# 2021 Water Quality Report

**U.S. Army Corps of Engineers**
**Saint Louis District**

## Rend Lake Water Quality Conditions: 1971-2021

**May 2023**

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Prepared for

United States Army Corps of Engineers
Saint Louis District
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## EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in Federal Statutes, Executive Orders, and internal regulations. These regulations were designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest rather than private gain; therefore, USACE, in the design, construction, management, operation, and maintenance of its facilities, will exert leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is USACEs policy to comply with requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals.

The United States Army Corps of Engineers, Saint Louis District (CEMVS), implemented a water quality monitoring program during the 1970s to evaluate how its civil projects may be affecting water resources. Data collected from this effort serves as an invaluable tool for evaluating the significance of annual water quality measurements and tracking long-term trends. Water quality data is provided to the Missouri Department of Natural Resources and the Illinois Environmental Protection Agency to be used as a screening mechanism for the Missouri and Illinois Water Quality Report which is required every two years by the Clean Water Act Sections 303(d) and 305(b).

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing law makers and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance and describes various programs implemented to restore and protect our waters. Currently the Illinois Environmental Protection Agency (IEPA, 2020) has listed Rend Lake impaired for fish consumption caused by mercury. The Big Muddy River (including Rayse Creek) upstream of Rend Lake is impaired for oil, mercury, dissolved oxygen, pH, and fecal coliform. The other main tributary, Casey Fork, is impaired for oil, total suspended solids, and PCBs. The smaller tributaries, Gun Creek and Atchison Creek, are impaired for dissolved oxygen. Immediately downstream of Rend Lake, the Big Muddy River is impaired for aquatic life and fish consumption caused by sedimentation/siltation, mercury, PCBs, Aldrin, Dieldrin, Endrin, Heptachlor, Mirex, and Toxaphene.

Water quality sampling in 2021 revealed the following concerns at Rend Lake: dissolved oxygen, temperature, Atrazine, chlorophyll, manganese, phosphorus, and bacteria.

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# INTRODUCTION

The Big Muddy River Watershed is located in Southern Illinois and encompasses a drainage area of approximately 2,390 square miles within the following counties: Franklin, Jackson, Jefferson, Marion, Perry, Union Washington, and Williamson. The Big Muddy River originates in Jefferson County, southeast of Centralia, Illinois and flows southward for approximately 156 miles, where it joins the Mississippi River, just south of Grand Tower, Illinois in Jackson County. Major tributaries of the Big Muddy River include: Beaucoup Creek, Little Muddy River, Casey Creek, Middle Fork of the Big Muddy, and Crab Orchard Creek. Lakes and reservoirs within the Big Muddy River Watershed include: Kinkaid Lake, Rend Lake, Crab Orchard Lake, Devil's Kitchen Lake, Little Grassy Lake, and Cedar Lake.

The Rend Lake Watershed is located in south-central Illinois. It flows generally in a southerly direction and drains approximately 311,000 acres, located in the following four counties: Jefferson, Franklin, Washington, and Marion. Elevation within the watershed ranges from 642.0 feet NGVD (National Geodetic Vertical Datum) in the northern portion of the watershed to 396.0 feet NGVD at the outfall of the Rend Lake dam at the southern extent of the watershed. Approximately 37,400 people reside within the Rend Lake Watershed and the average precipitation is approximately 41.1 inches per year. Land cover data for the watershed indicate the largest percentage of area is used for crop production (35%). Approximately 27% of the watershed area is forest and 20% of the watershed is pasture.

Rend Lake is located in Franklin and Jefferson counties, about three miles northwest of Benton, Illinois. The dam is located on the Big Muddy River, 103.7 miles upstream from its confluence with the Mississippi River. The Rend Lake project is comprised of 40,840 acres of land and water. The lake has a water surface area of 20,633 acres at the normal operating pool elevation of 405.0 feet NGVD. At this pool elevation the lake shoreline is approximately 162 miles; and extends upstream from the dam approximately 13 miles. Roughly 10 miles above the main dam are two sub-impoundment dams: one on the Big Muddy River and the other on the Casey Fork River. These sub-impoundments are used for regulating water levels for fish and wildlife management activities. The lake width varies from 1.5 to 3 miles. The depth is fairly shallow, with a maximum depth of about 35 feet near the main dam, when the pool elevation is at 405.0 feet NGVD. The Rend Lake project contains 53 recreation areas, with 756 campsites, 104 picnic sites, 30 boat ramps, 235 marina slips and over 34 miles of trails. Each year, on average, over two-million people visit the lake, which annually generates nearly $35 million in visitor spending within 30-miles of the project.

There is virtually no municipal or industrial use of groundwater in the area because of the abundant water supply provided by Rend Lake, which serves as the major municipal water supply for approximately 300,000 residents of Southern Illinois. This water supply system is managed by the Rend Lake Conservancy District (RLCD), which is the largest public water supply system (1,800 square miles) in the State of Illinois and draws nearly

13 million gallons of water per day from Rend Lake. Also, the lake provides industrial water supply for a coal mine in the area, which is managed by Adena Resources.

Rend Lake is managed and operated by the CEMVS for the authorized purposes of flood risk management, water supply, water quality, fish and wildlife conservation, recreation, and area redevelopment. The lake serves as a heavy recreational usage lake. The land surrounding the lake is used predominately for agriculture. Agricultural runoff and municipal wastewater treatment facilities are the primary potential source of pollution into the Rend Lake watershed. Additional sources are marinas, recreational watercraft discharges and wildlife fecal material runoff.

Water quality is of paramount importance for sustaining ecological integrity and services provided by the Big Muddy River and Rend Lake. Water quality is influenced by a range of both point and nonpoint pollution sources, which may include natural processes, industrial and municipal effluents, and surface runoff from agricultural arenas.

The USACE has implemented a Water Quality Management Plan (WQMP) as part of the operation and maintenance activities associated with managing USACEs' civil works projects throughout the District which includes, among other reservoirs and rivers, the Big Muddy River and Rend Lake. The WQMP addresses surface water quality management issues and adheres to the guidance and requirements specified by Clean Water Act (CWA), as well as the self-imposed Engineering Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for USACE Civil Works Projects" (USACE, 2018). Water quality monitoring is implemented to fulfill five primary objectives that drive the CEMVS WQMP:

1) Establish baseline conditions, identify significant water quality trends, and document problems and accomplishments.
2) Ensure that surface water quality, as affected by CEMVS projects, is suitable for project purposes, existing water uses, public health and safety, and in compliance with applicable state and federal water quality standards.
3) Provide support to water control, project operations, and navigation for regulations and modifications.
4) Investigate special problems, design and implement modifications, and improve water management procedures
5) Establish and maintain strong working partnerships and collaborations with appropriate entities within and outside USACE regarding water quality.

This report is intended to document and assess water quality conditions occurring at Rend Lake. The report describes conditions observed in 2021, as well as baseline data collected from 1971-2019. Additional historical data are available upon request.

# REND LAKE WQMP COVERAGE

The WQMP for Rend Lake includes water samples taken at the following locations: major tributaries (REN-7 and REN-5), main body of the lake (REN-2, REN-3, REN-4, REN-8, and Rend Marina), and just downstream of the dam (REN-1). See figures 1 and 2, and Table 1 for a site map and site coordinates.

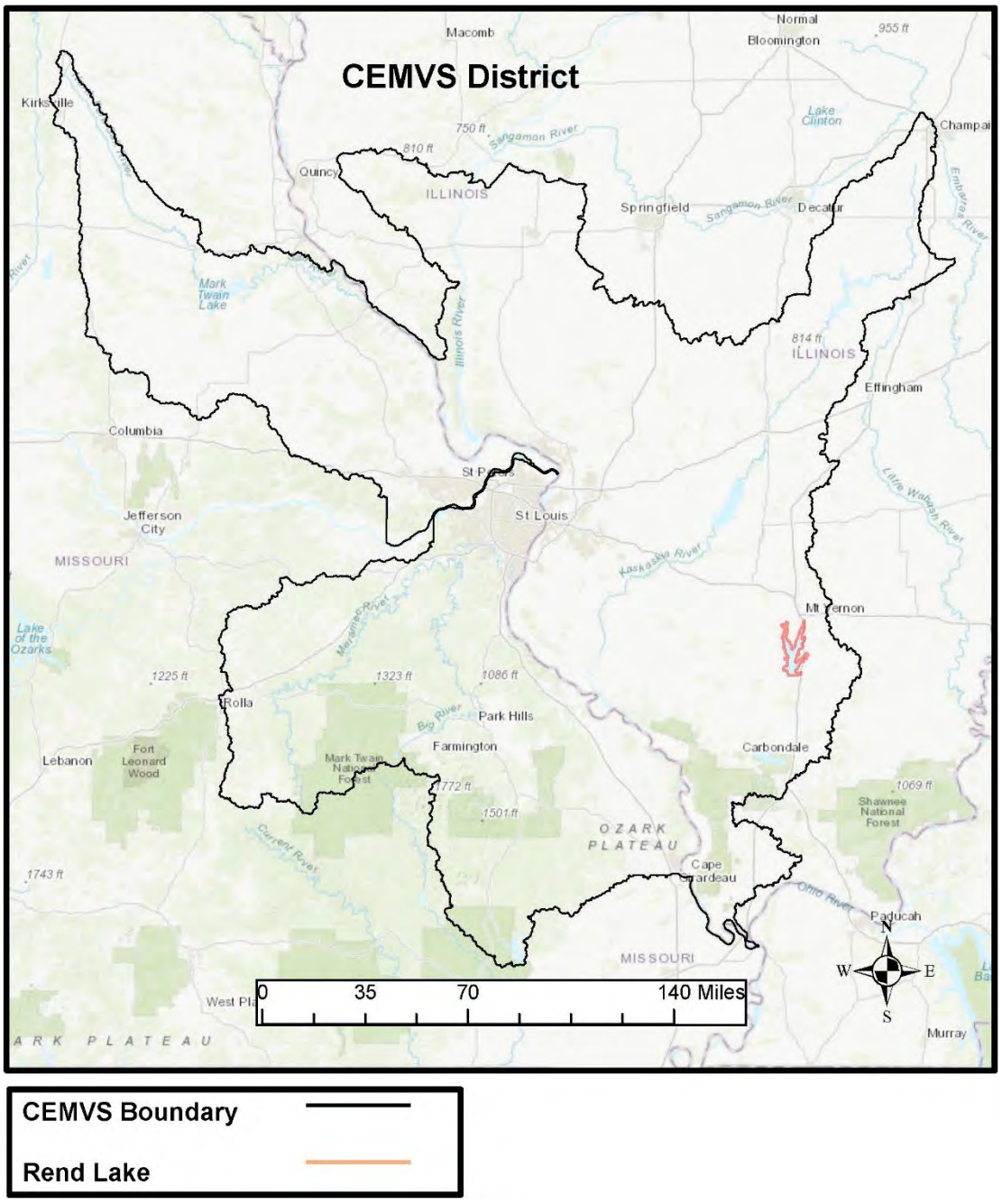



**Figure 1. CEMVS District and Rend Lake**

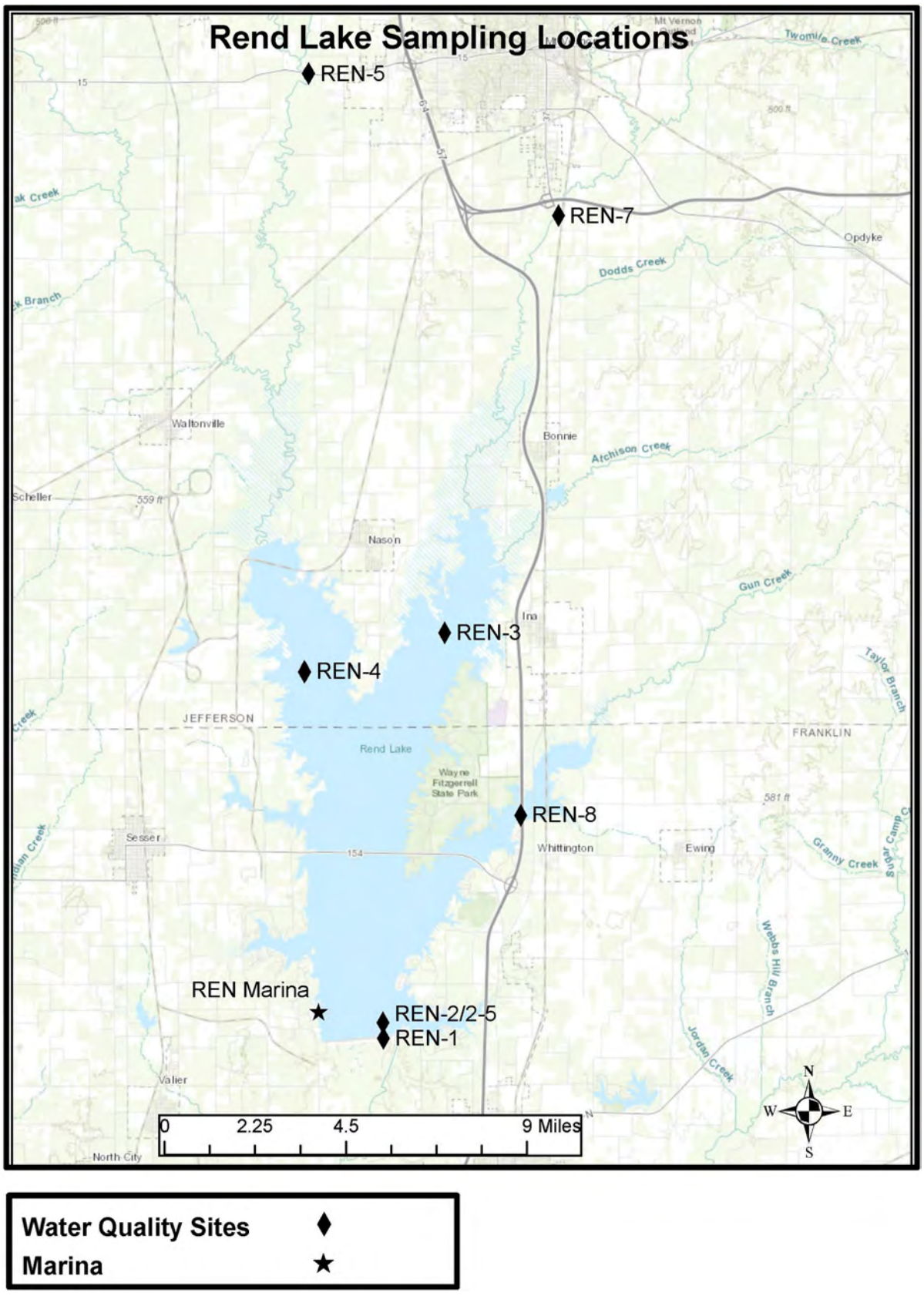



**Figure 2. Water Quality (WQ) Sampling Locations at Rend Lake**

## Sample Location Summary Table

**Table 1: Sample Location Summary and Geographic Location (NAD 1983)**

| Sample Location Type | Abbreviation | Site Name | Latitude | Longitude |
|---|---|---|---|---|
| Major Tributary | TRIB | REN-5 | 38.309795 | -88.988575 |
| | TRIB | REN-7 | 38.2695630 | -88.8987040 |
| Main Reservoir Surface | RS | REN-2 | 38.039294 | -88.961891 |
| | RS | REN-3 | 38.1517450 | -88.9395220 |
| | RS | REN-4 | 38.1407880 | -88.9899850 |
| | RS | REN-8 | 38.1002570 | -88.9123030 |
| | RS | REN-MAR | 38.044727 | -88.985267 |
| Reservoir Benthic | RB | REN-2-5 | 38.039294 | -88.961891 |
| Tail Race (below dam) | TR | REN-1 | 38.0369550 | -88.9615650 |

Samples at Marinas are not always taken in the exact same location.

# METHODS AND ANALYSIS: WATER QUALITY

## Data Collection and Historical Reference Data

During 2021, water quality samples were collected and analyzed for 9 locations during four separate sampling events (n=36; Table 1). One duplicate sample was also collected during each sampling event for quality control purposes. With the exception of the benthic sample location REN 2-5 in front of the dam, samples were collected from the upper one meter of the water column, preserved, and transported to the Applied Research and Development Laboratory (ARDL) in Mount Vernon, Illinois for analysis.

For the purpose of this report, historical reference data refers to water quality data collected during the previous years ranging as far back as 1971 (parameter dependent) at Rend Lake. Historical reference data are intended to represent the current condition of Rend Lake.

## Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses for 2020 data were performed on water quality monitoring data collected for 9 locations, and classified as TRIB (n= 2), RS (n=5), RB (n=1), and TR (n=1). For comparison, statistical analyses were also performed on historical water quality monitoring data and, although some sampling locations have been removed, they were classified in the same manner. Descriptive statistics were calculated to describe central tendencies and boxplots created to illustrate comparisons between groups. Monitoring results were compared to applicable water quality standard criteria established by the appropriate state agencies pursuant to the Federal Clean Water Act. If a state water quality standard criteria was not available, recommended criteria from the literature were considered.

Seasonal data are classified as: Winter (December 01 - March 14), Spring (March 15 – May 31), Summer (June 1 – September 15), Fall (September 16 – November 30).

## Quality Assurance

The United States Army Corps of Engineers, Saint Louis District quality assurance procedures considers two primary focus areas: (1) those that involve laboratory analysis of samples, and (2) those concerning the collection and processing of the water samples in the field.

Since 2012, ARDL has analyzed water quality samples for CEMVS. Their quality assurance program includes the use of quality control charts, check standards, field and in-house matrix spikes, laboratory blanks and performance evaluation samples. In addition, one blind duplicate sample is submitted for at least every 20 samples, or, in this case, every sampling event (one event/day at Rend Lake has 9 samples and one duplicate).

Internal checks are also used for field sampling. These include adherence to operating procedures for data collection and periodic evaluation of sampling personnel. Field sampling equipment and multimeters are calibrated/serviced in accordance with factory recommendations.

## Water Quality Parameters and Criteria

Parameters used to characterize water quality have been generally accepted criteria for assessing aquatic life and human health include:

**Temperature (Temp)** is important because it controls several aspects of water quality. Colder water holds more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as Salmonids, which require water temperatures below 20$^{o}$C. Water temperature criteria for warm water bodies in Illinois is within 2.8$^{o}$C of the seasonal norm.

**Dissolved Oxygen (DO)** refers to the measurement of free oxygen molecules ($O_2$) that are not bonded to any other elements; thus, oxygen bonded in water ($H_2O$) would not be considered in a measurement of dissolved oxygen. Oxygen is dissolved in surface waters through interactions with the atmosphere and as a waste product of photosynthesis ($CO_2 + H_2O = (CH_2O) + O_2$) from phytoplankton and aquatic vegetation. Additional factors influencing DO include temperature, pressure, and salinity.

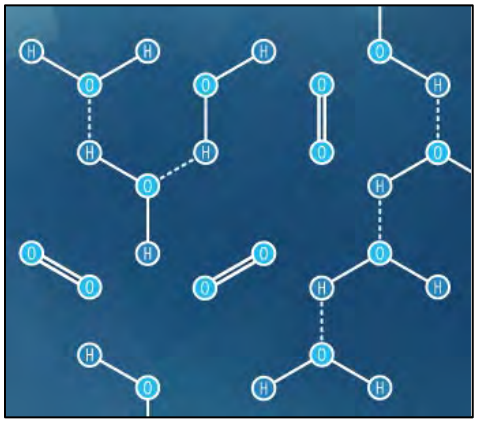


***Figure 1: Dissolved oxygen ($O_2$) vs oxygen bonded in water ($H_2O$).***

Dissolved oxygen is required for most aquatic life including fish, invertebrates, bacteria, and plants. Fish and invertebrates utilize DO for respiration through gills and cutaneous breathing, and plants require dissolved oxygen for respiration when photosynthesis is not possible. Smaller microbes and bacteria utilize DO for decomposition of organic materials, a process essential for nutrient cycling. Bottom feeders such as worms and mussels can persist when DO is $\geq$1mg/L, while most inland fish species require a minimum DO of 4mg/L. The DO water quality criteria for Illinois is $\geq$5mg/L.

**Potential of Hydrogen (pH)** is a measure of how acidic or basic water is. Potential of Hydrogen is reported on a logarithmic scale ranging from 0 – 14, with 7.0 being neutral. As pH increases from 7.0, water increases in alkalinity, whereas a decrease from 7.0 indicates an increase in acidity. Since pH is measured on a logarithmic scale, every

one-unit change in pH indicates a 10-fold change in acidity; thus, a pH of 6.0 is ten times more acidic than a pH of 7.0 and a pH of 4.0 would be one-thousand times more than a pH of 7.0.

The pH of water varies considerably beyond the local level. Natural variation in bedrock and soil composition through which water moves has been reported as one of the most influential factors. Additional factors include decomposition of organic materials, acidity of local precipitation, discharge of effluents and chemicals, and mining operations.

Most freshwater streams and rivers have a natural pH ranging from 6 to 8. As pH approaches 5 (acidic), less tolerant fish and aquatic invertebrate assemblages may be extirpated, and a pH below 4.5 would be without most desired aquatic life. Conversely, when pH exceeds 9.5 (alkaline), aquatic fish and invertebrates begin to rapidly decrease and beyond 10, fish become extirpated. The pH water quality criteria for Illinois ranges from 6.5 – 9.0.

**Conductivity** is a measure of water's ability to conduct electrical current. In its purist form, water has a *near* neutral charge, indicating that it is an inefficient conductor of electrical current. Thus the ability to carry electrical current is driven by water soluble ions (atoms and molecules with a charge) such as salts and other inorganic materials. Conductivity is also influenced by water temperature; as temperature increases, conductivity increases. For this reason, conductivity is commonly reported as Specific Conductivity (SpCond), which is the measurement of conductivity at 25 degrees Celsius.

Conductivity in streams and rivers is affected by the geology of the area. Streams running through granite tend to have lower conductivity due to granite being composed of inert material; materials that do not ionize or dissolve into ionic compounds in water. Conversely, streams that run through areas of limestone or clay soils tend to have higher conductivity readings because of the presence of materials that ionize. Conductivity is useful as a general measure of water quality. A stream tends to have a relatively constant range of conductivity that, once established, can be used as a baseline. Significant changes, either increases or decreases, might indicate a source of pollution has been introduced into the water. The pollution source could be a treatment plant, which raises the conductivity, or an oil spill, which would lower the conductivity. In general, there are no water quality criteria for SpCond. The District threshold of 500 µS/cm is a rule of thumb value that is often associated with some form of biological impairment.

