

# **Amendment #1 Update to Appendix B Sampling Process Design and Monitoring Schedule to the Upper Neches River Basin Clean Rivers Program FY 2014/2015 QAPP**

***Prepared by the Angelina and Neches  
River Authority (ANRA) in Cooperation  
with the Texas Commission on  
Environmental Quality (TCEQ)***

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**Effective: Immediately upon approval by all parties**

Questions concerning this QAPP should be directed to:

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## Justification

This document details the changes made to the basin-wide Quality Assurance Project Plan to update Appendix B for fiscal year 2015. This document also updates the field quality control activities and bacteria holding time requirements to match those of the TCEQ SWQM program to ensure a consistent state-wide monitoring program.

## Summary of Changes

Table B2.1 footnote regarding E. coli sample hold time is amended to allow a maximum of 30 hours between sample collection and analysis.

Table B2.1 is amended to add sample volumes and holding times for EPA Method 300.0 for Nitrate-N and Nitrite-N and change the sample volume for Chloride and Sulfate.

Section B5 Quality Control is amended to remove the requirement for field split collection.

The following tables in Appendix A are amended to allow a maximum of 30 hours' time elapsed between sample collection and analysis:

- Table A7.1

The following tables in Appendix A are amended to add analysis of Anions by EPA 300.0 (Nitrate-N, Nitrite-N, Sulfate, and Chloride) by the ANRA Environmental Laboratory (pending NELAP accreditation for the method by TCEQ):

- Table A7.1

The following information in Appendix B is amended to reflect changes to:

- Sample design rationale FY 2015
- Monitoring Sites table with updated legends
- Maps of sampling sites

## Detail of Changes

### Sample Design Rationale FY 2015

There were no changes made to ANRA's CRP monitoring schedule for FY 2015. Additional stations will be monitored by ANRA as part of a Federal Clean Water Act Section 319(h) grant, but those stations will be listed under a separate TCEQ Nonpoint Source (NPS) Monitoring QAPP and are not included in this document.

### Monitoring Sites Table

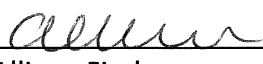
The attached monitoring Table B1.1 in Appendix B is added to reflect monitoring for FY 2015.

## **Maps**

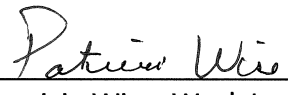
The attached maps are added to Appendix C to reflect monitoring sites for FY 2015.

These changes will be incorporated into the QAPP document and TCEQ and ANRA will acknowledge and accept these changes by signing this document.


**Texas Commission on Environmental Quality**  
**Water Quality Planning Division**

  
Allison Fischer  
Project Manager  
Clean Rivers Program

7-23-2014  
Date

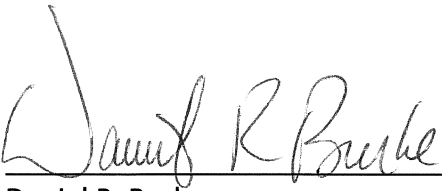
  
Patricia Wise, Work Leader  
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Allison Fischer  
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ANRA will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant, e.g., subcontractors, other units of government. ANRA will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project’s quality assurance records, and will ensure the documentation is available for review.

