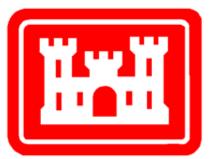
# **2020 Water Quality Report**



U.S. Army Corps of Engineers Saint Louis District

# Carlyle Lake Water Quality Conditions: 1971-2020



June 2021

Carlyle Lake Water Quality Conditions: 1971-2020

Prepared for

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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, 2018) has listed Carlyle Lake as impaired for total suspended solids, total phosphorous, and mercury while the Kaskaskia River upstream from the Lake is impaired for dissolved oxygen, Atrazine, and mercury. The lists of sources for these impairments are contaminated sediments, crop production, and unknown sources. The entire Kaskaskia watershed is impaired by the above parameters as well as many others.

Water quality sampling in 2020 revealed the following concerns at Carlyle Lake: bacteria, iron, pH, dissolved oxygen, temperature, Atrazine, and total phosphorus.

# TABLE OF CONTENTS

INTRODUCTION	5
CARLYLE LAKE WQMP COVERAGE	6
Sample Location Summary Table	8
METHODS AND ANALYSIS: WATER QUALITY	9
Data Collection and Historical Reference Data	9
Statistical Summary and Comparison to Applicable Water Quality Standards	9
Quality Assurance	9
Water Quality Parameters and Criteria	10
Laboratory Methods and Water Quality Criteria Summary Table	15
RESULTS AND SUMMARY STATISTICS: WATER QUALITY	17
DISCUSSION: WATER QUALITY	36
MONITORING PROGRAM RECOMMENDATIONS	39
WORKS CITED	40
APPENDIX A: FIELD DATA	41
APPENDIX B: LABORATORY DATA	45

## INTRODUCTION

The Carlyle Lake watershed encompasses approximately 1,663 square miles and includes all or portions of Bond, Clinton, Effingham, Fayette, Marion, Shelby, and Montgomery counties. The watershed includes the Kaskaskia River between Carlyle Lake Dam and Lake Shelbyville Dam and major tributaries of the Kaskaskia River, including: Big, Richland, Robinson, Becks, Ramsey, Old Hickory, and Hurricane Creeks (respectively) and the East Fork Kaskaskia River. Agriculture is the predominant land use within the watershed. Currently, 82% of the land is used for agricultural purposes. Of that 82%, 63% is cropland and 19% grassland. Since 1978, the number of farms has decreased by 25% and the acreage tilled has decreased by only 6%. Corn and soybeans are important to the region, but producers also grow 25% of the entire state's crop of wheat. Livestock production, including dairy, swine, poultry and beef cattle is a significant industry, especially in Clinton, Randolph and Washington Counties.

Carlyle Lake is located in south central Illinois at river mile 94.2 on the Kaskaskia River, upstream from its confluence with the Mississippi River and about one-half mile upstream from the town of Carlyle, Illinois. Carlyle is located in Clinton County, approximately 50 miles east of St. Louis, Missouri. Carlyle Lake is the largest manmade lake in the state and is approximately 12 miles long and 1-3 miles wide and has approximately 24,710 acres of water surface at summer pool elevation 445.0 feet NGVD (National Geodetic Vertical Datum). There are 88 miles of shoreline and approximately 12,800 acres of public land associated with the project. The lake is situated in gently rolling land with alluvial valleys with moderately low relief. The lake provides outdoor recreation opportunities for over 2.5 million visitors annually, which generates over \$80 million in visitor spending within 30- miles of the Lake. There are 41 recreation areas that include: 424 picnic sites, 726 campsites, 670 marina slips, 24 boat ramps, and 25 miles of hiking trails. The CEMVS manages and operates two large reservoirs on the Kaskaskia River, Lake Shelbyville and Carlyle Lake, as well as the 36 mile long navigable channel and lock and dam at the Kaskaskia River Project.

Carlyle Lake is managed and operated by the CEMVS for the authorized purposes of flood risk management, navigation, water supply, water quality, fish and wildlife conservation, and recreation. The lake serves as a heavy recreational usage lake. The land surrounding the lake is used predominately for agriculture. Surrounding communities have existing industrial/commercial operations and residents which discharge wastewater into municipal wastewater treatment plants that ultimately discharge treated water into the Kaskaskia River basin. Agricultural runoff and municipal wastewater treatment facilities are the primary potential source of pollution into the Carlyle 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 Kaskaskia River and Carlyle 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 Saint Louis District (CEMVS) of United States Army Corps of Engineers (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 Kaskaskia River and Carlyle 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 Carlyle Lake. The report describes conditions observed in 2020, as well as baseline data collected from 1971-2019. Data are available upon request.

# CARLYLE LAKE WQMP COVERAGE

The WQMP for Carlyle Lake includes water samples taken at the following locations: major tributaries (CAR-13 and CAR-12), main body of the lake (CAR-4, CAR-2, and the marinas), and just downstream of the dam (CAR-1). See figure 1 and Table 1 for a site map and site coordinates.

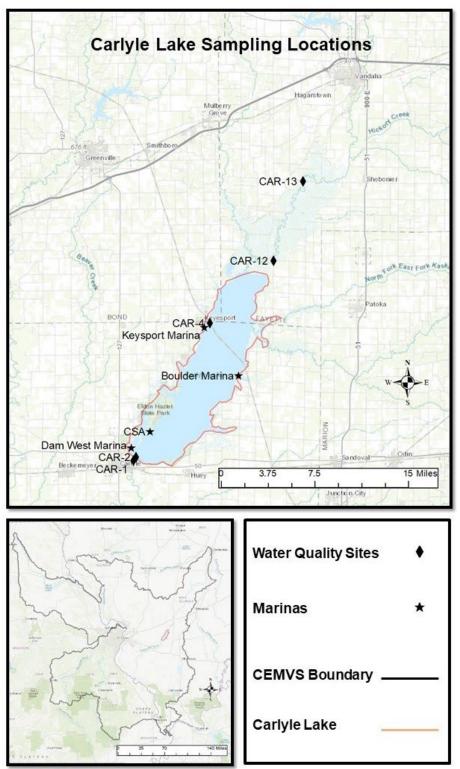


Figure 1. Water Quality (WQ) Sampling Locations in 2019 at Carlyle Lake

#### Sample Location Summary Table

Sample Location Type	Abbreviation	Site Name	Latitude	Longitude
Major Tributary	TRIB	CAR-13	38.868961	-89.159605
	TRIB	CAR-12	38.868961	-89.193475
Main Reservoir Surface	RS	CAR-2	38.619492	-89.352747
	RS	CAR-4	38.740632	-89.267266
	RS	CAR-BL	38.693092	-89.234040
	RS	CAR-DW	38.627955	-89.358246
	RS	CAR-KP	38.736930	-89.273674
	RS	CAR-CSA	38.642647	-89.336805
Reservoir Benthic	RB	CAR-2-10	38.619492	-89.352747
Tail Race (below dam)	TR	CAR-1	38.616240	-89.355828

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

Samples at Marinas are not always taken in the exact same location. *BL=Boulder Marina, DW=Dam West Marina, KP=Keyesport Marina, CSA=Carlyle Sailing Association.* 

## METHODS AND ANALYSIS: WATER QUALITY

#### Data Collection and Historical Reference Data

During 2020, water quality samples were collected and analyzed for 10 locations during four separate sampling events (n=40; Table 1). One duplicate sample was also collected during each sampling event for quality control purposes. 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 1974 (parameter dependent) at Carlyle Lake. Historical reference data are intended to represent the current condition of Carlyle Lake.

#### Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses were performed on water quality monitoring data collected for 10 locations, and classified as TRIB (n= 2), RS (n=2), 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 may have been removed, they were classified in the same manner. Descriptive statistics were calculated to describe central tendencies and corresponding 95% confidence levels for the mean. 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 Carlyle Lake has 6 samples and one duplicate).

Internal checks are also used for field sampling. This includes 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°C. Water temperature criteria for warm water bodies in Illinois is within 2.8°C of the seasonal norm.

**Dissolved Oxygen (DO)** refers to the measurement of free oxygen molecules (O<sub>2</sub>) that are not bonded to any other elements; thus, oxygen bonded in water (H<sub>2</sub>O) 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<sub>2</sub> + H<sub>2</sub>O (CH<sub>2</sub>O) + O<sub>2</sub>) from phytoplankton and aquatic vegetation. Additional factors influencing DO include temperature, pressure, and salinity.

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

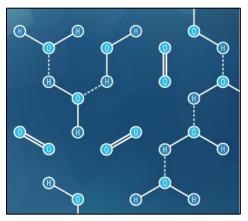


Figure 1: Dissolved oxygen  $(O_2)$  vs oxygen bonded in water  $(H_2O)$ .

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 invertebrate begins 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  $\mu$ S/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. 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 Kaskaskia 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.

<u>Total Ammonia Nitrogen (TAN)</u> 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 (algae 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<sub>4</sub>-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.

<u>Chlorophyll a (CHL a)</u> 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.

<u>**Trophic Status**</u> 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:

 $\begin{array}{l} {\sf TSI} \; ({\sf Seechi \; Depth}) = 10(6 \; - \; ({\sf In \; SD/ln \; 2})) \\ {\sf TSI} \; ({\sf Chlorophyll-}a) = {\sf TSI}({\sf Chl}) = 10(6 \; - \; ((2.04 \; - \; 0.68 \; {\sf In \; Chl})/{\sf In \; 2})) \\ {\sf TSI} \; ({\sf Total \; Phosphorus}) = {\sf TSI}({\sf TP}) = 10(6 \; - \; ({\sf In \; (48/TP)}/{\sf In \; 2})) \end{array}$ 

#### where In 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

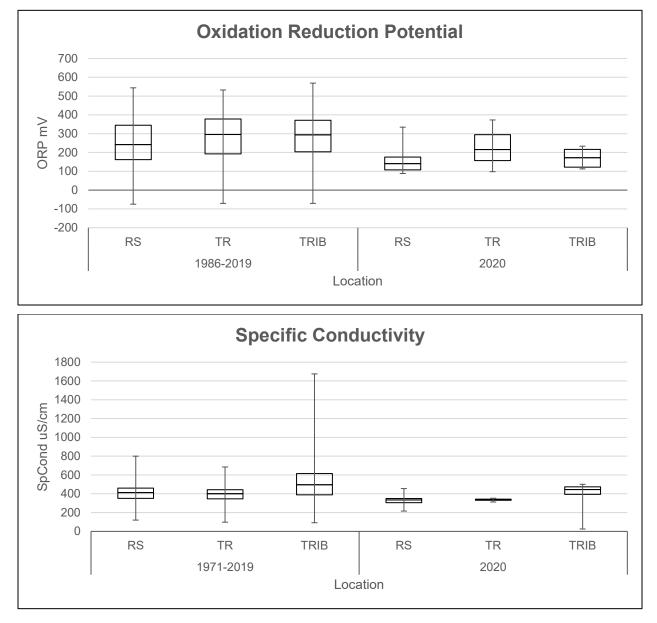
#### Laboratory Methods and Water Quality Criteria Summary Table

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

Metric	Abbreviation	Analysis Method	Water Quality Criteria	<u>Source</u>
Alachlor		EPA Method 8270C	< 2µg/L PWS or <1100 µg/L: aquatic life	Illinois EPA
Ammonia Nitrogen	NH₃	EPA Method 350.1	<15 mg/L	United States 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	< 25mg/cm <sup>3</sup> (Eutrophic Upper Limit)	Carlson 1977
Chlorpyrifos		EPA Method 8270C	< .11 µg/L: aquatic life	Illinois EPA
Cyanazine		EPA Method 8270C	< 30 µg/L: chronic or < 370 ug/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 <sub>3</sub>	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	рН	Multiparameter Meter	Range: 6.5 – 9.0pH	Illinois EPA
Specific Conductivity	SpCond	Multiparameter Meter	500 μS/cm	
Temperature	Тетр	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	тос	EPA Method 415.1		
Total Iron	TFe	EPA Method 6010C	< 1 mg/L	Illinois EPA
Total Phosphorus	ТР	EPA Method 365.2	Less than 0.05 mg/L	Illinois EPA
Total Suspended Solids	TSS	EPA Method 160.2		Illinois EPA
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		

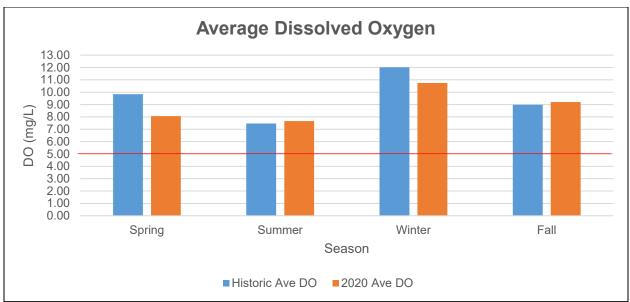
\*1 mg/L is equivalent to 1 drop in two bathtubs and 1 ug/L is equivalent to 1 drop in an Olympic size swimming pool. PWS is public water supply. DWS is drinking water standard.