**Oxidation Reduction Potential (ORP)** is a measurement of the net status of all the oxidation and reduction reactions in a given water sample. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. Oxidation reduction potential sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts. Positive readings indicate increased oxidizing potential and negative readings increased reduction. Oxidation reduction potential

values are used much like pH values to determine water quality. While pH readings characterize the state of a system relative to the receiving or donating hydrogen ions (base or acid), ORP readings characterize the relative state of losing or gaining electrons. Generally ORP readings above 400mV are harmful to aquatic life; however, ORP is a non-specific measurement, which is a reflection of a combination of effects of all the dissolved materials in the water. Therefore, the measurement of ORP in relatively clean water has only limited utility unless a predominant redox-active material is known to be present.

**Total Suspended Solids (TSS)** concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. **Turbidity (FNU)** measurements are inverse to suspended solid measurements. As TSS increases, the FNU or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of FNU. Total Suspended Solids measurements represent a combination of **Volatile Suspended Solids (VSS)**, which consist of organic material, and **Nonvolatile Suspended Solids (NVSS)**, which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids, VSS are analyzed. Volatile suspended solid concentration represents the organic portion of the total suspended solids. Organic material often includes plankton, and additional plant and animal debris present in water. Total VSS indicates the presence of organics in suspension; and, therefore, show additional demand levels of oxygen. The Illinois Environmental Protection Agency suggests that generally NVSS above 15 mg/L could highly impair recreational lake use while NVSS of 3 to 7 mh/L may cause slight impairment (Hudson, 1998). Illinois does not currently have a standard criteria for TSS, NVSS or VSS.

**Total Organic Carbon (TOC)** is a measure of the amount of organic carbon in a water body. In addition to natural organic substances, TOC includes insecticides and herbicides, as well as domestic and industrial waste. Industrial waste effluent may include carbon-containing compounds with various toxicity levels. Further, a high organic content means an increase in the growth of microorganisms which contribute to the depletion of oxygen supplies.

Currently, there are no state or federal water quality standard criteria set for TOC. Because carbon occurs naturally, its concentration varies based on physical and chemical attributes in a watershed; thus, this study relies on historical reference conditions to identify unfavorable conditions.

**Metals Iron (TFe) and Manganese (TMn)** (T=total) are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential,

or decreases in pH. Metals in surface waters can be from natural or human sources. Metal levels in surface water may pose a health risk to humans and the environment.

**Pesticides** are commonly used throughout much of the agricultural landscape that the Big Muddy River flows. This study considers one insecticide and seven herbicides. Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Two of the most widely used herbicides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The water quality standards for the pesticides sampled are located in Table 2.

**Nitrogen** occurs naturally in water through several forms including nitrogen (N2), nitrite (NO2-N), nitrate (NO3-N), ammonia (NH3), and ammonium (NH4). Nitrates are the most commonly reported form of nitrogen, and may have a meaningful influence on a water body's trophic status. Algae and other plants use NO3-N as a food source, thus excess levels of NO3-N can promote increases in algae production and hypereutrophic conditions.

In general, NO3-N does not have a *direct* effect on fish or aquatic insects. Illinois has set criteria standards for NO3-N to 10 mg/L to accommodate safe drinking waters for human and livestock; however, this threshold likely exceeds the concentration that is appropriate for assessing ecosystem health.

**Total Ammonia Nitrogen (TAN)** includes NH3 and NH4. Total ammonia nitrogen is a colorless gas with a strong pungent odor. Ammonia occurs naturally and is a biological requirement for aquatic life, however elevated concentrations can be toxic to freshwater organisms. Unnatural sources of ammonia include, accidental releases of ammonia rich fertilizer, effluent from sewage treatment plants, improper disposal of ammonia products, and livestock waste.

Toxic concentrations for freshwater organisms range from 0.53 – 22.8 mg/L, and are strongly dependent on both pH and temperature. In general, an increase in pH and/or temperature corresponds with an increase in toxicity. Additional information in regards to the relationship between pH, temperature, and ammonia, as it relates to toxicity, can be reviewed in Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (USEPA 2013).

**Total Phosphorus (TP)** is analyzed as phosphorus and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algal bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body;

therefore, any addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of runoff from agricultural fields and urban environments. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, and point source pollution. The general standard for phosphorous in lake water is 0.05 mg/L. Dissolved phosphorous, also called **Orthophosphate ($PO_4$-P)** is generally found in much smaller concentrations than total phosphorous, and is readily available for algal uptake. Orthophosphate concentrations in a water body vary widely over short periods of time as plants take it up and release it.

**Chlorophyll a (CHL_a)** is a measure of the amount of algae growing in a waterbody, and therefore can be used to classify trophic status. Although algae are a natural part of freshwater ecosystems, too much algae can cause aesthetic problems such as green scums and bad odors, and can result in decreased levels of DO.

**Pheophytin a (PHEO a)** is a natural degradation product or digestion of CHL_a. The ratio of PHEO_a to CHL_a can provide an indication of the decline or growth in eukaryotic algae and cyanobacteria populations.

**Trophic Status** is determined using a modified **Trophic State Index (TSI)**, as described by Carlson (1977). Trophic State Index is calculated from secchi-depth transparency, total phosphorus, and chlorophyll-a measurements. Values for these three parameters are converted to an index number ranging from 0-100 according to the following equations:

TSI (Seechi Depth) = 10(6 - (ln SD/ln 2))
TSI (Chlorophyll-*a*) = TSI(Chl) = 10(6 - ((2.04 - 0.68 ln Chl)/ln 2))
TSI (Total Phosphorus) = TSI(TP) = 10(6 – (ln (48/TP)/ln 2))

*where ln indicates the Natural Logarithm*

A TSI average value, calculated as the average of the three individually determined TSI metrics, is used as an overall indicator of a water body's trophic state. The relationship between TSI and trophic condition is defined as follows:

| TSI | Trophic Condition |
|---|---|
| 0-40 | Oligotrophic |
| 40-50 | Mesotrophic |
| 50-70 | Eutrophic |
| 70-100 | Hypereutrophic |

## Laboratory Methods and Water Quality Criteria Summary Table

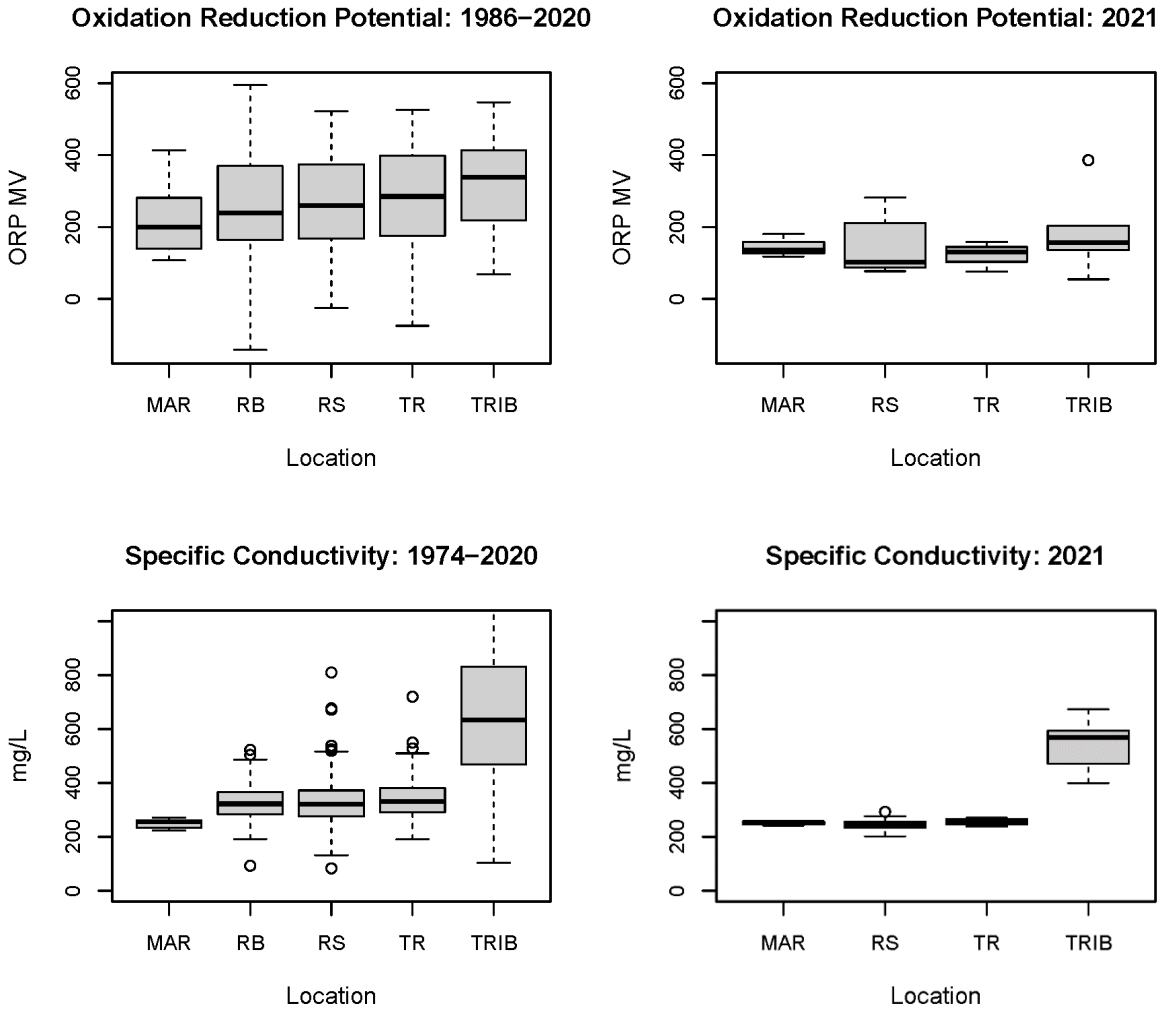
**Table 2: Metrics, Methods, and Water Quality Criteria Used for Evaluating Water Quality**

| Metric | Abbreviation | Analysis Method | Water Quality Criteria | Source |
|---|---|---|---|---|
| Alachlor | | EPA Method 8270C | < 2µg/L PWS or <1100 µg/L: aquatic life | Illinois EPA |
| Ammonia Nitrogen | $NH_3$ | EPA Method 350.1 | <15 mg/L | Illinois EPA |
| Atrazine | Atrazine | EPA Method 8270C | 9 µg/L: Chronic or 82 µg/L: Acute or 3 µg/L DWS | Illinois EPA |
| Bacteria: E. Coliform | E Col | EPA Method 1604 | < 235 E. Col per 100/mL for single sample | Illinois EPA |
| Chlorophyll a | Chl_a | SM Method 10200H | < 25 mg/cm$^3$ (Eutrophic Upper Limit) | Carlson 1977 |
| Chlorpyrifos | | EPA Method 8270C | < 0.11 µg/L: aquatic life | Illinois EPA |
| Cyanazine | | EPA Method 8270C | < 30 µg/L: chronic or < 370 µg/L acute (aquatic life) | Illinois EPA |
| Depth | Depth | Multiparameter Meter | Measurements reported at ~1 meter | ----- |
| Dissolved Oxygen | DO | Multiparameter Meter | Greater than 5.0mg/L | Illinois EPA |
| Metolachlor | | EPA Method 8270C | 30.4 µg/L: Chronic or 380 µg/L: Acute | Illinois EPA |
| Metribuzin | | EPA Method 8270C | 8.4 mg/L: aquatic life or 8.3 mg/L: human health | Illinois EPA |
| Nitrate as Nitrogen | $NO_3$ | Green Method | < 10 mg/L | Illinois EPA |
| Non-Volatile Suspended Solids | NVSS | TSS - VSS | ----- | ----- |
| Orthophosphate | Ortho | EPA Method 365.2 | ----- | ----- |
| Pendmethalin | | EPA Method 8270C | < 30 µg/L: chronic or < 350 µg/L acute (aquatic life) | Illinois EPA |
| Pheophytin a | Phpy_a | SM Method 10200H | ----- | ----- |
| Potential of Hydrogen | pH | Multiparameter Meter | Range: 6.5 – 9.0pH | Illinois EPA |
| Specific Conductivity | SpCond | Multiparameter Meter | 500 µS/cm | ----- |
| Temperature | Temp | Multiparameter Meter | Less than rise of 2.8°C above normal seasonal temperature | Illinois EPA |
| Total Dissolved Solids | TDS | Multiparameter Meter | < 500 mg/L | Illinois EPA |
| Total Manganese | TMn | EPA Method 6010C | < 1 mg/L | Illinois EPA |

| Metric | Abbreviation | Analysis Method | Water Quality Criteria | Source |
|---|---|---|---|---|
| Total Organic Carbon | TOC | EPA Method 415.1 | ----- | ----- |
| Total Iron | TFe | EPA Method 6010C | < 1 mg/L | Illinois EPA |
| Total Phosphorus | TP | EPA Method 365.2 | Less than 0.05 mg/L | Illinois EPA |
| Total Suspended Solids | TSS | EPA Method 160.2 | ----- | ----- |
| Trifluralin | | EPA Method 8270C | < 1.1 µg/L: chronic or < 26 µg/L acute (aquatic life) | Illinois EPA |
| Turbidity | Turb | Multiparameter Meter | ----- | ----- |
| Volatile Suspended Solids | VSS | EPA Method 160.4 | ----- | ----- |

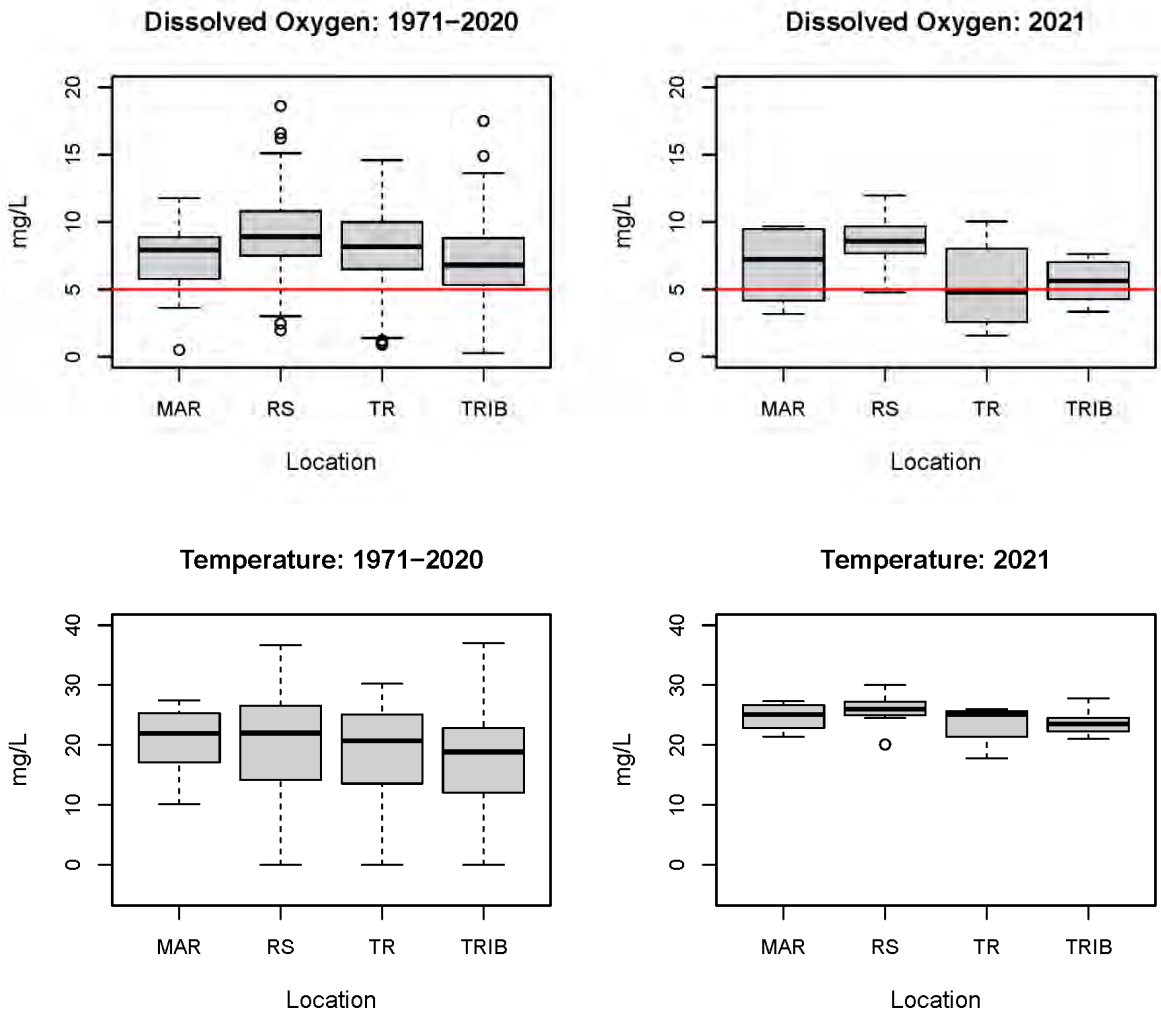
**1 mg/L is equivalent to 1 drop in two bathtubs and 1 ug/L is equivalent to 1 drop in an Olympic size swimming pool. PWS is public water supply. DWS is drinking water standard.*

# RESULTS AND SUMMARY STATISTICS: WATER QUALITY




| | Historical Reference 1974-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| ORP | MAR | 214.41 | 199.60 | 10 | 144.93 | 136.20 | 3 |
| | RB | 259.05 | 239.50 | 120 | ---- | ---- | ---- |
| | RS | 262.10 | 259.20 | 458 | 144.69 | 102.55 | 12 |
| | TR | 277.88 | 285.00 | 129 | 121.50 | 130.60 | 3 |
| | TRIB | 315.59 | 339.00 | 194 | 182.03 | 156.35 | 6 |
| SpCond | MAR | 251.11 | 256.45 | 10 | 251.68 | 252.55 | 4 |
| | RB | 324.38 | 322.50 | 178 | ---- | ---- | ---- |
| | RS | 327.73 | 322.00 | 760 | 246.62 | 244.80 | 16 |
| | TR | 352.48 | 331.00 | 231 | 256.88 | 258.95 | 4 |
| | TRIB | 696.79 | 633.00 | 377 | 542.40 | 567.90 | 8 |

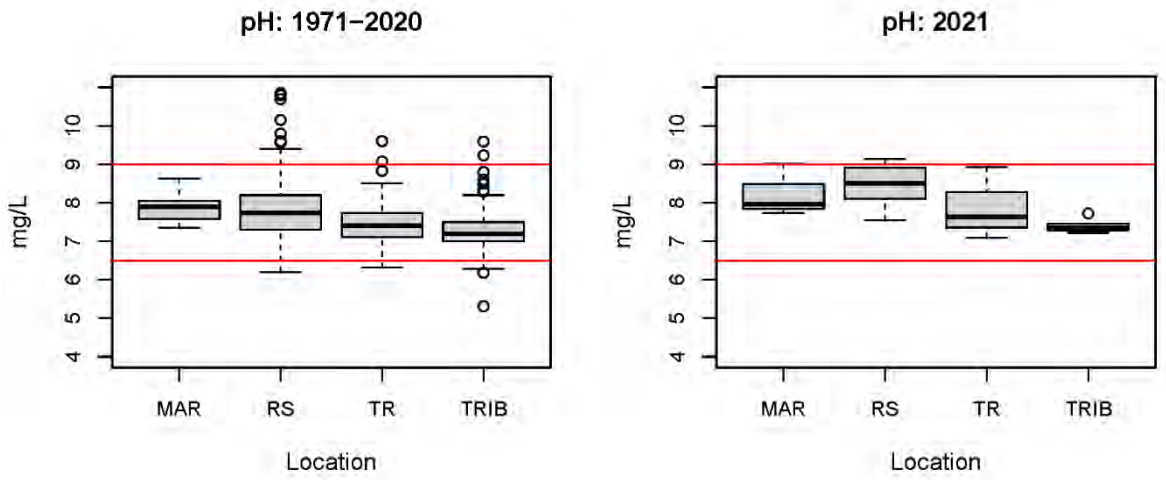
**This report does not acknowledge a water quality criteria for SpCond or ORP.*




** Red line placed at the 5 mg/L level for DO.*

| | Historical Reference 1971-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| DO | MAR | 7.13 | 7.92 | 10 | 6.83 | 7.23 | 4 |
| | RS | 9.08 | 8.90 | 704 | 8.59 | 8.58 | 16 |
| | TR | 8.21 | 8.18 | 226 | 5.30 | 4.78 | 4 |
| | TRIB | 7.17 | 6.80 | 345 | 5.60 | 5.63 | 8 |
| Temp | MAR | 20.89 | 21.99 | 10 | 24.73 | 25.10 | 4 |
| | RS | 20.07 | 22.00 | 768 | 26.18 | 26.00 | 16 |
| | TR | 18.69 | 20.70 | 236 | 23.53 | 25.15 | 4 |
| | TRIB | 16.74 | 18.86 | 380 | 23.66 | 23.50 | 8 |

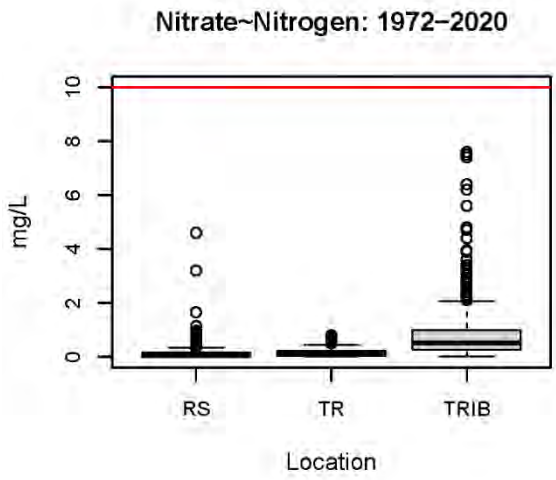
** During the four sampling events surface water DO was measured below the standard at the following locations: the outlet in May and August, two of the lake sites and the marina in July, and at the tributary REN-5 in May, July and September. In 2021 temperature was recorded above the standard (rise of 2.8° C above the natural temperatures) during the spring at all locations except the REN-1, and in July at two locations in the lake.. The historical seasonal mean temperature was used as the natural temperature.*

