.96                 | 1.02                             | 1.99                           | 0.96                          | 1.99                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.10          | 1.00          | 1.10          | 0.00           | 1.10           |
| 4                    | 6.300                            | 32.49                          | 0.00                          | 1.00                   | 0.00                  | 6.95                                    | 4.83                 | 6.46                | 4.83          | 6.46          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.95                 | 1.03                             | 1.99                           | 0.95                          | 1.99                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 5                    | 6.200                            | 32.56                          | 0.00                          | 1.00                   | 0.00                  | 6.94                                    | 4.79                 | 6.45                | 4.79          | 6.45          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.94                 | 1.04                             | 1.98                           | 0.94                          | 1.98                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 6                    | 6.100                            | 32.62                          | 0.00                          | 1.00                   | 0.00                  | 6.93                                    | 4.75                 | 6.44                | 4.75          | 6.44          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.93                 | 1.05                             | 1.98                           | 0.93                          | 1.98                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 7                    | 6.000                            | 32.69                          | 0.00                          | 1.00                   | 0.00                  | 6.92                                    | 4.71                 | 6.43                | 4.71          | 6.43          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.92                 | 1.06                             | 1.98                           | 0.92                          | 1.98                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 8                    | 5.900                            | 32.75                          | 0.00                          | 1.00                   | 0.00                  | 6.91                                    | 4.67                 | 6.42                | 4.67          | 6.42          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.91                 | 1.07                             | 1.97                           | 0.91                          | 1.97                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 9                    | 5.800                            | 32.81                          | 0.00                          | 1.00                   | 0.00                  | 6.90                                    | 4.63                 | 6.41                | 4.63          | 6.41          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |
| 0.90                 | 1.07                             | 1.97                           | 0.90                          | 1.97                   | 0.0                   | 0.0                                     | 0.0                  | 0.00                | 0.00          | 0.00          | 0.00          | 0.09          | 1.01          | 1.10          | 0.00           | 1.10           |