# RESULTS AND SUMMARY STATISTICS: WATER QUALITY

		<u>Histor</u>	rical Refere		<u>202</u>	<u>20</u>			
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
SpCond	RS	409.71	413.00	615	7.40	330.87	334.15	22	26.59
	TR	398.40	400.00	244	10.14	335.33	338.30	4	26.52
	TRIB	520.66	496.00	597	18.42	386.67	444.55	8	134.95
ORP	RS	247.81	242.00	261	14.87	160.06	141.10	16	37.80
	TR	284.29	296.00	129	21.17	228.93	215.80	3	342.98
	TRIB	282.73	293.55	166	19.17	171.33	172.35	6	58.55

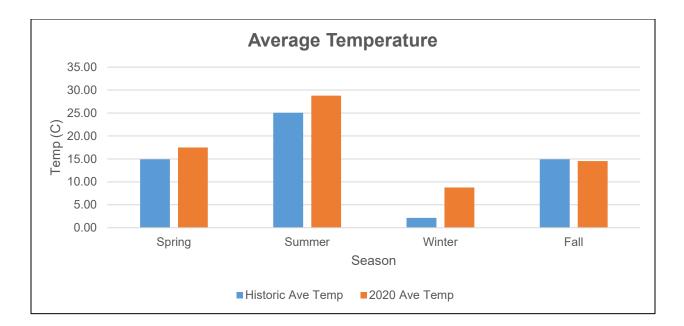
\*This report does not acknowledge a water quality criteria for SpCond or ORP.



Red line placed at the 5 mg/L level.

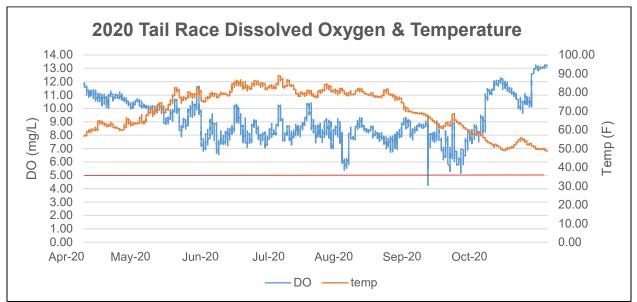
	Hi	storical R	Reference	1972-201	9		2	<u>020</u>	
					CL				CL
Season	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
Spring	RS	10.27	10.30	153	0.39	8.12	7.87	5	1.26
	TR	10.09	10.05	68	0.58	10.10	10.10	1	
	TRIB	9.31	9.00	154	0.39	6.94	6.94	2	5.40
Summer	RS	7.61	7.30	277	0.27	7.80	8.27	6	3.42
	TR	8.00	8.20	107	0.34	7.52	7.52	1	
	TRIB	7.04	6.89	230	0.27	7.33	7.33	2	2.16
Winter	RS	12.31	12.20	61	0.71	10.19	10.60	5	1.88
	TR	13.46	13.70	22	0.93	13.05	13.05	1	
	TRIB	11.53	11.85	106	0.46	10.99	10.99	2	2.54
Fall	RS	9.25	9.30	117	0.40	10.09	10.12	6	0.83
	TR	9.83	10.20	43	0.62	7.13	7.13	1	
	TRIB	8.31	8.70	96	0.48	7.59	7.59	2	5.59

\* On July 29 2020 DO was recorded at 2.51 mg/L at Boulder Marina. All other observations met the Illinois state standard.



	<u>His</u>	storical R	eference 1	972-201	9		<u>2</u>	020	
					CL				CL
Season	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
Spring	RS	15.58	16.85	156	0.91	17.74	17.90	5	0.57
	TR	15.52	16.92	70	1.25	17.20	17.20	1	
	TRIB	14.01	15.00	159	0.83	16.95	16.95	2	3.18
Summer	RS	25.90	26.00	278	0.32	29.18	29.05	6	0.67
	TR	25.51	26.00	109	0.44	28.90	28.90	1	
	TRIB	23.89	23.83	236	0.39	27.50	27.50	2	7.62
Fall	RS	15.77	17.00	120	0.94	14.63	14.20	6	0.97
	TR	16.09	18.15	44	1.51	14.40	14.40	1	
	TRIB	13.38	14.00	99	1.12	14.25	14.25	2	1.91
Winter	RS	2.25	1.00	63	0.68	9.18	9.56	5	1.29
	TR	2.81	2.00	23	1.13	7.78	7.78	1	
	TRIB	1.96	1.00	109	0.51	8.19	8.19	2	3.88

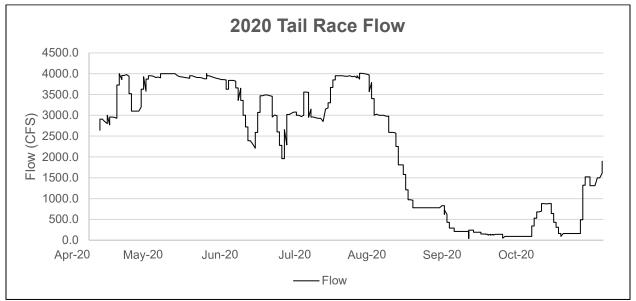
\*There were multiple observations in which the 2020 values exceeded the 2.8C rise above the historical mean values.



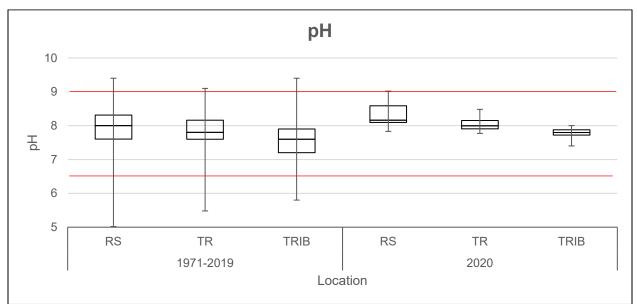
\*Data recorded by multi-parameter sonde at tail race. 30 minute data shown. Red line placed at the 5 mg/L level. DO was recorded between 4-5 mg/L briefly on September 30 2020. All other observations were greater than 5 mg/L during 2020.

2020 Tail Race Continuous Temperature and DO										
Parameter	Season	Mean	Median	Count	CL (95.0%)					
DO	Spring	10.6	10.6	3297	0.015					
	Summer	8.4	8.3	10272	0.017					
	Fall	9.5	8.8	6690	0.051					
Temp	Spring	17.5	17.3	3297	0.071					
	Summer	26.7	26.5	10272	0.034					
	Fall	15.1	14.6	6690	0.106					

\*Historical tail race continuous data not included in this report.



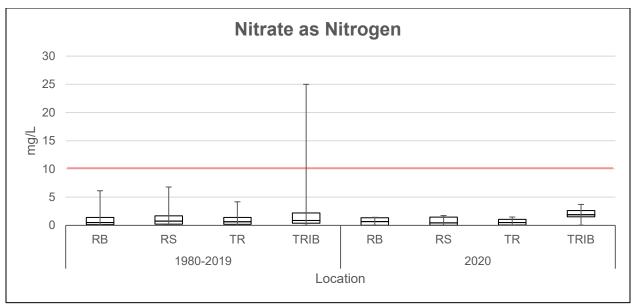
\*Revised daily flow data as reviewed by the USACE water management office.



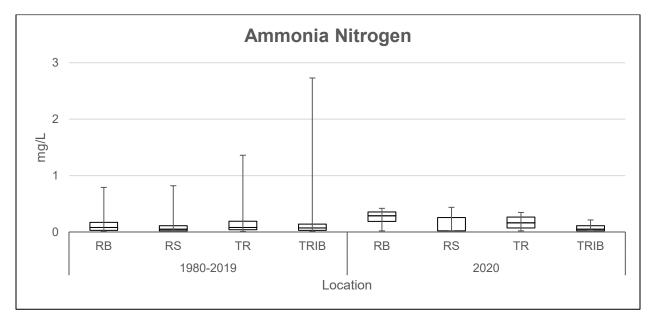
\*Red lines indicate the upper and lower water quality criteria standards (9 and 6.5).

		<u>H</u>	istorical R			<u>2020</u>			
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
рН	RS	7.98	8.00	611	0.04	8.31	8.16	22	0.16
	TR	7.87	7.90	243	0.07	8.06	8.00	4	0.48
	TRIB	7.55	7.60	590	0.04	7.77	7.80	8	0.16

\*pH was recorded above 9 at CSA on July 29 2020. All other readings were within water quality standards during 2020.

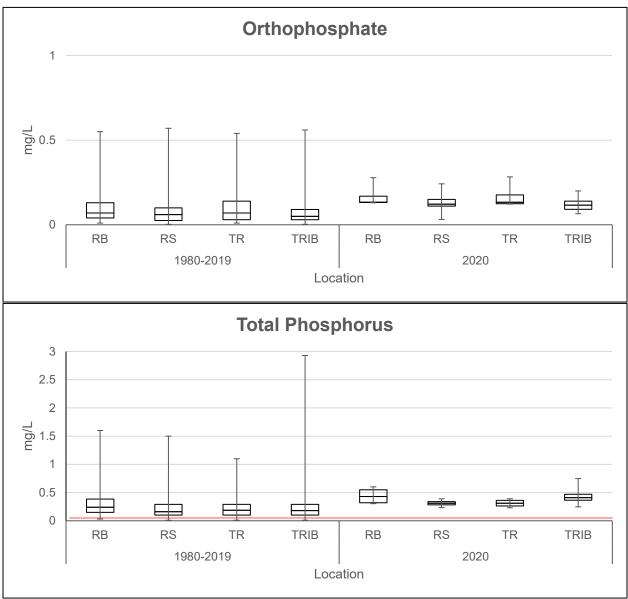


\*Red line indicates the water quality criteria standard (10 mg/L).



		<u>Histo</u>	rical Refe	<u>80-2019</u>	<u>2020</u>				
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
NO3N	RB	0.90	0.51	233	0.13	0.70	0.68	4	1.25
	RS	1.12	0.75	597	0.09	0.72	0.46	8	0.66
	TR	0.91	0.63	242	0.11	0.63	0.50	4	1.12
	TRIB	1.63	0.88	590	0.16	1.89	1.88	8	0.99
NH3N	RB	0.12	0.08	228	0.02	0.25	0.29	4	0.27
	RS	0.08	0.05	492	0.01	0.13	0.02	8	0.14
	TR	0.13	0.08	208	0.02	0.17	0.16	4	0.23
	TRIB	0.12	0.07	409	0.02	0.08	0.05	8	0.07

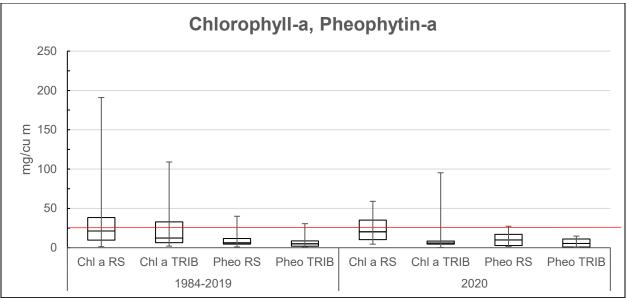
\*All observations of nitrate and ammonia nitrogen were within the water quality standard.



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

		<u>Histo</u>	rical Refe	<u>2020</u>					
	1			0	CL			0	CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
Ortho	RB	0.10	0.07	233	0.01	0.17	0.13	4	0.12
	RS	0.08	0.06	592	0.01	0.13	0.12	8	0.05
	TR	0.10	0.07	239	0.01	0.17	0.13	4	0.12
	TRIB	0.07	0.05	590	0.01	0.12	0.12	8	0.04
TP	RB	0.32	0.24	234	0.03	0.44	0.43	4	0.24
	RS	0.22	0.16	604	0.01	0.31	0.31	8	0.04
	TR	0.22	0.19	242	0.02	0.31	0.31	4	0.12
	TRIB	0.23	0.18	601	0.02	0.44	0.41	8	0.13

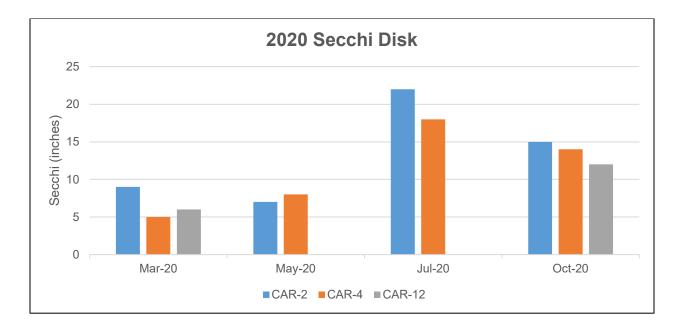
\*Total phosphorus exceeded the proposed criteria of 0.05 mg/L for all locations. This study does not acknowledge a water quality criteria for orthophosphate.