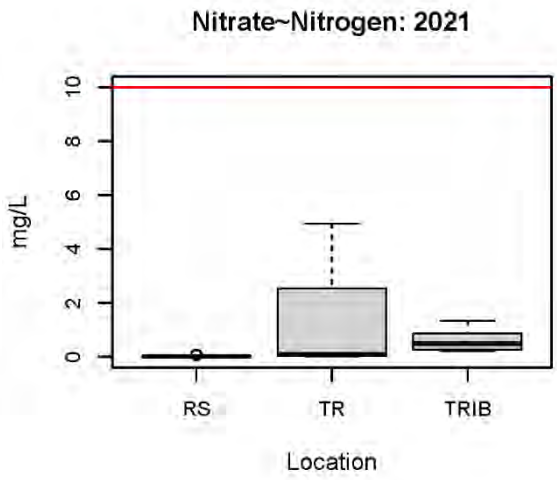



**Red lines indicate the upper and lower water quality criteria standards (9 and 6.5).*

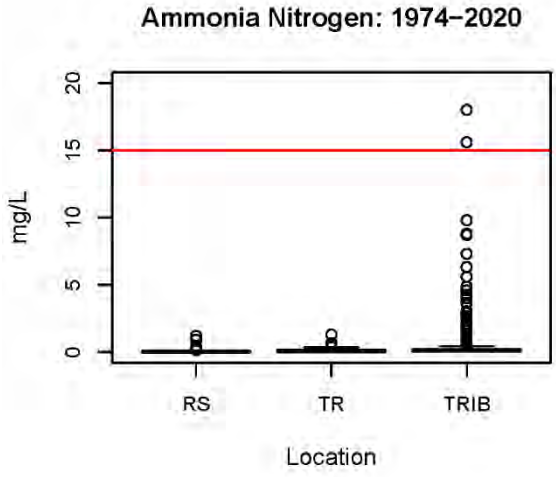
| | Historical Reference 1971-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| pH | MAR | 7.91 | 7.90 | 10 | 8.23 | 7.96 | 3 |
| | RS | 7.81 | 7.74 | 758 | 8.46 | 8.50 | 12 |
| | TR | 7.42 | 7.40 | 234 | 7.88 | 7.63 | 3 |
| | TRIB | 7.27 | 7.20 | 367 | 7.40 | 7.35 | 6 |

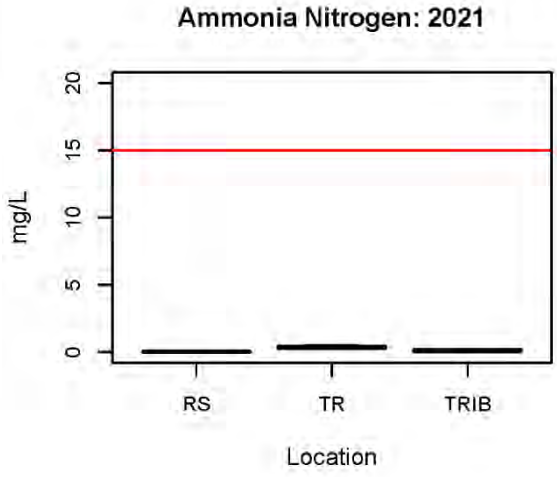
**During 2021 the pH was recorded above the standard of 6.5-9 in the lake in May and August.*



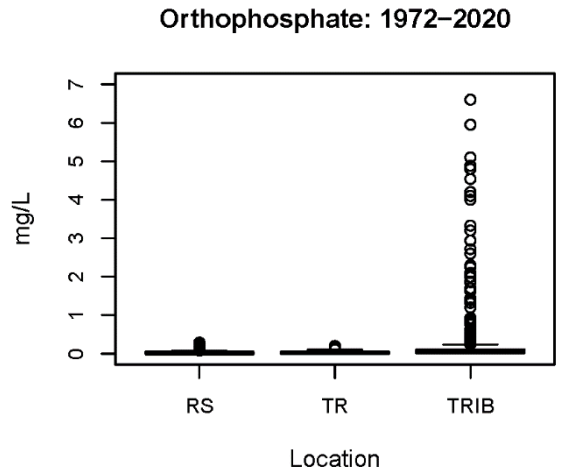

**Red line indicates the water quality standard (10 mg/L).*

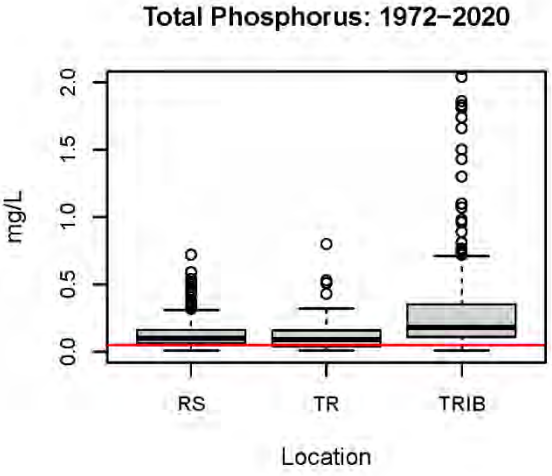


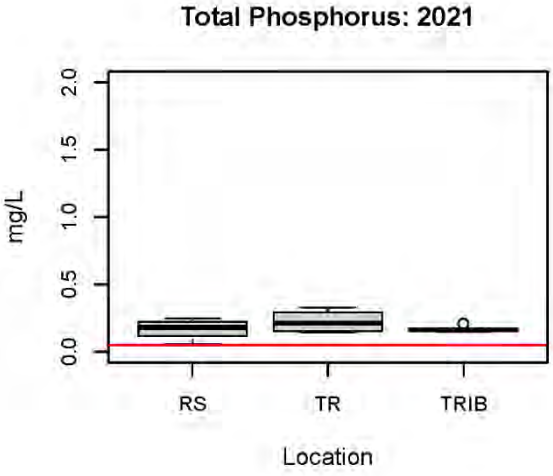




| | Historical Reference 1972-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| NO3-N | RS | 0.13 | 0.05 | 762 | 0.03 | 0.02 | 16 |
| | TR | 0.16 | 0.10 | 238 | 1.28 | 0.09 | 4 |
| | TRIB | 0.87 | 0.52 | 375 | 0.60 | 0.49 | 8 |
| NH3N | RS | 0.06 | 0.03 | 695 | 0.03 | 0.03 | 16 |
| | TR | 0.12 | 0.07 | 206 | 0.37 | 0.33 | 4 |
| | TRIB | 0.60 | 0.12 | 311 | 0.10 | 0.09 | 8 |

**All 2021 observations of nitrate and ammonia nitrogen were within the water quality standard.*



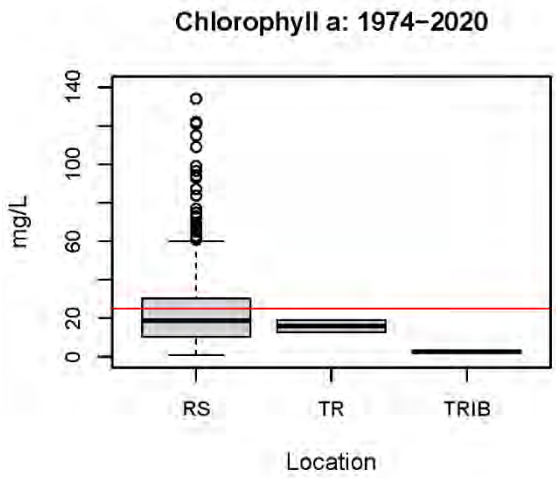



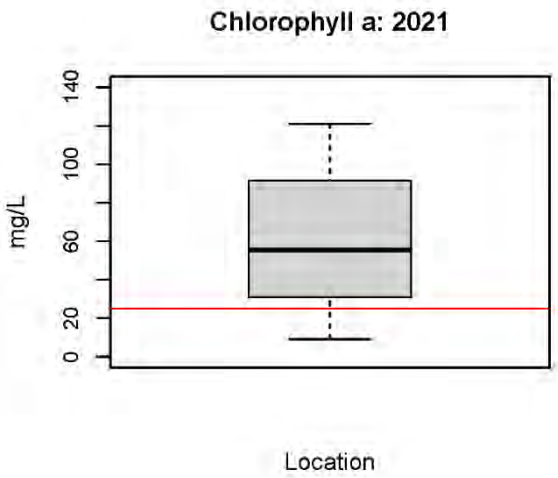




**Red line indicates the water quality standard of 0.05 mg/L.*

| | Historical Reference 1972-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| PO4 | RS | 0.03 | 0.02 | 743 | ---- | ---- | ---- |
| | TR | 0.04 | 0.02 | 221 | ---- | ---- | ---- |
| | TRIB | 0.33 | 0.05 | 374 | ---- | ---- | ---- |
| TP | RS | 0.13 | 0.10 | 798 | 0.17 | 0.18 | 16 |
| | TR | 0.12 | 0.09 | 242 | 0.22 | 0.21 | 4 |
| | TRIB | 0.53 | 0.18 | 387 | 0.17 | 0.16 | 8 |

**Total phosphorus exceeded the standard of 0.05 mg/L for all locations in 2021. This study does not acknowledge a standard for orthophosphate.*

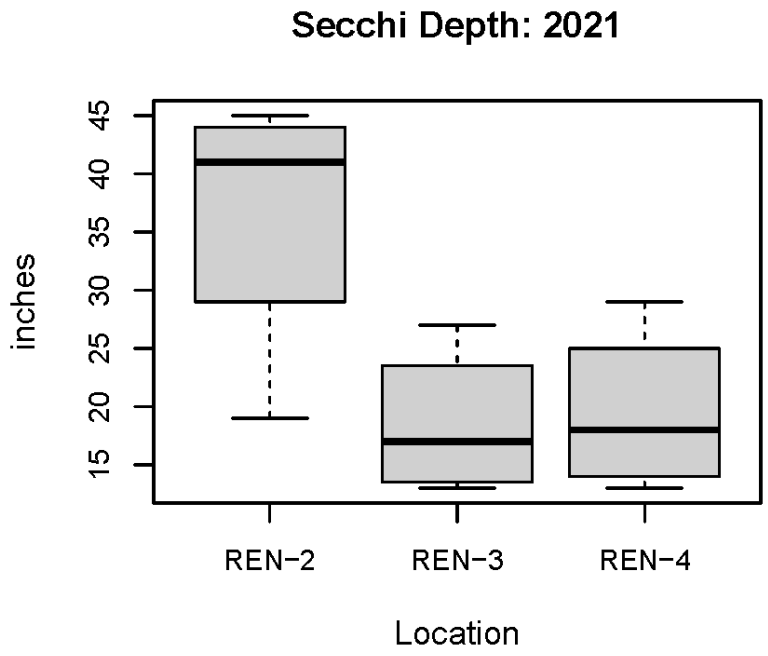


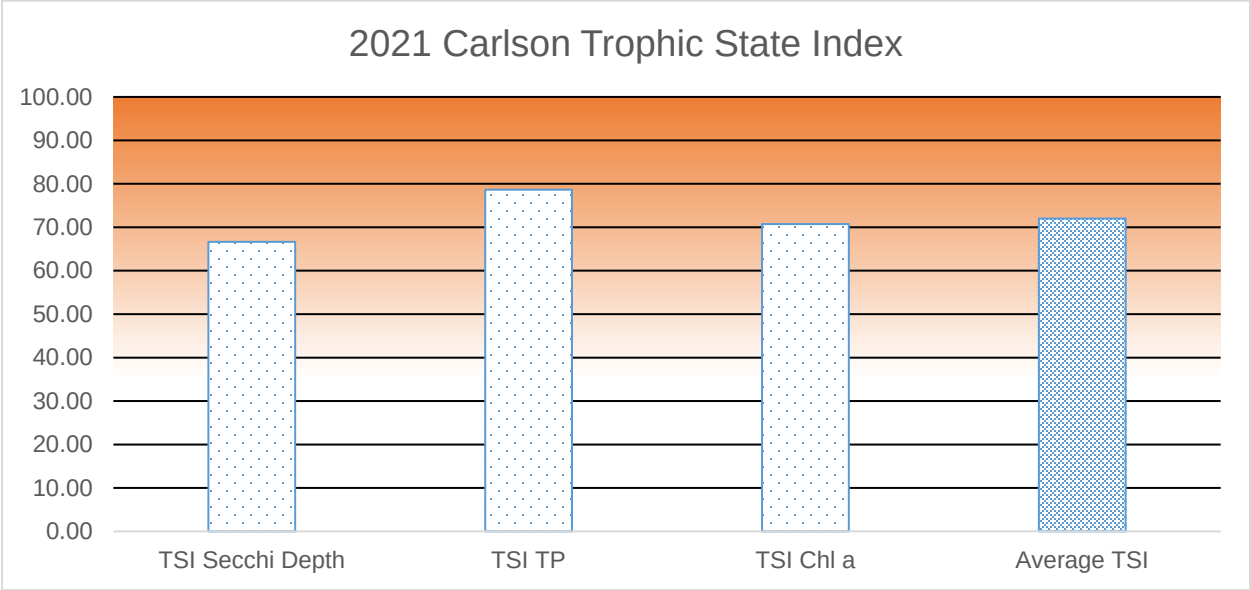




**Red line indicates the reference water quality standard of 25 mg/cm$^3$. See Carlson 1977.*

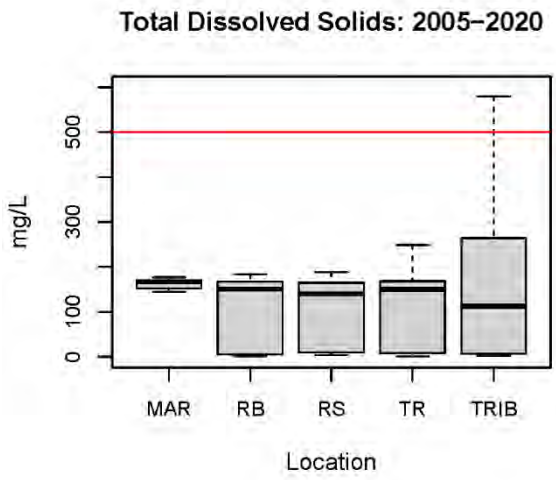
| | Historical Reference 1974-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Chl_a | RS | 24.06 | 18.70 | 513 | 59.85 | 55.35 | 16 |
| | TR | 15.85 | 15.85 | 2 | ---- | ---- | ---- |
| | TRIB | 2.60 | 2.60 | 2 | ---- | ---- | ---- |

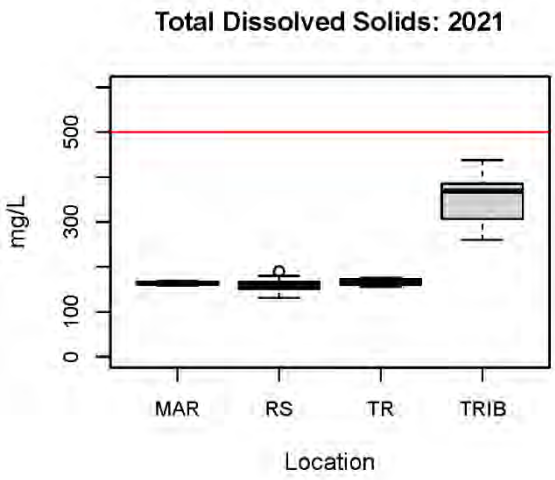
**Chl_a was collected only at the RS locations in 2021. The reference standard for chlorophyll-a of 25mg/cm$^3$ was exceeded at the lake sites throughout 2021. This study does not acknowledge a standard for pheophytin.*

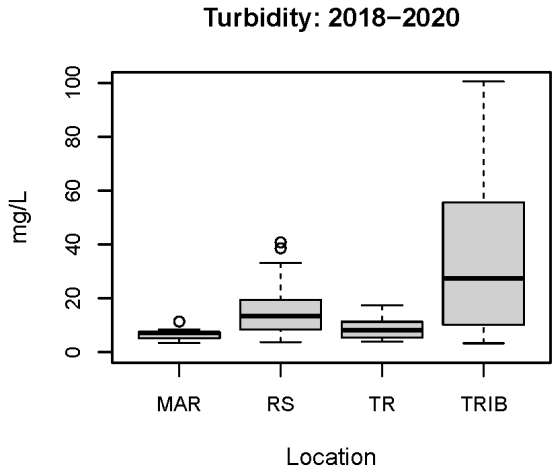


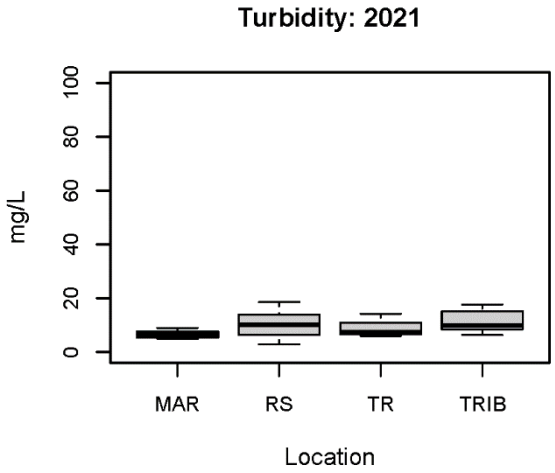




*<40 = Oligotrophic __ 40-50 = Mesotrophic __ 50-70 = Eutrophic __ >70 Hypereutrophic*



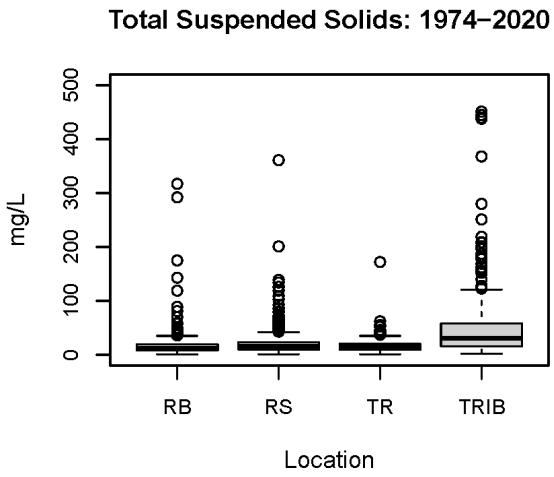



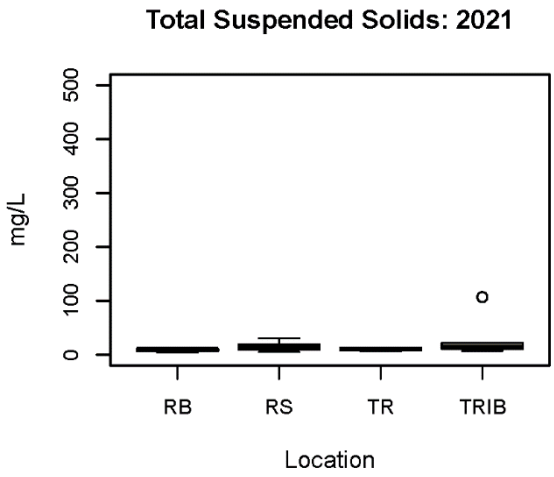




| | Historical Reference 2005-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| TDS | MAR | 163.30 | 167.00 | 10 | 163.50 | 164.00 | 4 |
| | RB | 100.57 | 150.50 | 20 | ---- | ---- | ---- |
| | RS | 93.70 | 140.00 | 85 | 160.31 | 159.00 | 16 |
| | TR | 101.00 | 150.00 | 21 | 167.00 | 168.50 | 4 |
| | TRIB | 156.70 | 112.50 | 44 | 352.63 | 369.00 | 8 |
| FNU | MAR | 6.75 | 7.14 | 10 | 6.60 | 6.24 | 4 |
| | RS | 14.96 | 13.31 | 48 | 10.53 | 10.21 | 16 |
| | TR | 8.77 | 8.17 | 12 | 8.76 | 7.42 | 4 |
| | TRIB | 48.06 | 27.31 | 24 | 11.37 | 9.90 | 8 |

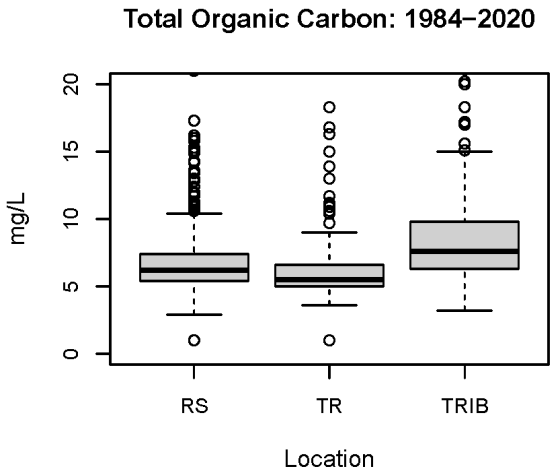
* *All 2021 observations of TDS were within the referenced water quality standard. This study does not acknowledge a standard for turbidity (FNU).*

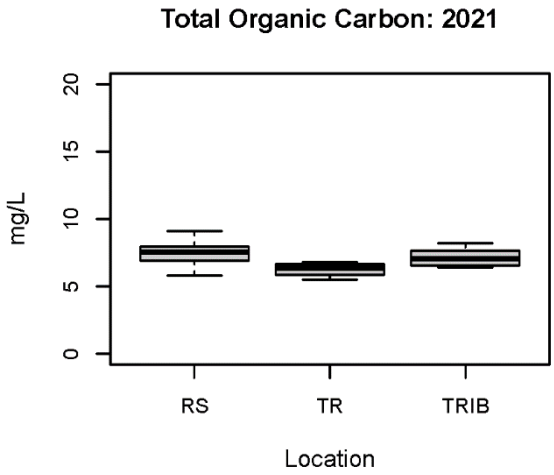



| | Historical Reference 1974-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| TSS | RB | 21.34 | 12.00 | 178 | 8.80 | 10.00 | 4 |
| | RS | 19.80 | 15.85 | 742 | 14.81 | 13.95 | 16 |
| | TR | 16.92 | 13.00 | 223 | 10.25 | 10.95 | 4 |
| | TRIB | 50.19 | 30.70 | 336 | 25.63 | 13.60 | 8 |

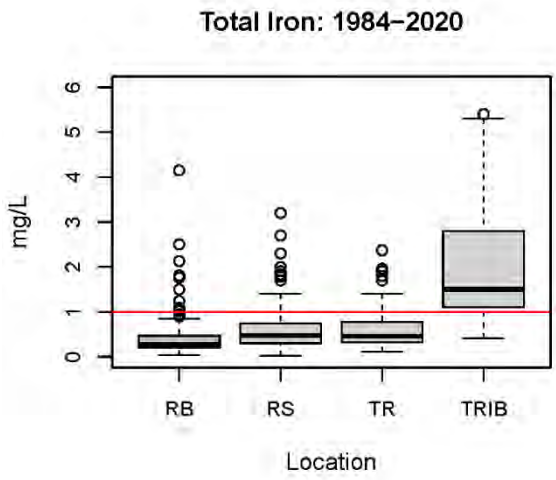
**The mean total suspended solids data measured in 2021 were greater at RS and TRIB locations, and less at the TR and RB when compared to the historical data. There is no numeric standard for TSS.*

