

TMDL Implementation Status for Upper San Antonio River Watersheds

Date of Status Report: November 4, 2021

I-Plan Approval Date: April 6, 2016

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Management Measures

Abbreviations

BMPs - Best management practices

BRWM - Bexar Regional Watershed Management Partnership

CoSA-CCDO - CoSA Center City Development & Operations Department

CoSA - City of San Antonio

CoSA-ACS - CoSA Animal Care Services

CoSA-PRD - CoSA Parks and Recreation Department

CoSA-TCI - CoSA Transportation & Capital Improvements Department

KSAB - Keep San Antonio Beautiful

SARA - San Antonio River Authority

SWCD - Soil & Water Conservation District

NRCS - Natural Resources Conservation Service

RWWA - River Walk Watershed Alliance

SAWS - San Antonio Water System

SSOs -Sanitary Sewer Overflows

AgriLife Extension - Texas A&M AgriLife Extension

TxDOT - Texas Department of Transportation

TSSWCB - Texas State Soil & Water Conservation Board

WCTS - Wastewater Collection and Transmission System

Management Measure 1: Implement WCTS Operation and Maintenance Programs to Reduce SSOs

Responsible Party	Implementation Goal	Status
SAWS	Continue to develop sanitary sewer overflow (SSO) reduction principals that focus proactively on best management practices (BMPs) to improve program management; capacity assessment; remedial measures; capacity, management, operation, and maintenance; and information services.	As a part of the Consent Decree with the Environmental Protection Agency (EPA) to reduce sewer spills, SAWS' Capacity and Condition Assessment reports were submitted in January 2018. Remedial measure plans, and alternatives analysis and 30% design were submitted in January 2019 and approved in March 2019 by EPA. Design and construction for remediation began in 2019 and will extend through 2023 with a possible extension. During the assessment phase, 11,598 miles of pipe were cleaned, and 6,848 miles were inspected. In addition, 88,654 manholes and 4,559 storm drains were inspected as well.

Management Measure 2: San Antonio Zoo UV Treatment System Implementation

Responsible Party	Implementation Goal	Status
CoSA-TCI, SAWS	Continue the on-going operation and maintenance of the UV system. Additionally, continue to monitor the UV treatment efficiency and effectiveness as a part of the municipal separate storm sewer system (MS4) permit.	On-going sampling and testing of water quality is conducted by SAWS. On-going maintenance and operation of the UV system is conducted by CoSA.

Management Measure 3: Advancement of Low Impact Development (LID)

Responsible Party	Implementation Goal	Status
SARA	Provide LID education and training,	SARA has implemented three virtual certification courses with online exam options for LID training and provided four trainings upon request to local/regional academic, government, and nonprofit entities. Since 2016, SARA has delivered 14 annual certification courses, 43 trainings upon request, and 183 audience-targeted educational offerings. On October 15, 2021, SARA provided their Condensed LID Manual to stakeholders.
SARA	Unified Development Code Attend CoSA’s Master Development Plan meetings, Preliminary Plan Review meetings, and meetings of the Historic Design Review Commission, and under an Interlocal agreement with the City, identify upcoming developments within the River Improvements Overlay District and offer LID assessments and stormwater BMP options. Also provide LID assessment assistance in coordination with CoSA on development plans that are self-identified as having LID components.	SARA has continued to attend Master Development Plan, Preliminary Plan Review, and Historic Design Review Commission meetings upon request. LID review assistance is also given to CoSA upon request. Additionally, SARA provided LID/GI coordination for 15 development projects within the River Improvements Overlay District (RIO) and offered LID assessments and stormwater BMP options to the developers and their designers from November 2020 through October 2021.