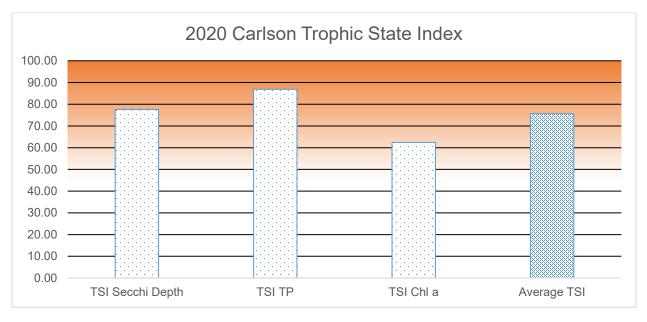


\*Red line approximately indicates the water quality standard of 25 mg/cm<sup>3</sup>. See Carlson 1977.

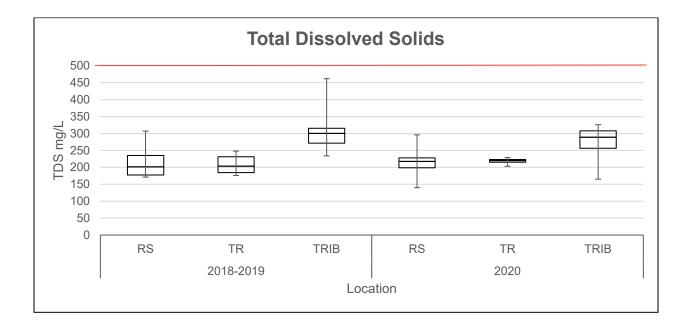
		Histo	rical Refere	<u>2020</u>								
			CL CL									
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)			
Chl a	RS	29.99	21.25	266	3.49	25.64	20.15	8	17.20			
	TRIB	24.21	12.40	59	6.78	22.92	6.10	5	50.38			
Pheo a	RS	8.48	6.30	220	0.87	11.16	9.90	8	8.26			
	TRIB	6.89	5.00	54	1.72	6.65	5.40	4	10.88			

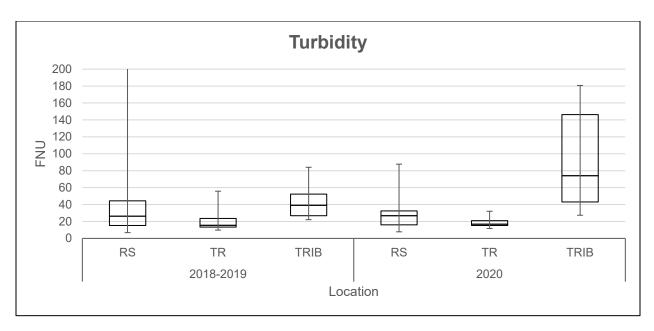
\*The proposed criteria for chlorophyll-a of 25mg/cm<sup>3</sup> was exceeded at the lake sites in May and October. This study does not acknowledge a criteria for pheophytin.





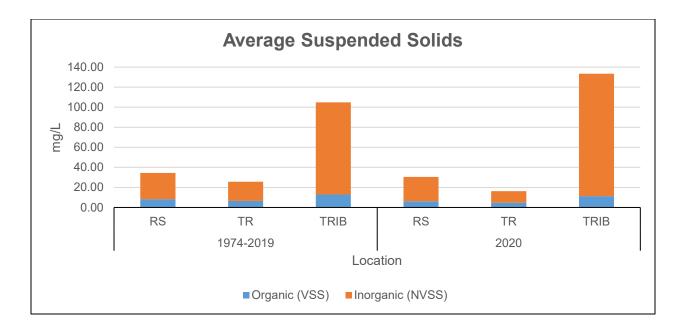
<40 = Oligotrophic \_\_\_\_ 40-50 = Mesotrophic \_\_\_\_ 50-70 = Eutrophic \_\_\_\_ >70 Hypereutrophic





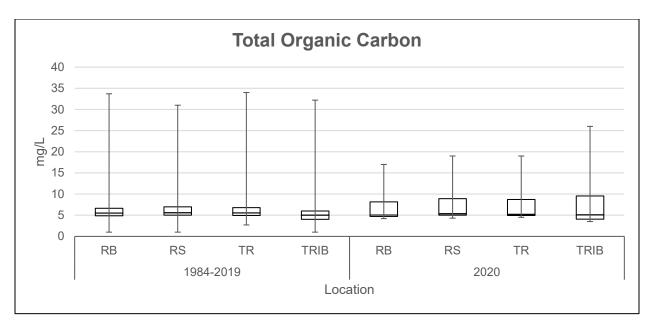
		Histor	ical Refere	<u>2019</u>							
				CL							
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)		
FNU	RS	48.45	26.25	33	26.30	29.29	26.82	22	8.42		
	TR	21.61	15.49	8	12.82	19.31	16.75	4	14.05		
	TRIB	42.99	38.99	16	10.30	92.87	73.99	8	51.91		
TDS	RS	210.47	201.50	34	13.19	215.09	217.50	22	17.31		
	TR	208.25	203.50	8	23.91	218.00	220.00	4	17.33		
	TRIB	309.69	300.50	16	34.80	270.00	289.00	8	51.59		

\* All observations of TDS were within the referenced water quality standard.



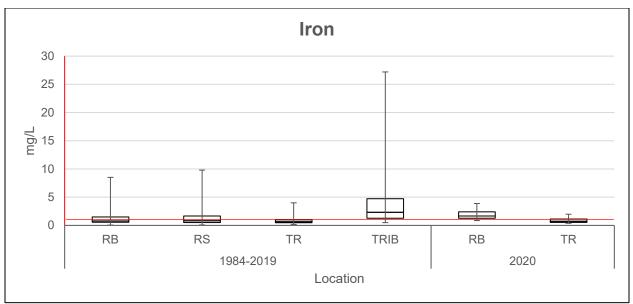
		<u>Histor</u>	<u>20</u>						
					CL				CL
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)
TSS	RS	34.41	25.00	505	2.85	30.51	19.30	8	20.54
	TR	25.58	21.00	210	2.72	16.20	16.40	4	10.00
	TRIB	104.84	62.00	421	13.02	133.50	94.50	8	101.99
VSS	RS	8.30	7.00	502	0.59	6.18	6.60	8	1.77
	TR	6.56	5.00	208	0.68	4.70	4.40	4	1.50
	TRIB	12.86	8.80	421	1.26	11.23	10.00	8	5.60
NVSS	RS	26.16	17.00	505	2.53	24.33	15.23	8	19.47
	TR	19.09	15.03	210	2.37	11.50	11.00	4	10.42
	TRIB	91.98	51.00	421	11.93	122.27	84.50	8	96.64

\*The solids data measured in 2020 were comparable to the historical data with the exception of TSS being greater in the tributaries. There is no numeric standard for solids.

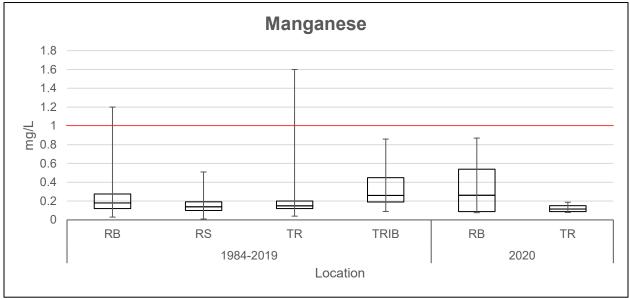


	<u>H</u>	istorical Re	eference 19	<u>2020</u>					
Location	Mean	Median	Count	CL(95.0%)	Mean	Median	Count	CL(95.0%)	
RB	6.54	5.50	176	0.60	7.83	5.05	4	9.76	
RS	6.48	5.60	302	0.38	8.48	5.35	8	5.19	
TR	6.57	5.55	142	0.61	8.48	5.20	4	11.18	
TRIB	5.97	5.00	194	0.56	9.15	5.10	8	7.10	

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



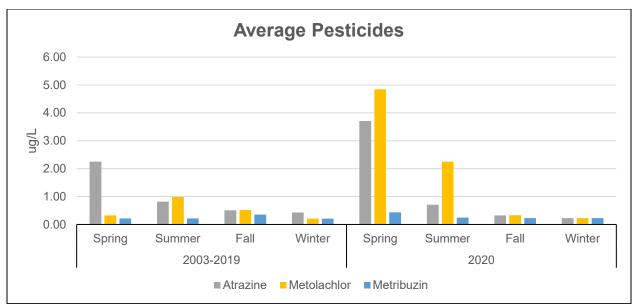
\*Red line indicates the water quality standard of 1 mg/L.



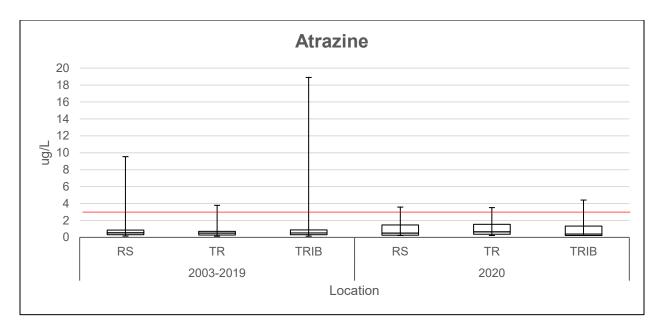
\*Red line indicates the water quality standard of 1 mg/L.

		Histo	orical Refer	2019							
		CL CL									
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)		
Iron	RB	1.21	0.79	174	0.17	2.02	1.67	4	2.10		
	TR	0.88	0.65	143	0.12	0.95	0.72	4	1.13		
Mang	RB	0.23	0.18	174	0.03	0.37	0.26	4	0.59		
Ū.	TR	0.19	0.15	141	0.03	0.12	0.12	4	0.08		

\*In 2020 iron exceeded the standard of 1 mg/L near the lake bottom in front of the dam twice and once in the tail race. Manganese did not exceed the criterion.

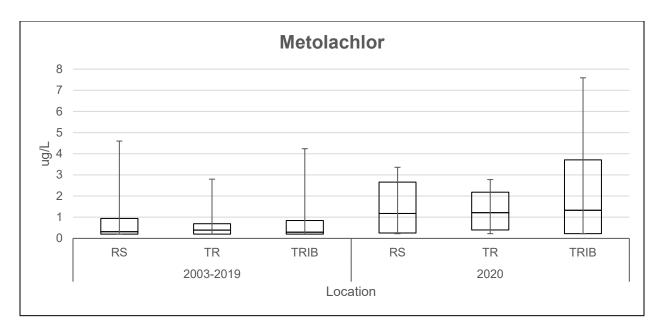


\*Of the eight pesticides tested, only the above three were reported above detection levels for the period 2003-2020.



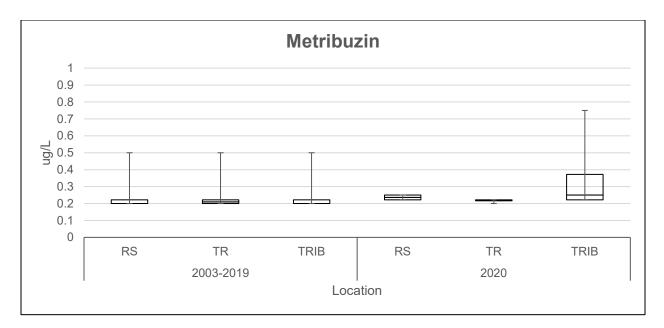
		Histor	rical Refer								
	CL										
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)		
Atrazine	RS	0.93	0.54	112	0.25	1.19	0.50	8	1.19		
	TR	0.66	0.50	56	0.17	1.26	0.66	4	2.43		
	TRIB	1.67	0.53	108	0.68	1.26	0.40	8	1.45		

\*Atrazine was measured above the DWS criterion of 3 ug/L at all sites on May 20 2020.