Dul ce WWTP - DO Model Output

|      |       |       |      |      |      |      |       |       |       |       |      |      |      |      |      |      |
|------|-------|-------|------|------|------|------|-------|-------|-------|-------|------|------|------|------|------|------|
| 10   | 5.700 | 32.86 | 0.00 | 1.00 | 0.00 | 6.90 | 4.59  | 6.40  | 4.59  | 6.40  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 0.89 | 1.08  | 1.97  | 0.89 | 1.97 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 11   | 5.600 | 32.92 | 0.00 | 1.00 | 0.00 | 6.89 | 4.55  | 6.39  | 4.55  | 6.39  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 0.87 | 1.09  | 1.96  | 0.87 | 1.96 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 12   | 5.500 | 32.97 | 0.00 | 1.00 | 0.00 | 6.88 | 4.51  | 6.39  | 4.51  | 6.39  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 0.86 | 1.10  | 1.96  | 0.86 | 1.96 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.09 | 1.01 | 1.10 | 0.00 | 1.10 |
| 13   | 5.400 | 33.02 | 0.00 | 1.00 | 0.00 | 6.88 | 4.47  | 6.38  | 4.47  | 6.38  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 0.85 | 1.10  | 1.96  | 0.85 | 1.96 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 14   | 5.300 | 33.07 | 0.00 | 1.00 | 0.00 | 6.87 | 4.43  | 6.37  | 4.43  | 6.37  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 0.84 | 1.11  | 1.95  | 0.84 | 1.95 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 15   | 5.200 | 33.12 | 0.00 | 1.00 | 0.00 | 6.86 | 4.40  | 6.36  | 4.40  | 6.36  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 0.83 | 1.12  | 1.95  | 0.83 | 1.95 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 0.08 | 1.02 | 1.10 | 0.00 | 1.10 |
| 16   | 5.100 | 32.77 | 0.00 | 1.00 | 0.00 | 4.80 | 21.72 | 28.55 | 21.72 | 28.55 | 1.72 | 2.77 | 0.70 | 5.19 | 1.72 | 5.19 |
| 0.90 | 1.12  | 2.01  | 0.90 | 2.01 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.77 | 0.70 | 5.19 | 1.72 | 5.19 |
| 17   | 5.000 | 32.81 | 0.00 | 1.00 | 0.00 | 4.83 | 21.57 | 28.51 | 21.57 | 28.51 | 1.71 | 2.74 | 0.74 | 5.19 | 1.71 | 5.19 |
| 0.89 | 1.12  | 2.01  | 0.89 | 2.01 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.74 | 0.74 | 5.19 | 1.71 | 5.19 |
| 18   | 4.900 | 32.85 | 0.00 | 1.00 | 0.00 | 4.85 | 21.42 | 28.47 | 21.42 | 28.47 | 1.71 | 2.71 | 0.77 | 5.19 | 1.71 | 5.19 |
| 0.88 | 1.13  | 2.01  | 0.88 | 2.01 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.71 | 0.77 | 5.19 | 1.71 | 5.19 |
| 19   | 4.800 | 32.89 | 0.00 | 1.00 | 0.00 | 4.88 | 21.28 | 28.43 | 21.28 | 28.43 | 1.71 | 2.69 | 0.80 | 5.19 | 1.71 | 5.19 |
| 0.87 | 1.13  | 2.01  | 0.87 | 2.01 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.69 | 0.80 | 5.19 | 1.71 | 5.19 |
| 20   | 4.700 | 32.93 | 0.00 | 1.00 | 0.00 | 4.90 | 21.13 | 28.39 | 21.13 | 28.39 | 1.70 | 2.66 | 0.83 | 5.19 | 1.70 | 5.19 |
| 0.86 | 1.14  | 2.00  | 0.86 | 2.00 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.66 | 0.83 | 5.19 | 1.70 | 5.19 |
| 21   | 4.600 | 32.97 | 0.00 | 1.00 | 0.00 | 4.92 | 20.98 | 28.34 | 20.98 | 28.34 | 1.70 | 2.63 | 0.86 | 5.19 | 1.70 | 5.19 |
| 0.86 | 1.15  | 2.00  | 0.86 | 2.00 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.63 | 0.86 | 5.19 | 1.70 | 5.19 |
| 22   | 4.500 | 33.01 | 0.00 | 1.00 | 0.00 | 4.93 | 20.83 | 28.30 | 20.83 | 28.30 | 1.70 | 2.60 | 0.90 | 5.19 | 1.70 | 5.19 |
| 0.85 | 1.15  | 2.00  | 0.85 | 2.00 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.60 | 0.90 | 5.19 | 1.70 | 5.19 |
| 23   | 4.400 | 33.05 | 0.00 | 1.00 | 0.00 | 4.95 | 20.69 | 28.26 | 20.69 | 28.26 | 1.69 | 2.57 | 0.93 | 5.19 | 1.69 | 5.19 |
| 0.84 | 1.16  | 2.00  | 0.84 | 2.00 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.57 | 0.93 | 5.19 | 1.69 | 5.19 |
| 24   | 4.300 | 33.08 | 0.00 | 1.00 | 0.00 | 4.96 | 20.54 | 28.22 | 20.54 | 28.22 | 1.69 | 2.54 | 0.96 | 5.19 | 1.69 | 5.19 |
| 0.83 | 1.16  | 2.00  | 0.83 | 2.00 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.54 | 0.96 | 5.19 | 1.69 | 5.19 |
| 25   | 4.200 | 33.12 | 0.00 | 1.00 | 0.00 | 4.98 | 20.40 | 28.18 | 20.40 | 28.18 | 1.69 | 2.52 | 0.99 | 5.19 | 1.69 | 5.19 |
| 0.82 | 1.17  | 1.99  | 0.82 | 1.99 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.52 | 0.99 | 5.19 | 1.69 | 5.19 |
| 26   | 4.100 | 33.15 | 0.00 | 1.00 | 0.00 | 4.99 | 20.26 | 28.14 | 20.26 | 28.14 | 1.68 | 2.49 | 1.02 | 5.19 | 1.68 | 5.19 |
| 0.82 | 1.17  | 1.99  | 0.82 | 1.99 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.49 | 1.02 | 5.19 | 1.68 | 5.19 |
| 27   | 4.000 | 33.19 | 0.00 | 1.00 | 0.00 | 5.00 | 20.12 | 28.10 | 20.12 | 28.10 | 1.68 | 2.46 | 1.05 | 5.19 | 1.68 | 5.19 |
| 0.81 | 1.18  | 1.99  | 0.81 | 1.99 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.46 | 1.05 | 5.19 | 1.68 | 5.19 |
| 28   | 3.900 | 33.22 | 0.00 | 1.00 | 0.00 | 5.01 | 19.98 | 28.06 | 19.98 | 28.06 | 1.68 | 2.44 | 1.08 | 5.19 | 1.68 | 5.19 |
| 0.80 | 1.19  | 1.99  | 0.80 | 1.99 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.44 | 1.08 | 5.19 | 1.68 | 5.19 |
| 29   | 3.800 | 33.25 | 0.00 | 1.00 | 0.00 | 5.03 | 19.84 | 28.02 | 19.84 | 28.02 | 1.67 | 2.41 | 1.11 | 5.19 | 1.67 | 5.19 |
| 0.79 | 1.19  | 1.99  | 0.79 | 1.99 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.41 | 1.11 | 5.19 | 1.67 | 5.19 |
| 30   | 3.700 | 33.28 | 0.00 | 1.00 | 0.00 | 5.04 | 19.70 | 27.98 | 19.70 | 27.98 | 1.67 | 2.38 | 1.14 | 5.19 | 1.67 | 5.19 |
| 0.79 | 1.20  | 1.98  | 0.79 | 1.98 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.38 | 1.14 | 5.19 | 1.67 | 5.19 |
| 31   | 3.600 | 33.31 | 0.00 | 1.00 | 0.00 | 5.05 | 19.56 | 27.94 | 19.56 | 27.94 | 1.67 | 2.36 | 1.17 | 5.19 | 1.67 | 5.19 |
| 0.78 | 1.20  | 1.98  | 0.78 | 1.98 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.36 | 1.17 | 5.19 | 1.67 | 5.19 |
| 32   | 3.500 | 33.34 | 0.00 | 1.00 | 0.00 | 5.06 | 19.42 | 27.90 | 19.42 | 27.90 | 1.66 | 2.33 | 1.20 | 5.19 | 1.66 | 5.19 |
| 0.77 | 1.21  | 1.98  | 0.77 | 1.98 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.33 | 1.20 | 5.19 | 1.66 | 5.19 |
| 33   | 3.400 | 33.37 | 0.00 | 1.00 | 0.00 | 5.07 | 19.28 | 27.86 | 19.28 | 27.86 | 1.66 | 2.31 | 1.23 | 5.19 | 1.66 | 5.19 |
| 0.77 | 1.21  | 1.98  | 0.77 | 1.98 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.31 | 1.23 | 5.19 | 1.66 | 5.19 |
| 34   | 3.300 | 33.40 | 0.00 | 1.00 | 0.00 | 5.08 | 19.15 | 27.82 | 19.15 | 27.82 | 1.66 | 2.28 | 1.26 | 5.19 | 1.66 | 5.19 |
| 0.76 | 1.22  | 1.98  | 0.76 | 1.98 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.28 | 1.26 | 5.19 | 1.66 | 5.19 |
| 35   | 3.200 | 33.43 | 0.00 | 1.00 | 0.00 | 5.09 | 19.01 | 27.78 | 19.01 | 27.78 | 1.65 | 2.26 | 1.29 | 5.19 | 1.65 | 5.19 |
| 0.75 | 1.22  | 1.97  | 0.75 | 1.97 | 0.0  | 0.0  | 0.0   | 0.00  | 0.00  | 0.00  | 0.00 | 2.26 | 1.29 | 5.19 | 1.65 | 5.19 |
| 36   | 3.100 | 33.45 | 0.00 | 1.00 | 0.00 | 5.10 | 18.88 | 27.74 | 18.88 | 27.74 | 1.65 | 2.23 | 1.31 | 5.19 | 1.65 | 5.19 |