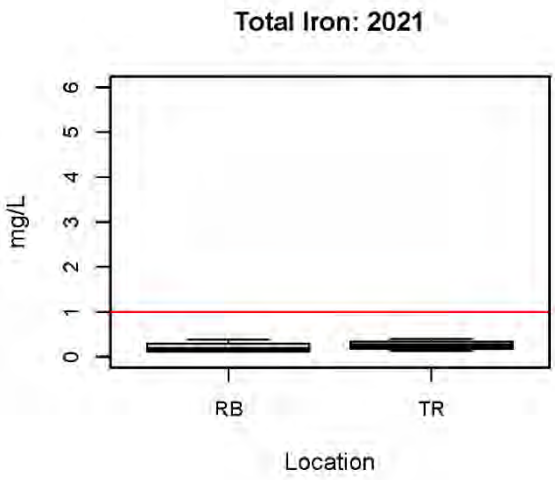


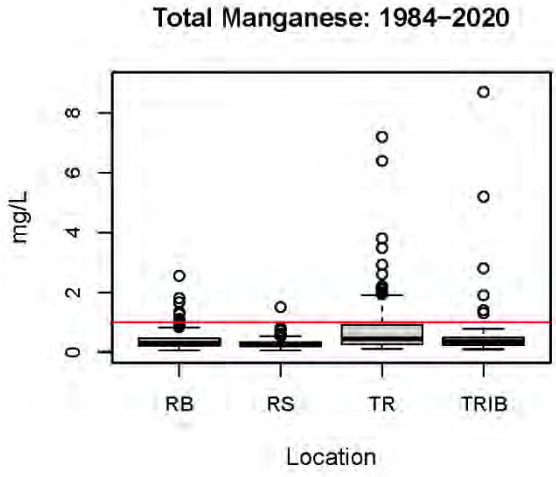

| | Historical Reference 1984-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| TOC | RS | 6.75 | 6.20 | 541 | 7.46 | 7.55 | 16 |
| | TR | 6.32 | 5.50 | 154 | 6.25 | 6.35 | 4 |
| | TRIB | 8.76 | 7.60 | 209 | 7.14 | 7.05 | 8 |

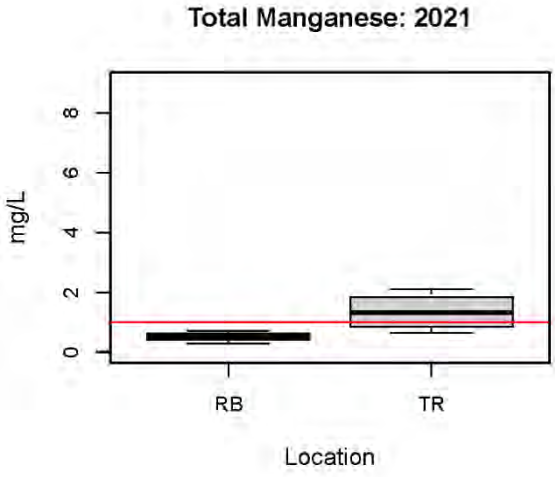
**This study does not recognize a water quality criteria for TOC.*




**Red line indicates the water quality standard of 1 mg/L.*

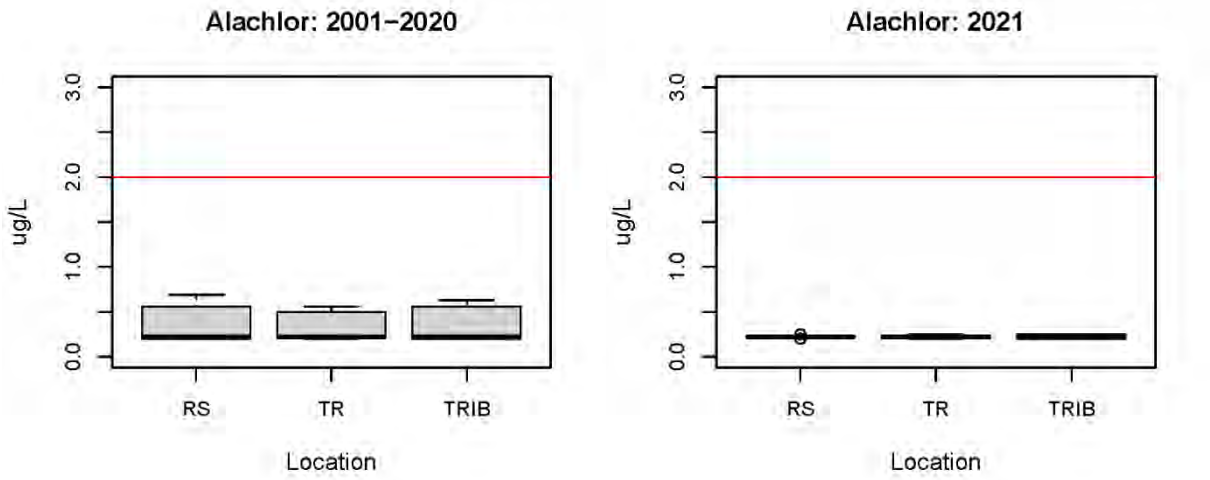



**Red line indicates the water quality standard of 1 mg/L.*

| | Historical Reference 1984-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| TFe | RB | 0.44 | 0.28 | 151 | 0.20 | 0.16 | 4 |
| | RS | 0.59 | 0.47 | 234 | ---- | ---- | ---- |
| | TR | 0.58 | 0.46 | 149 | 0.25 | 0.25 | 4 |
| | TRIB | 2.06 | 1.50 | 65 | ---- | ---- | ---- |
| TMn | RB | 0.41 | 0.31 | 151 | 0.52 | 0.54 | 4 |
| | RS | 0.28 | 0.25 | 234 | ---- | ---- | ---- |
| | TR | 0.77 | 0.44 | 149 | 1.34 | 1.31 | 4 |
| | TRIB | 0.64 | 0.34 | 66 | ---- | ---- | ---- |

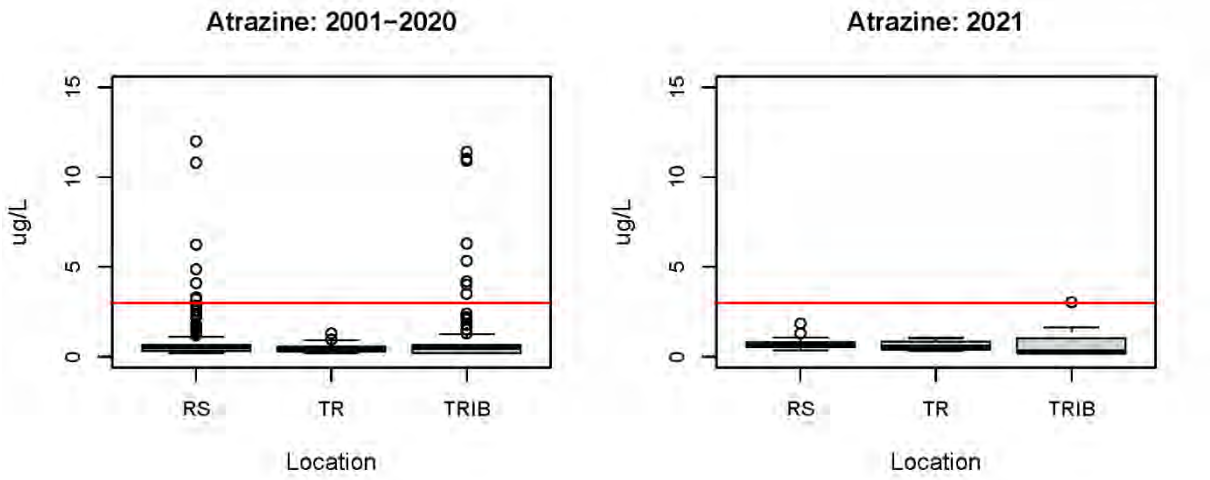
**In 2021 iron did not exceed the standard of 1 mg/L near the lake bottom in front of the dam. Manganese exceeded the standard of 1 mg/L in the tail race in May, July, and August.*




**Red line indicates the standard of 2 ug/L.*

| | Historical Reference 2001-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Alachlor | RS | 0.36 | 0.22 | 247 | 0.22 | 0.22 | 16 |
| | TR | 0.35 | 0.22 | 62 | 0.22 | 0.22 | 4 |
| | RS | 0.36 | 0.22 | 247 | 0.22 | 0.22 | 16 |

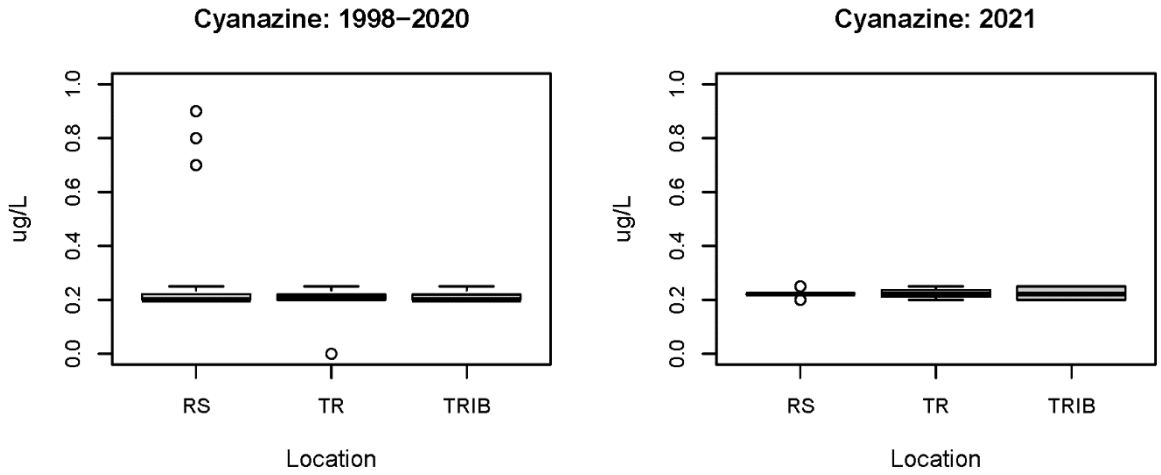
**Alachlor did not exceed the criteria in 2021.*




**Red line indicates the standard of 3 ug/L.*

| | Historical Reference 2001-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Atrazine | RS | 0.78 | 0.56 | 248 | 0.74 | 0.63 | 16 |
| | TR | 0.50 | 0.50 | 62 | 0.61 | 0.54 | 4 |
| | RS | 0.78 | 0.56 | 248 | 0.74 | 0.63 | 16 |

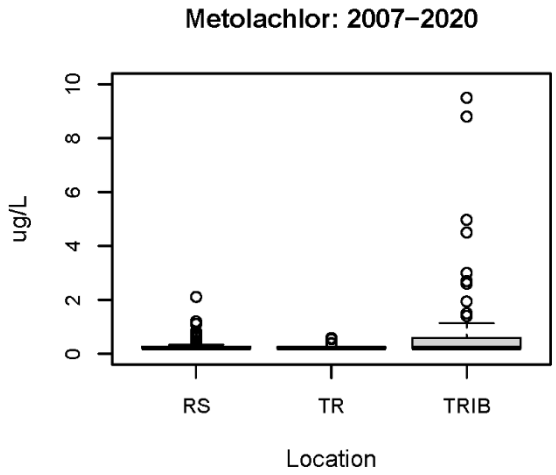
**Atrazine was measured above the DWS criterion of 3 ug/L in May 2021 the REN-5 tributary.*

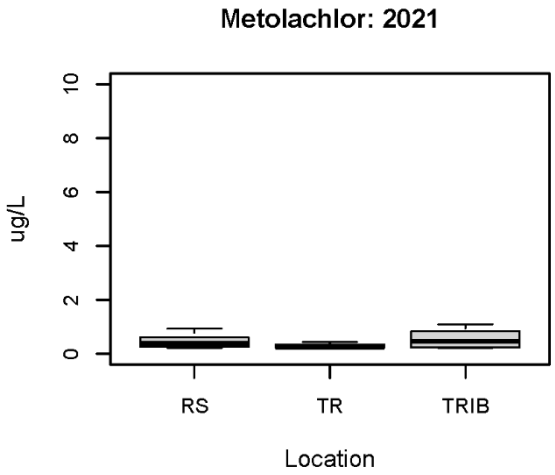



**The chronic standard of 30 ug/L for Cyanazine is not shown.*

| | Historical Reference 1998-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Cyanazine | RS | 0.22 | 0.20 | 144 | 0.22 | 0.22 | 16 |
| | TR | 0.20 | 0.21 | 36 | 0.22 | 0.22 | 4 |
| | TRIB | 0.21 | 0.20 | 70 | 0.22 | 0.22 | 8 |

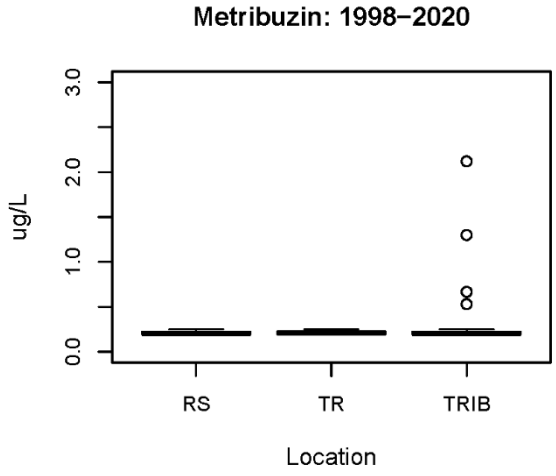
**Cyanazine was not measured above the minimum detectin limit of 0.2 ug/L in 2021.*

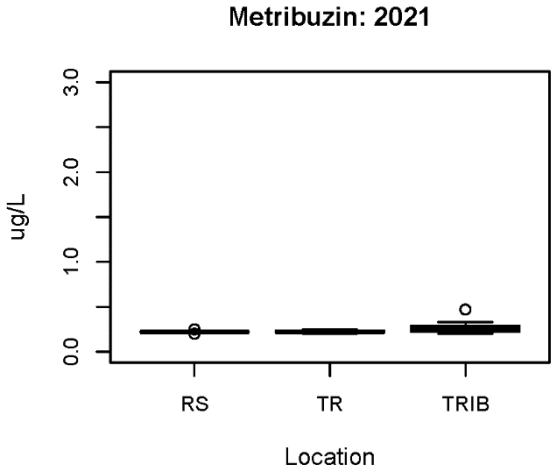



| | Historical Reference 2007-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Metolachlor | RS | 0.31 | 0.22 | 136 | 0.44 | 0.38 | 16 |
| | TR | 0.26 | 0.22 | 34 | 0.28 | 0.23 | 4 |
| | TRIB | 0.87 | 0.22 | 66 | 0.55 | 0.47 | 8 |

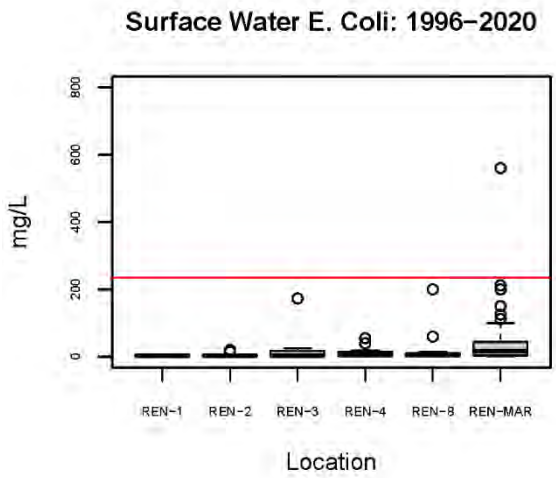
**Metolachlor did not exceed water quality criteria in 2021.*

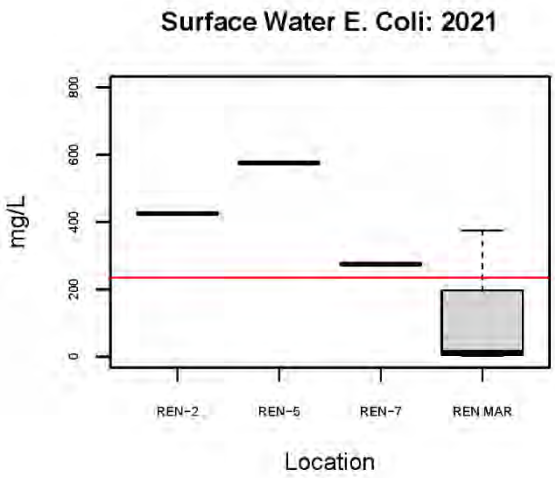



| | Historical Reference 1998-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| Metribuzin | RS | 0.21 | 0.20 | 144 | 0.22 | 0.22 | 16 |
| | TR | 0.21 | 0.21 | 36 | 0.22 | 0.22 | 4 |
| | TRIB | 0.26 | 0.20 | 70 | 0.27 | 0.25 | 8 |

**Metribuzin did not exceed water quality criteria in 2021.*




**Red line indicates the water quality standard of 235 col per 100 mL.*

| | Historical Reference 1996-2020 | | | | 2021 | | |
|---|---|---|---|---|---|---|---|
| | Location | Mean | Median | n | Mean | Median | n |
| E col | REN-1 | 3.00 | 3.00 | 1 | ---- | ---- | ---- |
| | REN-2 | 5.82 | 3.00 | 11 | 425.00 | 425.00 | 1 |
| | REN-3 | 22.91 | 3.00 | 11 | ---- | ---- | ---- |
| | REN-4 | 12.85 | 5.00 | 13 | ---- | ---- | ---- |
| | REN-5 | | | | 575.00 | 575.00 | 1 |
| | REN-7 | | | | 275.00 | 275.00 | 1 |
| | REN-8 | 24.92 | 5.00 | 13 | ---- | ---- | ---- |
| | REN-MAR | 47.75 | 16.50 | 48 | 101.00 | 13.00 | 4 |

**Marina bacteria levels exceeded the standard in front of the dam, in both tributaries, and at the Marina in May 2021.*

**2021 Swimming Beach Bacteria Levels (E. Coli / 100mL)**

| | Dale Miller | | North Marcum | | Sandusky | |
|---|---|---|---|---|---|---|
| | Shallow | Deep | Shallow | Deep | Shallow | Deep |
| 5/11/2021 | 1 | <1 | 1 | <1 | 3.1 | 1 |
| 5/24/2021 | 1 | 1 | <1 | <1 | 2 | 2 |
| 6/7/2021 | 6.3 | 8.6 | 2 | 5.2 | 4.1 | 3 |
| 6/21/2021 | 8.6 | 2 | NA | NA | <1 | <1 |
| 7/6/2021 | 3.1 | 2 | 1 | 2 | <1 | <1 |
| 7/19/2021 | 14.2 | 9.7 | 13.2 | 14.8 | 105 | 63.1 |
| 8/2/2021 | 1 | 1 | <1 | 1 | 2 | 1 |
| 8/17/2021 | <1 | <1 | 2 | <1 | <1 | 1 |
| 8/30/2021 | 1 | <1 | 9.7 | 10.9 | 1 | <1 |
| 9/14/2021 | 6.3 | 3.1 | 4.1 | 2 | 5.2 | 1 |

**Bacteria levels at the swimming beaches remained below the standard in 2021.*

# DISCUSSION: WATER QUALITY

Water quality metrics assessed by CEMVS can be sporadic and highly variable from year to year, thus long-term data collection using consistent and comparable methodology is critical to identify trends or patterns. In general, conditions observed during 2021 did not deviate far from conditions observed during the reference period (1972-2020); nevertheless, concerns regarding DO, temperature, Atrazine, Mn, TP, and bacteria were evident. In addition, CHL_a and subsequent TSI levels were indicative of a hyper eutrophic system.

There were 32 surface DO measurements in 2021. Seven of those 32 were below the standard of 5 mg/L. On May 25, 2021, DO was recorded at 3.53 at REN-1 and 4.35 mg/L at REN-5. On July 8, 2021 DO was recorded at 4.76 mg/L at REN-2, 3.35 at REN-5, and 3.19 at RL MAR. On August 5, 2021 DO was recorded at 1.58 mg/L at REN-1. On September 14, 2021 DO was recorded at 4.17 mg/L at REN-5. Similar low DO levels have been observed at REN-1 and REN-5 in recent years. Since 1972, the DO concentration was below the minimum standard 15 times at REN-1, six times at REN-2, twice at REN-4, 24 times at REN-5, and 10 times at REN-7. The 2021 DO means for TR (5.3 mg/L) and TRIB (5.6 mg/L) are lower than the historic means (8.21 and 7.17 mg/L). Given that most of the tributaries are impaired for DO, it is not unexpected to see low DO events occur in the tributaries, lake, or in the discharge. However, the number of DO exceedances increased in 2021, therefore it is important to continue monitoring for long term trends.

Temperature is important because it controls several aspects of water quality. Colder water holds more dissolved oxygen which is required by aquatic organisms. Water temperature criteria for warm water bodies in Illinois is within 2.8$^{o}$C of the seasonal norm. The statistical summary for temperature in the results section of this report compares the means and medians of historical and 2021 data by location. This revealed greater temperatures at each location in 2021. For comparison to the standard (within 2.8 $^{o}$C of the seasonal norm) the historical means of two seasons (spring and summer) that were sampled in 2021 were calculated. This comparison of historical means to each result of 2021 revealed that all observations in May except REN-1 as well as two lake sites in July, were greater than the standard. It is possible that this temperature exceedance is an anomaly or a result of sampling during exceptionally warm periods, but it will be important to continue monitoring to assess trends.

Pesticides are commonly used throughout much of the agricultural landscape that the Big Muddy River flows. Of the eight pesticides tested, only Alachlor, Atrazine, Cyanazine, Metolachlor, and Metribuzin were detected between 1998 and 2021. Of those five, only Atrazine was found to exceed the criteria in 2021. The Atrazine drinking water standard (3 ug/L) was exceeded on May 25, 2021 at REN-5 with a concentration of 3.04 ug/L. In the previous year it was exceeded at REN-4 and REN-8 with a level of

3.31 ug/L and 6.24 ug/L respectively. Atrazine levels were recorded over the standard multiple times in the tributaries historically. The 2021 Atrazine average (0.752 ug/L) is comparable to the historic Atrazine average (0.87 ug/L). Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water.

Living organisms require trace amounts of metals, but excessive levels can be harmful. TFe did not exceed the criterion of 1 mg/L in 2021. The mean TFe concentrations in 2021 were approximately 50% less than the historical data. Iron cycling is a function of oxidation-reduction processes. Elevated levels of iron near the bottom of a lake is not immediately detrimental to the overall lake system. Iron oxidizes relatively rapidly (minutes to hours); therefore, any iron released through the discharge should be oxidized in a short period of time. TMn in 2021 exceeded the criterion in the tailrace in May, July, and August with respective values of 1.58, 1.04, and 2.1 mg/L. Historically, TMn has exceeded the criterion multiple times in the tailrace and once in front of the dam. The mean concentrations of TMn in 2021 were significantly greater than the historical values. Since excessive levels of metals can be harmful to aquatic organisms it is essential to continue monitoring.