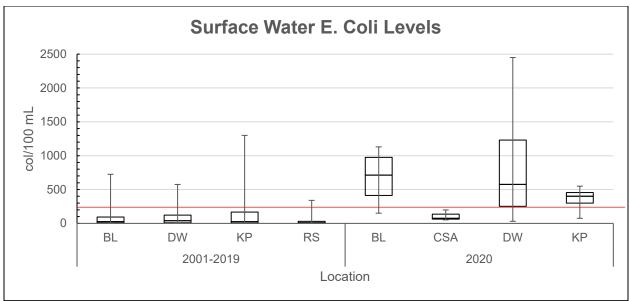
	<u>Histo</u>	rical Refe								
CL										
Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)		
RS	0.78	0.31	74	0.22	1.50	1.18	8	1.13		
TR	0.69	0.39	37	0.25	1.36	1.22	4	1.95		
TRIB	0.74	0.29	70	0.22	2.61	1.33	8	2.68		
	RS TR	LocationMeanRS0.78TR0.69	Location         Mean         Median           RS         0.78         0.31           TR         0.69         0.39	Location         Mean         Median         Count           RS         0.78         0.31         74           TR         0.69         0.39         37	Location         Mean         Median         Count         (95.0%)           RS         0.78         0.31         74         0.22           TR         0.69         0.39         37         0.25	Location         Mean         Median         Count         (95.0%)         Mean           RS         0.78         0.31         74         0.22         1.50           TR         0.69         0.39         37         0.25         1.36	Location         Mean         Median         Count         (95.0%)         Mean         Median           RS         0.78         0.31         74         0.22         1.50         1.18           TR         0.69         0.39         37         0.25         1.36         1.22	Location         Mean         Median         Count         (95.0%)         Mean         Median         Count           RS         0.78         0.31         74         0.22         1.50         1.18         8           TR         0.69         0.39         37         0.25         1.36         1.22         4		

\*Metolachlor did not exceed water quality criteria in 2020.



		<u>Histo</u>	rical Refe	<u>2020</u>							
	CL CL										
	Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)		
Metribuzin	RS	0.22	0.20	74	0.01	0.24	0.24	8	0.01		
	TR	0.22	0.21	37	0.02	0.22	0.22	4	0.02		
<b></b>	TRIB	0.22	0.20	70	0.01	0.36	0.25	8	0.20		

\*Metribuzin did not exceed water quality criteria in 2020.



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

	Histor	ical Refer	ence 200	<u>1-2019</u>		<u>20</u>					
			CL								
Marina Location	Mean	Median	Count	(95.0%)	Mean	Median	Count	(95.0%)			
Boulder	99.83	25	42	57.08	676.25	712.5	4	697.10			
Dam West	88.76	40	42	41.14	907.75	575.0	4	1717.16			
Keyesport Carlyle Sailing	139.90	25	42	77.61	356.25	400.0	4	320.52			
Association					108.67	75.00	3	196.42			
RS	36.87	8	30	26.32							

\*Marina bacteria levels exceeded the reference water quality criterion at all locations except CSA in 2020.

2019 Swimming Beach Bacteria Levels (E. Coli / 100mL)										
	Keye	esport	Harbor	Light	Dam	West	Mc	Nair	Coles	Creek
	East	West	East	West	North	South	North	South	North	South
5/6/2020	25	45	144	145	40	29	60	55	51	42
5/13/2020	36	50	130	133	43	47	70	55	85	68
5/20/2020	55	51	115	122	65	50	45	33	65	105
5/27/2020	105	102	120	110	45	42	65	60	95	90
6/3/2020	200	180	150	141	120	88	50	45	105	91
6/10/2020	88	79	158	145	45	41	150	110	58	52
6/17/2020	75	75	165	145	55	45	116	94	98	91
6/24/2020	100	90	150	135	75	55	40	40	120	114
7/1/2020	123	110	176	151	96	88	71	60	126	91
7/8/2020	128	89	110	105	160	141	180	150	146	142
7/15/2020	95	105	225	204	120	114	143	120	150	435
7/22/2020	115	108	185	154	105	92	133	112	165	140
7/29/2020	46	41	110	97	75	66	50	41	44	32
8/5/2020	74	58	171	161	84	80	97	78	89	91
8/12/2020	101	79	174	145	87	74	75	69	120	98
8/19/2020	71	88	152	132	75	55	56	40	144	132
8/26/2020	71	87	174	185	54	65	56	77	110	124
9/2/2020	74	58	171	161	84	80	97	78	89	91
9/9/2020	101	79	174	145	87	74	75	69	120	98
9/16/2020	71	88	152	132	75	55	56	40	144	132
9/23/2020	71	87	174	185	54	65	56	77	110	124
9/30/2020	110	91	145	155	60	64	51	68	91	112

\*Beach bacteria levels exceeded the reference water quality criterion once in July at Coles Creek South.

## 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 2020 did not deviate far from conditions observed during the reference period (1971-2019). Nevertheless, concerns regarding bacteria, TP, iron, pH, DO, temperature, and Atrazine were evident. In addition, CHL\_a and subsequent TSI levels were indicative of a hyper eutrophic system.

E. Coliform levels were observed above the swimming standard of 235 E. Coli per 100/mL (single sample) three out of the four sampling events for Boulder, Dam West, and Keyesport Marinas. Bacteria levels can be highly variable and high levels may not necessarily be representative of the entire system. There were precipitation events of approximately one inch or greater before each of these high samples were taken which may contribute to higher bacteria levels. Conversely, bacteria levels observed within the Carlyle Sailing Association waters were well under the standard. E. Coliform levels are monitored for the protection of human health as it relates to full body contact of recreational waters. Given that 2020 high bacteria levels in the Marinas are not swimming areas, there is a lower risk to humans. Long term bacteria monitoring and analyses will be important to assess changes over time. Swimming beaches at Carlyle Lake are also monitored for bacteria by the Lake Project staff. During 2020 the state standard was exceeded once at Coles Creek swimming beach at the south location with a result of 435 E. Coli per 100 mg/L.

Surface TP levels have surpassed the 0.05 mg/L criterion for several years. In 2020 the TP criterion was exceeded at all locations with a mean concentration across all sites of 0.36 mg/L. This is 38% greater than the historical mean of 0.23 mg/L, but similar to the 2019 mean of 0.37 mg/L. The mean NO3-N concentration in 2020 (1.17 mg/L) was comparable with the historic mean (1.29 mg/L) and did not exceed the criterion of 10 mg/L in 2020 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.

Living organisms require trace amounts of metals, excessive levels can be harmful. TFe exceeded the criterion of 1 mg/L three times at the bottom reservoir location in front of the dam and once in the tailrace in 2020. Comparably, there are multiple times TFe was high historically (1984-2019) at the same locations. The 2020 TFe mean concentrations were slightly greater (RB: 2.02 mg/L, TR: 0.95) than the historical means (RB: 1.21 mg/L, TR 0.88 mg/L). 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 spillway will be oxidized in a short period of time.

Potential of hydrogen (pH) is a measure of how acidic or basic water is. 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 invertebrate begins to rapidly decrease and beyond 10, fish become extirpated. In 2020, one of 34 measurements of pH exceeded the water quality standard (6.5-9). On July 29 2020, a pH of 9.02 was recorded at the Carlyle Sailing Association location. Since 1972, there have been multiple events pH was greater than nine. The 2020 mean pH of 8.15 is slightly greater than the historic value of 7.78.

In 2020 all 34 discrete observations of DO were within the state guidelines with one exception at Boulder Marina. On July 29 2020, DO was recorded at 2.51 mg/L in the Boulder Marina waters. Since 1972, there have been 22 measurements observed in the summer in which DO was below 5 mg/L. DO was measured at the tail race in 15-minute intervals from April 27 through November 24 2020. On September 30 DO was recorded between 4-5 mg/L for a brief time. All other measurements of DO were greater than the standard. It is not abnormal during warm air and water temperatures to experience low DO. DO has an inverse relationship with temperature. As temperature increases, the ability of water to contain DO decreases, therefore the DO concentration decreases. Water temperature measurements made during 2020 indicate it was a very warm year. This finding assumes that the historical reference 1971-2019 is the normal seasonal temperature. In a comparison of 2020 mean temperatures to historical mean temperatures, the water quality standard of <2.8°C was exceeded during the spring, summer, and winter. Discrete 2020 temperature readings exceeded the reference historical means multiple times during the spring, summer, and winter by as much as 3.16, 5.10, and 8.05°C respectively.

Pesticides are commonly used throughout much of the agricultural landscape that the Kaskaskia River flows. Of the eight pesticides tested, only Atrazine, Metolachlor, and Metribuzin were detected between 2003 and 2020. Of those three, only Atrazine was found to exceed the criteria. In 2020 the Atrazine drinking water standard (3 ug/L) was exceeded on May 20 at all locations with concentrations ranging from 3.35 - 4.41 ug/L. Atrazine levels were recorded over the standard multiple times in the lake and tributaries historically. The 2020 Atrazine mean (1.22 ug/L) is comparable to the historic Atrazine average (1.16 ug/L). Atrazine is a commonly used agricultural chemical which can be readily transported by rainfall runoff. Atrazine is suspected of causing cancer; and therefore, is 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.

Although there is not a state criterion for CHL\_a the proposed standard of 25 mg/cm<sup>3</sup> was exceeded at both lake sites and one tributary site in 2020. The 2020 combined (lake and tributary) CHL\_a mean concentration of 24.59 mg/cm<sup>3</sup> was less than the historical mean of 28.9 mg/cm<sup>3</sup>. CHL\_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm<sup>3</sup> is considered to be eutrophic (nutrient enrichment increases algal and plant growth and negative effects). The 2020 TSI level, an average of the individual trophic state indexes for secchi depth, CHL\_a, and TP, for Carlyle Lake is 75.64. Carlyle 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 over time.

Total suspended solids can affect water quality by increasing temperature through the absorption of sunlight by suspended particles in the water column, and consequently reduce DO. TSS are also strongly correlated with water clarity and the presence of Macrophytes. Though there are no numeric water quality standards for total solids, Carlyle Lake is listed as impaired by TSS. The 2020 TSS mean concentrations in the lake (30.5 mg/L) and tail race (16.2 mg/L) were lower than the historical means (lake: 34.4 mg/L, tail race: 25.6 mg/L). However, the 2020 TSS tributary mean concentration was greater (133.5 mg/L) than the historical tributary mean (104.8 mg/L).

All remaining parameters evaluated during the 2020 water quality monitoring effort were within designated criteria or within historical reference norms.

# MONITORING PROGRAM RECOMMENDATIONS

The IEPA currently has listed Carlyle Lake as impaired for total suspended solids, total phosphorous, and mercury while the Kaskaskia River upstream from the Lake is impaired for dissolved oxygen, Atrazine, and mercury. The lists of sources for these impairments are contaminated sediments, crop production, and unknown sources. At present the only tributary being sampled by CEMVS is the Kaskaskia River. IEPA also has the following listed as impaired: Hurricane Creek, North Fork Kaskaskia, and East Fork Kaskaskia. It is recommended to add these three tributaries as well as mercury in the lake to the routine sampling plan to increase the dataset and improve our ability to assess the water quality condition of Carlyle Lake.

In accordance with EM-1110-2-1201, sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. Sediment sampling and analyses occurred at Carlyle 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 hyper-eutrophic status of Carlyle Lake it is recommended that Nitrite (NO<sub>2</sub>) and Total Khejdahl Nitrogen (TKN) be added to the monitoring program if possible. Doing so would allow CEMVS to evaluate Total Nitrogen (TN), which is a strong indicator of trophic status.

Given the above-mentioned high bacteria levels observed at the Marinas in 2020, it is recommended to add routine bacteria sampling to the tributary (CAR-12, CAR-13, and any additional tributaries). This would be useful in capturing a larger picture of bacteria coming into the lake. It may also be useful to execute a review of all NPDES permits and other potential contributors to high bacteria levels in the marinas.