## B2 Sampling Methods

**Table B2.1 Sample Storage, Preservation and Handling Requirements**

Parameter	Matrix	Container**	Preservation	Sample Volume	Holding Time
TSS	Water	Plastic	< 6 °C	1000 ml	7 days
TDS	Water	Plastic	< 6 °C	500 ml	7 days
Ammonia-N	Water	Plastic	Acidify with H <sub>2</sub> SO <sub>4</sub> to pH<2, < 6 °C	500 ml (minimum) 1000 ml (requested)	28 days
Nitrate+Nitrite-N	Water	Plastic	Acidify with H <sub>2</sub> SO <sub>4</sub> to pH<2, < 6 °C	500 ml	28 days
Nitrate-N	Water	Plastic	< 6 °C	250 ml	48 hours
			< 6 °C	250 ml	48 hours
Phosphorus, Total	Water	Plastic	Acidify with H <sub>2</sub> SO <sub>4</sub> to pH<2, < 6 °C	500 ml	28 days
Chlorophyll-a / Pheophytin	Water	Plastic, Amber	< 6 °C, keep in dark; filter within 48 hours	200 ml (minimum)	Filter within 48 hours; frozen filters can be held 3 ½ weeks
E. coli*	Water	SPS	< 6 °C (not frozen); sodium thiosulfate	100 ml (minimum) 250 ml (for duplicates)	8 hours (may be extended to 30 hours if necessary)
Chloride	Water	Plastic	< 6 °C	250 ml	28 days
Sulfate	Water	Plastic	< 6 °C	250 ml	28 days

\*E.coli samples should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

\*\*Container Types: Plastic = High Density Polyethylene (HDPE) or Low Density Polyethylene (LDPE)  
SPS = Sterile Polyethylene

## B5 Quality Control

### Field Split

Field split samples are not required as part of the routine Clean Rivers Program, but if needed, may be inserted into the sample regime. The frequency is determined by the needs of the project.

# Appendix A: Measurement Performance Specifications (Table A7.1)

TABLE A7.1 Measurement Performance Specifications for Angelina & Neches River Authority										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2.5	NA	NA	NA	ANRA
	mg/L	water	SM 2540D	00530	5	1	NA	NA	NA	LCRA ELS
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH <sub>3</sub> -D (20th)	00610	0.1	0.1	70-130	20	80-120	ANRA
	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.02	70-130	20	80-120	LCRA ELS
NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N)	mg/L	water	EPA 353.2 Rev. 2.0 (1993)	00630	0.05	0.04	70-130	20	80-120	ANRA
	mg/L	water	SM 4500-NO <sub>3</sub> E	00630	0.05	0.04	70-130	20	80-120	ANRA
	mg/L	water	SM 4500 - NO <sub>3</sub> H	00630	0.05	0.02	70-130	20	80-120	LCRA ELS
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0* Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	ANRA
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0* Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	ANRA
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	ANRA
	mg/L	water	SM 4500-P E	00665	0.06	0.06	70-130	20	80-120	ANRA
	mg/L	water	EPA 365.4 Rev. 2.0 (2993)	00665	0.06	0.02	70-130	20	80-120	LCRA ELS
CHLORIDE (MG/L AS CL)	mg/L	water	SM 4500Cl-B	00940	5	5	70-130	20	80-120	ANRA
	mg/L	water	EPA 300.0* Rev. 2.1 (1993)	00940	5	5	70-130	20	80-120	ANRA LCRA ELS
SULFATE (MG/L AS SO4)	mg/L	water	SM 426C 15th Ed	00945	5	5	70-130	20	80-120	ANRA
	mg/L	water	EPA 300.0* Rev. 2.1 (1993)	00945	5	5	70-130	20	80-120	ANRA LCRA ELS
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	ANRA
	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	LCRA ELS
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	EPA 446.0	32211	3	2	NA	20	80-120	LCRA ELS

PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	Water	EPA 445	32213	3	2	NA	NA	NA	LCRA ELS
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	EPA 446	32218	3	2	NA	NA	NA	LCRA ELS
<b>CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L</b>	µg/L	water	EPA 445.0	70953	3	2	NA	20	80-120	LCRA ELS

\* The ANRA Environmental Laboratory expects the NELAP accreditation process for EPA 300.0 to be completed by September 1, 2014. EPA 300.0 will not be used by the ANRA Environmental Laboratory for generating reportable data until NELAP accreditation has been granted. Any samples received prior to the accreditation will be analyzed by the alternate methods listed (or in the case of Nitrate-N and Nitrite-N, combined Nitrate+Nitrite-N will be analyzed). This footnote does not apply to LCRA ELS, which has current certification for EPA 300.0.