TP levels have surpassed the 0.05 mg/L criterion for several years. In 2021 the TP criterion was exceeded at all locations with a mean concentration across all sites of 0.18 mg/L compared to the historical mean of 0.26 mg/L. Historical concentrations of TP are higher in the tributaries coming into the lake than the lake or tailrace. Phosphorus is a limiting nutrient for primary producers (algae and plants) due to its relatively low amount in the environment. Higher inputs of TP and NO3-N into the lake contribute to a highly productive environment which stimulates algal growth that can lead to blooms that deplete the oxygen levels during die off. In addition, blooms can sometimes contain toxins which may be harmful to humans and wildlife.

Although there is not a state criterion for CHL_a the proposed standard of 25 mg/cm$^3$ was exceeded at all the lake sampling locations at least once in 2021. The 2021 surface reservoir mean CHL_a concentration (59.85 mg/cm$^3$) was greater than twice the historical surface reservoir mean (24.06 mg/cm$^3$). CHL_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm$^3$ is considered to be eutrophic (nutrient enrichment increases algal and plant growth and negative effects). The 2021 TSI level, an average of the individual trophic state indexes for secchi depth, CHL_a, and TP, for Rend Lake was 72.01. Rend Lake is considered hyper-eutrophic based on this TSI level. This does not necessarily mean the water quality is poor, but that its trophic level indicates nutrient levels are abundant, which can support an abundance of plants and algae. Long term monitoring and analyses are important to assess changes in trophic levels over time.

Swimming beach bacteria levels remained below the standard in 2021. However, E coli levels were above the standard in front of the dam, in the tributaries, and the at the marina in May. Marina bacteria samples were taken at the three other events (July, August, September), all of which were below the standard. Bacteria occurs naturally, but is monitored at swimming beaches as required by law to protect human health. Bacteria is monitored at other locations as needed to identify potential leaking septic systems/wastewater treatment or other point and non-point sources. Though those locations may not be designated swimming areas, the public can still be exposed to bacteria. Ongoing monitoring is essential.

All remaining parameters evaluated during the 2021 water quality monitoring effort were within designated criteria or within historical reference norms.

# MONITORING PROGRAM RECOMMENDATIONS

The Illinois Environmental Protection Agency (IEPA, 2020) has listed Rend Lake and its tributaries with multiple water quality impairments. In order to better understand the causes of these impairments it is recommended the following be considered for implementation to the current monitoring program: chemical and in-situ data collected downstream of the spillway (previously unsampled), include mercury, PCBs, Aldrin, Dieldrin, Endrin, Heptachlor, Mirex, and Toxaphene. for site REN-1, augment current sampling suite at REN-7 (Casey Fork) to include PCBs and mercury, and augment the current sampling suite at site REN-5 (Big Muddy River) as well as all the lake sites to include mercury.

In accordance with EM-1110-2-1201, benthic sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. Sediment sampling and analyses occurred at Rend Lake in 2018, and prior to that in 2007. During these last analyses multiple exceedances over the recommended criteria were observed. Identifying trends over time is much more achievable with more consistent data. Contaminated sediments may have negative impacts on ecological processes. It is recommended, if possible, to sample and analyze for sediment metals and nutrients, as well as grain size analyses yearly or every two years.

Given the hypereutrophic status of Rend Lake it is recommended that Total Nitrogen (TN) be added to the monitoring program. Doing so would allow CEMVS to better evaluate trophic status. Similarly, it would strengthen the monitoring program to add CHL_a to every sample site. Currently CHL_a is only sampled at the lake sites and not the tributaries or lake discharge. This would allow for a trophic status comparison between the tributaries, lake, and discharge.

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# APPENDIX A:  FIELD DATA

| Date | Location | Depth (m) | Temp (°C) | ORP (mV) | Sp Cond (µS/cm) | pH | ODO (% Sat) | ODO (mg/L) | TDS (mg/L) | Turbidity (FNU) | Secchi (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/25/2021 | REN MAR | 1.133 | 21.4 | 118 | 242.6 | 7.96 | 105 | 9.28 | 158 | 4.94 | |
| 5/25/2021 | REN MAR | 2.597 | 19.6 | 120.4 | 241.5 | 7.4 | 63 | 5.78 | 157 | 7.49 | |
| 5/25/2021 | REN-1 | 0.678 | 17.8 | 130.6 | 254.7 | 7.09 | 37.2 | 3.53 | 166 | 7.45 | |
| 5/25/2021 | REN-2 | 1.084 | 20.1 | 129.5 | 240.8 | 7.55 | 93.7 | 8.49 | 157 | 4.1 | 45 |
| 5/25/2021 | REN-2 | 2.077 | 20 | 131.8 | 240.6 | 7.44 | 89.5 | 8.14 | 156 | 4.09 | |
| 5/25/2021 | REN-2 | 3.016 | 19.7 | 134.7 | 240.6 | 7.32 | 81.3 | 7.44 | 156 | 4.22 | |
| 5/25/2021 | REN-2 | 4.021 | 19.4 | 137.1 | 240.7 | 7.22 | 75.5 | 6.94 | 156 | 4.26 | |
| 5/25/2021 | REN-2 | 5.104 | 19.2 | 139.3 | 240.8 | 7.13 | 70.1 | 6.47 | 157 | 4.45 | |
| 5/25/2021 | REN-2 | 6.053 | 18.5 | 144 | 244 | 6.98 | 47.7 | 4.46 | 159 | 6.79 | |
| 5/25/2021 | REN-2 | 7.085 | 17.7 | 147.2 | 246.6 | 6.88 | 33.6 | 3.2 | 160 | 6.78 | |
| 5/25/2021 | REN-3 | 1.189 | 27.1 | 80.8 | 253.9 | 8.41 | 116.9 | 9.29 | 165 | 6.38 | 27 |
| 5/25/2021 | REN-3 | 2.014 | 26.4 | 87.6 | 252.9 | 8.23 | 112 | 9.01 | 164 | 6.8 | |
| 5/25/2021 | REN-3 | 3.128 | 23.1 | 109.8 | 273.1 | 7.02 | 14.6 | 1.25 | 178 | 25.92 | |
| 5/25/2021 | REN-4 | 1.06 | 25.4 | 100.1 | 271.7 | 8.09 | 105.3 | 8.64 | 177 | 5.69 | 29 |
| 5/25/2021 | REN-4 | 2.147 | 23.8 | 119.7 | 281.9 | 7.16 | 56 | 4.73 | 183 | 10.9 | |
| 5/25/2021 | REN-5 | 0 | 22.6 | 136 | 673 | 7.29 | 50.4 | 4.35 | 438 | 13.31 | |
| 5/25/2021 | REN-7 | 0 | 23.8 | 175.7 | 565 | 7.22 | 68.9 | 5.82 | 367 | 16.93 | |
| 5/25/2021 | REN-7 | 0.243 | 23.1 | 182.1 | 568 | 7.23 | 60.3 | 5.15 | 369 | 96.13 | |
| 5/25/2021 | REN-8 | 1.019 | 27.3 | 89.2 | 227.5 | 9.13 | 132.3 | 10.49 | 148 | 6.25 | |
| 5/25/2021 | REN-8 | 2.002 | 24 | 126.7 | 231.8 | 7.17 | 22.4 | 1.88 | 151 | 11.36 | |
| 5/25/2021 | REN-8 | 3.082 | 21.5 | 126.7 | 233.6 | 7.01 | 2.2 | 0.19 | 152 | 14.49 | |
| 5/25/2021 | REN-8 | 4.134 | 21.3 | 90.6 | 234.2 | 6.85 | 1.5 | 0.13 | 152 | 16.8 | |
| 7/8/2021 | REN-1 | 0 | 25.4 | | 263.2 | | 73.6 | 6.03 | 171 | 5.99 | |
| 7/8/2021 | REN-2 | 0.074 | 26.4 | | 258.1 | | 59.2 | 4.76 | 168 | 2.87 | 43 |
| 7/8/2021 | REN-2 | 1.176 | 26.1 | | 257.4 | | 57 | 4.61 | 167 | 3.3 | |
| 7/8/2021 | REN-2 | 2.184 | 26 | | 257.4 | | 51.8 | 4.2 | 167 | 3.01 | |
| 7/8/2021 | REN-2 | 3.226 | 25.8 | | 257.7 | | 32.5 | 2.64 | 167 | 2.33 | |
| 7/8/2021 | REN-2 | 4.127 | 25.8 | | 257.7 | | 30.5 | 2.48 | 167 | 2.32 | |
| 7/8/2021 | REN-2 | 5.098 | 25.6 | | 258.8 | | 22.7 | 1.85 | 168 | 4.48 | |

| Date | Location | Depth (m) | Temp (°C) | ORP (mV) | Sp Cond (µS/cm) | pH | ODO (% Sat) | ODO (mg/L) | TDS (mg/L) | Turbidity (FNU) | Secchi (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/8/2021 | REN-3 | 2.034 | 29.9 | | 275.8 | | 109.4 | 8.28 | 179 | 52.66 | |
| 7/8/2021 | REN-4 | 0.383 | 29.2 | | 292.9 | | 98 | 7.5 | 190 | 13.56 | 13 |
| 7/8/2021 | REN-4 | 1.132 | 28.4 | | 287.6 | | 55.9 | 4.35 | 187 | 15.49 | |
| 7/8/2021 | REN-5 | 0.202 | 25.2 | | 517.1 | | 40.7 | 3.35 | 336 | 9.24 | |
| 7/8/2021 | REN-7 | 0 | 27.8 | | 572.4 | | 85.1 | 6.67 | 372 | 7.81 | |
| 7/8/2021 | REN-8 | 1.156 | 30 | | 248.9 | | 158.4 | 11.96 | 162 | 15.52 | |
| 7/8/2021 | REN-8 | 2.013 | 29.2 | | 240.6 | | 66.1 | 5.06 | 156 | 25.28 | |
| 7/8/2021 | REN-8 | 3.094 | 28.9 | | 241.4 | | 23.6 | 1.82 | 157 | 37.54 | |
| 7/8/2021 | RL MAR | 0.324 | 27 | | 257.5 | | 96 | 7.65 | 167 | 6.76 | |
| 7/8/2021 | RL MAR | 0.325 | 27.1 | | 257.5 | | 100.7 | 8.01 | 167 | 6.64 | |
| 7/8/2021 | RL MAR | 1.042 | 26 | | 259 | | 39.4 | 3.19 | 168 | 5.99 | |
| 8/5/2021 | REN-1 | 0.241 | 26.1 | 129.6 | 269.9 | 7.62 | 20.8 | 1.69 | 175 | 7.03 | |
| 8/5/2021 | REN-1 | 0.838 | 26 | 158.2 | 270.5 | 7.63 | 19.5 | 1.58 | 176 | 7.39 | |
| 8/5/2021 | REN-2 | 1.066 | 26.9 | 281.8 | 253.8 | 8.93 | 110.4 | 8.81 | 165 | 9.74 | 19 |
| 8/5/2021 | REN-2 | 2.056 | 26.8 | 261.2 | 254.6 | 8.8 | 94.2 | 7.53 | 166 | 9.69 | |
| 8/5/2021 | REN-2 | 3.117 | 26.6 | 243.1 | 254.9 | 8.69 | 86.3 | 6.93 | 166 | 9.8 | |
| 8/5/2021 | REN-2 | 4.131 | 26.4 | 263.7 | 255.9 | 8.46 | 71 | 5.71 | 166 | 9.06 | |
| 8/5/2021 | REN-2 | 4.996 | 26.4 | 271 | 256.3 | 8.3 | 63.4 | 5.1 | 167 | 9.83 | |
| 8/5/2021 | REN-3 | 1.081 | 25.3 | 226.8 | 242.8 | 8.13 | 83.6 | 6.86 | 158 | 10.65 | 20 |
| 8/5/2021 | REN-3 | 2.056 | 25.2 | 242.5 | 244.3 | 7.61 | 63.5 | 5.22 | 159 | 10.91 | |
| 8/5/2021 | REN-3 | 2.76 | 25.1 | 236.3 | 244.9 | 7.59 | 62.4 | 5.14 | 159 | 13.64 | |
| 8/5/2021 | REN-4 | 1.194 | 26.5 | 195.2 | 223.4 | 8.86 | 126.6 | 10.17 | 145 | 10.52 | 21 |
| 8/5/2021 | REN-4 | 2.087 | 26.2 | 207.3 | 224.8 | 8.27 | 100.8 | 8.14 | 146 | 13.41 | |
| 8/5/2021 | REN-5 | 0.091 | 21 | 385.9 | 427.5 | 7.3 | 61 | 5.43 | 278 | 17.68 | |
| 8/5/2021 | REN-7 | 0.091 | 23.2 | 203.2 | 570.8 | 7.45 | 89.5 | 7.64 | 371 | 9.16 | |
| 8/5/2021 | REN-8 | 1.163 | 25.6 | 269.8 | 202.2 | 7.68 | 80 | 6.54 | 131 | 9.89 | |
| 8/5/2021 | REN-8 | 2.097 | 25.5 | 273.4 | 203.3 | 7.57 | 74.6 | 6.1 | 132 | 9.69 | |
| 8/5/2021 | REN-8 | 3.033 | 25.5 | 277.6 | 204.9 | 7.42 | 65.3 | 5.35 | 133 | 15.92 | |
| 8/5/2021 | RL MAR | 1.034 | 27.3 | 180.6 | 255.4 | 9.01 | 122 | 9.67 | 166 | 8.98 | |

| Date | Location | Depth (m) | Temp (°C) | ORP (mV) | Sp Cond (µS/cm) | pH | ODO (% Sat) | ODO (mg/L) | TDS (mg/L) | Turbidity (FNU) | Secchi (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8/5/2021 | RL MAR | 2.708 | 26.4 | 166.6 | 255.9 | 8.13 | 59.2 | 4.76 | 166 | 22.62 | |
| 9/14/2021 | REN-1 | 0.091 | 24.2 | 182.5 | 252.6 | 7.54 | 80.5 | 6.75 | 164 | 7.72 | |
| 9/14/2021 | REN-1 | 1.093 | 24.9 | 75.7 | 239.1 | 8.92 | 121.5 | 10.05 | 155 | 14.22 | |
| 9/14/2021 | REN-2 | 1.155 | 24.5 | 94.6 | 246.8 | 8.32 | 94.5 | 7.87 | 160 | 8.6 | 39 |
| 9/14/2021 | REN-2 | 2.034 | 24.4 | 109.1 | 248.2 | 7.86 | 72.2 | 6.04 | 161 | 8.33 | |
| 9/14/2021 | REN-2 | 3.084 | 24.1 | 120.4 | 249 | 7.52 | 45.1 | 3.79 | 162 | 8.1 | |
| 9/14/2021 | REN-2 | 4.096 | 24 | 122.4 | 249.3 | 7.49 | 41.2 | 3.47 | 162 | 7.36 | |
| 9/14/2021 | REN-2 | 5.059 | 23.9 | 123.3 | 249.7 | 7.48 | 37.4 | 3.15 | 162 | 7.47 | |
| 9/14/2021 | REN-2 | 6.202 | 23.9 | 126.2 | 251.4 | 7.44 | 31 | 2.61 | 163 | 9.19 | |
| 9/14/2021 | REN-3 | 1.122 | 24.9 | 76.9 | 239.1 | 8.91 | 121.8 | 10.07 | 155 | 14.16 | 14 |
| 9/14/2021 | REN-3 | 2.071 | 24.7 | 82.1 | 239.6 | 8.85 | 111.6 | 9.28 | 156 | 15.14 | |
| 9/14/2021 | REN-3 | 3.172 | 24.3 | 98.6 | 240.6 | 8.4 | 90.9 | 7.61 | 156 | 21.16 | |
| 9/14/2021 | REN-4 | 1.068 | 24.6 | 105 | 240 | 8.59 | 102.3 | 8.51 | 156 | 13.58 | 15 |
| 9/14/2021 | REN-5 | 0.29 | 21.9 | 137 | 399.6 | 7.4 | 47.6 | 4.17 | 260 | 10.56 | |
| 9/14/2021 | REN-7 | 0.312 | 23.8 | 54.4 | 613.8 | 7.72 | 87.1 | 7.35 | 399 | 6.3 | |
| 9/14/2021 | REN-8 | 1.202 | 25.1 | 86.6 | 227.6 | 8.92 | 102.8 | 8.48 | 148 | 18.57 | |
| 9/14/2021 | REN-8 | 2.155 | 25.1 | 87.6 | 227.7 | 8.88 | 98.9 | 8.16 | 148 | 20.98 | |
| 9/14/2021 | REN-8 | 3.211 | 24.8 | 101 | 217.5 | 8.58 | 79.9 | 6.62 | 141 | 26.1 | |
| 9/14/2021 | RL MAR | 1.041 | 24.2 | 136.2 | 249.7 | 7.73 | 61.8 | 5.17 | 162 | 6.49 | |
| 9/14/2021 | RL MAR | 2.195 | 24 | 143.9 | 253.3 | 7.47 | 25.4 | 2.14 | 165 | 10.9 | |

# APPENDIX B:  LABORATORY DATA

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

**Customer Name: SLCOE** **Date: 6/24/21**

**Project Name: Rend Lake** **Lab Name: ARDL, Inc.**

**Samples Received at ARDL: 5/25/21** **ARDL Report No.: 8703**

## CASE NARRATIVE

| Customer Sample No. | Date Collected | Lab ID Number | Analyses Requested |
|---|---|---|---|
| REN-1 | 5/25/21 | 8703-01 | NP Pesticides, Metals(1), Inorganics(2) |
| REN-2-0 | 5/25/21 | 8703-02 | NP Pesticides, Inorganics(2)(3), E Coli |
| REN-2-5 | 5/25/21 | 8703-03 | Metals(1), Inorganics(2) |
| REN-3 | 5/25/21 | 8703-04 | NP Pesticides, Inorganics(2)(3) |
| REN-4 | 5/25/21 | 8703-05 | NP Pesticides, Inorganics(2)(3) |
| REN-5 | 5/25/21 | 8703-06 | NP Pesticides, Inorganics(2), E Coli |
| REN-7 | 5/25/21 | 8703-07 | NP Pesticides, Inorganics(2), E Coli |
| REN-8 | 5/25/21 | 8703-08 | NP Pesticides, Inorganics(2)(3) |
| REN-15-0 | 5/25/21 | 8703-09 | NP Pesticides, Inorganics(2)(3) |
| REN-RL-MAR | 5/25/21 | 8703-10 | E Coli |

(1) Including iron and manganese.
(2) Including ammonia, nitrate, total phosphorus, TOC, TSS and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

The quality control data are summarized as follows:

### NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria, except atrazine (47%) and metolachlor (38%). The parent sample results are flagged with a 'J' qualifier as appropriate.

## CASE NARRATIVE (Continued)

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

## INORGANIC FRACTION

TOC were analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS and TVSS.
RPD on all duplicate analyses were within control limits.

## DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

## REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

# Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8703

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-1 | ARDL Lab No.: | 008703-01 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603105 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1220 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 0.330 | J | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 0.220 | J | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 81% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008703-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 05/25/2021 Moisture: NA
Received: 05/25/2021 Sampling Time: 1220

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.396 | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 |
| (a) Manganese | 0.00400 | 0.00500 | | 1.58 | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 |
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.29 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Nitrate as Nitrogen | 0.0950 | 0.100 | | 4.94 | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Phosphorus | 0.00800 | 0.0100 | | 0.144 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 9.2 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 5.5 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-2-0 | ARDL Lab No.: | 008703-02 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603108 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 0930 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.367 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.256 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 86% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008703-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 05/25/2021 Moisture: NA
Received: 05/25/2021 Sampling Time: 0930

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | ND | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Chlorophyll-a, Correcte | 1.0 | 1.00 | | 9.1 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| E. Coliform | 1.0 | 1.00 | | 425 | COL/100 ML | NONE | 1604 | NA | 05/25/21 | 05275908 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Pheophytin-a | 1.0 | 1.00 | | 3.6 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Phosphorus | 0.00800 | 0.0100 | | 0.0571 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 5.2 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.8 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-03
Field ID: REN-2-5
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 0945

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.380 | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 |
| (a) Manganese | 0.00400 | 0.00500 | | 0.717 | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 |
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.15 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Phosphorus | 0.00800 | 0.0100 | | 0.096 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 11.2 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 5.9 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-3 | ARDL Lab No.: | 008703-04 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603109 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1035 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.822 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.444 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 56% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008703-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 05/25/2021 Moisture: NA
Received: 05/25/2021 Sampling Time: 1035

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | ND | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Chlorophyll-a, Correcte | 1.0 | 1.00 | | 10.9 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Pheophytin-a | 1.0 | 1.00 | | ND | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Phosphorus | 0.00800 | 0.0100 | | 0.0787 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 5.0 | 5.00 | | 9.5 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | 5.0 | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.0 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-4 | ARDL Lab No.: | 008703-05 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603110 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1058 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 1.30 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.933 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 82% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-05
Field ID: REN-4
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 1058

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.038 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Chlorophyll-a, Correcte | 1.0 | 1.00 | | 12.7 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Pheophytin-a | 1.0 | 1.00 | | 2.5 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Phosphorus | 0.00800 | 0.0100 | | 0.0744 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 8.0 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | 4.4 | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.7 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-5 | ARDL Lab No.: | 008703-06 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603111 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 0825 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 3.04 | | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | 0.330 | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 0.940 | | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 77% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-06
Field ID: REN-5
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 0825

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.17 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| E. Coliform | 1.0 | 1.00 | | 575 | COL/100 ML | NONE | 1604 | NA | 05/25/21 | 05275908 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.431 | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Phosphorus | 0.00800 | 0.0100 | | 0.161 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 22.4 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.4 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-7 | ARDL Lab No.: | 008703-07 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603112 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1310 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 1.64 | | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | 0.470 | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 0.720 | | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 81% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-07
Field ID: REN-7
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 1310

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.1 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| E. Coliform | 1.0 | 1.00 | | 275 | COL/100 ML | NONE | 1604 | NA | 05/25/21 | 05275908 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.543 | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Phosphorus | 0.00800 | 0.0100 | | 0.148 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 4.0 | 4.00 | | 13.2 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.9 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-8 | ARDL Lab No.: | 008703-08 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603113 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1012 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | 1.85 | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | 0.600 | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 84% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-08
Field ID: REN-8
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 1012

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.051 | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Chlorophyll-a, Correcte | 1.0 | 1.00 | | 38.6 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Pheophytin-a | 1.0 | 1.00 | | 6.7 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Phosphorus | 0.00800 | 0.0100 | | 0.122 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 5.0 | 5.00 | | 13.5 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | 8.5 | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.6 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-15-0 | ARDL Lab No.: | 008703-09 |
| Desc/Location: | REND LAKE | Lab Filename: | E0603114 |
| Sample Date: | 05/25/2021 | Received Date: | 05/25/2021 |
| Sample Time: | 1115 | Prep. Date: | 05/26/2021 |
| Matrix: | WATER | Analysis Date: | 06/03/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 1.26 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.933 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 76% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008703-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 05/25/2021 Moisture: NA
Received: 05/25/2021 Sampling Time: 1115

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.020 | 0.030 | | ND | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 |
| Chlorophyll-a, Correcte | 1.0 | 1.00 | | 13.6 | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Nitrate as Nitrogen | 0.0380 | 0.0400 | | 3.18 | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 |
| Pheophytin-a | 1.0 | 1.00 | | ND | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 |
| Phosphorus | 0.00800 | 0.0100 | | 0.0787 | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 |
| Solids, Total Suspended | 5.0 | 5.00 | | 8.0 | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 |
| Solids, Volatile Suspen | 1.0 | 1.0 | | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.5 | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008703-10
Field ID: REN-RL-MAR
Received: 05/25/2021

Sampling Loc'n: REND LAKE
Sampling Date: 05/25/2021
Sampling Time: 1125

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| E. Coliform | 1.0 | 1.00 | | 375 | COL/100 ML | NONE | 1604 | NA | 05/25/21 | 05275908 |

(a) DOD and/or NELAC Accredited Analyte.