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APPENDIX A: FIELD DATA

					Sp						
		Depth	Temp	ORP	Cond		ODO	ODO	TDS	Turbidity	Secchi
Date	Location	(m)	(°C)	(mV)	(µS/cm)	рН	(% Sat)	(mg/L)	(mg/L)	(FNU)	(in)
3/10/2020	CAR-1	0.82	7.78	215.8	337.3	7.95	109.7	13.05	219	32.05	_
3/10/2020	CAR-12	0.92	7.89	214.1	500.7	7.99	94.4	11.19	325	45.76	6
3/10/2020	CAR-12	2.01	7.94	211.1	499.3	7.97	94.3	11.17	325	44.35	
3/10/2020	CAR-12	3.21	7.94	208.3	498.1	7.95	94	11.13	324	43.99	
3/10/2020	CAR-12	4.25	7.94	207.2	498	7.94	93.9	11.12	324	45.74	
3/10/2020	CAR-13	0.99	8.50	130.6	464	8	92.3	10.79	302	96.22	
3/10/2020	CAR-2	1.11	7.67	161.7	341.7	7.97	96.6	11.52	222	31.34	9
3/10/2020	CAR-2	1.00	7.67	164.5	342	7.97	96.5	11.51	222	32.47	
3/10/2020	CAR-2	2.08	7.72	168	345.5	7.96	96.4	11.48	225	30.96	
3/10/2020	CAR-2	3.20	7.72	168.3	346.1	7.97	96.3	11.46	225	31.65	
3/10/2020	CAR-2	4.16	7.72	168.6	345.3	7.97	96.2	11.46	224	31.94	
3/10/2020	CAR-2	4.93	7.72	156.6	344.5	7.97	96	11.45	224	31.55	
3/10/2020	CAR-4	0.85	9.56	151	403	8.14	96.6	11	262	57.8	5
3/10/2020	CAR-4	2.25	9.56	149.3	403.2	8.21	96.4	10.98	262	57.6	
3/10/2020	CAR-4	3.31	9.56	149.6	403.3	8.23	96.5	10.98	262	57.63	
3/10/2020	CAR-4	4.27	9.61	151.3	403.7	8.22	96.5	10.98	262	55.78	
3/10/2020	CAR-4	3.92	9.67	152.6	403.4	8.22	96.4	10.96	262	58.55	
3/10/2020	CAR-4	4.30	9.50	155.6	402.6	8.19	98.2	11.19	262	66.36	
3/10/2020	CAR-4	4.91	9.56	152.1	404.2	8.2	95.9	10.93	263	61.75	
3/10/2020	CAR-4	6.57	9.56	152.9	403.8	8.22	95.6	10.9	262	64.1	
3/10/2020	CAR-BL-MAR	1.58	10.39	154.9	251.8	7.91	68.2	7.62	164	87.72	
3/10/2020	CAR-DW-MAR	1.00	8.67	163.8	321.7	7.96	87.8	10.22	209	33.96	
3/10/2020	CAR-DW-MAR	2.05	8.67	162.2	321.7	7.94	86.7	10.09	209	39.65	
3/10/2020	CAR-KP-MAR	0.95	9.61	129.4	455.4	8.09	93.2	10.6	296	64.37	
5/20/2020	CAR-1	0.81	17.20	373.1	352.3	8.04	105.1	10.1	229	16.33	
5/20/2020	CAR-12	0.83	17.20	233.6	253.8	7.61	67.7	6.51	165	167.12	
5/20/2020	CAR-13	0.65	16.70	216.8	281.6	7.77	76	7.38	183	135.83	
5/20/2020	CAR-2	1.14	17.30	334.8	350.4	8.13	81.9	7.87	228	14.46	7
5/20/2020	CAR-2	2.02	17.20	333.9	350.3	8.16	81.2	7.81	228	14.81	
5/20/2020	CAR-2	3.21	17.20	333.4	350.3	8.12	80.1	7.71	228	15.15	

		Dauth	<b>T</b>	000	Sp		000	000	TDO	Taunh i dite a	Ossahi
Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Cond (µS/cm)	pН	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
5/20/2020	CAR-2	4.20	17.10	332.7	350.4	8.1	、	7.66	228	15.45	( )
5/20/2020	CAR-2	5.24	17.10	331.9	350.5	8.1	79.2	7.63	228	15.83	
5/20/2020	CAR-2	6.11	17.10	330.1	350.7	8.1	78.7	7.58	228	16.73	
5/20/2020	CAR-4	1.08	18.20	270.9	427.5	8.72	97.6	9.2	278	32.37	8
5/20/2020	CAR-4	2.06	18.10	270.6	449.9	8.58	94.4	8.9	292	29.45	
5/20/2020	CAR-4	3.21	18.20	266	422.2	8.73	96.8	9.12	274	34.43	
5/20/2020	CAR-4	4.22	18.10	265.9	434.2	8.69	95.8	9.03	282	32.34	
5/20/2020	CAR-4	5.22	18.10	266.3	447.8	8.6	93.4	8.81	291	31.55	
5/20/2020	CAR-4	5.25	18.10	266.7	453.3	8.53	91.9	8.67	295	32.51	
5/20/2020	CAR-4	6.12	18.10	265.3	441.6	8.57	92.1	8.69	287	34.49	
5/20/2020	CAR-BL-MAR	2.77	17.70	127.1	376.1	8.3	67.6	6.44	244	109.37	
5/20/2020	CAR-BL-MAR	0.99	17.90	88.4	352	8.24	72.1	6.84	229	17.27	
5/20/2020	CAR-DW-MAR	0.10	17.20	291.8	349.9	8.17	79.2	7.61	227	13.75	
5/20/2020	CAR-DW-MAR	2.30	16.90	291.5	352.6	8.09	67	6.48	229	15.09	
5/20/2020	CAR-DW-MAR	3.23	16.70	258.9	356	7.97	59	5.73	231	160.06	
5/20/2020	CAR-KP-MAR	2.40	18.10	220.2	415.2	8.66	90.8	8.57	270	303.69	
5/20/2020	CAR-KP-MAR	1.03	18.10	216.5	414.9	8.74	96.5	9.1	270	28.82	
7/29/2020	CAR-1	0.76	28.90	97.9	339.3	8.48	97.8	7.52	221	11.68	
7/29/2020	CAR-12	1.24	26.90	119.7	450.5	7.8	89.8	7.16	293	34.71	
7/29/2020	CAR-13	0.00	28.10	112.8	438.6	7.84	96.1	7.5	285	51.75	
7/29/2020	CAR-2	1.13	28.80	108.2	334.8	8.58	82.5	6.36	218	7.76	22
7/29/2020	CAR-2	2.12	28.50	114.9	339	8.3	52.8	4.09	220	8.62	
7/29/2020	CAR-2	3.22	28.40	127	341.5	7.95	38.8	3.02	222	10.22	
7/29/2020	CAR-2	4.00	28.30	131.4	343.5	7.79	27.1	2.11	223	11.41	
7/29/2020	CAR-2	5.19	28.10	134.5	345.6	7.7	19.6	1.53	225	13.72	
7/29/2020	CAR-4	1.22	28.70	97.5	216.1	8.84	117	9.05	140	35.39	18
7/29/2020	CAR-4	2.31	28.50	103	216.8	8.78	109.8	8.52	141	38.45	
7/29/2020	CAR-4	3.08	28.50	106.8	217.5	8.73	105.5	8.19	141	43.38	
7/29/2020	CAR-4	4.21	28.30	118.3	220.6	8.47	83.7	6.51	143	42.73	
7/29/2020	CAR-4	5.14	28.10	125.9	224.2	8.09	57.1	4.46	146	52.28	

					Sp						
Data		Depth	Temp	ORP	Cond		ODO	ODO	TDS	Turbidity	Secchi
Date	Location	(m)	(°C)	(mV)	(µS/cm)	рН	(% Sat)	(mg/L)	(mg/L)	(FNU)	(in)
7/29/2020	CAR-BL-MAR	1.21	28.50	131.2	287.8	7.83	32.4	2.51	187	26.87	
7/29/2020	CAR-CSA	0.88	30.20	105.9	321.1	9.02	163.8	12.33	209	11.41	
7/29/2020	CAR-DW-MAR	1.12	29.60	110.7	339.3	8.59	102	7.75	221	12.12	
7/29/2020	CAR-KP-MAR	0.71	29.30	104.4	216.7	8.84	114.7	8.78	141	23.73	
10/22/2020	CAR-1	1.28	14.40		312.4	7.77	69.8	7.13	203	17.16	
10/22/2020	CAR-12	1.16	14.10		500.9	7.79	78.1	8.03	326	27.34	12
10/22/2020	CAR-12	3.62	14.00		501	7.78	78.2	8.04	326	23.88	
10/22/2020	CAR-12	6.75	14.00		499.7	7.77	76.9	7.92	325	30.41	
10/22/2020	CAR-13	0.96	14.40		431.7	7.4	70.1	7.15	281	180.71	
10/22/2020	CAR-2	1.07	14.20		308.3	8.24	94.6	9.7	200	15.53	15
10/22/2020	CAR-2	2.16	14.20		308.3	8.2	93.9	9.62	200	17.36	
10/22/2020	CAR-2	3.05	14.20		308.3	8.2	93.9	9.63	200	17.08	
10/22/2020	CAR-2	4.20	14.20		308.4	8.18	93.2	9.55	200	17.81	
10/22/2020	CAR-2	5.32	14.20		308.5	8.14	92.8	9.51	201	25.53	
10/22/2020	CAR-2	6.11	14.20		308.7	8.11	92.5	9.49	201	20.6	
10/22/2020	CAR-2	7.20	14.20		308.7	8.09	92.5	9.48	201	21.71	
10/22/2020	CAR-2	7.96	14.20		308.7	8.08	92.3	9.46	201	21.65	
10/22/2020	CAR-4	1.12	14.00		336.9	7.97	108.2	11.15	219	26.77	14
10/22/2020	CAR-4	2.08	13.70		343.6	7.92	97.9	10.15	223	28.86	
10/22/2020	CAR-4	3.03	13.10		351	7.8	91.2	9.58	228	35.27	
10/22/2020	CAR-4	3.66	13.00		351.3	7.73	89.3	9.39	228	52.61	
10/22/2020	CAR-BL-MAR	0.00	16.40		303.7	8.1	101.1	9.87	197	29.64	
10/22/2020	CAR-CSA	1.45	14.90		307.5	8.45	105.1	10.6	200	23.06	
10/22/2020	CAR-DW-MAR	1.09	14.20		304.8	8.12	86.4	8.87	198	20.02	
10/22/2020	CAR-DW-MAR	2.04	14.10		303.6	8.03	83.6	8.59	197	22.96	
10/22/2020	CAR-KP-MAR	0.82	14.10		333.5	8.15	101	10.37	217	29.15	

APPENDIX B: LABORATORY DATA



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

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#### **Customer Name: SLCOE**

### Project Name: Carlyle Lake/Kaskaskia River

#### Samples Received at ARDL: 3/10/20

Date: 4/2/20

Lab Name: ARDL, Inc.

ARDL Report No.: 8587

CAS	ΕN	AR	RA'	ΓΙν	E
					_

<u>Customer</u>	Date	<u>Lab ID</u>	
Sample No.	<u>Collected</u>	<u>Number</u>	Analyses Requested
CAR-1	3/10/20	8587-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	3/10/20	8587-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	3/10/20	8587-03	Metals(1), Inorganics(2)
CAR-4	3/10/20	8587-04	NP Pesticides, Inorganics(2)(3)
CAR-13	3/10/20	8587-05	NP Pesticides, Inorganics(2)
CAR-12	3/10/20	8587-06	NP Pesticides, Inorganics(2)(3)
CAR-15	3/10/20	8587-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	3/10/20	8587-08	E. Coli
CAR-DW-Marina	3/10/20	8587-09	E. Coli
CAR-BL-Marina	3/10/20	8587-10	E. Coli
KAS-1	3/10/20	8587-11	Inorganics(2)(3)(4), E. Coli
KAS-2	3/10/20	8587-12	Inorganics(2)(3)(4), E. Coli

(1) Including iron and manganese.

(2) Including ammonia, nitrate, orthophosphate, 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:

#### PESTICIDE FRACTION

#### 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. The closing CCV passed criteria for all analytes.

#### PREPARATION BLANK

The blank met acceptance criteria.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Carlyle Lake/Kaskaskia River

# **CASE NARRATIVE (Continued)**

# 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 STANDARD**

All internal standard criteria were met.

# **SURROGATE**

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 within acceptable limits, except for iron which is greater than the LOQ, however less than 10% of the lowest concentration sample therefore acceptable. The data is flagged appropriately with a 'B' qualifier in the associated samples.