Dul ce WWTP - DO Model Output

|      |       |       |      |      |      |      |      |      |       |       |       |       |       |      |      |      |      |      |      |
|------|-------|-------|------|------|------|------|------|------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| 0.74 | 1.23  | 1.97  | 0.74 | 1.97 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.74 | 27.70 | 18.74 | 27.70 | 1.65 | 2.21 | 1.34 | 5.19 | 1.65 | 5.19 |
| 37   | 3.000 | 33.48 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.11 | 18.74 | 27.70 | 18.74 | 27.70 | 1.65  | 2.21 | 1.34 | 5.19 | 1.65 | 5.19 |      |
| 0.74 | 1.23  | 1.97  | 0.74 | 1.97 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.74 | 27.70 | 18.74 | 27.70 | 1.65 | 2.21 | 1.34 | 5.19 | 1.65 | 5.19 |
| 38   | 2.900 | 33.50 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.12 | 18.61 | 27.66 | 18.61 | 27.66 | 1.64  | 2.18 | 1.37 | 5.19 | 1.64 | 5.19 |      |
| 0.73 | 1.24  | 1.97  | 0.73 | 1.97 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.48 | 27.62 | 18.48 | 27.62 | 1.64 | 2.16 | 1.40 | 5.19 | 1.64 | 5.19 |
| 39   | 2.800 | 33.53 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.13 | 18.48 | 27.62 | 18.48 | 27.62 | 1.64  | 2.16 | 1.40 | 5.19 | 1.64 | 5.19 |      |
| 0.72 | 1.24  | 1.97  | 0.72 | 1.97 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.35 | 27.58 | 18.35 | 27.58 | 1.64 | 2.13 | 1.42 | 5.19 | 1.64 | 5.19 |
| 40   | 2.700 | 33.55 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.14 | 18.35 | 27.58 | 18.35 | 27.58 | 1.64  | 2.13 | 1.42 | 5.19 | 1.64 | 5.19 |      |
| 0.72 | 1.25  | 1.97  | 0.72 | 1.97 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.22 | 27.54 | 18.22 | 27.54 | 1.63 | 2.11 | 1.45 | 5.19 | 1.63 | 5.19 |
| 41   | 2.600 | 33.58 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.15 | 18.22 | 27.54 | 18.22 | 27.54 | 1.63  | 2.11 | 1.45 | 5.19 | 1.63 | 5.19 |      |
| 0.71 | 1.26  | 1.96  | 0.71 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 18.09 | 27.49 | 18.09 | 27.49 | 1.63 | 2.09 | 1.48 | 5.19 | 1.63 | 5.19 |
| 42   | 2.500 | 33.60 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.16 | 18.09 | 27.49 | 18.09 | 27.49 | 1.63  | 2.09 | 1.48 | 5.19 | 1.63 | 5.19 |      |
| 0.70 | 1.26  | 1.96  | 0.70 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.96 | 27.45 | 17.96 | 27.45 | 1.63 | 2.06 | 1.50 | 5.19 | 1.63 | 5.19 |
| 43   | 2.400 | 33.62 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.17 | 17.96 | 27.45 | 17.96 | 27.45 | 1.63  | 2.06 | 1.50 | 5.19 | 1.63 | 5.19 |      |
| 0.70 | 1.27  | 1.96  | 0.70 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.83 | 27.41 | 17.83 | 27.41 | 1.62 | 2.04 | 1.53 | 5.19 | 1.62 | 5.19 |
| 44   | 2.300 | 33.64 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.18 | 17.83 | 27.41 | 17.83 | 27.41 | 1.62  | 2.04 | 1.53 | 5.19 | 1.62 | 5.19 |      |
| 0.69 | 1.27  | 1.96  | 0.69 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.71 | 27.37 | 17.71 | 27.37 | 1.62 | 2.02 | 1.56 | 5.19 | 1.62 | 5.19 |
| 45   | 2.200 | 33.67 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.19 | 17.71 | 27.37 | 17.71 | 27.37 | 1.62  | 2.02 | 1.56 | 5.19 | 1.62 | 5.19 |      |
| 0.68 | 1.28  | 1.96  | 0.68 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.58 | 27.33 | 17.58 | 27.33 | 1.62 | 1.99 | 1.58 | 5.19 | 1.62 | 5.19 |
| 46   | 2.100 | 33.69 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.20 | 17.58 | 27.33 | 17.58 | 27.33 | 1.62  | 1.99 | 1.58 | 5.19 | 1.62 | 5.19 |      |
| 0.68 | 1.28  | 1.96  | 0.68 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.45 | 27.29 | 17.45 | 27.29 | 1.61 | 1.97 | 1.61 | 5.19 | 1.61 | 5.19 |
| 47   | 2.000 | 33.71 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.21 | 17.45 | 27.29 | 17.45 | 27.29 | 1.61  | 1.97 | 1.61 | 5.19 | 1.61 | 5.19 |      |
| 0.67 | 1.29  | 1.96  | 0.67 | 1.96 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.33 | 27.25 | 17.33 | 27.25 | 1.61 | 1.95 | 1.63 | 5.19 | 1.61 | 5.19 |
| 48   | 1.900 | 33.73 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.21 | 17.33 | 27.25 | 17.33 | 27.25 | 1.61  | 1.95 | 1.63 | 5.19 | 1.61 | 5.19 |      |
| 0.66 | 1.29  | 1.95  | 0.66 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.21 | 27.21 | 17.21 | 27.21 | 1.61 | 1.93 | 1.66 | 5.19 | 1.61 | 5.19 |