Responsible Party	Implementation Goal	Status
SARA	<p>SA2020</p> <p>Continue LID advocacy and promotion to relevant development parties to implement LID projects. Also, promote LID to at least eight significant development projects annually and work to implement more Unified Development Code (UDC) amendments in 2020, if necessary.</p>	<p>Since 2016, there have been a total of 112 LID projects received. Of those 112 applications, 51 have been approved and 33 projects have been completed.</p>
SARA	<p>LID BMP Monitoring</p> <p>Continue current BMP water quality monitoring at its Guenther Street and Euclid Avenue properties and conduct post-implementation monitoring to gauge effectiveness of the BMP's. Also, amend appropriate watershed master plans with recommendations based upon the described modeling efforts.</p>	<p>LID BMP Monitoring is being continued at the following locations:</p> <ul style="list-style-type: none"> ▪ Guenther Street ▪ Elmendorf Lake Park ▪ Atlanta Street <p>Monitoring has been completed at Hausman Road and Ray Ellison Drive. Additionally, monitoring is delayed at the SARA Sheridan Facility and future monitoring will be completed at the CoSA Water Polisher site.</p>
SARA	<p>Modeling</p> <p>Amend appropriate watershed master plans with recommendations based upon modeling efforts</p>	<p>SARA implements site-scale modeling for the Green Stormwater Infrastructure Master Plan. The plan seeks to integrate water quality with water quantity concerns and provides recommendations on best management practices that can achieve both results. Modeling tools help to identify and prioritize sites within the affected watershed that have the highest potential for green stormwater implementation.</p> <p>Regional Center modeling is also being completed, or has already been completed for the following locations:</p> <ul style="list-style-type: none"> ▪ Brooks (2018) ▪ TAMU - SA (2019) ▪ Rolling Oaks (2020) ▪ WNW/Near NW (2022)

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Responsible Party	Implementation Goal	Status
SARA	<p>Watershed Master Plans</p> <p>Update the Upper San Antonio River and Salado Creek Watershed Master Plans annually.</p>	<p>The Upper San Antonio River (USAR) and Salado Creek watershed master plans are updated annually.</p>
SARA	<p>Long Term Monitoring</p> <p>Review monitoring annually with TCEQ and other monitoring partners in a coordinated monitoring process. Provide the TMDL I-Plan group, at its annual meeting, an updated monitoring map, and a summary of changes in <i>E. coli</i> concentrations at all on-going routine monitoring sites in the I-Plan area.</p>	<p>SARA will review monitoring annually with TCEQ and other monitoring partners in a coordinated monitoring process which allows for a more effective use of limited resources. The outcome of the meetings could be an increase or decrease in sites being monitored. SARA provided the TMDL I-Plan group, at its annual meeting, an updated monitoring map, and a summary of changes in <i>E. coli</i> concentrations at all on-going routine monitoring sites in the I-Plan area. Find Clean Rivers Program (CRP) and SARA routine surface water monitoring sites on the CRP Coordinated Monitoring website (https://cms.lcra.org).</p>

Management Measure 4: MS4 Related Activities and MS4 Phase 1 Water Quality Protection Activities

Responsible Party	Implementation Goal	Status
SAWS, CoSA, TxDOT	<p>Continue to manage the MS4 permit in compliance with its requirements and identify bacteria reduction related BMPs that can be implemented.</p>	<p>SAWS continues to collect monitoring samples for compliance with the MS4 permit. Specifically, SAWS monitors instream influent and effluent for the Zoo's UV System, collects various <i>E. coli</i> samples at different upstream and downstream sections of the San Antonio River, and implements their Illicit Discharge and Detection (IDDE) Program to identify dry weather discharges and cross connection points at a minimum of 150 locations annually. SAWS continues to implement the Capacity Management Operation Maintenance program, SSO program and a water related public education program.</p> <p>As of November 30, 2016, TxDOT now operates under a statewide permit and is no longer a co-permittee with SAWS or CoSA. Their MS4 permit is in the process of being renewed by TCEQ.</p>

Management Measure 5: Avian Management for the River Walk and Other Riparian Areas

Responsible Party	Implementation Goal	Status
CoSA-CCDO	Continue to use a falconer for six months of the year, and a laser device the other six months of the year to reduce the grackle population in the downtown area. Also, utilize continued effort through public awareness and early detection to aid in the reduction of avian-related load contributions.	CoSA continues to utilize a falconer for six months out of the year and a laser device the other six months of the year to reduce grackle and cowbird population in the downtown area under normal conditions and as a response to citizen complaints. In addition, CoSA removed 98 Yellow-Crowned Night Heron nests from the River Walk in spring 2021. Additionally, CoSA continues to educate the public and provide early detection to aid in the reduction of avian load contributions.

Management Measure 6: Expansion of Pooper Scooper Program

Responsible Party	Implementation Goal	Status
CoSA-PRD	Continue installation of Mutt Mitt Stations with future linear creekway trail projects and community outreach.	Twelve additional Mutt Mitt dispensers were installed along Alazan and Zarzamora Creekway trailheads in the past year.

Management Measure 7: Increase Awareness and Enforcement of Pet Control Ordinance

Responsible Party	Implementation Goal	Status
CoSA-ACS	Continue education and outreach programs for relevant topics such as animal vaccinations and spay and neutering programs.	As of August 2021, a new city-wide campaign (“Scoop the Poop”) is underway to help educate the public on proper disposal of pet waste and bring awareness to city law requirements. In addition, CoSA-ACS held 57 community events in FY2021.