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020  
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)  
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).  
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2007 (RG-416)

**TABLE A7.1 Measurement Performance Specifications for Angelina & Neches River Authority**

Bacteriological Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
<b>E. COLI, COLILERT, IDEXX METHOD, MPN/100ML</b>	MPN/100 mL	water	IDEXX Colilert **	31699	1	1	NA	0.50*	NA	ANRA
<b>E.COLI, COLILERT, IDEXX, HOLDING TIME</b>	hours	water	NA	31704	NA	NA	NA	NA	NA	ANRA

\* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.

\*\* E.coli samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020  
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998. (Note: The 21st edition may be cited if it becomes available.)  
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).  
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2007 (RG-416)



## **Appendix B Sampling Process Design and Monitoring Schedule (plan)**

### ***Sample Design Rationale FY 2015***

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the Angelina & Neches River Authority coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

No changes were made to the monitoring schedule for FY 2015. ANRA will continue to monitor the same monitoring stations at the same frequency as in FY 2014. The additional monitoring stations added in FY 2014 will be continued in FY 2015.

- ANRA will continue monitoring Lake Striker as well as the tributaries to Lake Striker (Bowles Creek and Johnson Creek that show a history of low pH values.
- Monitoring will continue at the additional monitoring station on Ayish Bayou so that data can be collected for AU\_02.
- Monitoring will continue to be performed on Cedar Creek and Hurricane Creek within the City of Lufkin city limits in an effort to collect additional data regarding bacterial impairments.
- Monitoring will continue at Bayou Carrizo, a tributary to Sam Rayburn Reservoir which has not been historically monitored prior to FY 2014.
- Lake Naconiche monitoring, which began in FY 2014, will continue in FY 2015.
- West Creek, which was a part of the Attoyac Bayou Watershed Protection Plan monitoring, will continue to be monitored by ANRA in FY 2015.

## Monitoring Sites for FY 2015

The sample design for SWQM is shown in Table B1.1 below.

**Table B1.1 Sample Design and Schedule, FY 2015**

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed
NECHES RIVER AT US 69 1.01 KM NORTH OF FM 1014/US 69 INTERSECTION 1.8 KM NORTHWEST OF ROCKLAND IN TYLER COUNTY	10585	0604	6	10	AN	AN	RT	4	4	4	4											
CEDAR CREEK AT ELLIS AVE IN LUFKIN	21434	0604A	6	10	AN	AN	RT	4	4	4	4											
CEDAR CREEK AT FM 1336 1.29 KM WEST-SOUTHWEST OF FM 324/FM 1336 INTERSECTION IN SOUTHWEST LUFKIN	13528	0604A	6	10	AN	AN	RT	4	4	4	4											
CEDAR CREEK AT FM 2497 5.55 KM NORTHWEST OF FM 2497/US 59 INTERSECTION 7.45 KM NORTH NORTHWEST OF CITY OF DIBOLL	10478	0604A	6	10	AN	AN	RT	4	4	4	4											
CEDAR CREEK AT ST LOOP 287 IN LUFKIN	10479	0604A	6	10	AN	AN	RT	4	4	4	4											
HURRICANE CREEK 38 METERS DOWNSTREAM OF KIWANIS PARK DRIVE AND DIRECTLY DOWNSTREAM OF CONFLUENCE WITH UNNAMED TRIBUTARY IN LUFKIN	21433	0604B	6	10	AN	AN	RT	4	4	4	4											
HURRICANE CREEK AT FM 324 6.74 KM SOUTH SOUTHWEST OF LUFKIN	13529	0604B	6	10	AN	AN	RT	4	4	4	4											
HURRICANE CREEK AT ST LOOP 287 IN SOUTH LUFKIN	10487	0604B	6	10	AN	AN	RT	4	4	4	4											
JACK CREEK AT FM 2497 5 KM SOUTHEAST OF SH 94/FM 2497 INTERSECTION 13.3 KM SOUTHWEST OF LUFKIN	10492	0604C	6	10	AN	AN	RT	4	4	4	4											
JACK CREEK AT FM 3150 7 KM WEST OF LUFKIN	10494	0604C	6	10	AN	AN	RT	4	4	4	4											
JACK CREEK AT SH 94 WEST OF LUFKIN 550 M EAST OF FM 706/ SH 94 INTERSECTION	10493	0604C	6	10	AN	AN	RT	4	4	4	4											
PINEY CREEK AT FM 358 2.4 KM EAST OF FM 3154/FM 358 INTERSECTION 10 KM EAST OF CITY OF PENNINGTON	16096	0604D	6	10	AN	AN	RT	4	4	4	4											
BILOXI CREEK AT ANGELINA CR216 8 KM SOUTHEAST OF LUFKIN 2.4 KM DOWNSTREAM OF US69	10499	0604M	6	10	AN	AN	RT			6	6											