| 49   | 1.800 | 33.75 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.22 | 17.21 | 27.21 | 17.21 | 27.21 | 1.61  | 1.93 | 1.66 | 5.19 | 1.61 | 5.19 |      |
| 0.66 | 1.30  | 1.95  | 0.66 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 17.08 | 27.17 | 17.08 | 27.17 | 1.60 | 1.91 | 1.68 | 5.19 | 1.60 | 5.19 |
| 50   | 1.700 | 33.77 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.23 | 17.08 | 27.17 | 17.08 | 27.17 | 1.60  | 1.91 | 1.68 | 5.19 | 1.60 | 5.19 |      |
| 0.65 | 1.30  | 1.95  | 0.65 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.96 | 27.13 | 16.96 | 27.13 | 1.60 | 1.89 | 1.71 | 5.19 | 1.60 | 5.19 |
| 51   | 1.600 | 33.78 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.24 | 16.96 | 27.13 | 16.96 | 27.13 | 1.60  | 1.89 | 1.71 | 5.19 | 1.60 | 5.19 |      |
| 0.65 | 1.31  | 1.95  | 0.65 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.84 | 27.09 | 16.84 | 27.09 | 1.60 | 1.86 | 1.73 | 5.19 | 1.60 | 5.19 |
| 52   | 1.500 | 33.80 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.25 | 16.84 | 27.09 | 16.84 | 27.09 | 1.60  | 1.86 | 1.73 | 5.19 | 1.60 | 5.19 |      |
| 0.64 | 1.31  | 1.95  | 0.64 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.72 | 27.05 | 16.72 | 27.05 | 1.59 | 1.84 | 1.76 | 5.19 | 1.59 | 5.19 |
| 53   | 1.400 | 33.82 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.26 | 16.72 | 27.05 | 16.72 | 27.05 | 1.59  | 1.84 | 1.76 | 5.19 | 1.59 | 5.19 |      |
| 0.63 | 1.31  | 1.95  | 0.63 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.60 | 27.01 | 16.60 | 27.01 | 1.59 | 1.82 | 1.78 | 5.19 | 1.59 | 5.19 |
| 54   | 1.300 | 33.84 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.27 | 16.60 | 27.01 | 16.60 | 27.01 | 1.59  | 1.82 | 1.78 | 5.19 | 1.59 | 5.19 |      |
| 0.63 | 1.32  | 1.95  | 0.63 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.48 | 26.97 | 16.48 | 26.97 | 1.59 | 1.80 | 1.81 | 5.19 | 1.59 | 5.19 |
| 55   | 1.200 | 33.85 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.28 | 16.48 | 26.97 | 16.48 | 26.97 | 1.59  | 1.80 | 1.81 | 5.19 | 1.59 | 5.19 |      |
| 0.62 | 1.32  | 1.95  | 0.62 | 1.95 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.36 | 26.93 | 16.36 | 26.93 | 1.58 | 1.78 | 1.83 | 5.19 | 1.58 | 5.19 |
| 56   | 1.100 | 33.87 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.29 | 16.36 | 26.93 | 16.36 | 26.93 | 1.58  | 1.78 | 1.83 | 5.19 | 1.58 | 5.19 |      |
| 0.62 | 1.33  | 1.94  | 0.62 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.25 | 26.89 | 16.25 | 26.89 | 1.58 | 1.76 | 1.85 | 5.19 | 1.58 | 5.19 |
| 57   | 1.000 | 33.89 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.30 | 16.25 | 26.89 | 16.25 | 26.89 | 1.58  | 1.76 | 1.85 | 5.19 | 1.58 | 5.19 |      |
| 0.61 | 1.33  | 1.94  | 0.61 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.13 | 26.85 | 16.13 | 26.85 | 1.58 | 1.74 | 1.88 | 5.19 | 1.58 | 5.19 |
| 58   | 0.900 | 33.90 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.31 | 16.13 | 26.85 | 16.13 | 26.85 | 1.58  | 1.74 | 1.88 | 5.19 | 1.58 | 5.19 |      |
| 0.60 | 1.34  | 1.94  | 0.60 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 16.01 | 26.81 | 16.01 | 26.81 | 1.57 | 1.72 | 1.90 | 5.19 | 1.57 | 5.19 |
| 59   | 0.800 | 33.92 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.32 | 16.01 | 26.81 | 16.01 | 26.81 | 1.57  | 1.72 | 1.90 | 5.19 | 1.57 | 5.19 |      |
| 0.60 | 1.34  | 1.94  | 0.60 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 15.90 | 26.77 | 15.90 | 26.77 | 1.57 | 1.70 | 1.92 | 5.19 | 1.57 | 5.19 |
| 60   | 0.700 | 33.93 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.33 | 15.90 | 26.77 | 15.90 | 26.77 | 1.57  | 1.70 | 1.92 | 5.19 | 1.57 | 5.19 |      |
| 0.59 | 1.35  | 1.94  | 0.59 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 15.78 | 26.73 | 15.78 | 26.73 | 1.57 | 1.68 | 1.94 | 5.19 | 1.57 | 5.19 |
| 61   | 0.600 | 33.94 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.34 | 15.78 | 26.73 | 15.78 | 26.73 | 1.57  | 1.68 | 1.94 | 5.19 | 1.57 | 5.19 |      |
| 0.59 | 1.35  | 1.94  | 0.59 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 15.67 | 26.69 | 15.67 | 26.69 | 1.56 | 1.66 | 1.97 | 5.19 | 1.56 | 5.19 |
| 62   | 0.500 | 33.96 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 5.35 | 15.67 | 26.69 | 15.67 | 26.69 | 1.56  | 1.66 | 1.97 | 5.19 | 1.56 | 5.19 |      |
| 0.58 | 1.36  | 1.94  | 0.58 | 1.94 | 0.0  | 0.0  | 0.0  | 0.0  | 0.00  | 0.0   | 0.00  | 0.0   | 0.00  | 0.0  | 0.00 | 0.0  | 0.00 | 0.0  | 0.00 |