# METHOD BLANK REPORT

**ARDL, Inc. 400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008703 Report Date: 06/04/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | NA | ARDL Lab No.: | 008703-01B1 |
| Desc/Location: | NA | Lab Filename: | E0603103 |
| Sample Date: | NA | Received Date: | NA |
| Sample Time: | NA | Prep. Date: | 05/26/2021 |
| Matrix: | QC Material | Analysis Date: | 06/03/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11339 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units |
|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L |
| Atrazine | 0.200 | 0.200 | ND | | UG/L |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L |
| Alachlor | 0.200 | 0.200 | ND | | UG/L |
| Metolachlor | 0.200 | 0.200 | ND | | UG/L |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 96% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

# BLANK SUMMARY REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LOD | LOQ | Blank Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.040 | 0.050 | ND | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 | 008703-01B1 |
| (a) Manganese | 0.004 | 0.005 | ND | MG/L | 3010A | 6010C | 05/27/21 | 05/28/21 | P7521 | 008703-01B1 |
| Ammonia Nitrogen | 0.020 | 0.030 | ND | MG/L | NONE | 350.1 | NA | 06/03/21 | 06035926 | 008703-01B1 |
| Chlorophyll-a, Corre | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 | 008703-09B1 |
| Nitrate as Nitrogen | 0.019 | 0.020 | ND | MG/L | NONE | GREEN | NA | 05/26/21 | 06015920 | 008703-04B1 |
| Pheophytin-a | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 05/26/21 | 06/03/21 | 06145940 | 008703-09B1 |
| Phosphorus | 0.008 | 0.010 | ND | MG/L | 365.2 | 365.2 | 06/01/21 | 06/02/21 | 06035925 | 008701-02B1 |
| Solids, Total Suspen | 1.0 | 1.0 | ND | MG/L | NONE | 160.2 | NA | 05/26/21 | 06015916 | 008703-07B1 |
| Solids, Volatile Sus | 1.0 | 1.0 | ND | MG/L | NONE | 160.4 | NA | 05/26/21 | 06015917 | 008703-07B1 |
| Total Organic Carbon | 0.50 | 1.0 | ND | MG/L | NONE | 415.1 | NA | 06/04/21 | 06145939 | 008703-01B1 |

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008703

# BLANK SPIKE/SPIKE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11339 Prep. Date: 05/26/2021
Amount Used: 1000 mL Level: LOW Analysis Date: 06/03/2021

| Parameter | Spike Result | Spike Level | Spike % Rec | Duplicate Result | Duplicate Level | Duplicate % Rec | Recovery Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | 3.48 | 4 | 87 | -- | -- | -- | 30-130 | -- | -- |
| Atrazine | 3.41 | 4 | 85 | -- | -- | -- | 30-130 | -- | -- |
| Metribuzin | 3.37 | 4 | 84 | -- | -- | -- | 30-130 | -- | -- |
| Alachlor | 3.45 | 4 | 86 | -- | -- | -- | 30-130 | -- | -- |
| Metolachlor | 3.33 | 4 | 83 | -- | -- | -- | 30-130 | -- | -- |
| Chlorpyrifos | 3.31 | 4 | 83 | -- | -- | -- | 30-130 | -- | -- |
| Cyanazine | 3.51 | 4 | 88 | -- | -- | -- | 30-130 | -- | -- |
| Pendimethalin | 3.51 | 4 | 88 | -- | -- | -- | 30-130 | -- | -- |

| SURROGATE RECOVERIES: | Spike %R | Duplicate %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 86.3 | -- | 30-130 |

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008703-01, NP PESTICIDES (8270SIM-MOD)

# LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LCS 1 Result | LCS 1 Level | LCS 1 % Rec | LCS 2 Result | LCS 2 Level | LCS 2 % Rec | % Rec Limits | Mean % Rec | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 5.2 | 5.0 | 105 | -- | -- | -- | 87-115 | -- | P7521 | 008703-01C1 |
| (a) Manganese | 0.81 | 0.75 | 108 | -- | -- | -- | 90-114 | -- | P7521 | 008703-01C1 |
| Ammonia Nitrogen | 1.1 | 1.0 | 109 | -- | -- | -- | 80-120 | -- | 06035926 | 008703-01C1 |
| Nitrate as Nitrogen | 1.1 | 1.0 | 110 | -- | -- | -- | 80-120 | -- | 06015920 | 008703-04C1 |
| Phosphorus | 0.67 | 0.67 | 100 | -- | -- | -- | 80-120 | -- | 06035925 | 008701-02C1 |
| Total Organic Carbon | 19.6 | 20.0 | 98 | -- | -- | -- | 76-120 | -- | 06145939 | 008703-01C1 |

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008703 Report Date: 06/04/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID: REN-1 Prep. Date: 05/26/2021 ARDL Lab No.: 008703-01
Desc/Location: REND LAKE Amount Used: 1000 mL Lab Filename:
Sample Date: 05/25/2021 % Moisture: NA Received Date: 05/25/2021
Sample Time: 1220 QC Batch: B11339 Analysis Date: 06/03/2021
Matrix: WATER Level: LOW

| Parameter | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | ND | 2.8 | 4 | 70 | 2.34 | 4 | 58.5 | 30-130 | 17.9 | 30 |
| Atrazine | 0.330 | 2.78 | 4 | 61.3 | 1.73 | 4 | 35 | 30-130 | 46.6 * | 30 |
| Metribuzin | ND | 2.43 | 4 | 60.8 | 1.5 | 4 | 37.5 | 30-130 | 47.3 * | 30 |
| Alachlor | ND | 2.78 | 4 | 69.5 | 1.86 | 4 | 46.5 | 30-130 | 39.7 * | 30 |
| Metolachlor | 0.220 | 3.03 | 4 | 70.3 | 2.07 | 4 | 46.3 | 30-130 | 37.6 * | 30 |
| Chlorpyrifos | ND | 2.6 | 4 | 65 | 2.16 | 4 | 54 | 30-130 | 18.5 | 30 |
| Cyanazine | ND | 2.61 | 4 | 65.3 | 1.66 | 4 | 41.5 | 30-130 | 44.5 * | 30 |
| Pendimethalin | ND | 2.73 | 4 | 68.3 | 2.24 | 4 | 56 | 30-130 | 19.7 | 30 |

| SURROGATE RECOVERIES: | MS %R | MSD %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 71 | 53 | 30-130 |

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008703-01, NP PESTICIDES (8270SIM-MOD)

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Matrix | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | WATER | 0.40 | 1.4 | 1.0 | 104 | 1.4 | 1.0 | 105 | 87-115 | 1 | 20 | P7521 | 008703-01MS |
| (a) Manganese | WATER | 1.6 | 2.1 | 0.50 | 103 | 2.1 | 0.50 | 109 | 90-114 | 2 | 20 | P7521 | 008703-01MS |
| Ammonia Nitrogen | WATER | 0.29 | 2.2 | 2.0 | 96 | 2.1 | 2.0 | 93 | 75-125 | 3 | 20 | 06035926 | 008703-01MS |
| Nitrate as Nitrogen | WATER | ND | 0.83 | 1.0 | 83 | 0.82 | 1.0 | 82 | 75-125 | 1 | 20 | 06015920 | 008703-04MS |
| Phosphorus | WATER | 0.074 | 0.93 | 0.83 | 104 | 0.91 | 0.83 | 101 | 75-125 | 3 | 20 | 06035925 | 008703-05MS |
| Total Organic Carbon | WATER | 5.5 | 10.6 | 5.0 | 102 | 10.6 | 5.0 | 102 | 76-120 | 0 | 20 | 06145939 | 008703-01MS |

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008703

# SAMPLE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008703 Report Date: 06/15/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Conc'n | First Duplicate | Second Duplicate | Units | Percent Diff | Mean (Smp,D1,D2) | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|
| Chlorophyll-a, Corrected | 13.6 | 14.5 | -- | MG/CU.M. | 6 | -- | 06145940 | 008703-09D1 |
| Pheophytin-a | ND | 0 | -- | MG/CU.M. | NC | -- | 06145940 | 008703-09D1 |
| Solids, Total Suspended | 13.2 | 12.4 | -- | MG/L | 6 | -- | 06015916 | 008703-07D1 |
| Solids, Volatile Suspend | ND | 0 | -- | MG/L | NC | -- | 06015917 | 008703-07D1 |

(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008703

# Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8703

# ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8703

## CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Ben Greeling / Jake Lambert

| SAMPLE NUMBER | DATE | TIME | COMP | GRAB | NO. OF CONTAINERS | TSS, TVSS | Chloro/Pheo | TOC, T-PO4 | NO3-N, NH3-N | NP Pest | T.Fe, T.Mn | E. coli | MS/MSD | REMARKS OR SAMPLE LOCATION | PRESERVATION: ICED | PRESERVATION: SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ren – 1 | 5/25/21 | 1220 | | X | | X | | X | X | X | X | X | | | X | |
| Ren – 2 – 0 | | 0930 | | X | | X | X | X | X | X | | X | | | X | |
| Ren – 2 – 5 | | 0945 | | X | | X | | X | X | | X | | | | X | |
| Ren – 3 | | 1035 | | X | | X | X | X | X | X | | | | | X | |
| Ren – 4 | | 1058 | | X | | X | X | X | X | X | | | | | X | |
| Ren – 5 | | 0825 | | X | | X | | X | X | X | | X | | | X | |
| Ren – 7 | | 1310 | | X | | X | | X | X | X | | X | | | X | |
| Ren – 8 | | 1012 | | X | | X | X | X | X | X | | | | | X | |
| Ren – 15- 0 | | 1115 | | X | | X | X | X | X | X | | | | | X | |
| Ren-RL-Mar | | 1125 | | X | | | | | | | | X | | | X | |

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | REMARKS/SPECIAL INSTRUCTIONS: |
|---|---|---|---|---|
| | 5/25/21 | 1321 | | |
| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | |
| Received for Laboratory by: (Signature) | Date 5/25/21 | Time 1347 | Shipping Ticket No. | |

PURCHASE ORDER NO: _____

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8703 Cooler # Blue

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 05/25/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 05/25/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - DSD

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? ____, Seal Date: ____, Seal Name: ____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ____ NO ✓ Observed Cooler Temp. 1.0 C (sample Temp)
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 05/25/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 05/25/2021 | On: |

Chain-of-Custody # ____

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# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8703 Cooler # Red

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 05/25/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 05/25/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - DSD

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ____ NO ✓ Observed Cooler Temp. 1.2 C (Sample Temp)
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 05/25/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 05/25/2021 | On: |

Chain-of-Custody # _____

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ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

**Customer Name: SLCOE** **Date: 8/3/21**

**Project Name: Rend Lake** **Lab Name: ARDL, Inc.**

**Samples Received at ARDL: 7/8/21** **ARDL Report No.: 8734**

## CASE NARRATIVE

| Customer Sample No. | Date Collected | Lab ID Number | Analyses Requested |
|---|---|---|---|
| REN-1 | 7/08/21 | 8734-01 | NP Pesticides, Metals(1), Inorganics(2) |
| REN-2-0 | 7/08/21 | 8734-02 | NP Pesticides, Inorganics(2)(3) |
| REN-2-5 | 7/08/21 | 8734-03 | Metals(1), Inorganics(2) |
| REN-3 | 7/08/21 | 8734-04 | NP Pesticides, Inorganics(2)(3) |
| REN-4 | 7/08/21 | 8734-05 | NP Pesticides, Inorganics(2)(3) |
| REN-5 | 7/08/21 | 8734-06 | NP Pesticides, Inorganics(2) |
| REN-7 | 7/08/21 | 8734-07 | NP Pesticides, Inorganics(2) |
| REN-8 | 7/08/21 | 8734-08 | NP Pesticides, Inorganics(2)(3) |
| REN-15-0 | 7/08/21 | 8734-09 | NP Pesticides, Inorganics(2)(3) |
| REN-RL-MAR | 7/08/21 | 8734-10 | E Coli |

(1) Including iron and manganese.
(2) Including ammonia, nitrate, total phosphorus, TOC, TSS and TVSS.
(3) Including chlorophyll-a and pheophytin-a.
(4) Including nitrite and TKN.

The quality control data are summarized as follows:

### NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

## CASE NARRATIVE (Continued)

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD met criteria.

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

### INORGANIC FRACTION

TOC were analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS and TVSS. RPD on all duplicate analyses were within control limits, except pheophytin-a. The parent sample has been flagged appropriately with a 'J' qualifier.

### DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

### REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

# Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8734

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-1 | ARDL Lab No.: | 008734-01 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721114 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1245 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | 1.05 | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | 0.438 | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 83% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1245

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.205 | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 |
| (a) Manganese | 0.00400 | 0.00500 | | 1.04 | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 |
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.368 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.121 | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Phosphorus | 0.00800 | 0.0100 | | 0.165 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 6.4 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.2 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-2-0 | ARDL Lab No.: | 008734-02 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721117 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1000 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 0.690 | | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 0.310 | | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 71% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
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**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1000

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0641 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 23.6 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.069 | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Pheophytin-a | 1.00 | 1.00 | J | 2.5 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Phosphorus | 0.00800 | 0.0100 | | 0.113 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 5.2 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 5.8 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1000

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.111 | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 |
| (a) Manganese | 0.00400 | 0.00500 | | 0.290 | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 |
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.159 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.101 | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Phosphorus | 0.00800 | 0.0100 | | 0.113 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | ND | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 5.5 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

Sample 008734-03, Inorganic Analyses

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-3 | ARDL Lab No.: | 008734-04 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721118 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1100 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 1.08 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.478 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 79% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008734-04
Field ID: REN-3
Received: 07/08/2021

Sampling Loc'n: REND LAKE
Sampling Date: 07/08/2021
Sampling Time: 1100

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0465 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 63.5 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Pheophytin-a | 1.00 | 1.00 | | 2.4 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Phosphorus | 0.00800 | 0.0100 | | 0.174 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 23.2 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | 10.4 | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 8.0 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

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**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-4 | ARDL Lab No.: | 008734-05 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721119 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1125 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.767 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.633 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 65% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1125

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 48.8 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Pheophytin-a | 1.00 | 1.00 | | 4.4 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Phosphorus | 0.00800 | 0.0100 | | 0.20 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 18.4 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | 8.8 | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.9 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-5 | ARDL Lab No.: | 008734-06 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721120 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 0845 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | 0.425 | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | 0.688 | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 76% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 0845

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.157 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.268 | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Phosphorus | 0.00800 | 0.0100 | | 0.208 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 10.8 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 8.2 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-7 | ARDL Lab No.: | 008734-07 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721121 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1350 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 0.270 | | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 1.09 | | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 79% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008734-07
Field ID: REN-7
Received: 07/08/2021

Sampling Loc'n: REND LAKE
Sampling Date: 07/08/2021
Sampling Time: 1350

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0685 | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.691 | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Phosphorus | 0.00800 | 0.0100 | | 0.174 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 10.0 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.9 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-8 | ARDL Lab No.: | 008734-08 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721122 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1033 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Atrazine | 0.200 | 0.200 | 0.370 | | UG/L | 1 |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L | 1 |
| Alachlor | 0.200 | 0.200 | ND | | UG/L | 1 |
| Metolachlor | 0.200 | 0.200 | 0.260 | | UG/L | 1 |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L | 1 |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L | 1 |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 52% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1033

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 108 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Pheophytin-a | 1.00 | 1.00 | | 8.2 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Phosphorus | 0.00800 | 0.0100 | | 0.174 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 14.4 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | 10.8 | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 8.8 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/22/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-15-0 | ARDL Lab No.: | 008734-09 |
| Desc/Location: | REND LAKE | Lab Filename: | E0721123 |
| Sample Date: | 07/08/2021 | Received Date: | 07/08/2021 |
| Sample Time: | 1100 | Prep. Date: | 07/12/2021 |
| Matrix: | WATER | Analysis Date: | 07/21/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368A |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.944 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.411 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 66% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008734-09
Field ID: REN-15-0
Received: 07/08/2021

Sampling Loc'n: REND LAKE
Sampling Date: 07/08/2021
Sampling Time: 1100

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 59.0 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 |
| Pheophytin-a | 1.00 | 1.00 | | 3.0 | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 |
| Phosphorus | 0.00800 | 0.0100 | | 0.161 | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 |
| Solids, Total Suspended | 4.0 | 4.00 | | 22.4 | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 |
| Solids, Volatile Suspen | 4.0 | 4.00 | | 10.0 | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 |
| Total Organic Carbon | 0.500 | 1.00 | | 8.0 | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008734-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 07/08/2021 Moisture: NA
Received: 07/08/2021 Sampling Time: 1150

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| E. Coliform | 1.0 | 1.00 | | 6.0 | COL/100 ML | NONE | 1604 | NA | 07/08/21 | 07136036 |

(a) DOD and/or NELAC Accredited Analyte.

# METHOD BLANK REPORT

**ARDL, Inc. 400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008733 Report Date: 07/22/2021

| | | | |
|---|---|---|---|
| Project Name: | SHELBYVILLE LAKE/KAS | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | NA | ARDL Lab No.: | 008733-01B1 |
| Desc/Location: | NA | Lab Filename: | E0721103 |
| Sample Date: | NA | Received Date: | NA |
| Sample Time: | NA | Prep. Date: | 07/12/2021 |
| Matrix: | QC Material | Analysis Date: | 07/21/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11368 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units |
|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L |
| Atrazine | 0.200 | 0.200 | ND | | UG/L |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L |
| Alachlor | 0.200 | 0.200 | ND | | UG/L |
| Metolachlor | 0.200 | 0.200 | ND | | UG/L |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 82% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

# BLANK SUMMARY REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LOD | LOQ | Blank Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.040 | 0.050 | ND | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 | 008732-01B1 |
| (a) Manganese | 0.004 | 0.005 | ND | MG/L | 3010A | 6010C | 07/19/21 | 07/20/21 | P7553 | 008732-01B1 |
| Ammonia Nitrogen | 0.020 | 0.030 | ND | MG/L | NONE | 350.1 | NA | 07/14/21 | 07156051 | 008734-01B1 |
| Chlorophyll-a, Corre | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 | 008734-02B1 |
| Nitrate as Nitrogen | 0.019 | 0.020 | ND | MG/L | NONE | GREEN | NA | 07/20/21 | 07236089 | 008734-02B1 |
| Pheophytin-a | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 07/09/21 | 07/13/21 | 07146048 | 008734-02B1 |
| Phosphorus | 0.008 | 0.010 | ND | MG/L | 365.2 | 365.2 | 07/26/21 | 07/27/21 | 07276100 | 008734-01B1 |
| Solids, Total Suspen | 1.0 | 1.0 | ND | MG/L | NONE | 160.2 | NA | 07/09/21 | 07136030 | 008734-02B1 |
| Solids, Volatile Sus | 1.0 | 1.0 | ND | MG/L | NONE | 160.4 | NA | 07/09/21 | 07136031 | 008734-02B1 |
| Total Organic Carbon | 0.50 | 1.0 | ND | MG/L | NONE | 415.1 | NA | 07/11/21 | 07166059 | 008733-08B1 |

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008734

# BLANK SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008733 Report Date: 07/22/2021

Project Name: SHELBYVILLE LAKE/KAS Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11368 Prep. Date: 07/12/2021
Amount Used: 1000 mL Level: LOW Analysis Date: 07/21/2021

| Parameter | Spike Result | Spike Level | Spike % Rec | Duplicate Result | Duplicate Level | Duplicate % Rec | Recovery Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | 3.38 | 4 | 85 | -- | -- | -- | 30-130 | -- | -- |
| Atrazine | 3.54 | 4 | 89 | -- | -- | -- | 30-130 | -- | -- |
| Metribuzin | 3.54 | 4 | 89 | -- | -- | -- | 30-130 | -- | -- |
| Alachlor | 3.67 | 4 | 92 | -- | -- | -- | 30-130 | -- | -- |
| Metolachlor | 3.49 | 4 | 87 | -- | -- | -- | 30-130 | -- | -- |
| Chlorpyrifos | 3.36 | 4 | 84 | -- | -- | -- | 30-130 | -- | -- |
| Cyanazine | 3.54 | 4 | 89 | -- | -- | -- | 30-130 | -- | -- |
| Pendimethalin | 3.42 | 4 | 86 | -- | -- | -- | 30-130 | -- | -- |

| SURROGATE RECOVERIES: | Spike %R | Duplicate %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 87.3 | -- | 30-130 |

(a) DOD-QSM Accredited Analyte.
'*' indicates a recovery outside of standard limits.
Spike Blanks for 008733-01, NP PESTICIDES (8270SIM-MOD)

# LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LCS 1 Result | LCS 1 Level | LCS 1 % Rec | LCS 2 Result | LCS 2 Level | LCS 2 % Rec | % Rec Limits | Mean % Rec | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 4.9 | 5.0 | 98 | -- | -- | -- | 87-115 | -- | P7553 | 008732-01C1 |
| (a) Manganese | 0.76 | 0.75 | 102 | -- | -- | -- | 90-114 | -- | P7553 | 008732-01C1 |
| Ammonia Nitrogen | 0.99 | 1.0 | 99 | -- | -- | -- | 80-120 | -- | 07156051 | 008734-01C1 |
| Nitrate as Nitrogen | 0.95 | 1.0 | 95 | -- | -- | -- | 80-120 | -- | 07236089 | 008734-02C1 |
| Phosphorus | 0.66 | 0.67 | 99 | -- | -- | -- | 80-120 | -- | 07276100 | 008734-01C1 |
| Total Organic Carbon | 20.3 | 20.0 | 102 | -- | -- | -- | 76-120 | -- | 07166059 | 008733-08C1 |