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed
BILOXI CREEK AT FM 1818 2.5 KM EAST OF FM 1818/ FM 58 INTERSECTION 13.8 KM EAST OF DIBOLL	16097	0604M	6	10	AN	AN	RT	4	4	4	4											
BUCK CREEK AT FM 1818 4.72 KM WEST OF FM 844/ FM 1818 17.94 KM EAST OF DIBOLL	16098	0604N	6	10	AN	AN	RT	4	4	4	4											
LAKE RATCLIFF WHERE NORTHWEST ARM OF LAKE JOINS MAIN BODY 350 M NORTHWEST OF THE SOUTHWEST CORNER OF DAM1.48 KM WEST OF RATCLIFF	17339	0604T	6	10	AN	AN	RT	4	4	4												
BAYOU CARRIZO AT SH 21 NEAR NACOGDOCHES	21432	0610	6	10	AN	AN	RT	4	4	4	4											
SAM RAYBURN RESERVOIR NEAR SHIRLEY CREEK IN THE ANGELINA RIVER CHANNEL 5.13 KM NE OF FM 2109/ FM 2801 INTERSECTION	15524	0610	6	10	AN	AN	RT	4	4	4												
SAM RAYBURN RESERVOIR ADJACENT TO ALLIGATOR COVE IN THE ATTOYAC RIVER CHANNEL 3.94 KM NORTHWEST OF FM 3185/ SH 147 INTERSECTION	15523	0610	6	10	AN	AN	RT	4	4	4												
SAM RAYBURN RESERVOIR ON ANGELINA RIVER CHANNEL 0.75 KM DOWNSTREAM OF MARIONS FERRY BOAT RAMP 4.2 KM NORTH AND 2.2 KM EAST OF FM 1669/ SH 103 INTERSECTION NEAR LUFKIN	21100	0610	6	10	AN	AN	RT	4	4	4												
AYISH BAYOU AT SH 103 0.8 KM EAST OF FM 705	15361	0610A	6	10	AN	AN	RT	4	4	4	4											
AYISH BAYOU AT WEST COLUMBIA STREET IN CITY OF SAN AUGUSTINE	21431	0610A	6	10	AN	AN	RT	4	4	4	4											
ANGELINA RIVER 340 METERS UPSTREAM OF SH 204 9.93 KM WEST OF CUSHING	10633	0611	6	5	AN	AN	RT	4	4	4	4											
ANGELINA RIVER AT SH 21 11.17 KM EAST NORTHEAST OF ALTO	10630	0611	6	10	AN	AN	RT	4	4	4	4											
ANGELINA RIVER UPSTREAM SAM RAYBURN RESERVOIR AT FM 1798 5.5 KM WEST OF LANEVILLE	10635	0611	6	5	AN	AN	RT	4	4	4	4											
LA NANA BAYOU AT LOOP 224 NORTH IN THE CITY OF NACOGDOCHES 1.2 KM EAST OF THE INTERSECTION OF US BUS 59F/ST LOOP 224 NORTH	16301	0611B	6	10	AN	AN	RT	4	4	4	4											
LA NANA BAYOU AT NACOGDOCHES CR 526 6.9 MI SOUTH OF NACOGDOCHES BETWEEN FM 2863 AND FM 3228	10474	0611B	6	10	AN	AN	RT	4	4	4	4											
LA NANA BAYOU IMMEDIATELY UPSTREAM OF EAST MAIN STREET/STATE HIGHWAY 7/ STATE HIGHWAY 21 IN NACOGDOCHES	20792	0611B	6	10	AN	AN	RT	4	4	4	4											