Dulce WWTP - DO Model Output

|      |       |       |      |      |      |      |       |       |       |       |       |       |       |      |      |      |      |      |      |
|------|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| 63   | 0.400 | 33.97 | 0.00 | 1.00 | 0.00 | 5.36 | 15.56 | 26.65 | 15.56 | 26.65 | 1.56  | 1.65  | 1.99  | 5.19 | 1.56 | 5.19 |      |      |      |
| 0.58 | 1.36  | 1.94  | 0.58 | 1.94 | 0.0  | 0.0  | 0.0   | 0.00  | 5.37  | 15.45 | 26.61 | 15.45 | 26.61 | 1.56 | 1.63 | 2.01 | 5.19 | 1.56 | 5.19 |
| 64   | 0.300 | 33.99 | 0.00 | 1.00 | 0.00 | 5.37 | 15.45 | 26.61 | 15.45 | 26.61 | 1.56  | 1.63  | 2.01  | 5.19 | 1.56 | 5.19 |      |      |      |
| 0.57 | 1.37  | 1.94  | 0.57 | 1.94 | 0.0  | 0.0  | 0.0   | 0.00  | 5.38  | 15.34 | 26.57 | 15.34 | 26.57 | 1.55 | 1.61 | 2.03 | 5.19 | 1.55 | 5.19 |
| 65   | 0.200 | 34.00 | 0.00 | 1.00 | 0.00 | 5.38 | 15.34 | 26.57 | 15.34 | 26.57 | 1.55  | 1.61  | 2.03  | 5.19 | 1.55 | 5.19 |      |      |      |
| 0.57 | 1.37  | 1.94  | 0.57 | 1.94 | 0.0  | 0.0  | 0.0   | 0.00  | 5.39  | 15.23 | 26.53 | 15.23 | 26.53 | 1.55 | 1.59 | 2.05 | 5.19 | 1.55 | 5.19 |
| 66   | 0.100 | 34.01 | 0.00 | 1.00 | 0.00 | 5.39 | 15.23 | 26.53 | 15.23 | 26.53 | 1.55  | 1.59  | 2.05  | 5.19 | 1.55 | 5.19 |      |      |      |
| 0.56 | 1.37  | 1.93  | 0.56 | 1.93 | 0.0  | 0.0  | 0.0   | 0.00  | 5.40  | 15.12 | 26.49 | 15.12 | 26.49 | 1.55 | 1.57 | 2.07 | 5.19 | 1.55 | 5.19 |
| 67   | 0.000 | 34.02 | 0.00 | 1.00 | 0.00 | 5.40 | 15.12 | 26.49 | 15.12 | 26.49 | 1.55  | 1.57  | 2.07  | 5.19 | 1.55 | 5.19 |      |      |      |
| 0.55 | 1.38  | 1.93  | 0.55 | 1.93 | 0.0  | 0.0  | 0.0   | 0.00  |       |       |       |       |       |      |      |      |      |      |      |

