MEMORANDUM

Date: June 4, 2020

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Conservation Effluent Pool: Annual Summary**

This memorandum is provided in compliance with Board Resolution 2010-302 relating to the Conservation Effluent Pool which requires an annual report by May 31 on the status of the Conservation Pool.

In recognition that riparian areas in the Southwest are severely threatened and vulnerable, Pima County and the City of Tucson reserved in a Conservation Effluent Pool (Pool) up to 10,000 acre-feet of effluent per year. This water is set aside for use in riparian restoration projects.

Background

Use of effluent from the Pool is restricted to those entities identified in the 2001 Supplemental Agreement between City of Tucson (City) and Pima County, including a number of local water providers and the Regional Flood Control District. Until recently, no allocation requests had been made by eligible entities.

Use of the Pool would require a decision from the Pima County Board of Supervisors, as well as the City's Mayor and Council, with the exception of Endangered Species Act related riparian projects, which are authorized upon submittal of the required evidence to the Pool Administrators.

The Conservation Effluent Pool is available to any qualified entity to mitigate project effects under Section 7 or Section 10 of the Endangered Species Act, although such a connection with the Act is not required. In late 2017, the endangered Gila Topminnow was detected in the Santa Cruz River effluent downstream of the Agua Nueva Wastewater Reclamation facility (Agua Nueva). Additional surveys have confirmed that the river is being used by this endangered species.

City of Tucson Application

In December 2018, City of Tucson became the first qualified entity to submit a formal request for evaluation by the Pool Administrators. The City requested to allocate portions of the Pool in amounts to cover the evapotranspiration losses in the two effluent-dependent reaches of the Santa Cruz River downstream of the metropolitan treatment facilities, as well as to the Heritage Project located upstream of Congress Street. All three proposals were

characterized as designated riparian projects, in that none of them claimed any water from the Pool in relation to the mitigation for the Gila Topminnow.

The Pool Administrators evaluated the three applications in January 2019 and found all three to be incomplete relative to information required by the application form posted on the County's webpage for the Pool.

In late 2019, the City resubmitted a revised proposal for only one reach of the river, the downtown reach called the Heritage Project. The existing discharges from the Santa Cruz Heritage Project to the Santa Cruz River use effluent owned by City of Tucson, not Pool water.

Pool Administrators Julia Fonseca and Tim Thomure found the application to be incomplete on January 22, 2020, mainly due to some inconsistent or vague information. Assuming the Heritage application is resubmitted and completed, it will be scheduled for the Board's review and approval within 30 days of the Pool Administrators' concurrence.

The completeness review and application requirements are based on standards specified in the Intergovernmental Agreement for administration of the Pool. Clarity is needed regarding the water requirements of the habitat features that are part of the proposed project in order to ensure the Pool is used judiciously over time.

Pima County Regional Flood Control District application

The trend of decreasing effluent from the Agua Nueva facility is likely to continue as water conservation further reduces sewage inflows, and more water is diverted from Agua Nueva for other uses. In light of this, Pima County Regional Flood Control District is developing a proposal to allocate some of the Pool to support the river downstream of Agua Nueva (attached).

Pima County Regional Flood Control District is evaluating river management for the Santa Cruz River from Grant Road to Pinal County line. As part of that management plan, the District will consider other potential allocations of Pool water for the planning area.

Attachment

c: Carmine DeBonis, Deputy County Administrator for Public Works
Suzanne Shields, Director, Regional Flood Control District
Jackson Jenkins, Director Regional Wastewater Reclamation Department
Carla Blackwell, Director, Development Services
Linda Mayro, Director, Sustainability and Conservation
Julia Fonseca, Environmental Planning Manager, Sustainability and Conservation

CONSERVATION EFFLUENT POOL USER APPLICATION

Date: May 28, 2020

Contact Information

Name of Operator: Pima County Regional Flood Control District and Pima County Regional Wastewater Department
Phone #: 520 724-4608

Address: 201 N. Stone Avenue, Tucson, AZ 85701

Point of contact: Eleonora Demaria, 201 N. Stone Avenue, Tucson, AZ 85701

Is this project a: ESA Riparian Project

1. **Describe the amount of perennial, intermittent, or ephemeral surface or subsurface water already available at the site of the proposed Riparian Project and the amount of water from those sources that the Operator plans to use to support the proposed project.**