Management Measure 8: BMP Assessment, Pilot Studies, and Mission Drive-In Redevelopment

Responsible Party	Implementation Goal	Status
CoSA-TCI	Provide on-going operations and maintenance at the Mission Drive-In project.	<p>CoSA is responsible for on-going operations and maintenance at the Mission Drive-In project (“Mission Marquee Plaza”) that include an infiltration basin, pervious (turf) plaza, pervious pavement, bioswales, a rain garden, and a rainwater collection system for site irrigation. Construction was completed in 2015 and LID feature effectiveness was monitored for two years after installation.</p> <p>In addition, CoSA has now begun BMP assessment, pilot studies, and redevelopment for their Maverick Park Pilot Project and the Brooks City Base - Research Parkway Pilot Project.</p>
SARA	Complete monitoring of Mission Drive-In Library, erosion control project at SARA’s Environmental Center, rain garden education videos and educational website, LEEDS certification for maintenance facility, and pre- and post-construction monitoring on Hausman Road, Ray Ellison Drive and at Hemisfair Park. Also, complete the stormwater improvement project at SARA’s main office.	<p>The Mission Drive-in Library is completed. Four rain garden educational videos have been completed and posted on the SARA website. LEED certification was awarded to the MROC facility.</p> <p>Monitoring is on-going for Elmendorf Lake Park and Guenther Retrofit flow data, and results from monitoring at Hausman Road and Ray Ellison Drive are forthcoming.</p>

Management Measure 9: Feral Hog Management

Responsible Party	Implementation Goal	Status
AgriLife Extension, TSSWCB, SARA	Host feral hog workshops in the affected watershed.	Three feral hog workshops have been hosted by Texas A&M AgriLife Extension.
TSSWCB, SARA	Promote feral hog abatement activities in different stakeholder meetings in the watershed.	Loaner gates are currently being utilized by landowners in Wilson county.

Management Measure 10: Livestock Management

Responsible Party	Implementation Goal	Status
TSSWCB, Alamo SWCD, Wilson County SWCD, NRCS, SARA	Promote programs that help implement BMPs for grazing livestock and develop WQMPs on livestock operations within affected watershed.	39 NRCS Conservation Plans in the USAR HUC12 watersheds received EQIP funding for implementing conservation practices.
TSSWCB, Alamo SWCD, Wilson County SWCD	Promote annual status reviews on existing WQMPs in the affected watershed.	There is no current information available on this management measure at this time.

Management Measure 11: Inspection of New Construction Sites

Responsible Party	Implementation Goal	Status
Bexar County	Ensure that all construction sites over one acre are permitted and inspect all permitted construction sites at regular intervals.	As of September 30, 2021, Bexar County has conducted 993 construction site inspections in the USAR watershed since 2017. 236 of those permits are new stormwater permits in the watershed. Additionally, the county now employs four stormwater quality permit inspectors.

Management Measure 12: Evaluate Restoration of Westside Creeks

Responsible Party	Implementation Goal	Status
CoSA, SARA, Bexar County	Finish construction on Elmendorf Lake Park improvements (Apache Creek).	<p>Elmendorf Lake Park Improvements were completed in January 2017. Improvements included were rain gardens, bio-retention swales, constructed wetlands, and lake aeration. A water quality monitoring station has been established on Lake Elmendorf and BMP monitoring is on-going.</p> <p>Restoration work was performed on Martinez Creek in May 2021. The Alazan Creek project is scheduled for completion on November 19, 2021. Additionally, a total of 226.1 acres are maintained between Alazan, Apache, Martinez, and San Pedro Creeks.</p>

Management Measure 13: Mission Reach Ecosystem Restoration and Recreation Project

Responsible Party	Implementation Goal	Status
SARA	Provide project and technical management, and coordinate between project partners. Conduct on-going operations and maintenance activities after project completion. Implement a trash collection system at outfalls if feasible.	SARA conducts on-going operations and maintenance activities in accordance with the O&M document with the United States Army Corps of Engineers. These activities include a goal to reaching 70% coverage from native vegetation Year 5. Based on aerial analysis, the current coverage is 49.4% in Year 5, which is slightly down from the 50.31% coverage in Year 4. Additionally, two trash BMPs have been installed on tributaries to the Mission Reach to assess future implementation feasibility.
SARA, KSAB	Promote the “Adopt a Spot” program, and secure at least one sponsor in areas that drain to Mission Reach and at least five sponsors in areas that drain to Museum Reach.	SARA continues to promote the “Adopt a Spot” program and seek to secure sponsors in areas that drain to Museum Reach. There are now three sponsors in the Museum Reach drainage area.