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008734 Report Date: 07/22/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID: REN-1 Prep. Date: 07/12/2021 ARDL Lab No.: 008734-01
Desc/Location: REND LAKE Amount Used: 800 mL Lab Filename:
Sample Date: 07/08/2021 % Moisture: NA Received Date: 07/08/2021
Sample Time: 1245 QC Batch: B11368A Analysis Date: 07/21/2021
Matrix: WATER Level: LOW

| Parameter | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | ND | 4.26 | 5 | 85.3 | 4.04 | 5 | 80.8 | 30-130 | 5.4 | 30 |
| Atrazine | 1.05 | 5.2 | 5 | 83 | 5.06 | 5 | 80.3 | 30-130 | 2.7 | 30 |
| Metribuzin | ND | 4.29 | 5 | 85.8 | 4.15 | 5 | 83 | 30-130 | 3.3 | 30 |
| Alachlor | ND | 4.61 | 5 | 92.3 | 4.56 | 5 | 91.3 | 30-130 | 1.1 | 30 |
| Metolachlor | 0.438 | 4.68 | 5 | 84.8 | 4.54 | 5 | 82 | 30-130 | 3 | 30 |
| Chlorpyrifos | ND | 4.03 | 5 | 80.5 | 3.93 | 5 | 78.5 | 30-130 | 2.5 | 30 |
| Cyanazine | ND | 4.39 | 5 | 87.8 | 4.26 | 5 | 85.3 | 30-130 | 2.9 | 30 |
| Pendimethalin | ND | 4.15 | 5 | 83 | 4.06 | 5 | 81.3 | 30-130 | 2.1 | 30 |

| SURROGATE RECOVERIES: | MS %R | MSD %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 85 | 82 | 30-130 |

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008734-01, NP PESTICIDES (8270SIM-MOD)

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Matrix | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | WATER | 0.21 | 1.2 | 1.0 | 97 | 1.2 | 1.0 | 97 | 87-115 | 0 | 20 | P7553 | 008734-01MS |
| (a) Manganese | WATER | 1.0 | 1.6 | 0.50 | 103 | 1.6 | 0.50 | 104 | 90-114 | 0 | 20 | P7553 | 008734-01MS |
| Ammonia Nitrogen | WATER | 0.37 | 2.4 | 2.0 | 102 | 2.3 | 2.0 | 97 | 75-125 | 4 | 20 | 07156051 | 008734-01MS |
| Nitrate as Nitrogen | WATER | 0.069 | 0.83 | 1.0 | 76 | 0.82 | 1.0 | 75 | 75-125 | 1 | 20 | 07236089 | 008734-02MS |
| Phosphorus | WATER | 0.17 | 0.99 | 0.83 | 99 | 1 | 0.83 | 100 | 75-125 | 1 | 20 | 07276100 | 008734-01MS |

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

# SAMPLE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008734 Report Date: 07/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Conc'n | First Duplicate | Second Duplicate | Units | Percent Diff | Mean (Smp,D1,D2) | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|
| Chlorophyll-a, Corrected | 23.6 | 23.6 | -- | MG/CU.M. | 0 | -- | 07146048 | 008734-02D1 |
| Pheophytin-a | 2.5 | 4.4 | -- | MG/CU.M. | 55* | -- | 07146048 | 008734-02D1 |
| Solids, Total Suspended | 5.2 | 5.2 | -- | MG/L | 0 | -- | 07136030 | 008734-02D1 |
| Solids, Volatile Suspend | ND | ND | -- | MG/L | NC | -- | 07136031 | 008734-02D1 |

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.

(a) DOD and/or NELAC Accredited Analyte

# Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8734

8734

# ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

## CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Kaleb Bakers, Ben Greeling

| | SAMPLE NUMBER | DATE | TIME | COMP | GRAB | NO. OF CONTAINERS | TSS, TVSS | Chloro/Pheo | TOC, T-PO4 | NO3-N, NH3-N | NP Pest | T.Fe; T.Mn | E. coli | MS/MSD | | | | | | REMARKS OR SAMPLE LOCATION | PRESERVATION ICED | PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Ren – 1 | 7/8/21 | 1245 | | x | | X | | X | X | X | X | | X | | | | | | | X | |
| 2 | Ren – 2 – 0 | 7/8/21 | 1000 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| 3 | Ren – 2 – 5 | 7/8/21 | 1000 | | x | | X | | X | X | | X | | | | | | | | | X | |
| 4 | Ren – 3 | 7/8/21 | 1100 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| 5 | Ren – 4 | 7/8/21 | 1125 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| 6 | Ren – 5 | 7/8/21 | 0845 | | x | | X | | X | X | X | | | | | | | | | | X | |
| 7 | Ren – 7 | 7/8/21 | 1350 | | x | | X | | X | X | X | | | | | | | | | | X | |
| 8 | Ren – 8 | 7/8/21 | 1033 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| 9 | Ren – 15- 0 | 7/8/21 | 1100 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| 10 | Ren-RL-Mar | 7/8/21 | 1150 | | x | | | | | | | | X | | | | | | | | X | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| Relinquished by: (Signature) Kaleb Bakers | Date 7/8/21 | Time 1400 | Received by: (Signature) Chelsea Jackson | REMARKS/SPECIAL INSTRUCTIONS: |
| Relinquished by: (Signature) Chelsea Jackson | Date 7/8/21 | Time 1425 | Received by: (Signature) | |
| Received for Laboratory by: (Signature) Dalton Blenneman | Date 07/08/21 | Time 1425 | Shipping Ticket No. | |

PURCHASE ORDER NO: _____

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8734 Cooler # Red 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 07/08/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/08/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 1.2 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/08/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO N/A

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 07/08/2021 | On: |

Chain-of-Custody # _____

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8734 Cooler # Blue 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 07/08/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/08/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier-Valerie

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓____ Observed Cooler Temp. 0.9 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/08/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 07/08/2021 | On: |

Chain-of-Custody # _____

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

**Customer Name: SLCOE** **Date: 8/30/21**

**Project Name: Rend Lake** **Lab Name: ARDL, Inc.**

**Samples Received at ARDL: 8/5/21** **ARDL Report No.: 8760**

## CASE NARRATIVE

| Customer Sample No. | Date Collected | Lab ID Number | Analyses Requested |
|---|---|---|---|
| REN-1 | 8/05/21 | 8760-01 | NP Pesticides, Metals(1), Inorganics(2) |
| REN-2-0 | 8/05/21 | 8760-02 | NP Pesticides, Inorganics(2)(3) |
| REN-2-5 | 8/05/21 | 8760-03 | Metals(1), Inorganics(2) |
| REN-3 | 8/05/21 | 8760-04 | NP Pesticides, Inorganics(2)(3) |
| REN-4 | 8/05/21 | 8760-05 | NP Pesticides, Inorganics(2)(3) |
| REN-5 | 8/05/21 | 8760-06 | NP Pesticides, Inorganics(2) |
| REN-7 | 8/05/21 | 8760-07 | NP Pesticides, Inorganics(2) |
| REN-8 | 8/05/21 | 8760-08 | NP Pesticides, Inorganics(2)(3) |
| REN-15-0 | 8/05/21 | 8760-09 | NP Pesticides, Inorganics(2)(3) |
| REN-RL-MAR | 8/05/21 | 8760-10 | E Coli |

(1) Including iron and manganese.
(2) Including ammonia, nitrate, total phosphorus, TOC, TSS and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

Due to delays in receipt of these samples from the common carrier, the cooler exceeded temperature requirements prior to being received by the accredited laboratory for TOC. The results are flagged appropriately.

The quality control data are summarized as follows:

### NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria. The ICV passed all criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes, except as noted below. The following table shows the exceedances of the CCVs (±20%).

| Analyte | CCV |
|---|---|
| Trifluralin | +26% |

The results are flagged with a 'Q' qualifier as appropriate.

## CASE NARRATIVE (Continued)

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

### INORGANIC FRACTION

TOC were analyzed by an accredited outside laboratory due to instrument status.

PREPARATION BLANK
Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for nitrate. The parent sample has been flagged appropriately with a 'J' qualifier.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS and TVSS.
RPD on all duplicate analyses were within control limits.

### DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

@ - Improper sample preservation, cooler temperature high, was noted. Analysis performed as directed.

## CASE NARRATIVE (Continued)

### REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

[redacted]

# Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8760

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-1 | ARDL Lab No.: | 008760-01 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811105 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1300 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.444 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.233 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 51% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1300

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.129 | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 |
| (a) Manganese | 0.00400 | 0.00500 | | 2.10 | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 |
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.53 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Phosphorus | 0.00800 | 0.0100 | | 0.329 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 6.67 | 6.67 | | 12.7 | MG/L | NONE | 160.2 | NA | 08/11/21 | 08176165 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | ND | MG/L | NONE | 160.4 | NA | 08/11/21 | 08176166 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 6.8 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-2-0 | ARDL Lab No.: | 008760-02 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811108 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1015 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.556 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.278 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 55% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008760-02
Field ID: REN-2-0
Received: 08/05/2021

Sampling Loc'n: REND LAKE
Sampling Date: 08/05/2021
Sampling Time: 1015

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | J | 0.0219 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 75.3 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Pheophytin-a | 1.00 | 1.00 | | 6.0 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Phosphorus | 0.00800 | 0.0100 | | 0.204 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 4.00 | 4.00 | | 11.2 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | 8.4 | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 7.9 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1015

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.119 | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 |
| (a) Manganese | 0.00400 | 0.00500 | | 0.536 | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 |
| Ammonia Nitrogen | 0.020 | 0.030 | | 0.2 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | J | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Phosphorus | 0.00800 | 0.0100 | | 0.204 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 10.0 | 10.0 | | 10.0 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 10.0 | 10.0 | | ND | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 6.6 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-3 | ARDL Lab No.: | 008760-04 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811109 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1105 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.644 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.511 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 72% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1105

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 59.0 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Pheophytin-a | 1.00 | 1.00 | | 7.1 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Phosphorus | 0.00800 | 0.0100 | | 0.187 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 5.00 | 5.00 | | 15.5 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 5.00 | 5.00 | | 9.5 | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 7.2 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |
| Field ID: | REN-4 | ARDL Lab No.: | 008760-05 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811110 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1135 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.533 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.611 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 66% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1135

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 51.7 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Pheophytin-a | 1.00 | 1.00 | | 11.8 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Phosphorus | 0.00800 | 0.0100 | | 0.204 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 5.00 | 5.00 | | 10.0 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 5.00 | 5.00 | | 7.0 | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 7.5 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-5 | ARDL Lab No.: | 008760-06 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811111 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 0910 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 65% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008760-06
Field ID: REN-5
Received: 08/05/2021

Sampling Loc'n: REND LAKE
Sampling Date: 08/05/2021
Sampling Time: 0910

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0638 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.252 | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Phosphorus | 0.00800 | 0.0100 | | 0.165 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 6.67 | 6.67 | | 107 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | ND | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 6.6 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-7 | ARDL Lab No.: | 008760-07 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811112 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1345 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 76% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1345

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0913 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 1.02 | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Phosphorus | 0.00800 | 0.0100 | | 0.152 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 4.00 | 4.00 | | 14.0 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 6.4 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-8 | ARDL Lab No.: | 008760-08 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811113 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1040 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.556 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.822 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 77% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1040

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0313 | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 48.1 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Pheophytin-a | 1.00 | 1.00 | | 7.2 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Phosphorus | 0.00800 | 0.0100 | | 0.174 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 4.00 | 4.00 | | 15.6 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | 8.0 | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 7.2 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-15-0 | ARDL Lab No.: | 008760-09 |
| Desc/Location: | REND LAKE | Lab Filename: | E0811114 |
| Sample Date: | 08/05/2021 | Received Date: | 08/05/2021 |
| Sample Time: | 1105 | Prep. Date: | 08/09/2021 |
| Matrix: | WATER | Analysis Date: | 08/11/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.622 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.511 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 68% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1105

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 52.7 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 |
| Pheophytin-a | 1.00 | 1.00 | | 5.8 | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 |
| Phosphorus | 0.00800 | 0.0100 | | 0.191 | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 |
| Solids, Total Suspended | 4.00 | 4.00 | | 12.8 | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | 8.4 | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 |
| Total Organic Carbon | 0.500 | 1.00 | @ | 6.9 | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008760-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 08/05/2021 Moisture: NA
Received: 08/05/2021 Sampling Time: 1200

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| E. Coliform | 1.00 | 1.00 | | 3.0 | COL/100 ML | NONE | 1604 | NA | 08/05/21 | 08066141 |

(a) DOD and/or NELAC Accredited Analyte.

# METHOD BLANK REPORT

**ARDL, Inc. 400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008760 Report Date: 08/12/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | NA | ARDL Lab No.: | 008760-01B1 |
| Desc/Location: | NA | Lab Filename: | E0811103 |
| Sample Date: | NA | Received Date: | NA |
| Sample Time: | NA | Prep. Date: | 08/09/2021 |
| Matrix: | QC Material | Analysis Date: | 08/11/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11385 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units |
|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L |
| Atrazine | 0.200 | 0.200 | ND | | UG/L |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L |
| Alachlor | 0.200 | 0.200 | ND | | UG/L |
| Metolachlor | 0.200 | 0.200 | ND | | UG/L |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 91% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

# BLANK SUMMARY REPORT

## ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LOD | LOQ | Blank Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.040 | 0.050 | ND | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 | 008756-01B1 |
| (a) Manganese | 0.004 | 0.005 | ND | MG/L | 3010A | 6010C | 08/09/21 | 08/10/21 | P7570 | 008756-01B1 |
| Ammonia Nitrogen | 0.020 | 0.030 | ND | MG/L | NONE | 350.1 | NA | 08/09/21 | 08096152 | 008760-01B1 |
| Chlorophyll-a, Corre | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 | 008760-02B1 |
| Nitrate as Nitrogen | 0.019 | 0.020 | ND | MG/L | NONE | GREEN | NA | 08/11/21 | 08206173 | 008760-03B1 |
| Pheophytin-a | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 08/06/21 | 08/12/21 | 08126162 | 008760-02B1 |
| Phosphorus | 0.008 | 0.010 | ND | MG/L | 365.2 | 365.2 | 08/12/21 | 08/13/21 | 08236177 | 008756-01B1 |
| Solids, Total Suspen | 1.0 | 1.0 | ND | MG/L | NONE | 160.2 | NA | 08/09/21 | 08116155 | 008760-04B1 |
| Solids, Total Suspen | 1.0 | 1.0 | ND | MG/L | NONE | 160.2 | NA | 08/11/21 | 08176165 | 008760-01B1 |
| Solids, Volatile Sus | 1.0 | 1.0 | ND | MG/L | NONE | 160.4 | NA | 08/09/21 | 08116156 | 008760-04B1 |
| Solids, Volatile Sus | 1.0 | 1.0 | ND | MG/L | NONE | 160.4 | NA | 08/11/21 | 08176166 | 008760-01B1 |
| Total Organic Carbon | 0.50 | 1.0 | ND | MG/L | NONE | 415.1 | NA | 08/22/21 | 08306206 | 008760-01B1 |

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008760

# BLANK SPIKE/SPIKE DUPLICATE REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11385 Prep. Date: 08/09/2021
Amount Used: 1000 mL Level: LOW Analysis Date: 08/11/2021

| Parameter | Spike Result | Spike Level | Spike % Rec | Duplicate Result | Duplicate Level | Duplicate % Rec | Recovery Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | 3.5 | 4 | 88 | -- | -- | -- | 30-130 | -- | -- |
| Atrazine | 3.39 | 4 | 85 | -- | -- | -- | 30-130 | -- | -- |
| Metribuzin | 3.4 | 4 | 85 | -- | -- | -- | 30-130 | -- | -- |
| Alachlor | 3.71 | 4 | 93 | -- | -- | -- | 30-130 | -- | -- |
| Metolachlor | 3.32 | 4 | 83 | -- | -- | -- | 30-130 | -- | -- |
| Chlorpyrifos | 3.28 | 4 | 82 | -- | -- | -- | 30-130 | -- | -- |
| Cyanazine | 3.42 | 4 | 86 | -- | -- | -- | 30-130 | -- | -- |
| Pendimethalin | 3.47 | 4 | 87 | -- | -- | -- | 30-130 | -- | -- |

| SURROGATE RECOVERIES: | Spike %R | Duplicate %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 81.5 | -- | 30-130 |

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008760-01, NP PESTICIDES (8270SIM-MOD)

# LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LCS 1 Result | LCS 1 Level | LCS 1 % Rec | LCS 2 Result | LCS 2 Level | LCS 2 % Rec | % Rec Limits | Mean % Rec | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 4.8 | 5.0 | 95 | -- | -- | -- | 87-115 | -- | P7570 | 008756-01C1 |
| (a) Manganese | 0.75 | 0.75 | 99 | -- | -- | -- | 90-114 | -- | P7570 | 008756-01C1 |
| Ammonia Nitrogen | 1.0 | 1.0 | 100 | -- | -- | -- | 80-120 | -- | 08096152 | 008760-01C1 |
| Nitrate as Nitrogen | 0.97 | 1.0 | 97 | -- | -- | -- | 80-120 | -- | 08206173 | 008760-03C1 |
| Phosphorus | 0.69 | 0.67 | 103 | -- | -- | -- | 80-120 | -- | 08236177 | 008756-01C1 |
| Total Organic Carbon | 19.7 | 20.0 | 99 | -- | -- | -- | 85-115 | -- | 08306206 | 008760-01C1 |

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008760 Report Date: 08/12/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Field ID: REN-1 Prep. Date: 08/09/2021 ARDL Lab No.: 008760-01
Desc/Location: REND LAKE Amount Used: 900 mL Lab Filename:
Sample Date: 08/05/2021 % Moisture: NA Received Date: 08/05/2021
Sample Time: 1300 QC Batch: B11385 Analysis Date: 08/11/2021
Matrix: WATER Level: LOW

| Parameter | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | ND | 2.89 | 4.44 | 65 | 3.52 | 4.44 | 79.3 | 30-130 | 19.8 | 30 |
| Atrazine | 0.444 | 3.54 | 4.44 | 69.8 | 4.19 | 4.44 | 84.3 | 30-130 | 16.7 | 30 |
| Metribuzin | ND | 2.9 | 4.44 | 65.3 | 3.4 | 4.44 | 76.5 | 30-130 | 15.9 | 30 |
| Alachlor | ND | 3.36 | 4.44 | 75.5 | 3.71 | 4.44 | 83.5 | 30-130 | 10.1 | 30 |
| Metolachlor | 0.233 | 3.37 | 4.44 | 70.5 | 3.82 | 4.44 | 80.8 | 30-130 | 12.7 | 30 |
| Chlorpyrifos | ND | 2.81 | 4.44 | 63.3 | 3.11 | 4.44 | 70 | 30-130 | 10.1 | 30 |
| Cyanazine | ND | 3.03 | 4.44 | 68.3 | 3.61 | 4.44 | 81.3 | 30-130 | 17.4 | 30 |
| Pendimethalin | ND | 2.89 | 4.44 | 65 | 3.47 | 4.44 | 78 | 30-130 | 18.2 | 30 |

| SURROGATE RECOVERIES: | MS %R | MSD %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 65 | 76 | 30-130 |

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008760-01, NP PESTICIDES (8270SIM-MOD)

# MATRIX SPIKE/SPIKE DUPLICATE REPORT
## ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Matrix | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | WATER | 0.13 | 1.0 | 1.0 | 90 | 1.0 | 1.0 | 91 | 87-115 | 1 | 20 | P7570 | 008760-01MS |
| (a) Manganese | WATER | 2.1 | 2.6 | 0.50 | 98 | 2.6 | 0.50 | 101 | 90-114 | 1 | 20 | P7570 | 008760-01MS |
| Ammonia Nitrogen | WATER | 0.53 | 2.5 | 2.0 | 100 | 2.6 | 2.0 | 103 | 75-125 | 2 | 20 | 08096152 | 008760-01MS |
| Nitrate as Nitrogen | WATER | ND | 0.70 | 1.0 | 70 * | 0.74 | 1.0 | 74 * | 75-125 | 6 | 20 | 08206173 | 008760-03MS |
| Phosphorus | WATER | 0.19 | 1.0 | 0.83 | 102 | 1.1 | 0.83 | 104 | 75-125 | 2 | 20 | 08236177 | 008760-04MS |
| Total Organic Carbon | WATER | 6.8 | 12.0 | 5.0 | 104 | 12.0 | 5.0 | 104 | 76-120 | 0 | 20 | 08306206 | 008760-01MS |

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.
(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008760

# SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008760 Report Date: 08/30/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Conc'n | First Duplicate | Second Duplicate | Units | Percent Diff | Mean (Smp,D1,D2) | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|
| Chlorophyll-a, Corrected | 75.3 | 70.8 | -- | MG/CU.M. | 6 | -- | 08126162 | 008760-02D1 |
| Pheophytin-a | 6.0 | 6.1 | -- | MG/CU.M. | 2 | -- | 08126162 | 008760-02D1 |
| Solids, Total Suspended | 15.5 | 15.5 | -- | MG/L | 0 | -- | 08116155 | 008760-04D1 |
| Solids, Volatile Suspend | 9.5 | 9.5 | -- | MG/L | 0 | -- | 08116156 | 008760-04D1 |

(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008760

# Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8760

# ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8760

## CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Ben Greeling, Kaleb Parkers

| SAMPLE NUMBER | DATE | TIME | COMP | GRAB | NO. OF CONTAINERS | TSS, TVSS | Chloro/Pheo | *TOC, T-PO4 | *NO3-N, NH3-N | NP Pest | #T.Fe; T.Mn | E. coli | MS/MSD | | | | | | REMARKS OR SAMPLE LOCATION | PRESERVATION ICED | PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ren – 1 | 8/5/21 | 1300 | | x | | X | | X | X | X | X | | X | | | | | | | X | |
| Ren – 2 – 0 | 8/5/21 | 1015 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| Ren – 2 – 5 | 8/5/21 | 1015 | | x | | X | | X | X | | X | | | | | | | | | X | |
| Ren – 3 | 8/5/21 | 1105 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| Ren – 4 | 8/5/21 | 1135 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| Ren – 5 | 8/5/21 | 0910 | | x | | X | | X | X | X | | | | | | | | | | X | |
| Ren – 7 | 8/5/21 | 1345 | | x | | X | | X | X | X | | | | | | | | | | X | |
| Ren – 8 | 8/5/21 | 1040 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| Ren – 15- 0 | 8/5/21 | 1105 | | x | | X | X | X | X | X | | | | | | | | | | X | |
| Ren-RL-Mar | 8/5/21 | 1200 | | x | | | | | | | | X | | | | | | | | X | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
|---|---|---|---|
| Kaleb Parkers | 8/5/21 | 1353 | |
| Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
| | 8/5/21 | 1405 | |
| Received for Laboratory by: (Signature) | Date | Time | Shipping Ticket No. |
| Dalton Brenneman | 08/05/21 | 1405 | |

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with $H_2SO_4$
#Preserved with $HNO_3$

PURCHASE ORDER NO: _____

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8760 Cooler # Red

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 08/05/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 08/05/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARL Courier - Dean

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 1.4 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 08/05/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 08/05/2021 | On: |

Chain-of-Custody # _____

M:\ADMIN\FORMS\COOLER RECEIPT REPORT.doc Rev. 02/22/17

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8760 Cooler # Blue

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received 08/05/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 08/05/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... (YES) NO
   If YES, enter carrier name and airbill number here: ARDL Courier - Dean
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? ____, Seal Date: ____, Seal Name: ____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 0.8 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 08/05/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 08/05/2021 | On: |

Chain-of-Custody # ____

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ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

**Customer Name: SLCOE** **Date: 10/21/21**

**Project Name: Rend Lake** **Lab Name: ARDL, Inc.**

**Samples Received at ARDL: 9/14/21** **ARDL Report No.: 8848**

## CASE NARRATIVE

| Customer Sample No. | Date Collected | Lab ID Number | Analyses Requested |
|---|---|---|---|
| REN-1 | 9/14/21 | 8848-01 | NP Pesticides, Metals(1), Inorganics(2) |
| REN-2-0 | 9/14/21 | 8848-02 | NP Pesticides, Inorganics(2)(3) |
| REN-2-5 | 9/14/21 | 8848-03 | Metals(1), Inorganics(2) |
| REN-3 | 9/14/21 | 8848-04 | NP Pesticides, Inorganics(2)(3) |
| REN-4 | 9/14/21 | 8848-05 | NP Pesticides, Inorganics(2)(3) |
| REN-5 | 9/14/21 | 8848-06 | NP Pesticides, Inorganics(2) |
| REN-7 | 9/14/21 | 8848-07 | NP Pesticides, Inorganics(2) |
| REN-8 | 9/14/21 | 8848-08 | NP Pesticides, Inorganics(2)(3) |
| REN-15-0 | 9/14/21 | 8848-09 | NP Pesticides, Inorganics(2)(3) |
| REN-RL-MAR | 9/14/21 | 8848-10 | E. Coli |

(1) Including iron and manganese.
(2) Including ammonia, nitrate, total phosphorus, TOC, TSS and TVSS.
(3) Including chlorophyll-a and pheophytin-a.