   Diminished flow extent in the Santa Cruz River starting in 2014 has impacted the survival chances of the Gila Topminnow since its return to the river in 2017. This CEP request aims to maintain the habitat of the Gila Topminnow, an endangered species, in the Santa Cruz river stretch between the Agua Nueva Wastewater Reclamation Facility (ANWRF) and the river's confluence with the Cañada del Oro Wash. The Santa Cruz River north of the two existing regional wastewater reclamation facilities is the longest effluent-dependent reach in Arizona providing perennial flow to important wildlife habitat as it is described in the Pima County Multi-species Conservation Plan (MSCP). Besides the effluent-dependent reach, the Santa Cruz River is an ephemeral river that flows mainly during the summer monsoon-dominated months. Historically, pockets with water along the main channel enabled irrigated agriculture and sustained wildlife and riparian vegetation. However, during the last century and due to its interaction with humans, the river has experienced dramatic transformations making the perennial effluent reach all the more important. Except for a few isolated large winter events, the river only flows after heavy monsoon storms. Upstream of the ANWRF, historical streamflow records indicate that the river is dry 70% of the time, with 54% of no flow days in the summer season (defined as July, August, and September) and 75% for the rest of the year. The magnitude and sporadic occurrence of these natural flows are insufficient to support the habitat for fish and aquatic invertebrates making effluent flows north of the wastewater reclamation treatment plants crucial for ecosystem health in the river.

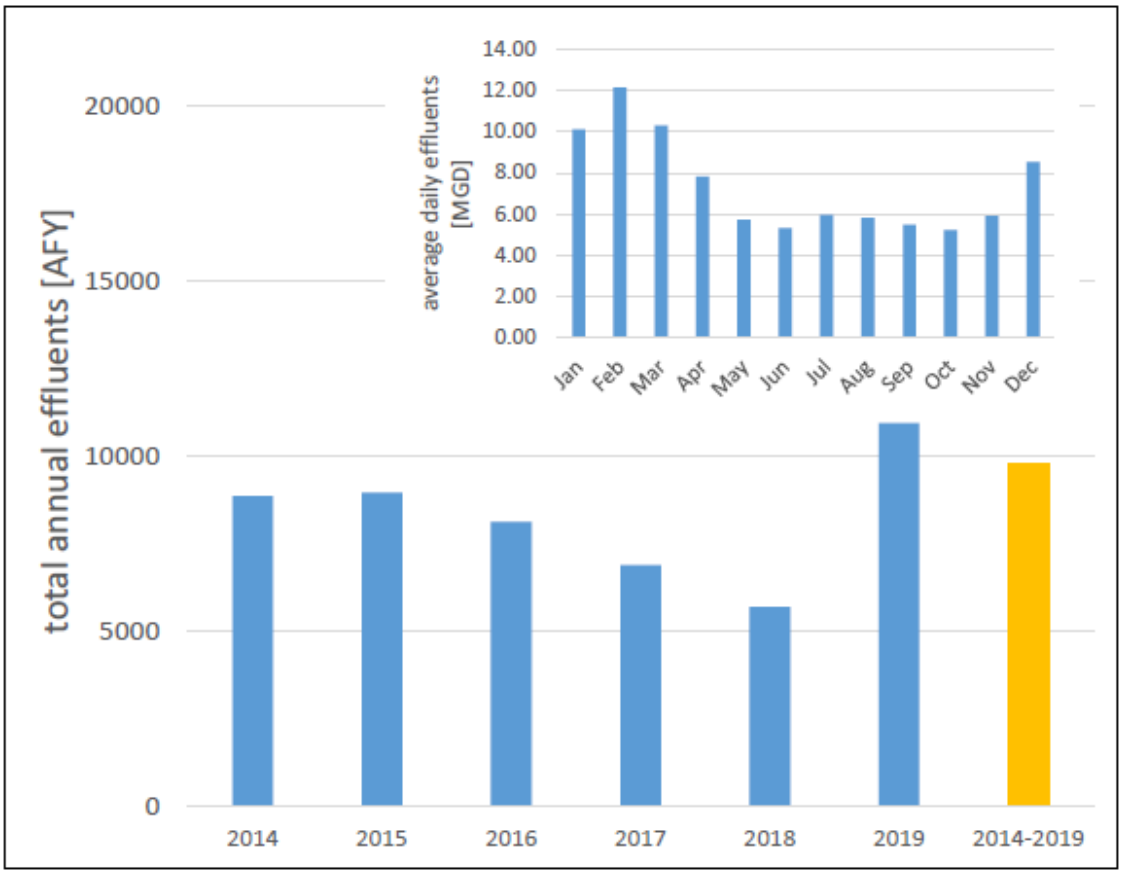
   Prior to 2014, the river flowed uninterrupted from the treatment plant at Roger Road to Ina Rd supporting a riparian tree canopy as indicated by the air photo from 2011 (Figure 1 a). In 2014, the plant at Roger Road was decommissioned and was replaced by the ANWRF managed by Pima County, which has lower operational capacity, but higher quality water. Because of the change in discharge and increased infiltration from the improved quality water, the flows no longer reliably

reached Ina Road and the woody vegetation upstream of Ina Road has died (Harris environmental, 2015; Figure 1 b).