## 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 the control limits, except 2 of 2 for iron. 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.
- 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.
- B This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Page 2 of 3

ARDL Report No.: 8587

Project Name: Carlyle Lake/Kaskaskia River

# ARDL Report No.: 8587

# **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

Page 3 of 3



# 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 8587

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

Lab Report No: 008587

Report Date: 03/31/2020

-	CARLYLE LAKE/KA		Analysis: N		DES (827	0SIM-MO	D)
Project No.: NELAC Certi	fied - IL100308	-	l Method: 8 o Method: 3				
	111000000						
Field ID:	CAR-1		ARDL	Lab No.:	00858	7-01	
Desc/Location:	CARLYLE LAKE		Lab F	`ilename:	E0330	005	
Sample Date:	03/10/2020		Recei	ved Date:	03/10	/2020	
Sample Time:	1130		Prep.	Date:	03/12	/2020	
Matrix:	WATER		Analy	vsis Date:	03/30	/2020	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	atch:	B1118	5	
% Moisture:	NA		Level	.:	LOW		
					Data		Dilutior
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.22	2 0.222	ND		UG/L	1
Atrazine		0.22	2 0.222	ND		UG/L	1
Metribuzin		0.22	2 0.222	ND		UG/L	1
Alachlor		0.22	2 0.222	ND		UG/L	1
Metolachlor		0.22	2 0.222	ND		UG/L	1
Chlorpyrifos		0.22	2 0.222	ND		UG/L	1
Cyanazine		0.22	2 0.222	ND		UG/L	1
Pendimethalin		0.22	2 0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results	
Triphenylphosphate	30-130	69%	

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

(a) DOD-QSM Accredited Analyte.

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

> 008587 Lab Report No:

CARLYLE LAKE/KASKASKIA RIVER

Project Name:

03/30/2020 Report Date: Analysis: Inorganics

Project No:				,				Z	ELAC Certi	NELAC Certified - IL100308	00308
ARDL No: 0 Field ID: C	008587-01 CAR-1		Sampling Samplin	1 0		CARLYLE LAKE 03/10/2020			Matrix: Moisture:	: WATER : NA	
Received: 0	03/10/2020	0	Samp	Sampling Time:	.me: 1130						
							Prep	Analysis	Prep	Analysis	Run
Analyte		LOD	ТОQ	Flag	Result	Units	Method	Method	Date	Date	Number
(a) Iron		0.0400	0.0500	JB	1.97	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
(a) Manganese		0.00400	0.00500		0.0926	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
Ammonia Nitrogen	1	0.0200	0.0300		0.346	MG/L	NONE	350.1	NA	03/30/20 (	03305161
Nitrate as Nitrogen	ngen	0.0190	0.0200		1.48	MG/L	NONE	GREEN	NA	03/11/20 (	03195144
Phosphorus		0.00800	0.0100		0.351	MG/L	365.2	365.2	03/18/20	03/20/20 (	03235153
Phosphorus, -ortho	tho	0.00800	0.0100		0.125	MG/L	NONE	365.2	NA	03/12/20 (	03165130
Solids, Total Suspended	Ispended	4.0	4.00		22.8	MG/L	NONE	160.2	NA	03/16/20 (	03195137
Solids, Volatile Suspen	Suspen	4.0	4.00		DN	MG/L	NONE	160.4	NA	03/16/20 (	03195138
Total Organic Carbon	Irbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/18/20 (	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-01, Inorganic Analyses

Lab Report No:				: 03/31/			
	CARLYLE LAKE/KAS			PESTICIE	DES (827	70SIM-MO	D)
Project No.:		Analytical Me					
NELAC Certii	Eied - IL100308	Prep Me	ethod: 39	510C			
Field ID:	CAR-2-0		ARDL 1	Lab No.:	00858	37-02	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0330	8000	
Sample Date:	03/10/2020		Receiv	ved Date:	03/10	)/2020	
Sample Time:	1210		Prep.	Date:	03/12	2/2020	
Matrix:	WATER		Analys	sis Date:	03/30	0/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1118	35	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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
URROGATE RECOVI	ERIES.	Lim	ite		Ro	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

Sample 008587-02, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

76%

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

Lab Report No: 008587

03/30/2020 Report Date:

Project Name: C Project No:	CARLYLE	LAKE/KASKP	CARLYLE LAKE/KASKASKIA RIVER	~				Z	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: ( Field ID: C Received: (	008587-02 CAR-2-0 03/10/2020	2 2 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0	Sampling Samplin Samplin	0 0		CARLYLE LAKE 03/10/2020 1210			Matrix: Moisture:	:: WATER :: NA	
Analyte	۵	LOD	ΓΟΌ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	c	0.0200	0.0300		0.437	MG/L	NONE	350.1	NA	03/30/20 03305161	3305161
Chlorophyll-a, Correcte	Correcte	1.0	1.00		4.5	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Nitrate as Nitrogen	ogen	0.0380	0.0400		1.74	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a		1.0	1.00		3.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus		0.00800	0.0100		0.312	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	tho	0.00800	0.0100		0.138	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	uspended	2.50	2.50		22.0	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	e Suspen	2.50	2.50		2.75	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	arbon	0.500	1.00		4.3	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-02, Inorganic Analyses

Lab Report No: 008587

Report Date: 03/30/2020

Project Name: CARLYLE Project No:	CARLYLE LAKE/KASKASKIA RIVER	ASKIA RIVER					Ν	Analysis: ELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008587-03 Field ID: CAR-2-10 Received: 03/10/2020	-03 -0 -020	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 03/10/2020 1210			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟŎ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500	щ	1.92	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
(a) Manganese	0.00400	0.00500		0.0929	MG/L	3010A	6010C	03/16/20	03/23/20	P7347
Ammonia Nitrogen	0.0200	0.0300		0.332	MG/L	NONE	350.1	NA	03/30/20	03305161
Nitrate as Nitrogen	0.0190	0.0200		1.43	MG/L	NONE	GREEN	NA	03/11/20	03195144
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.133	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	d 4.0	4.00		28.0	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	n 4.0	4.00		ND	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.2	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-03, Inorganic Analyses

Lab Report No:	008587	Repo	ort Date	: 03/31/	2020		
Project Name: Project No.: NELAC Certi:	CARLYLE LAKE/KASK A fied - IL100308	nalytical Me	-		DES (82'	70SIM-MC	) )
Field ID:	CAR-4		ARDL 1	Lab No.:	0085	87-04	
Desc/Location:	CARLYLE LAKE		Lab F	ilename:	E033	0009	
Sample Date:	03/10/2020		Recei	ved Date:	03/1	0/2020	
Sample Time:	1315		Prep.	Date:	03/1:	2/2020	
Matrix:	WATER		Analy	sis Date:	03/3	0/2020	
Amount Used:	800 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B111	85	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Re	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

Page 1 of 1

80%

Lab Report No: 008587

CARLYLE LAKE/KASKASKIA RIVER

Project Name: Project No:

Report Date: 03/30/2020

NELAC Certified - IL100308

Analysis: Inorganics

I

Matrix: WATER Moisture: NA	Prep Analysis Run Date Date Number	NA 03/30/20 03305161	03/11/20 03/23/20 03245156	NA 03/11/20 03195144	03/11/20 03/23/20 03245156	03/18/20 03/20/20 03235153	NA 03/12/20 03165130	NA 03/16/20 03195137	NA 03/16/20 03195138	NN 02/10/00 NN
	Analysis Method	350.1	10200H	GREEN	10200H	365.2	365.2	160.2	160.4	1 1 1
	Prep Method	NONE	10200H	NONE	10200H	365.2	NONE	NONE	NONE	TINCIN .
CARLYLE LAKE 03/10/2020 1315	Units	MG/L	MG/CU.M.	MG/L	MG/CU.M.	MG/L	MG/L	MG/L	MG/L	
	Result	0.254	11.3	1.65	4.5	0.342	0.187	76.0	8.0	0 4
Sampling Loc'n: Sampling Date: Sampling Time:	Flag									
Samp. Samj Samj	ΓΟŎ	0.0300	1.00	0.0200	1.00	0.0100	0.0100	6.67	6.67	-
o	LOD	0.0200	1.0	0.0190	1.0	0.00800	0.00800	6.67	6.67	
ARDL No: 008587-04 Field ID: CAR-4 Received: 03/10/2020	Analyte	Ammonia Nitrogen	Chlorophyll-a, Correcte	Nitrate as Nitrogen	Pheophytin-a	Phosphorus	, -ortho	Solids, Total Suspended	Solids, Volatile Suspen	Total Organia

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-04, Inorganic Analyses

Lab Report No: 008587

Report Date: 03/31/2020

Project No.:		Analytical Me	ethod: 82	270C	DES (827	70SIM-MO	D)
NELAC Certi:	fied - IL100308	Prep Me	ethod: 35	510C			
Field ID:	CAR-13		ARDL 1	Lab No.:	00858	37-05	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E033(	010	
Sample Date:	03/10/2020		Receiv	ved Date:	03/10	0/2020	
Sample Time:	1520		Prep.	Date:	03/12	2/2020	
Matrix:	WATER		Analys	sis Date:	03/30	0/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1118	85	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	ERIES:	Lim	its		Rea	sults	

		resures	
Triphenylphosphate	30-130	76%	
		1	

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

(a) DOD-QSM Accredited Analyte.

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008587 Lab Report No: CARLYLE LAKE/KASKASKIA RIVER

Project Name: Project No:

03/30/2020 Report Date: Analysis: Inorganics NELAC Certified - IL100308

ARDL No: 0 Field ID: C Received: 0	008587-05 CAR-13 03/10/2020		Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 03/10/2020 1520			Matrix: Moisture:	: WATER : NA	
kt		LOD	TOQ	Flag	ns	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen		0.0200	0.0300		0.191	MG/L	NONE	350.1	NA	03/30/20 03305161	03305161
Nitrate as Nitrogen	den	0.0380	0.0400		2.62	MG/L	NONE	GREEN	NA	03/11/20 03195144	03195144
Phosphorus	1	0.00800	0.0100		0.429	MG/L	365.2	365.2	03/18/20	03/20/20 03235153	03235153
Phosphorus, -ortho	ho	0.00800	0.0100		0.20	MG/L	NONE	365.2	NA	03/12/20 03165130	03165130
Solids, Total Suspended	Ispended	6.67	6.67		221	MG/L	NONE	160.2	NA	03/16/20 03195137	03195137
Solids, Volatile Suspen	Suspen	6.67	6.67		14.7	MG/L	NONE	160.4	NA	03/16/20 03195138	03195138
Total Organic Carbon	rbon	0.500	1.00		4.7	MG/L	NONE	415.1	NA	03/18/20 03235151	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-05, Inorganic Analyses

Lab Report No: 008587

Report Date: 03/31/2020

Project Name: Project No.:	CARLYLE LAKE/KASI	KASK Anal Analytical Me	-	P PESTICII	DES (827	0SIM-MO	D)
	fied - IL100308		ethod: 3				
	LIGG IDI00000	1100 11		5100			
Field ID:	CAR-12		ARDL 1	Lab No.:	00858	37-06	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0330	0011	
Sample Date:	03/10/2020		Receiv	ved Date:	03/10	)/2020	
Sample Time:	1430		Prep.	Date:	03/12	2/2020	
Matrix:	WATER		Analy	sis Date:	03/30	)/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1118	35	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV		Lim				sults	

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	86%

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

(a) DOD-QSM Accredited Analyte.

Lab Report No: 008587

CARLYLE LAKE/KASKASKIA RIVER

Project Name: Project No:

Report Date: 03/30/2020

Analysis: Inorganics NELAC Certified - IL100308

ARDL No: 008587-06 Field ID: CAR-12 Received: 03/10/2020	6 20	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 03/10/2020 1430			Matrix: Moisture:	:: WATER :: NA	
Analyte	LOD	год	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.213	MG/L	NONE	350.1	NA	03/30/20 03305161	03305161
Chlorophyll-a, Correcte	1.0	1.00		6.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20 03245156	03245156
Nitrate as Nitrogen	0.0950	0.100		3.71	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		ND	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.451	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.122	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		104	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		6.8	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		3.5	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-06, Inorganic Analyses

Lab Report No: 008587

Report Date: 03/31/2020

Project Name: Project No.:	CARLYLE LAKE/KA	SKASK Ar Analytical	nalysis: NH Method: 82		DES (827	70SIM-MO	D)
NELAC Certi:	fied - IL100308	Prep	Method: 35	510C			
Field ID:	CAR-15		ARDL 1	Lab No.:	00858	37-07	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0330	0012	
Sample Date:	03/10/2020		Receiv	ved Date:	03/10	0/2020	
Sample Time:	1045		Prep.	Date:	03/12	2/2020	
Matrix:	WATER		Analy	sis Date:	03/30	0/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B111	85	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin	999-11-11-11-11-11-11-11-11-11-11-11-11-	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 RECOV	ERIES:	L	imits		Re	sults	

SURROGATE RECOVERIES:	Limits	Results	
Triphenylphosphate	30-130	81%	

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

(a) DOD-QSM Accredited Analyte.