TOC were analyzed by an accredited outside laboratory due to instrument status.

The quality control data are summarized as follows:

### NP PEST FRACTION – METHOD 8270 SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria. The ICV passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

## CASE NARRATIVE (Continued)

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria, except atrazine with an RPD of 33.2. The parent sample results are flagged with a 'J' qualifier as appropriate.

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

### INORGANICS FRACTION

PREPARATION BLANK
Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a, pheophytin-a, TSS and TVSS. RPD on all duplicate analyses were within control limits.

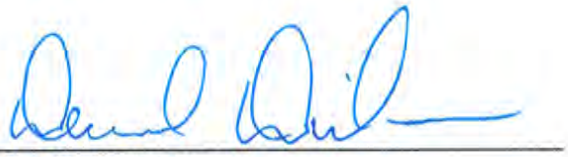
### DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.



Dean S. Dickerson
Technical Services Manager

[redacted]

# Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8848

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-1 | ARDL Lab No.: | 008848-01 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923105 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1141 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.633 | J | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.233 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 63% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008848-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 09/14/2021 Moisture: NA
Received: 09/14/2021 Sampling Time: 1141

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.286 | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 |
| (a) Manganese | 0.00400 | 0.00500 | | 0.633 | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 |
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.301 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.058 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Phosphorus | 0.00800 | 0.0100 | | 0.26 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 6.67 | 6.67 | | 12.7 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | ND | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.5 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-2-0 | ARDL Lab No.: | 008848-02 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923108 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 0933 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.611 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.222 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 61% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008848-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 09/14/2021 Moisture: NA
Received: 09/14/2021 Sampling Time: 0933

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0316 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 104 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.077 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Pheophytin-a | 1.00 | 1.00 | | 15.1 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Phosphorus | 0.00800 | 0.0100 | | 0.239 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 4.00 | 4.00 | | 11.6 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | 8.0 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.0 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-03
Field ID: REN-2-5
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 0942

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.0400 | 0.0500 | | 0.202 | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 |
| (a) Manganese | 0.00400 | 0.00500 | | 0.538 | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 |
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.188 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.048 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Phosphorus | 0.00800 | 0.0100 | | 0.234 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 6.67 | 6.67 | | 10.0 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | 7.33 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.7 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-3 | ARDL Lab No.: | 008848-04 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923109 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1202 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | 0.600 | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 65% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008848-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 09/14/2021 Moisture: NA
Received: 09/14/2021 Sampling Time: 1202

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0398 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 97.1 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.030 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Pheophytin-a | 1.00 | 1.00 | | 14.7 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Phosphorus | 0.00800 | 0.0100 | | 0.247 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 4.00 | 4.00 | | 23.6 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | 11.2 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 8.2 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-4 | ARDL Lab No.: | 008848-05 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923110 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1219 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | 0.463 | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 54% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-05
Field ID: REN-4
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 1219

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | J | 0.0224 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 86.2 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Pheophytin-a | 1.00 | 1.00 | | 17.3 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Phosphorus | 0.00800 | 0.0100 | | 0.239 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 6.67 | 6.67 | | 21.3 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | 10.0 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.7 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-5 | ARDL Lab No.: | 008848-06 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923111 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 0824 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 800 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Atrazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metribuzin | 0.250 | 0.250 | ND | | UG/L | 1 |
| Alachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Metolachlor | 0.250 | 0.250 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.250 | 0.250 | ND | | UG/L | 1 |
| Cyanazine | 0.250 | 0.250 | ND | | UG/L | 1 |
| Pendimethalin | 0.250 | 0.250 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 76% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-06
Field ID: REN-5
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 0824

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0983 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.225 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Phosphorus | 0.00800 | 0.0100 | | 0.17 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 4.00 | 4.00 | | 20.4 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 4.00 | 4.00 | | ND | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.2 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-7 | ARDL Lab No.: | 008848-07 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923112 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1311 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 74% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-07
Field ID: REN-7
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 1311

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0641 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 1.33 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Phosphorus | 0.00800 | 0.0100 | | 0.152 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 1.33 | 1.33 | | 7.2 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 1.33 | 1.33 | | ND | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 6.5 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270C
NELAC Certified - IL100308 Prep Method: 3510C

| | | | |
|---|---|---|---|
| Field ID: | REN-8 | ARDL Lab No.: | 008848-08 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923113 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1002 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.644 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 71% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008848-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 09/14/2021 Moisture: NA
Received: 09/14/2021 Sampling Time: 1002

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | 0.0394 | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 121 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | 0.061 | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Pheophytin-a | 1.00 | 1.00 | | 17.7 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Phosphorus | 0.00800 | 0.0100 | | 0.247 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 6.67 | 6.67 | | 30.7 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | 13.3 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 9.1 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

| | |
|---|---|
| Project Name: REND LAKE | Analysis: NP PESTICIDES (8270SIM-MOD) |
| Project No.: | Analytical Method: 8270C |
| NELAC Certified - IL100308 | Prep Method: 3510C |

| | | | |
|---|---|---|---|
| Field ID: | REN-15-0 | ARDL Lab No.: | 008848-09 |
| Desc/Location: | REND LAKE | Lab Filename: | E0923114 |
| Sample Date: | 09/14/2021 | Received Date: | 09/14/2021 |
| Sample Time: | 1223 | Prep. Date: | 09/16/2021 |
| Matrix: | WATER | Analysis Date: | 09/23/2021 |
| Amount Used: | 900 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| Trifluralin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Atrazine | 0.222 | 0.222 | 0.622 | | UG/L | 1 |
| Metribuzin | 0.222 | 0.222 | ND | | UG/L | 1 |
| Alachlor | 0.222 | 0.222 | ND | | UG/L | 1 |
| Metolachlor | 0.222 | 0.222 | 0.244 | | UG/L | 1 |
| Chlorpyrifos | 0.222 | 0.222 | ND | | UG/L | 1 |
| Cyanazine | 0.222 | 0.222 | ND | | UG/L | 1 |
| Pendimethalin | 0.222 | 0.222 | ND | | UG/L | 1 |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 73% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-09
Field ID: REN-15-0
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 1223

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.0200 | 0.0300 | | ND | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 |
| Chlorophyll-a, Correcte | 1.00 | 1.00 | | 89.0 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Nitrate as Nitrogen | 0.0190 | 0.0200 | | ND | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 |
| Pheophytin-a | 1.00 | 1.00 | | 16.5 | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 |
| Phosphorus | 0.00800 | 0.0100 | | 0.243 | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 |
| Solids, Total Suspended | 6.67 | 6.67 | | 20.7 | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 |
| Solids, Volatile Suspen | 6.67 | 6.67 | | 9.33 | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 |
| Total Organic Carbon | 0.500 | 1.00 | | 7.7 | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 |

(a) DOD and/or NELAC Accredited Analyte.

**ARDL, INC.**
**400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008848-10
Field ID: REN-RL-MAR
Received: 09/14/2021

Sampling Loc'n: REND LAKE
Sampling Date: 09/14/2021
Sampling Time: 1028

Matrix: WATER
Moisture: NA

| Analyte | LOD | LOQ | Flag | Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run Number |
|---|---|---|---|---|---|---|---|---|---|---|
| E. Coliform | 1.0 | 1.0 | | 20.0 | COL/100 ML | NONE | 1604 | NA | 09/14/21 | 09166291 |

(a) DOD and/or NELAC Accredited Analyte.

# METHOD BLANK REPORT

**ARDL, Inc. 400 Aviation Drive; P.O. Box 1566**
**Mt. Vernon, Illinois 62864**

Lab Report No: 008848 Report Date: 09/24/2021

| | | | |
|---|---|---|---|
| Project Name: | REND LAKE | Analysis: | NP PESTICIDES (8270SIM-MOD) |
| Project No.: | | Analytical Method: | 8270C |
| NELAC Certified - IL100308 | | Prep Method: | 3510C |

| | | | |
|---|---|---|---|
| Field ID: | NA | ARDL Lab No.: | 008848-01B1 |
| Desc/Location: | NA | Lab Filename: | E0923103 |
| Sample Date: | NA | Received Date: | NA |
| Sample Time: | NA | Prep. Date: | 09/16/2021 |
| Matrix: | QC Material | Analysis Date: | 09/23/2021 |
| Amount Used: | 1000 mL | Instrument ID: | AG5 |
| Final Volume: | 1 mL | QC Batch: | B11407 |
| % Moisture: | NA | Level: | LOW |

| Parameter | LOD | LOQ | Result | Data Flag | Units |
|---|---|---|---|---|---|
| Trifluralin | 0.200 | 0.200 | ND | | UG/L |
| Atrazine | 0.200 | 0.200 | ND | | UG/L |
| Metribuzin | 0.200 | 0.200 | ND | | UG/L |
| Alachlor | 0.200 | 0.200 | ND | | UG/L |
| Metolachlor | 0.200 | 0.200 | ND | | UG/L |
| Chlorpyrifos | 0.200 | 0.200 | ND | | UG/L |
| Cyanazine | 0.200 | 0.200 | ND | | UG/L |
| Pendimethalin | 0.200 | 0.200 | ND | | UG/L |

| SURROGATE RECOVERIES: | Limits | Results |
|---|---|---|
| Triphenylphosphate | 30-130 | 84% |

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DOD-QSM Accredited Analyte.

# BLANK SUMMARY REPORT

**ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864**

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LOD | LOQ | Blank Result | Units | Prep Method | Analysis Method | Prep Date | Analysis Date | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 0.040 | 0.050 | ND | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 | 008823-01B1 |
| (a) Manganese | 0.004 | 0.005 | ND | MG/L | 3010A | 6010C | 09/15/21 | 09/21/21 | P7616 | 008823-01B1 |
| Ammonia Nitrogen | 0.020 | 0.030 | ND | MG/L | NONE | 350.1 | NA | 09/20/21 | 09216310 | 008848-01B1 |
| Chlorophyll-a, Corre | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 | 008848-02B1 |
| Nitrate as Nitrogen | 0.019 | 0.020 | ND | MG/L | NONE | GREEN | NA | 10/01/21 | 10056382 | 008848-03B1 |
| Pheophytin-a | 1.0 | 1.0 | ND | MG/CU.M. | 10200H | 10200H | 09/15/21 | 10/04/21 | 10066383 | 008848-02B1 |
| Phosphorus | 0.008 | 0.010 | ND | MG/L | 365.2 | 365.2 | 10/04/21 | 10/05/21 | 10076396 | 008847-03B1 |
| Solids, Total Suspen | 1.0 | 1.0 | ND | MG/L | NONE | 160.2 | NA | 09/20/21 | 09246332 | 008848-01B1 |
| Solids, Volatile Sus | 1.0 | 1.0 | ND | MG/L | NONE | 160.4 | NA | 09/20/21 | 09246333 | 008848-01B1 |
| Total Organic Carbon | 0.50 | 1.0 | ND | MG/L | NONE | 415.1 | NA | 09/19/21 | 09246337 | 008847-01B1 |

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008848

# BLANK SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11407 Prep. Date: 09/16/2021
Amount Used: 1000 mL Level: LOW Analysis Date: 09/23/2021

| Parameter | Spike Result | Spike Level | Spike % Rec | Duplicate Result | Duplicate Level | Duplicate % Rec | Recovery Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | 4.14 | 4 | 104 | -- | -- | -- | 30-130 | -- | -- |
| Atrazine | 3.97 | 4 | 99 | -- | -- | -- | 30-130 | -- | -- |
| Metribuzin | 4.07 | 4 | 102 | -- | -- | -- | 30-130 | -- | -- |
| Alachlor | 4.7 | 4 | 118 | -- | -- | -- | 30-130 | -- | -- |
| Metolachlor | 4.09 | 4 | 102 | -- | -- | -- | 30-130 | -- | -- |
| Chlorpyrifos | 4 | 4 | 100 | -- | -- | -- | 30-130 | -- | -- |
| Cyanazine | 4.44 | 4 | 111 | -- | -- | -- | 30-130 | -- | -- |
| Pendimethalin | 4.17 | 4 | 104 | -- | -- | -- | 30-130 | -- | -- |

| SURROGATE RECOVERIES: | Spike %R | Duplicate %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 85.3 | -- | 30-130 |

(a) DOD-QSM Accredited Analyte.

'*' indicates a recovery outside of standard limits.

Spike Blanks for 008848-01, NP PESTICIDES (8270SIM-MOD)

# LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | LCS 1 Result | LCS 1 Level | LCS 1 % Rec | LCS 2 Result | LCS 2 Level | LCS 2 % Rec | % Rec Limits | Mean % Rec | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | 5.0 | 5.0 | 100 | -- | -- | -- | 87-115 | -- | P7616 | 008823-01C1 |
| (a) Manganese | 0.78 | 0.75 | 104 | -- | -- | -- | 90-114 | -- | P7616 | 008823-01C1 |
| Ammonia Nitrogen | 1.0 | 1.0 | 104 | -- | -- | -- | 80-120 | -- | 09216310 | 008848-01C1 |
| Nitrate as Nitrogen | 0.96 | 1.0 | 96 | -- | -- | -- | 80-120 | -- | 10056382 | 008848-03C1 |
| Phosphorus | 0.65 | 0.67 | 98 | -- | -- | -- | 80-120 | -- | 10076396 | 008847-03C1 |
| Total Organic Carbon | 20.6 | 20.0 | 103 | -- | -- | -- | 76-120 | -- | 09246337 | 008847-01C1 |

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008848 Report Date: 09/24/2021

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270C
Project No.: Prep Method: 3510C

| | | | | | |
|---|---|---|---|---|---|
| Field ID: | REN-1 | Prep. Date: | 09/16/2021 | ARDL Lab No.: | 008848-01 |
| Desc/Location: | REND LAKE | Amount Used: | 900 mL | Lab Filename: | |
| Sample Date: | 09/14/2021 | % Moisture: | NA | Received Date: | 09/14/2021 |
| Sample Time: | 1141 | QC Batch: | B11407 | Analysis Date: | 09/23/2021 |
| Matrix: | WATER | Level: | LOW | | |

| Parameter | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| Trifluralin | ND | 3.9 | 4.44 | 87.8 | 3.11 | 4.44 | 70 | 30-130 | 22.5 | 30 |
| Atrazine | 0.633 | 4.76 | 4.44 | 92.8 | 3.4 | 4.44 | 62.3 | 30-130 | 33.2 * | 30 |
| Metribuzin | ND | 4.08 | 4.44 | 91.8 | 2.88 | 4.44 | 64.8 | 30-130 | 34.5 * | 30 |
| Alachlor | ND | 4.42 | 4.44 | 99.5 | 3.66 | 4.44 | 82.3 | 30-130 | 19 | 30 |
| Metolachlor | 0.233 | 4.23 | 4.44 | 90 | 3.44 | 4.44 | 72.3 | 30-130 | 20.5 | 30 |
| Chlorpyrifos | ND | 3.77 | 4.44 | 84.8 | 3.03 | 4.44 | 68.3 | 30-130 | 21.6 | 30 |
| Cyanazine | ND | 4.53 | 4.44 | 102 | 3.18 | 4.44 | 71.5 | 30-130 | 35.2 * | 30 |
| Pendimethalin | ND | 3.94 | 4.44 | 88.8 | 3.18 | 4.44 | 71.5 | 30-130 | 21.5 | 30 |

| SURROGATE RECOVERIES: | MS %R | MSD %R | %R Limits |
|---|---|---|---|
| Triphenylphosphate | 73 | 57 | 30-130 |

(a) DOD-QSM Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008848-01, NP PESTICIDES (8270SIM-MOD)

# MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Matrix | Sample Result | MS Result | MS Level | MS % Rec | MSD Result | MSD Level | MSD % Rec | % Rec Limits | RPD | RPD Limit | Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) Iron | WATER | 0.29 | 1.2 | 1.0 | 91 | 1.2 | 1.0 | 91 | 87-115 | 1 | 20 | P7616 | 008848-01MS |
| (a) Manganese | WATER | 0.63 | 1.1 | 0.50 | 96 | 1.1 | 0.50 | 96 | 90-114 | 0 | 20 | P7616 | 008848-01MS |
| Ammonia Nitrogen | WATER | 0.30 | 2.3 | 2.0 | 100 | 2.3 | 2.0 | 100 | 75-125 | 0 | 20 | 09216310 | 008848-01MS |
| Nitrate as Nitrogen | WATER | 0.048 | 0.87 | 1.0 | 82 | 0.80 | 1.0 | 75 | 75-125 | 8 | 20 | 10056382 | 008848-03MS |
| Phosphorus | WATER | 0.24 | 1.1 | 0.83 | 100 | 1.1 | 0.83 | 102 | 75-125 | 1 | 20 | 10076396 | 008848-02MS |

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

# SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008848 Report Date: 10/08/2021

Project Name: REND LAKE NELAC Certified - IL100308

| Analyte | Sample Conc'n | First Duplicate | Second Duplicate | Units | Percent Diff | Mean (Smp,D1,D2) | Analytical Run | QC Lab Number |
|---|---|---|---|---|---|---|---|---|
| Chlorophyll-a, Corrected | 104 | 105 | -- | MG/CU.M. | 1 | -- | 10066383 | 008848-02D1 |
| Pheophytin-a | 15.1 | 14.8 | -- | MG/CU.M. | 2 | -- | 10066383 | 008848-02D1 |
| Solids, Total Suspended | 12.7 | 12.0 | -- | MG/L | 6 | -- | 09246332 | 008848-01D1 |
| Solids, Volatile Suspend | ND | ND | -- | MG/L | NC | -- | 09246333 | 008848-01D1 |

(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008848

# Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8848

# ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8848

## CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Ben Gruling, Rick Archecki

| SAMPLE NUMBER | DATE | TIME | COMP | GRAB | NO. OF CONTAINERS | TSS, TVSS | Chloro/Pheo *TOC, T-PO4 | *NO3-N, NH3-N | NP Pest | #T.Fe; T.Mn | E. coli | MS/MSD | REMARKS OR SAMPLE LOCATION | PRESERVATION ICED | PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ren – 1 | 9/14/21 | 1141 | | X | | X | X | X | X | | X | | | X | |
| Ren – 2 – 0 | | 0933 | | X | | X | X | X | X | | | | | X | |
| Ren – 2 – 5 | | 0942 | | X | | X | X | | X | | | | | X | |
| Ren – 3 | | 1202 | | X | | X | X | X | X | | | | | X | |
| Ren – 4 | | 1214 | | X | | X | X | X | X | | | | | X | |
| Ren – 5 | | 0824 | | X | | X | X | X | X | | | | | X | |
| Ren – 7 | | 1311 | | X | | X | X | X | X | | | | | X | |
| Ren – 8 | | 1002 | | X | | X | X | X | X | | | | | X | |
| Ren – 15- 0 | | 1223 | | X | | X | X | X | X | | | | | X | |
| Ren-RL-Mar | | 1028 | | X | | | | | | X | | | | X | |

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
|---|---|---|---|
| | 9/14/21 | 1329 | Valerie Jenkins |
| Relinquished by: (Signature) Valerie Jenkins | Date 8/14/21 | Time 1346 | Received by: (Signature) |
| Received for Laboratory by: (Signature) Kellie Brenneman | Date 09/14/2021 08/14/21 | Time 1346 | Shipping Ticket No. |

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with $H_2SO_4$
#Preserved with $HNO_3$

PURCHASE ORDER NO: _____

# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8848 Cooler # Red 1

Number of Coolers in Shipment: 2

Project: Red Lake Date Received: 09/14/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 09/14/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES (NO) N/A

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 0.8 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 09/14/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 09/14/2021 | On: |

Chain-of-Custody # _____

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# COOLER RECEIPT REPORT
## ARDL, INC.

ARDL #: 8848 Cooler # Red 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 09/14/2021

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 09/14/2021 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier-Valerie

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES (NO) NA

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓____ Observed Cooler Temp. 1.6 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 09/14/2021 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

| Comments and/or Corrective Action: |
|---|
| |
| |
| |
| |
| |
| (By: Signature) Date: |

| Sample Transfer | |
|---|---|
| Fraction: All | Fraction: |
| Area #: Walk-In | Area #: |
| By: DCB | By: |
| On: 09/14/2021 | On: |

Chain-of-Custody # _____

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