Figure 1. Time evolution of the Santa Cruz river riparian vegetation due to changes in effluent amount and quality: a) Year 2011 Roger Road plant, and b) 2015 Agua Nueva plant.

In the last six years (2014-2019), the ANWRF has delivered on average 9,765 Acre-feet per Year (AFY) to the Santa Cruz River Managed Underground Storage Facility (SCRMUSF) with effluent volumes ranging from 5,681 in 2018 to 10,921 AFY in 2019 (Figure 2). Effluent totals are larger during the colder months (November through April) and decrease as demand for irrigation increases during summer months (Figure 2 inset). Flows measured downstream of the confluence with Cañada del Oro Wash indicate that effluent flows reach this section of the river despite the decrease in released volumes.

Figure 2. Total annual effluent water delivered to the Santa Cruz River from the Agua Nueva WRF. The inset plot shows the average daily effluent in Million Gallons per Day (MGD) for each month.



In 2017, after more than 70 years, the Gila Topminnow was observed in the Santa Cruz River upstream of El Camino del Cerro adjacent to Christopher Columbus Park and south of Ina Road (Figure 3). During this time, the species was listed as endangered (1967) under the US Endangered Species Act (ESA). Gila Topminnows are generalists that occur in low elevation headwater springs, cienegas, perennial and intermittent streams, as well as in the margins of large rivers. This species prefers relatively warm, slow moving water that have mats of algae, vegetation, and debris in places along stream edges or below riffles. Substantial amounts of aquatic vegetation are likely to support their diet of small invertebrates and algae. Experts think that the most likely source for these Gila Topminnow was from a population at Sabino Canyon, reaching the Santa Cruz River via the Rillito Creek, commonly referred to as the Rillito River. This indicates that the maintenance of a

wetted habitat from Agua Nueva to at least the Rillito River confluence is crucial for habitat connectivity.

To support the habitat of the Gila Topminnow, this proposal requests 5,600 AFY of effluent flow to be allocated to maintain a wetted area on the main channel of the effluent-dependent Santa Cruz River. This effluent will maintain the pools, runs, and streamside aquatic vegetation that the fish species needs during its life cycle. The ESA proposed project will not rely on natural, i.e. monsoon or winter floods, sources of water. It solely relies on effluent water to support the critical habitat of the Gila Topminnow along the river section that stretches from the Agua Nueva outfall to the area where the Santa Cruz River and the Rillito Creek and Cañada del Oro Wash meet.

2. Describe whether the proposed Riparian Project requires Effluent or Reclaimed Water and the means by which that water resource will be measured and delivered to the project.

The project requires effluent water delivered to the project area by the ANWRF. The Pima County Regional Wastewater Reclamation Department (RWRD) will measure and deliver the resources needed for the project through the outfall to the Santa Cruz River immediately west of the ANWRF. To verify that the effluent is successfully delivered to the endangered fish population, the Regional Flood Control District (District) will reinstall the ALERT 6014 sensor, which has measured low flows from November 2017 to June 2019 in the Santa Cruz River downstream of the confluence with the Cañada del Oro Wash. An ultrasonic level controller will be installed in the ANWRF outfall to measure how much effluent is delivered to the river. In addition, the District will install sensors to monitor the extent of the wetted area using pressure transducers and temperature sensors, which are a new low cost novel method is under testing. Drone flights will also be used for monitoring purposes. Orthorectified imagery will be used to monitor the extent of the wetted area and riparian vegetation, when available.