\*\*\*\*\* PHYTOPLANKTON AND PERI PHYTON DATA \*\*\*\*\*

| ELEM PERI NO. N&P LIM | ENDING PERI SPC LIM | BANK PERI SHADE GROW frac 1/da | SECCHI PERI DEPTH RESP m 1/da | PHYT PERI DEATH PREF 1/da | PHYT PERI LIT P/R LIM | PHYT PERI N P PERIP LIM LIM g/m <sup>2</sup> | PHYT PERI N&P LIM | PHYT PERI TOT LIM | PHYT PERI GROW 1/da | PHYT PERI RESP 1/da | PHYT PERI DEATH 1/da | PHYT PERI SETT 1/da | PHYT PERI P/R RATIO | PHYTO µg/L | PERI PERI N LIM | PERI PERI LIT LIM | PERI PERI N LIM | PERI PERI P LIM |      |
|-----------------------|---------------------|--------------------------------|-------------------------------|---------------------------|-----------------------|--|-------------------|-------------------|---------------------|---------------------|----------------------|---------------------|---------------------|------------|-----------------|-------------------|-----------------|-----------------|------|
| 1                     | 6.600               | 0.02                           | 1.00                          | 0.91                      | 0.46                  | 0.79   | 0.96              | 0.86              | 0.40                | 1.392               | 0.351                | 0.176               | 0.334               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 2                     | 6.500               | 0.02                           | 1.00                          | 0.91                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.397               | 0.353                | 0.176               | 0.335               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 3                     | 6.400               | 0.02                           | 1.00                          | 0.91                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.402               | 0.354                | 0.177               | 0.336               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 4                     | 6.300               | 0.02                           | 1.00                          | 0.91                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.406               | 0.355                | 0.177               | 0.336               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 5                     | 6.200               | 0.02                           | 1.00                          | 0.91                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.411               | 0.356                | 0.178               | 0.337               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 6                     | 6.100               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.415               | 0.357                | 0.179               | 0.337               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 7                     | 6.000               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.419               | 0.358                | 0.179               | 0.338               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 8                     | 5.900               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.424               | 0.359                | 0.180               | 0.338               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 9                     | 5.800               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.428               | 0.360                | 0.180               | 0.339               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 10                    | 5.700               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.432               | 0.361                | 0.181               | 0.339               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 11                    | 5.600               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.435               | 0.362                | 0.181               | 0.339               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 12                    | 5.500               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.96              | 0.87              | 0.40                | 1.439               | 0.363                | 0.181               | 0.340               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 13                    | 5.400               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.97              | 0.87              | 0.40                | 1.442               | 0.364                | 0.182               | 0.340               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 14                    | 5.300               | 0.02                           | 1.00                          | 0.92                      | 0.46                  | 0.79   | 0.97              | 0.87              | 0.40                | 1.446               | 0.365                | 0.182               | 0.341               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 15                    | 5.200               | 0.02                           | 1.00                          | 0.93                      | 0.46                  | 0.79   | 0.97              | 0.87              | 0.40                | 1.449               | 0.365                | 0.183               | 0.341               | 3.2        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |
| 16                    | 5.100               | 0.02                           | 1.00                          | 0.20                      | 0.46                  | 0.92   | 0.97              | 0.94              | 0.44                | 1.568               | 0.360                | 0.180               | 0.263               | 3.5        | 0.0             | 0.91              | 0.00            | 0.00            | 0.00 |



| Dul ce WWTP - DO Model Output |       |       |       |       |      |      |      |      |      |       |       |       |       |     |     |      |      |      |      |  |
|-------------------------------|-------|-------|-------|-------|------|------|------|------|------|-------|-------|-------|-------|-----|-----|------|------|------|------|--|
| 43                            | 2.400 | 0.02  | 1.00  | 0.42  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.636 | 0.374 | 0.187 | 0.268 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 44                            | 2.300 | 0.02  | 1.00  | 0.43  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.637 | 0.374 | 0.187 | 0.268 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 45                            | 2.200 | 0.02  | 1.00  | 0.44  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.639 | 0.375 | 0.187 | 0.268 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 46                            | 2.100 | 0.02  | 1.00  | 0.44  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.641 | 0.375 | 0.188 | 0.268 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 47                            | 2.000 | 0.02  | 1.00  | 0.45  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.643 | 0.375 | 0.188 | 0.268 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 48                            | 1.900 | 0.02  | 1.00  | 0.46  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.644 | 0.376 | 0.188 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 49                            | 1.800 | 0.02  | 1.00  | 0.46  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.646 | 0.376 | 0.188 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 50                            | 1.700 | 0.02  | 1.00  | 0.47  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.647 | 0.376 | 0.188 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 51                            | 1.600 | 0.02  | 1.00  | 0.48  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.649 | 0.377 | 0.188 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 52                            | 1.500 | 0.02  | 1.00  | 0.48  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.651 | 0.377 | 0.188 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 53                            | 1.400 | 0.02  | 1.00  | 0.49  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.652 | 0.377 | 0.189 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 54                            | 1.300 | 0.02  | 1.00  | 0.49  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.653 | 0.378 | 0.189 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 55                            | 1.200 | 0.02  | 1.00  | 0.50  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.655 | 0.378 | 0.189 | 0.269 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 56                            | 1.100 | 0.02  | 1.00  | 0.51  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.656 | 0.378 | 0.189 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 57                            | 1.000 | 0.02  | 1.00  | 0.51  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.658 | 0.378 | 0.189 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 58                            | 0.900 | 0.02  | 1.00  | 0.52  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.659 | 0.379 | 0.189 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 59                            | 0.800 | 0.02  | 1.00  | 0.52  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.660 | 0.379 | 0.189 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 60                            | 0.700 | 0.02  | 1.00  | 0.53  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.661 | 0.379 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 61                            | 0.600 | 0.02  | 1.00  | 0.54  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.663 | 0.379 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 62                            | 0.500 | 0.02  | 1.00  | 0.54  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.664 | 0.380 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 63                            | 0.400 | 0.02  | 1.00  | 0.55  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.665 | 0.380 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 64                            | 0.300 | 0.02  | 1.00  | 0.55  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.666 | 0.380 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 65                            | 0.200 | 0.02  | 1.00  | 0.56  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.667 | 0.380 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 66                            | 0.100 | 0.02  | 1.00  | 0.56  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.668 | 0.381 | 0.190 | 0.270 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 67                            | 0.000 | 0.02  | 1.00  | 0.57  | 0.46 | 0.92 | 0.97 | 0.95 | 0.44 | 1.669 | 0.381 | 0.190 | 0.271 | 3.5 | 0.0 | 0.91 | 0.00 | 0.00 | 0.00 |  |
| 0.00                          | 0.00  | 0.00  | 0.000 | 0.000 | 0.0  |      | 0.0  |      |      |       |       |       |       |     |     |      |      |      |      |  |
| 20 DEG C RATE                 |       |       |       |       |      |      |      |      |      | 2.000 | 0.200 | 0.100 | 0.050 |     |     |      |      |      |      |  |
|                               | 1.000 | 0.100 | 0.100 |       |      |      |      |      |      |       |       |       |       |     |     |      |      |      |      |  |



