



City of New Braunfels Standard Operating Procedures for Assessment of Dissolved Oxygen Conditions in Landa Lake & Operation of the Aeration System

August 31, 2015

Purpose: To evaluate dissolved oxygen (DO) concentrations in Landa Lake and operate the existing aeration system, as needed to mitigate low DO levels.

Background: The Edwards Aquifer Habitat Conservation Plan (EAHCP) contains key management objectives for fountain darter habitat within the Comal River system. One of these objectives provides that DO concentrations shall be maintained at concentrations >4.0 mg/L throughout fountain darter habitat. Due to concerns that Landa Lake may be unable to support adequate DO levels during certain seasonal or low-flow conditions, two Keeton Industries Solaer Model SB-4B solar powered aeration systems were installed in 2013. The aeration systems consist of solar panels, plastic housing cabinets, compressors, batteries, weighted air lines, and pad air diffusers. The solar panels, housing cabinets, batteries, and control units are located on the eastern bank of Landa Lake immediately south of the NBU water tank (Figure 1). The air diffusers are connected to the compressors with weighted air lines anchored across the bed of Landa Lake. Photos of the aeration systems are shown in Figure 2. A Manta 2 multi-parameter water quality sonde was installed in Landa Lake in 2013 to monitor water quality parameters including DO, temperature, conductivity, pH and turbidity which are measured and logged every 30 minutes. The location of the water quality monitoring sonde is shown in Figure 2. A telemetry system transmits water quality data from the sonde to data tables readily accessible via the internet through Environet (<https://ienvironet.com/organizations/273/nodes/1357>).

Procedures for Evaluating Dissolved Oxygen Concentrations in Landa Lake and Activating the Aeration System

The following procedures will be implemented by City of New Braunfels staff or its consultant (SWCA Environmental Consultants) to assess existing dissolved oxygen conditions of Landa Lake and to activate the aeration system, as needed, based on real-time dissolved oxygen concentrations.

1. Real-time DO data from the Landa Lake sonde is observed via the Environet telemetry website to assess DO concentrations and trends. The data is accessible at <https://ienvironet.com/organizations/273/nodes/1357>.

ATTACHMENT 3

2. Upon observation of DO levels approaching or **below 4 mg/L**, the aeration system is activated. The Environet website allows for alarms to be sent via text or email to indicate deviation from acceptable conditions.
3. The aeration system is manually activated by switching on the units at the control panel which is housed within the plastic housing cabinets (Figure 3). The plastic housing cabinets are equipped with a padlock to which CONB and SWCA staff retain keys.
4. The control panel includes a timer which can be set to activate/ de-activate the aerators at preset times. Although the timer can be set to activate the aerators only during periods of low DO (i.e., nighttime hours), the aerators are typically activated to remain operational continuously.
5. Each aerator line may be controlled independently by opening and closing valves on the aerator manifold. Each of the housing units contains similar configurations for controlling the system.
6. The aerators are to remain operational until DO levels remain above 4 mg/L for an entire 48 hour period. The aerators will be switched off once DO levels have been observed to be greater than 4 mg/L for 48 hours.
7. The aerator system, including the air line and diffusers, as well as the water quality sonde and telemetry system are inspected regularly to ensure continued functionality and operability. The aeration system will be operated throughout the year, as needed, to exercise the system and ensure continued operability. Any damages or issues associated with the aeration system and water quality sonde will be repaired and/ or investigated immediately and recorded on the Aeration System Inspection and Maintenance Log (Appendix 1).

This standard operating procedure will be updated based on field evaluations and additional DO management research findings in order to optimize the DO management program and DO mitigation efforts.



<p>10245 West Little York, Suite 600 Houston, Texas 77040 (281) 617-3227 phone (281) 617-3227 fax www.swca.com</p>	<p>CITY OF NEW BRAUNFELS AERATOR & SONDE LOCATIONS MAP COMAL COUNTY, TEXAS</p>	<ul style="list-style-type: none"> Aerator Pads Sonde Compressor Station Telemetry Station 		Background:	ESRI World Imagery									
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SHEET 1 OF 1		MAP 3	<table border="1"> <tr> <td>Created By:</td> <td>AC</td> </tr> <tr> <td>Approved By (or Quasi):</td> <td>AC</td> </tr> <tr> <td>SWCA Project No.:</td> <td>27474</td> </tr> <tr> <td>Date Produced:</td> <td>December 6, 2013</td> </tr> <tr> <td colspan="2">NAD 1983 State Plane Texas South Central Zone 4204</td> </tr> </table>		Created By:	AC	Approved By (or Quasi):	AC	SWCA Project No.:	27474	Date Produced:	December 6, 2013	NAD 1983 State Plane Texas South Central Zone 4204	
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Figure 1. Location of aeration system and water quality monitoring sonde



Figure 2. Photos of aeration system (top-solar panels and housing cabinets containing compressors, controls, and batteries; Bottom-air diffuser located at the bottom of Landa Lake).



Figure 3. Aeration system housing unit and controls