3. Describe the Operator's 10-year schedule for accepting Conservation Pool Effluent at the proposed Riparian Project

The effluent will be delivered continuously except in the event of treatment plant maintenance or shutdowns. The total requested volume is 5,600 AFY, however the monthly total fluctuate from 429 AF to 475 Acre-foot per Month (AFM) depending on the season (Table 1). The effluent volume delivered to the channel at the Agua Nueva outfall is expected to change depending on existing agreements between the involved partners for the managed recharge project in that reach. There is currently an informal "gentleman's agreement" between Tucson Water and RWRD to discharge, on average, 5 MGD in order to minimize the effects to the river at Agua Nueva and allow the effluent to generate managed recharge credits for the City of Tucson (City) and the Bureau of Reclamation (BOR) under the Southern Arizona Water Rights Settlement Act (SAWRSA). This agreement for 5 MGD flow is not tracked or enforced in any formal way. Furthermore, the daily discharge has historically fluctuated between 2.15 and 24.1 MGD in the last six years. While the Gila Topminnow have proven to be resilient during short periods of no discharge, long periods without effluent put them at risk. Effluent records indicate the on average discharges to the river have been below 5 MGD for as long as 3.7 consecutive days. For this reason, this CEP proposal intends to establish a formal target flow rate at the Agua Nueva outfall of 5 MGD on a weekly average basis.

Effluent discharge to the Santa Cruz River at the Agua Nueva outfall is the product of two operational decisions: 1) The demand of the reclaimed system operated by Tucson Water, and 2) The need for sufficient flow left over to keep RWRD's dechlorination system effective prior to river discharge. When there is insufficient effluent left over after diversion into the reclaimed system, flow is not maintained to the river. To implement this CEP proposal, daily flow volume to the river shall be monitored using an ultrasonic level controller installed in the effluent's outfall. When flow volume drops below 5 MGD because of reclaimed water demand on any given day, a volume of CEP shall be devoted to flow on the six days following that occurrence in order to average 5 MGD for the week.

Any discharge to the river at Agua Nueva is typically comprised of two effluent allocations–Tucson Water's and the SAWRSA share managed by the BOR. If the SAWRSA has used a substantial portion of their allocation by diversion from the river (a practice not currently occurring), flow at the Agua Nueva outfall could be limited. In such instances, CEP shall be used to "backstop" the flow in order to maintain the target flow volume of 5 MGD on a weekly average basis.

By committing to provide a backstop to ensure a delivery of at least 5 MGD to the river, the CEP allocation will ensure that the habitat for the Gila Topminnow will continue to exist downstream of Agua Nueva even if the reclaimed demand rises or the BOR pursues a project to remove its SAWRSA share of effluent from the river.

Table 1. Requested amounts for the duration of the project.

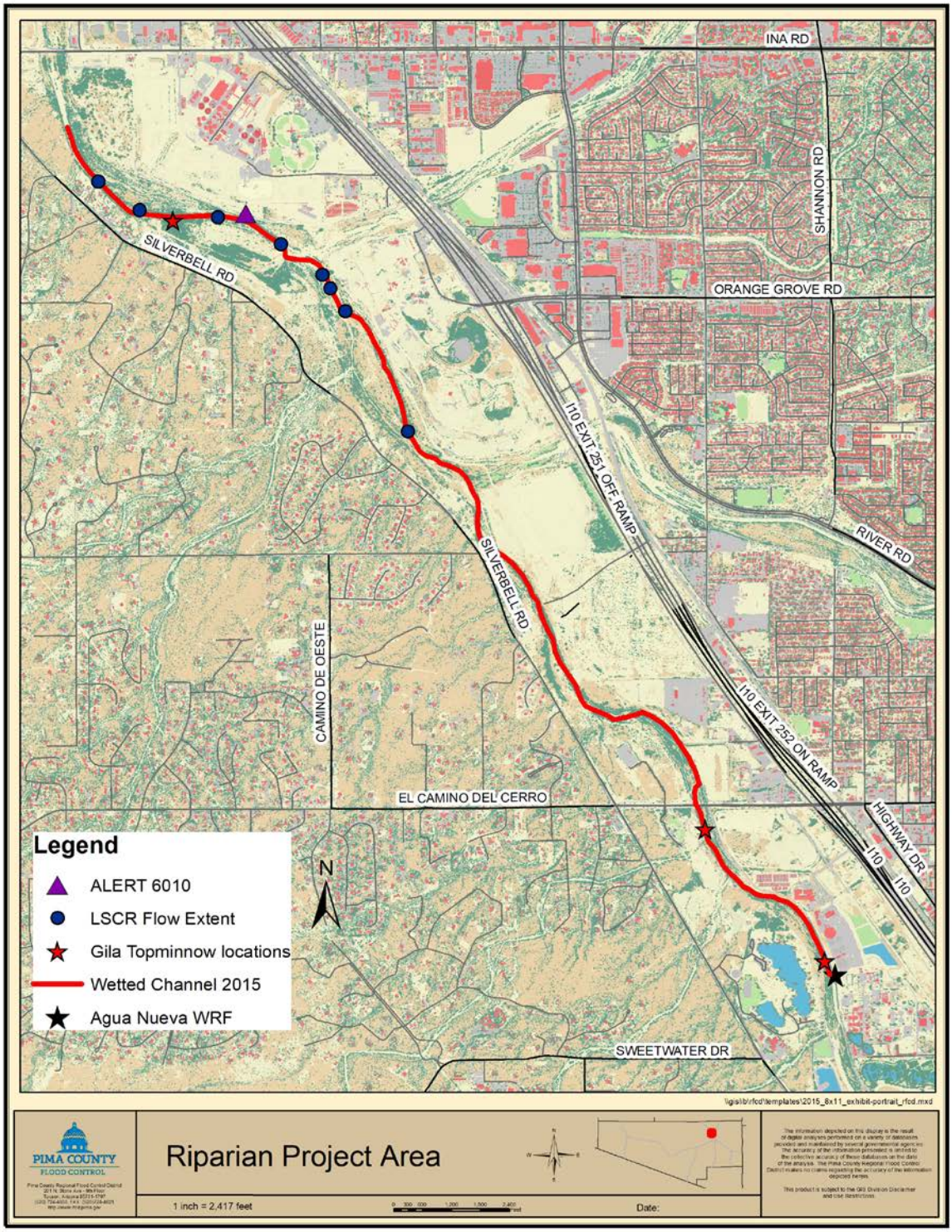
YEAR	ANNUAL EFFLUENT REQUESTED (AFY)	MONTHLY EFFLUENT REQUESTED (AFY)
2020	5,600	429 - 475
2021	5,600	429 - 475
"	"	"
"	"	"
"	"	"
2030	5,600	429 - 475