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bacteria	Flow	24 hr DO	AqHab	Benthics	Nekton	Metal Water	Organic Water	Metal Sed	Organic Sed	Fish Tissue	Amb Tox Water	Amb Tox Sed
MUD CREEK AT US 79 9.8 KM EAST OF JACKSONVILLE AND 5.9 KM WEST OF NEW SUMMERFIELD	14477	0611C	6	5	AN	AN	RT	4	4	4	4											
MUD CREEK AT US 84 0.87 KM SOUTHWEST OF REKLAW	10532	0611C	6	5	AN	AN	RT	4	4	4	4											
LAKE NACOGDOCHES IN MAIN POOL NEAR DAM 375 M EAST OF WESTERN EDGE OF DAM 126 M NORTH OF DAM 10 MI WEST OF NACOGDOCHES	15801	0611Q	6	10	AN	AN	RT	4	4	4												
LAKE NACOGDOCHES NEAR ISLAND IN UPPER LAKE EQUIDISTANT BETWEEN ISLAND AND BOAT RAMP AT THE END OF HARBOR DRIVE AND 3.37 KM SOUTH OF SH 21	21021	0611Q	6	10	AN	AN	RT	4	4	4												
BOWLES CREEK AT CHEROKEE CR 4608/RUSK CR 4194 SOUTHWEST OF HENDERSON	21429	0611R	6	5	AN	AN	RT	4	4	4	4											
JOHNSON CREEK AT RUSK CR 476 SOUTHWEST OF HENDERSON	21430	0611R	6	5	AN	AN	RT	4	4	4	4											
LAKE STRIKER NEAR DAM APPROX 0.8 MILES SOUTHEAST OF POWERPLANT 138 M NORTHWEST OF SPILLWAY AND 7.5 MILES SOUTHEAST OF NEW SUMMERFIELD	17824	0611R	6	5	AN	AN	RT	4	4	4												
LAKE STRIKER UPPER LAKE EQUIDISTANT BETWEEN SHORELINES 2.28KM SOUTHEAST OF INTERSECTION OF FM2274/FM32889.4 KM E. OF NEW SUMMERFIELD	17822	0611R	6	5	AN	AN	RT	4	4	4												
ATTOYAC BAYOU AT SH 21 0.71 KM WEST OF INTERSECTION OF SH 21/ FM 1196 4.77 KM EAST OF CHIRENO	10636	0612	6	10	AN	AN	RT	4	4	4	4											
ATTOYAC BAYOU AT SH 7 1.75 KM NORTHEAST OF MARTINSVILLE	15253	0612	6	10	AN	AN	RT	4	4	4	4											
ATTOYAC BAYOU AT US 59 4.12 KM NORTHEAST OF GARRISON	16076	0612	6	10	AN	AN	RT	4	4	4	4											
NACONICHE LAKE NEAR THE DAM 226 METERS NORTH AND 715 METERS WEST OF INTERSECTION OF FM 2435 AND US 59 NORTHEAST OF CITY OF NACOGDOCHES	21435	0612	6	10	AN	AN	RT	4	4	4												
WEST CREEK AT FM 2913 2.57 KM N OF INTERSECTION WITH SH 7	20845	0612F	6	10	AN	AN	RT	4	4	4	4											

### ***Critical vs. non-critical measurements***

All data collected under this QAPP and entered into SWQMIS are considered critical.

## **Appendix C: Station Location Maps**

### ***Station Location Maps***

Maps of stations monitored by ANRA are provided below. The maps were generated by ANRA. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact Jeremiah Polling, ANRA Information Systems Coordinator, at 936-633-7551, or via email at [jpolling@anra.org](mailto:jpolling@anra.org).