Dulce WWTP - DO Model Output

NOTE ON NITR PREF: 1.0=N03 ; 0.0=NH3

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

REACH SUMMARY REPORT: Amargo to Disch

| RCH NO. | REACH NAME   | AVG VELO | AVG DEPTH | AVG WIDTH | BEGIN DIST | ENDING DIST | REACH LENGTH | TRAVEL TIME | FLOW AT RCH END | AVG VELO | AVG DEPTH | AVG WIDTH | FLOW AT RCH END |
|---------|--------------|----------|-----------|-----------|------------|-------------|--------------|-------------|-----------------|----------|-----------|-----------|-----------------|
|         |              | fps      | ft        | ft        | km         | km          | km           | days        | m3/s            | m/s      | m         | m         | cfs             |
| 1       | Amargo Creek | 0.238    | 0.803     | 10.04     | 6.70       | 0.00        | 6.70         | 1.07        | 0.06107         | 0.07264  | 0.245     | 3.06      | 2.156           |

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

STREAM SUMMARY REPORT: Amargo to Disch

|                  |   |         |                              |
|------------------|---|---------|------------------------------|
| TRAVEL TIME      | = | 1.07    | DAYS                         |
| MAXIMUM EFFLUENT | = | 43.05   | PERCENT                      |
| FLOW             | = | 0.03478 | T0 0.06107 m <sup>3</sup> /s |
| DISPERSION       | = | 0.0000  | T0 0.0000 m <sup>2</sup> /s  |
| VELOCITY         | = | 0.06955 | T0 0.07358 m/s               |
| DEPTH            | = | 0.20    | T0 0.26 m                    |
| WIDTH            | = | 2.50    | T0 3.22 m                    |
| BOD DECAY        | = | 0.18    | T0 0.19 per day              |
| NH3 DECAY        | = | 0.75    | T0 0.85 per day              |
| SOD              | = | 0.29    | T0 0.56 g/m <sup>2</sup> /d  |
| NH3 SED SOURCE   | = | 0.00    | T0 0.00 g/m <sup>2</sup> /d  |
| PO4 SED SOURCE   | = | 0.06    | T0 0.09 g/m <sup>2</sup> /d  |
| REAERATION       | = | 10.28   | T0 12.68 per day             |
| BOD SETTLING     | = | 0.26    | T0 0.34 per day              |
| ORG-N DECAY      | = | 0.13    | T0 0.13 per day              |
| ORG-N SETTLING   | = | 0.00    | T0 0.00 per day              |
| TEMPERATURE      | = | 32.28   | T0 34.02 deg C               |
| DISSOLVED OXYGEN | = | 4.80    | T0 6.99 mg/L                 |