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

> 008587 Lab Report No:

CARLYLE LAKE/KASKASKIA RIVER

Project Name:

03/30/2020 Report Date: Analysis: Inorganics

Project No:							4	NELAC Certified - IL100308	fied - IL1003	00308
ARDL No: 008587-07 Field ID: CAR-15 Received: 03/10/2020	20	Sampling Samplin Samplin	ampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 03/10/2020 1045			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.192	MG/L	NONE	350.1	NA	03/30/20 03305161	03305161
Chlorophyll-a, Correcte	1.0	1.00		6.8	MG/CU.M.	10200H	10200H	03/11/20	03/23/20 03245156	03245156
Nitrate as Nitrogen	0.0950	0.100		3.72	MG/L	NONE	GREEN	NA	03/11/20	03195144
Pheophytin-a	1.0	1.00		1.9	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.455	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	4.0	4.00		104	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	4.0	4.00		6.4	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		3.6	MG/L	NONE	415.1	NA	03/18/20 03235151	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-07, Inorganic Analyses

	03/30/2020
	Report Date: 03/30/2020
ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864	
	008587
	Lab Report No: 008587

Project Name: Project No:	<pre>Project Name: CARLYLE LAKE/KASKASKIA RIVER Project No:</pre>	(ASKIA RIVER				NE	Analysis LAC Certi	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: Field ID: Received:	ARDL No: 008587-08 Field ID: CAR-KP-MARINA Received: 03/10/2020	Sampling   Sampling Sampling		Loc'n: CARLYLE LAKE r Date: 03/10/2020 r Time: 1330			Matrix: Moisture:	Matrix: WATER isture: NA	
Analyte	te LOD	LOQ F	Flag Res	Result Units	Prep Method	Prep Analysis Method Method	Prep Date	Analysis Date	Run Number

03/10/20 03165129

NA

1604

NONE

COL/100 ML

425

1.00

1.0

E. Coliform

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-08, Inorganic Analyses

26	Report Date: 03/30/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 03/10/20 03165129
Box 1566 62864				Prep Method	NONE
ARDL, INC. Aviation Drive; P.O. Mt. Vernon, Illinois			CARLYLE LAKE 03/10/2020 1220	Units	COL/100 ML
AR ation D Vernon,				Result	825
400 Avi Mt.		а	Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
		KASKIA RIVE	Samp Sam Sam	LOQ	1.00
	008587	CARLYLE LAKE/KASKASKIA RIVER	008587-09 CAR-DW-MARINA 03/10/2020	LOD	1.0
	t No:	1		yte	
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-09, Inorganic Analyses

	020	ics 00308		Run Number
	03/30/2	Inorgan ied - IL1	WATER NA	Analysis Date
	Report Date: 03/30/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: Moisture:	Prep 1 Date
10	ц	Z		Prep Analysis Method Method
Box 156( 62864				Prep Method
ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864			CARLYLE LAKE 03/10/2020 1550	Units
AR tion D ernon,			: CARL' : 03/1( : 1550	Result
400 Aviat Mt. V€		к <u>i</u>	Sampling Loc'n: Sampling Date: Sampling Time:	Flag R
		ASKIA RIVE	Samp Sam Sam	Тор
	o: 008587	ARLYLE LAKE/KASK	008587-10 CAR-BL-MARINA 03/10/2020	LOD
	Lab Report No: 008587	Project Name: CARLYLE LAKE/KASKASKIA RIVER Project No:	ARDL No: 008587-10 Field ID: CAR-BL-MAR Received: 03/10/2020	Analyte

	ın Jer	5129
	Run Number	03165
-	Analysis Date	03/10/20 03165129
	Prep Date	NA
	Prep Analysis Method Method	1604
	Prep Method	NONE
	Units	COL/100 ML NONE
	Result	925
	Flag	
	TOQ	1.00
	LOD	1.0
	Analyte	E. Coliform

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-10, Inorganic Analyses

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

Lab Report No: 008587

03/30/2020 Report Date:

	Received:	03/10/2020		Samp	Ing T	ime: 820(	0					
Field ID: KAS-1 Sampling Date: 03/10/2020 Moisture: NA	ARDL No: Field ID:	008587-11 KAS-1		Samp. Samp	ling Loc Jing Da	c'n: KASH ate: 03/1	KASKIA RIVER 10/2020			Matrix Moisture	K: WATER e: NA	
ARDL No: 008587-11 Sampling Loc'n: KASKASKIA RIVER Matrix: WATER	Project No:				4				NE	LAC Certi	ified - IL1	00308
NEL ing Loc'n: KASKASKIA RIVER	Project Name: CARLYLE LAKE/KASKASKIA RIVER	CARLYLE LAKE	E/KASKA	SKIA RIVE	~					Analysis	Analysis: Inorganics	ics
Sampling Date: 03/10/2020 Moisture:	Field ID:	KAS-1		Sam	oling Di	ate: 03/3	10/2020			Moisture		
	Received:	03/10/2020		Samp	Iing T	ime: 820(	0					
/2020 Sampling Time: 8200												
/2020 Sampling Time: 8200								Prep	Analysis	Prep	Analysis	
/2020 Sampling Time: 8200 Prep Analysis	Analy		LOD	ГОQ	Flag	Result	Units	Method	Method	Date	Date	Number
/2020 Sampling Time: 8200 Prep Analysis Prep Analysis Prep Analysis LOD LOQ Flag Result Units Method Method Date Date N						[        	F/ UN	LINOIN	- C L C	EIX	., 130000 00/00/00	

Analyte	LOD	ΓΟÕ	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	03/30/20 03305161	03305161
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	03/11/20	03/23/20 03245156	03245156
E. Coliform	1.0	1.00		150	COL/100 ML	NONE	1604	NA	03/10/20 03165129	03165129
Kjeldahl Nitrogen	0.190	0.200		1.37	MG/L	351.2	351.2	03/16/20	03/17/20 03195139	03195139
Nitrate as Nitrogen	0.0190	0.0200		1.29	MG/L	NONE	GREEN	NA	03/11/20 03195144	03195144
Nitrite as Nitrogen	0.0200	0.0200		0.022	MG/L	NONE	354.1	NA	03/11/20 03165131	03165131
Pheophytin-a	1.0	1.00		1.8	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156
Phosphorus	0.00800	0.0100		0.394	MG/L	365.2	365.2	03/18/20	03/20/20	03235153
Phosphorus, -ortho	0.00800	0.0100		0.12	MG/L	NONE	365.2	NA	03/12/20	03165130
Solids, Total Suspended	6.67	6.67		68.7	MG/L	NONE	160.2	NA	03/16/20	03195137
Solids, Volatile Suspen	6.67	6.67		DN	MG/L	NONE	160.4	NA	03/16/20	03195138
Total Organic Carbon	0.500	1.00		4.5	MG/L	NONE	415.1	NA	03/18/20	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-11, Inorganic Analyses

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

> 008587 Lab Report No:

CARLYLE LAKE/KASKASKIA RIVER

Project Name: Project No:

03/30/2020 Report Date: NELAC Certified - IL100308

Analysis: Inorganics

ARDL No: 008587-12 Field ID: KAS-2 Received: 03/10/2020	120	Sampling Samplin Samplin			KASKASKIA RIVER 03/10/2020 1000			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟŐ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.166	MG/L	NONE	350.1	NA	03/30/20 03305161	3305161
Chlorophyll-a, Correcte	1.0	1.00		9.1	MG/CU.M.	10200H	10200H	03/11/20	03/23/20 03245156	3245156
E. Coliform	1.0	1.00		600	COL/100 ML	NONE	1604	NA	03/10/20 03165129	3165129
Kjeldahl Nitrogen	0.190	0.200		1.1	MG/L	351.2	351.2	03/16/20	03/17/20 0	03195139
Nitrate as Nitrogen	0.0190	0.0200		1.34	MG/L	NONE	GREEN	NA	03/11/20 C	03195144
Nitrite as Nitrogen	0.0200	0.0200		0.023	MG/L	NONE	354.1	NA	03/11/20 C	03165131
Pheophytin-a	1.0	1.00		1.6	MG/CU.M.	10200H	10200H	03/11/20	03/23/20 0	03245156
Phosphorus	0.00800	0.0100		0.386	MG/L	365.2	365.2	03/18/20	03/20/20 C	03235153
Phosphorus, -ortho	0.00800	0.0100		0.143	MG/L	NONE	365.2	NA	03/12/20 0	03165130
Solids, Total Suspended	1 4.0	4.00		65.6	MG/L	NONE	160.2	NA	03/16/20 0	03195137
Solids, Volatile Suspen	1 4.0	4.00		4.4	MG/L	NONE	160.4	NA	03/16/20 0	03195138
Total Organic Carbon	0.500	1.00		4.6	MG/L	NONE	415.1	NA	03/18/20 0	03235151

(a) DOD and/or NELAC Accredited Analyte.

Sample 008587-12, Inorganic Analyses

Page 1 of 1

#### METHOD BLANK REPORT ARDL, Inc. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864

Lab Report No: 008587

Report Date: 03/31/2020

Project Name: Project No.:	CARLYLE LAKE/KA	SKASK Analy Analytical Met	sis: NP PEST hod: 8270C	TICIDES (82	270SIM-M	)
NELAC Certi	fied - IL100308	Prep Met	hod: 3510C			
Field ID:	NA		ARDL Lab No	D.: 008	587-01B1	
Desc/Location:	NA		Lab Filenam	ne: E033	30003	
Sample Date:	NA		Received Da	ate: NA		
Sample Time:	NA		Prep. Date:	: 03/:	12/2020	
Matrix:	QC Material		Analysis Da	ate: 03/3	30/2020	
Amount Used:	1000 mL		Instrument	ID: AG5		
Final Volume:	1 mL		QC Batch:	B11	185	
% Moisture:	NA		Level:	LOW		
					Data	
Parameter		LOD	LOQ	Result	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 RECOV	ERIES:	Limit	S	R	esults	

SURROGATE RECOVERIES:LimitsResultsTriphenylphosphate30-13098%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008587

Report Date: 03/30/2020

<b>RIVER</b>
KASKIP
LAKE/KASI
CARLYLE L
ect Name:
Proj

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	0.083	MG/L	3010A	6010C	03/16/20	03/23/20	P7347	008587-01B1
(a) Manganese	0.004	0.005	QN	MG/L	3010A	6010C	03/16/20	03/23/20	P7347	008587-01B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	03/30/20	03305161	008587-01B1
Chlorophyll-a, Corre	1.0	1.0	DN	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156	008587-07B1
E. Coliform	1.0	1.0	DN	COL/100 ML	NONE	1604	NA	03/10/20	03165129	008587-08B1
Kjeldahl Nitrogen	0.19	0.20	QN	MG/L	351.2	351.2	03/16/20	03/17/20	03195139	008587-12B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	03/11/20	03195144	008587-02B1
Nitrite as Nitrogen	0.020	0.020	QN	MG/L	NONE	354.1	NA	03/11/20	03165131	008587-11B1
Pheophytin-a	1.0	1.0	QN	MG/CU.M.	10200H	10200H	03/11/20	03/23/20	03245156	008587-07B1
Phosphorus	0.008	0.010	DN	MG/L	365.2	365.2	03/18/20	03/20/20	03235153	008586-01B1
Phosphorus, -ortho	0.008	0.010	QN	MG/L	NONE	365.2	NA	03/12/20	03165130	008587-03B1
Solids, Total Suspen	1.0	1.0	QN	MG/L	NONE	160.2	NA	03/16/20	03195137	008587-03B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	03/16/20	03195138	008587-03B1
Total Organic Carbon	0.50	1.0	DN	MG/L	NONE	415.1	NA	03/18/20	03235151	008587-01B1

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008587

	ARDL	ARDL, INC.	BLANK SPIKE/SPIKE DU 400 Aviation Drive;	IKE/SPIH tion Dri	KE DUPLIC. Lve; P.O.	SPIKE/SPIKE DUPLICATE REPORT iation Drive; P.O. Box 1566		Mt. Vernon, IL	IL 62864	54
Lab Report No:	008587							Re	Report Date:	e: 03/31/2020
Project Name: CARLYLE LAKE/KASKASK Project No.:	CARLYLE LAKE	/KASKASK	Analysis:	NP PESTI	CIDES (82	NP PESTICIDES (8270SIM-MOD)	Anal	Analytical Method: Prep Method:	1	8270C 3510C
Matrix: Amount Used:	QC Material 1000 mL		QC Bat Level:	2C Batch: Level:	B11185 LOW		Prep. Analys	Prep. Date: Analysis Date:	03/12/2020 03/30/2020	120 120
		Spike	spike	Spike	e Duplicate	ate Duplicate	Duplicate	Recovery		RPD
ц ц	Parameter	Result	Level	% Rec	c Result	t Level	% Rec	Limits	RPD	Limit
Tri	Trifluralin	3.23	4	81		1		30-130		
1	Atrazine	3.39	4	85		1	t T	30-130	!	1
Me	Metribuzin	2.99	4	75	!	-	1	30-130	1	1
7	Alachlor	3.43	4	86		1		30-130		1
Met	Metolachlor	3.51	4	88	1	1	1	30-130	1	1
Ch	Chlorpyrifos	3.59	4	06	1	ł	ł	30-130	1	-
C	Cyanazine	3.76	4	94	1	1	ł	30-130		1
Penc	Pendimethalin	3.07	4	77	1	1	ł	30-130	!	1
	St	SURROGATE RECOVERIES:	IES:		Spike %R	Duplicate %R	%R Limits			
	Ŧ	Triphenylphosphate	a		94	1	30-130			

(a) DOD-QSM Accredited Analyte.