Management Measure 14: Environmental Investigators

Responsible Party	Implementation Goal	Status
SARA	Environmental Investigators will continue to investigate activities and conditions in the San Antonio River Basin adjacent to rivers, creeks, and waterways that have the potential for adverse environmental impact or that threaten public health and safety.	<p>Between October 2020 and 2021, SARA’s Environmental Investigators conducted the following investigations:</p> <ul style="list-style-type: none"> ▪ Chemical Spills (12) ▪ Sewage Spills (9) ▪ Fish Kills (2) ▪ Floodplain Violations (1) ▪ Dumping in Bexar/Wilson (3) ▪ General Water Quality Issues (8)

Management Measure 15: "Be Watershed Wise" Campaign

Responsible Party	Implementation Goal	Status
SARA	Utilize the "Be Watershed Wise" initiative and related stormwater education outreach to reach over 75,000 individuals and have over 1,500 citizens signed up to be Watershed Wise Warriors/Citizen Scientists.	<p>The "Be River Proud" campaign, now The River Warrior Volunteer Group, began in 2019. In September 2020, a new digital creative and commercial campaign was launched with a focus on sustainability and green infrastructure. At this time, there are 1,400 registered River Warrior volunteers. The volunteer group hosts field trips and now has a Campus Cleanup Service-Learning program available to students.</p> <p>A new watershed-wide campaign as begun as a part of "Be River Proud". The campaign's focus is to increase community education around littering in the river. The campaign has a Litterati smartphone app challenge associated to help educate and raise public awareness.</p>
SARA	Conduct a statistically valid public survey and compare results with previous surveys to determine if trends indicate a growing appreciation of the San Antonio River Watershed and knowledge of sustainability issues.	A phone survey was conducted in 2018.
SARA	Offer and promote a training opportunity in association with the Paseo del Rio Association for restaurant operators to train staff on "Don't feed the wildlife" and other water quality BMPs associated with the River Walk area.	A new outreach campaign emphasizing "Don't feed the wildlife" was launched in Fall 2019 for all areas of the River Walk, Museum Reach, and Mission Reach.

Management Measure 16: Homeless and Vagrant Population: Cleaning and Control of Brush and Dumping at Encampments

Responsible Party	Implementation Goal	Status
CoSA-CCDO, CoSA-TCI, CoSA-Code Department, CoSA-Police Department	Continue to coordinate with the CoSA Code and Police Departments and document through their annual report to TCEQ the amount of debris removed at encampments along drainage structures by this management measure.	In coordination with various departments, CoSA-TCI continues to remove debris from encampments along drainage structures on a weekly basis through its Drainage Maintenance Program. There have been 813 cleanups to date and 2,134 tons of debris removed from drainage structures. When compared to the previous fiscal year, CoSA noted that there was a 245% increase in debris.

Management Measure 17: Inspection and Repair of Septic Systems

Responsible Party	Implementation Goal	Status
Bexar County	Continue to educate and inspect septic systems that have been identified in older developed areas that are not being served by public sanitary sewer as a part of the County's OSSF Program.	<p>Since the last meeting, Bexar County has attended four HOA events, conducted at least one neighborhood cleanup per year, and now allows online reporting of septic issues. Additionally, three helicopter surveys were completed to observe and prevent illegal sewage discharge into public rivers. The County does participate annual in Basura Bash, however the event was cancelled in 2020 due to COVID-19.</p> <p>Bexar County employs two Code Compliance and two OSSF Designated Representative inspectors. As of October 10, 2021, the County has completed 1,095 OSSF permits in the watershed since 2018.</p>

Management Measure 18: Specially Designed Boat (Lady Eco)

Responsible Party	Implementation Goal	Status
CoSA-CCDO	Continue to remove trash and debris from the river annually.	Lady Eco is utilized daily from Nueva Street to the Pearl area. Approximately, 92 tons of trash and floatable debris has been removed.