Jicarilla Apache Utility Authority Dulce WWTP  
Permit NM0030520 - DO Model

INPUT/OUTPUT LOADING SUMMARY

Dul ce WWTP - DO Model Output

| CHL A                               | PERI P | NCM  | FLOW<br>m <sup>3</sup> /s | DO<br>kg/d | BOD1<br>kg/d | BOD2<br>kg/d | ORG-N<br>kg/d | NH3-N<br>kg/d | N03-N<br>kg/d | ORG-P<br>kg/d | P04-P<br>kg/d |
|-------------------------------------|--------|------|---------------------------|------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| HEADWATER FLOW                      |        |      | 0.03478                   | 21.03      | 15.02        | 19.53        | 0.00          | 0.30          | 3.00          | 3.00          | 3.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| INCREMENTAL INFLOW                  |        |      | 0.00000                   | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 0.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| INCREMENTAL OUTFLOW                 |        |      | 0.00000                   | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 0.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| WASTELOADS                          |        |      | 0.02629                   | 4.54       | 102.21       | 131.73       | 9.09          | 14.54         | 0.48          | 2.27          | 2.50          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| WITHDRAWLS                          |        |      | 0.00000                   | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 0.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| FLOW THRU LOWER BNDRY               |        |      | -0.06107                  | -28.48     | -79.76       | -139.79      | -8.16         | -8.30         | -10.94        | -2.93         | -7.28         |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| DISPERSION THRU LOWER BNDRY         |        |      |                           | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 0.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| DISPERSION THRU HDWTR BNDRY         |        |      |                           | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 0.00          |
| 0.00                                |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| NON-POINT INPUT                     |        |      |                           | 0.00       | 0.00         | 0.00         | 0.00          |               |               | 0.00          |               |
|                                     |        | 0.00 |                           |            |              |              |               |               |               |               |               |
| NATURAL REAERATION                  |        |      |                           | 91.64      |              |              |               |               |               |               |               |
| DAM REAERATION                      |        |      |                           | 0.00       |              |              |               |               |               |               |               |
| SOD BACKGROUND                      |        |      |                           | -4.76      |              |              |               |               |               |               |               |
| BOD1 DECAY                          |        |      |                           | -35.10     | -15.26       |              |               |               |               |               |               |
| BOD1 SETTLING                       |        |      |                           | -5.11      | -22.22       |              |               |               |               |               |               |
| ANAEROBIC BOD1 DECAY                |        |      |                           |            | 0.00         |              |               |               |               |               |               |
| BOD2 DECAY                          |        |      |                           | -11.48     |              | -11.48       |               |               |               |               |               |
| BOD2 SETTLING                       |        |      |                           | 0.00       |              | 0.00         |               |               |               |               |               |
| ANAEROBIC BOD2 DECAY                |        |      |                           |            |              | 0.00         |               |               |               |               |               |
| BOD2 HYDROLYSIS                     |        |      |                           |            | 0.00         | 0.00         |               |               |               |               |               |
| ORG-N DECAY                         |        |      |                           | 0.00       |              |              | -0.92         | 0.92          |               |               |               |
| ORG-N SETTLING                      |        |      |                           |            |              |              | 0.00          | 0.00          |               |               |               |
| NH3-N DECAY (NITRIFICATION)         |        |      |                           | -32.29     |              |              |               | -7.46         | 7.46          |               |               |
| NH3-N BACKGROUND SEDIMENT SOURCE    |        |      |                           |            |              |              |               | 0.00          |               |               |               |
| DENITRIFICATION                     |        |      |                           |            | 0.00         |              |               |               | 0.00          |               |               |
| ORG-P HYDROLYSIS                    |        |      |                           |            |              |              |               |               |               | -0.24         | 0.24          |
| ORG-P SETTLING                      |        |      |                           |            |              |              |               |               |               | -2.10         | 1.05          |
| PO4-P BACKGROUND SEDIMENT SOURCE    |        |      |                           |            |              |              |               |               |               |               | 0.48          |
| PHYTOPLANKTON GROWTH/PHOTOSYNTHESIS |        |      |                           | 0.00       |              |              |               | 0.00          | 0.00          |               | 0.00          |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |
| PHYTOPLANKTON RESPIRATION/EXCRETION |        |      |                           | 0.00       |              |              |               | 0.00          |               |               | 0.00          |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |
| PHYTOPLANKTON SETTLING              |        |      |                           | 0.00       |              |              |               | 0.00          |               |               | 0.00          |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |
| PHYTOPLANKTON DEATH                 |        |      |                           |            | 0.00         | 0.00         | 0.00          |               |               | 0.00          |               |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |
| PERI PHYTON GROWTH/PHOTOSYNTHESIS   |        |      |                           | 0.00       |              |              |               | 0.00          | 0.00          |               | 0.00          |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |
| PERI PHYTON RESPIRATION/EXCRETION   |        |      |                           | 0.00       |              |              |               | 0.00          |               |               | 0.00          |
| 0.00                                |        |      |                           |            |              |              |               |               |               |               |               |

|                       |      |          | Dulce WWTP | - DO Model | Output  |       |        |        |       |       |      |
|-----------------------|------|----------|------------|------------|---------|-------|--------|--------|-------|-------|------|
| PERI PHYTON DEATH     |      |          |            | 0.00       | 0.00    | 0.00  |        |        |       |       | 0.00 |
|                       | 0.00 |          |            |            |         |       |        |        |       |       |      |
| NCM DECAY             |      |          | 0.00       |            |         |       |        |        |       |       |      |
|                       | 0.00 |          |            |            |         |       |        |        |       |       |      |
| NCM SETTLING          |      |          | 0.00       |            |         |       |        |        |       |       |      |
|                       | 0.00 |          |            |            |         |       |        |        |       |       |      |
| TOTAL INPUTS          |      | 0.06107  | 117.22     | 117.23     | 151.27  | 9.09  | 15.76  | 10.94  | 5.28  | 7.28  |      |
|                       | 0.00 | 0.00     |            |            |         |       |        |        |       |       |      |
| TOTAL OUTPUTS         |      | -0.06107 | -117.22    | -117.23    | -151.27 | -9.09 | -15.76 | -10.94 | -5.28 | -7.28 |      |
|                       | 0.00 | 0.00     |            |            |         |       |        |        |       |       |      |
| NET CONVERGENCE ERROR |      | 0.00000  | 0.00       | 0.00       | 0.00    | 0.00  | 0.00   | 0.00   | 0.00  | 0.00  | 0.00 |
|                       | 0.00 | 0.00     |            |            |         |       |        |        |       |       |      |

..... EXECUTION COMPLETED