4. Provide a general description of the proposed Riparian Project, specifying its location, goals, and the type of vegetation or wildlife the project will support. Include the location (pdf map requested) and CEP water demands of any Critical Vegetation or other habitat features as distinct from aquifer recharge or recreational uses of water.

Location

The Riparian Project will extend to the location of the ALERT 6010 site approximately 3.5 miles of the five-mile stretch of the Santa Cruz River that starts at the outfall of the Agua Nueva treatment plant and extends north to the proximity of Ina Road (Figure 3). The length of the river stretch was determined by measuring the spatial extent of the wet channel in May 2015 using orthorectified aerial imagery. Additionally, flow extent field observations taken on June 14 or 15 over the last six years (2014-2019) are used to validate flow conditions during the critical warm and dry period before monsoon storms arrive.

Figure 3. Geographic location of the proposed ESA Riparian Project. The red stars show the locations where the Gila Topminnow has been observed, the blue dots show the flow extent observed in mid-June 2014-2019. The wetted channel is calculated with 2015 orthorectified areal imagery.



Goals

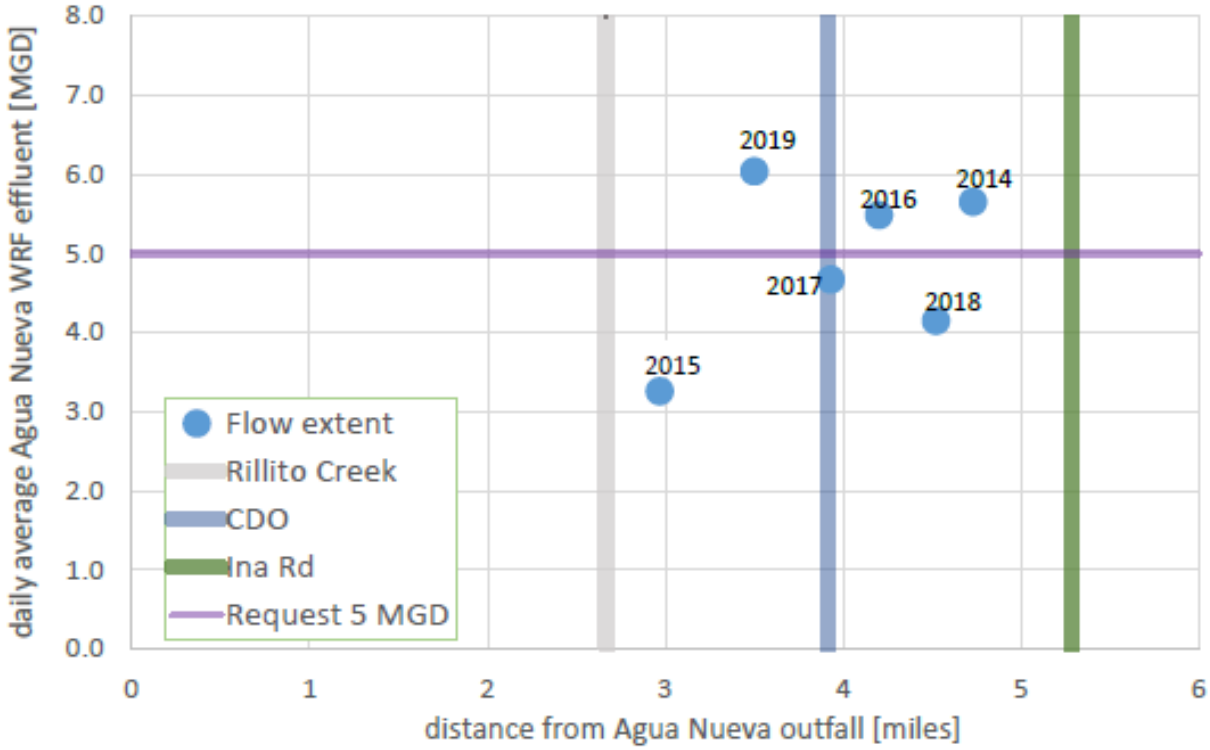
The main goal of this CEP is to maintain the established habitat for the of Gila Topminnow species in the Santa Cruz River. Pima County is devoted to preserving healthy river conditions along the Santa Cruz River for vegetation and wildlife habitats and recreational and public enjoyment through efforts like the Living River Project and the Multi-species Conservation Plan (MSCP). The District and the RWRD is requesting that a portion of the CEP from the Santa Cruz River be assigned to maintain a wetted portion of the channel that will support the habitat of the endangered Gila Topminnow. Ancillary benefits of this request are to support the riparian vegetation in the river channel needed for other fish species, aquatic invertebrate species, and numerous birds and reptiles identified in the MSCP. The green ribbon that effluent-supported vegetation creates in the semi-arid landscape of Southern Arizona is also crucial to decrease flow velocity, control sediment transport, and increase bank stability and groundwater recharge.

5. What is the total quantity and annual amount (in acre feet) of Effluent requested to accomplish the Operator's goals in the developing and maintaining the proposed Riparian Project, including any anticipated change that will occur in Effluent demand.