Management Measure 19: Implement Measures to Improve Maintenance and Cleaning Operations for River Loop Area

Responsible Party	Implementation Goal	Status
CoSA-CCDO	Improve maintenance practices to reduce runoff and chemical spills and continue to implement the zero-tolerance policy.	All runoff from power washing is captured before it enters the river. River water is used to wash down sidewalks, and the rinse water is directed into shrub beds utilizing sand booms. In addition, absorbents are used to help clean-up beverage spills and bird feces.

Management Measure 20: Street Sweeping Activities

Responsible Party	Implementation Goal	Status
Bexar County	Continue to perform street sweeping within the unincorporated area of the county.	Bexar County continues to sweep throughout the year and moves by order of their schedule or call-ins. As of October 5, 2021, a total of 17,945 streets have been swept by the County since 2016.
CoSA	Continue to perform street sweeping in the downtown area (except for two holidays), twice a year for residential streets, and four times a year for arterial/collector streets.	CoSA continues to maintain a continuous street sweeping schedule. A total of 57,654.67 miles have been swept and 6,244.92 floatable debris tonnage have been removed between September 1, 2020 and 2021. The City also maintains a website with a sweeping schedule and city map (source: https://www.sanantonio.gov/TCI/Projects/Street-Sweeping-Schedule).

Management Measure 21: San Antonio River Loop Sediment Removal

Responsible Party	Implementation Goal	Status
CoSA-TCI	Continue to review the River Loop every two years (even numbered years) and evaluate and clean as necessary, the River Loop, Loop Extension, and Main Channel, if feasible.	In January 2020, the Main Channel was drained and dredged. Approximately, 2,447 cubic yards of sediment was removed. The River Loop is scheduled to be drained and dredged in January 2022.

Management Measure 22: Urban Horse Stable Assessment

Responsible Party	Implementation Goal	Status
CoSA-ASC	Provide number of citations/warnings issued as well as the number of animals impounded. Inspect all private livestock pens annually during the existing permit process and provide number of citations and warnings issued as well as number of animals impounded.	CoSA-ASC continues to inspect the 13 commercial horse stables and other private livestock pens. In the past fiscal year, 67 private livestock permit inspections were conducted, 23 citations for violation of livestock permits were issued, and 55 commercial carriage horse permits were licensed.

Management Measure 23: Creek Book

Responsible Party	Implementation Goal	Status
SARA	A new revision of the Creek Book will be scheduled with plans to enhance the content on LID and sustainability.	The Creek Book was last updated in 2017. All information in the Creek Book has been incorporated in the River Authority's website (sariverauthority.org). A digital Creek Book was not created.

Management Measure 24: BMP Assessment Report – 2010

Responsible Party	Implementation Goal	Status
SARA, BRWM Water Quality Focus Group	Identify and assess potential sources of bacteria, and to evaluate BMPs to control those sources.	Completed prior to I-Plan development.

Management Measure 25: Provide Illegal Dumping Signs for Existing Vegetated Swales/Filter Strips

Responsible Party	Implementation Goal	Status
CoSA-TCI, SARA	Conduct site inspections to verify that refuse is no longer being dumped into the bugger area and place signs to discourage dumping.	Completed prior to I-Plan development.

Management Measure 26: Animal Pound Wash-Down

Responsible Party	Implementation Goal	Status
CoSA-ACS	Reduce potential load from routine wash-down practices at the animal control center near the San Antonio Zoo.	Completed prior to I-Plan development.

Management Measure 27: Wildlife – Bat Colony in Houston Street Bridge

Responsible Party	Implementation Goal	Status
CoSA-CCDO	Examine roost beneath Houston Street Bridge and perform work to keep the bats from roosting in the future. Perform annual inspections to verify that the colony is not roosting under any bridges in the River Walk area.	Completed prior to I-Plan development.

Management Measure 28: SAWS' Recycled Water Program and Streamflow Augmentation Discharges

Responsible Party	Implementation Goal	Status
SAWS	Increase water quality by augmenting streams as a part of the Recycled Water Program to increase flow and reduce concerns for DO and fecal coliform.	Completed prior to I-Plan development.

Management Measure 29: Connection of 117 Homes in the Espada Community Located on Southwest Bexar County

Responsible Party	Implementation Goal	Status
SAWS	Connect 117 homes in the Espada community to sewer service from private septic systems.	Completed prior to I-Plan development.

Management Measure 30: San Antonio River Walk Implementation Project and Plan (to include new sections of the River Walk)

Responsible Party	Implementation Goal	Status
CoSA, SARA, Bexar County, RWWA	Educate citizens on bacteria controls and identify merchants' and patrons' behaviors that contribute to elevated bacteria levels.	Completed prior to I-Plan development.