The total annual volume requested to sustain the Gila Topminnow's habitat in the designated reach is 5,600 AFY (1,825 MG). The flow volume required for this Riparian Project was estimated using field observations that have been obtained by the Distric during the period 2014-2019 as part of the Living River project. Each year, the District and Sonoran Institute's professionals go to the field before the official onset of the monsoon season (June 15) to document the flow extent in the river.

Measurements are done between 9 and 11 a.m. for consistency in the observations. This flow extent measurement is representative of the hot and dry months before the arrival of monsoon storms and also coincides with the largest demand of effluent from water users (Figure 2 inset), which increases the pressure on the Gila Topminnow's ecosystem. The daily delivered effluent from the ANWRF for each flow extent observation is shown in Figure 4. The plot shows that an average effluent of 5 MGD supports continuous flow that reaches as least as far as south as the Rillito Creek and, depending on the year, to within 0.5 miles of Ina Road. This request does not account for the diurnal variability in effluent deliveries and it is based on daily average effluent amounts. Anticipated changes that could potentially occur are explained in detail in Section 3**.** The project will use an ultrasonic level controller installed in the Agua Nueva outfall to quantify how much of the requested effluent volume is actually being delivered to the river and to make the flow adjustments needed in case the CEP request is not being met.

Figure 4. Extent of the wetted channel, flow extent, for the years 2014 to 2019 as a function of effluent deliveries (MGD).



6. **Please describe the design and construction schedule the Operator will follow in developing the proposed Riparian Project.**

   The project does not require any design and construction. It will require the installation of pressure and temperature sensors, the ultrasonic water level sensor at the ANWR outfall and drone surveys in the channel to monitor the flow extent.

7. **Please describe the funding source(s) the Operator will use to develop and maintain the proposed Riparian Project**

   The District will install and maintain the sensors installed in the channel to monitor the impact of the CEP request. The District will fund drone flights and pressure transducer, temperature, and water level sensors. The District will process and archive all field data. Sensors installation will occur within three months from the start of the project and maintained during the spring and fall.