ואי indicates a recovery outside of standard limits. איירי חיירי לא איי אייניסי חין איי היידידיהי (2770 איי

Spike Blanks for 008587-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

ARDL Report 8587 - Page 25 of 33

Lab Report No: 008587Project Name:CARLYLE LAKE/KASKASKIA RIVERProject Name:CARLYLE LAKE/KASKASKIA RIVERIcs IIcs IAnalyteIcs IIcs IIcs IIcs IIcs IAnalyteIcs IIcs II	RIVER LCS 2 LCS 2 Result 		N U	* Rec Mean Limits * Rec 87-115 * Rec 90-114 * 80-120 * 80-120 * 80-120 * 80-120 *	Report NELAC Analytic Run P734 0319510 0319512 0319512 0319512 0319513	Date: 03/30/2020 Certified - IL100308 Certified - IL100308 Number 0 008587-01C1 0 008587-01C1 0 008587-01C1 0 008587-01C1 81 008587-01C1 81 008587-01C1 81 008587-01C1
	RIVER LCS 2 Result 				NELAC Analytic Run P734' P734' 033051( 0319513 0319513 0319513 0319513 0319513	
LCS 1 LCS 1 Result Level 4.7 5.0 0.74 0.75 1.0 1.0 1.1 1.0 0.99 1.0 0.67 0.67 0.67 0.67 0.097 0.10 17.4 20.0						QC Lab Number 008587-01C1 008587-01C1 008587-01C1 008587-01C1 008587-02C1 008587-02C1
4.7       5.0         0.74       0.75         1.0       1.0         1.1       1.0         1.1       1.0         0.98       1.0         0.99       1.0         0.997       0.10         17.4       20.0					P7347 P7347 03305161 03195139 03195144 03195144 03165131 03255153	008587-01C1 008587-01C1 008587-01C1 008587-01C1 008587-01C1 008587-12C1 008587-11C1
0.74 0.75 1.0 1.0 1.1 1.0 0.98 1.0 0.99 1.0 0.67 0.67 0.097 0.10 17.4 20.0					P7347 03305161 03195139 03195144 03195144 03165131 03255153	008587-01C1 008587-01C1 008587-12C1 008587-12C1 008587-11C1
1.0 1.0 1.1 1.0 0.98 1.0 0.99 1.0 0.67 0.67 0.097 0.10 17.4 20.0					03305161 03195139 03195144 03165131 0325153	008587-01C1 008587-12C1 008587-02C1 008587-11C1
1.1 1.0 0.98 1.0 0.99 1.0 0.67 0.67 0.097 0.10 17.4 20.0					03195139 03195144 03165131 03235153	008587-12C1 008587-02C1 008587-11C1
0.98 1.0 0.99 1.0 0.67 0.67 0.097 0.10 17.4 20.0					03195144 03165131 03235153	008587-02C1 008587-11C1
0.99 1.0 0.67 0.67 0.097 0.10 17.4 20.0		:			03165131 03235153	008587-11C1
0.67 0.67 0.097 0.10 17.4 20.0					03235153	
0.097 0.10 17.4 20.0	;	!				008586-01C1
17.4 20.0		1	80-	80-120	03165130	008587-03C1
	-			76-120	03235151	008587-01C1
	1	1			03235151	008587-01C1
NOTE: Any values tabulated above marked with an aster	asterisk are outside of acceptable limits.	de of accepta	ble limits.			

Page 1 of 1

Inorganic LCS Results for 008587

<b>AR</b> Lab Report No: 008587	ARDL, INC.	MATRIX SPIKE/SPIKE 400 Aviation Drive;	SPIKE/SPIKE ation Drive	KE DUPLICATE .ve; P.O. Box	LCATE REPORT Box 1566		<b>Mt. Vernon, IL</b> Repoi	1, IL Report	<b>62864</b> Date:	03/31/2020
Project Name: CARLYLE LAKE/KASKASK Project No.:	AKE/KASKASK	Analysis:	NP PESTI	PESTICIDES (82	(8270SIM-MOD)		Analytical Method: Prep Method:	ical Method: Prep Method:	d: 8270C d: 3510C	
:. 	LAKE 20	Prep. Amount % Mois		03/12/2020 900 mL NA	0	AF Lo Re			008587-01 03/10/2020	
Sample Time: 1130 Matrix: WATER		QC Bat Level:	ch:	B11185 LOW		Ar	Analysis Da	Date: 03/	03/30/2020	
	Sample	WS	WS	MS	MSD	MSD	MSD	\$ Rec		RPD
Parameter	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin	GN	2.84	4.44	64	2.86	4.44	64.3	30-130	0.4	30
Atrazine	DN	3.24	4.44	73	2.99	4.44	67.3	30-130	8.2	30
Metribuzin	ΠN	2.91	4.44	65.5	2.63	4.44	59.3	30-130	10	30
Alachlor	DN	3.16	4.44	71	ы	4.44	67.5	30-130	5.1	30
Metolachlor	QN	3.38	4.44	76	3.21	4.44	72.3	30-130	5.1	30
Chlorpyrifos	DN	3.26	4.44	73.3	3.19	4.44	71.8	30-130	2.1	30
Cyanazine	DN	3.64	4.44	82	3.07	4.44	69	30-130	17.2	30
Pendimethalin	QN	2.71	4.44	61	2.72	4.44	61.3	30-130	0.4	30
				10						
	SURKUGAIE KELUVE	KLES:		MS %K	MSD %R	*R LIMITS	ts			

(a) DOD-QSM Accredited Analyte.

'nc' indicates sample >4X spike level.

'\*' indicates a recovery outside of standard limits.

Matrix Spikes for 008587-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

30-130

73

75

Triphenylphosphate

	62864
	님
_	Vernon,
REPORT	Mt.
DUPLICATE	x 1566
	P.O. Box
SPIKE/SPIKE	Drive; P
MATRIX SE	Aviation
	400
	INC.
	ARDL,

Lab Report No: 008587

Project Name:

Report Date: 03/30/2020

CARLYLE LAKE/KASKASKIA RIVER

NELAC Certified - IL100308

	Sample	Sample	SM	SM	SM	MSD	MSD	MSD	% Rec		RPD		QC Lab
Analyte	Matrix	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit	Run	Number
(a) Iron	WATER	2.0	2.8	1.0	85 *	2.8	1.0	85 *	87-115	ο	20	P7347	008587-01MS
(a) Manganese	WATER	0.093	0.60	0.50	101	0.60	0.50	102	90-114	Ч	20	P7347	008587-01MS
Ammonia Nitrogen	WATER	0.35	2.4	2.0	103	2.3	2.0	100	75-125	m	20	03305161	008587-01MS
Kjeldahl Nitrogen	WATER	1.1	2.0	0.80	115	2.0	0.80	108	75-125	б	20	03195139	008587-12MS
Nitrate as Nitrogen	WATER	1.7	2.7	1.0	97	2.7	1.0	94	75-125	1	20	03195144	008587-02MS
Phosphorus	WATER	0.31	1.2	0.83	112	1.2	0.83	105	75-125	ŝ	20	03235153	008587-02MS
Phosphorus, -ortho	WATER	0.13	0.25	0.10	113	0.24	0.10	110	75-125	Ч	20	03165130	008587-03MS
Total Organic Carbon	WATER	4.5	9.1	5.0	16	9.1	5.0	92	76-120	0	20	03235151	008587-01MS

Inorganic Matrix Spikes for 008587

(a) DOD and/or NELAC Accredited Analyte.

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

	03/30/2020	IL100308	QC Lab Number	008587-07D1 008587-07D1 008587-03D1 008587-03D1
non, IL 62864	Report Date: 03/	NELAC Certified -	Analytical Run	03245156 000 03195137 000 03195138 000
r 6 Mt. Vernon,			Mean (Smp,D1,D2)	
SAMPLE DUPLICATE REPORT on Drive; P.O. Box 1566			Percent Diff	NC 4 0 8
I DUPLICAI Ve; P.O.			Units	MG/CU.M. MG/L MG/L
SAMPLE DU 400 Aviation Drive;		RIVER	First Second Duplicate Duplicate	
400 Avi		CARLYLE LAKE/KASKASKIA I	First Duplicate	20 20 20 20 20 20
ARDL, INC.	٢	LE LAKE/	Sample Conc'n	6.8 28.0 ND ND
ARDL,	Lab Report No: 008587	Project Name: CARLY	Analyte	Chlorophyll-a, Corrected Pheophytin-a Solids, Total Suspended Solids, Volatile Suspend

(a) DOD and/or NELAC Accredited Analyte Sample Duplicates for 008587

# Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8587

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	CHAIN OF CUSTODY RECORD	PRESERVATION	SPECIFY SPECIFY CHEMICALS ADDED AND FINAL PH IF KNOWN		X	X	X	X	X	X	X	X	X	X	X	X				-			
C.     P.O. Box 1566, 400 Aviation Drive, Mt. Venon, IL 62864     SS 25       G (8) 244-3235 Phone     (6) 344-1149 Fax       G (8) 244-3235 Phone     (6) 344-1149 Fax       BACE     (13) 244-3235 Phone     (6) 344-1149 Fax       PACE     ITME     Time       PACE     (13) 244-3235 Phone     (6) 344-1149 Fax       PACE     ITME     Time     State       PACE     ITME     Red     (6) 344-1149 Fax       PACE     ITME     Red     (7) 34-35       PACE     ITME     Red     (7) 34-35       PACE     ITME     Red     (7) 34-35       PACE     ITME     Red     (7) 35-35       PACE     ITME     Red     (7) 35-35       PACE     ITME     Red       PACE     R     R       PACE     R     R       PACE     R       PACE     R       PACE     R       PACE     R <td>CHAIN OF C</td> <td></td> <td>1000</td> <td></td>	CHAIN OF C		1000																				
C.     P.O. Box 1566, 400 Aviation Drive, Mt. Venon, IL 62864     SS 257       (618) 244-3235 Phone     (618) 244-1149 Fax.     (618) 244-3235 Phone     (618) 244-3235 Phone       Antice     Table     Table     (618) 244-3235 Phone     (618) 244-3235 Phone       Antice     Table     Table     (618) 244-3235 Phone     (618) 244-3235 Phone       Antice     Table     Table     (618) 244-3235 Phone     (618) 244-3235 Phone       Antice     Table     Partice     (618) 244-3235 Phone     (618) 244-3235 Phone       Antice     Table     Antice     (618) 244-3235 Phone     (618) 244-325 Phone       Antice     Table     (718)     (718)     (718)       Antice     1710     121/20     121/20     (718)       Antice     171/20     121/20     121/20     121/20       Antice     123/10     1/2/20     121/20     121/20       Antice     Mark 12/20     121/20     121/20     121/20       Antic	1		A P																				
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61			20	No	-															ONS:			
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61			N	21	-															UCTI			
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61	10		951	NN*	-	-				-					X	X				ISTR			
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61	Ã	4	v . 11	o w											/ 、					ALIN	03		
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61	1-1		180	E. E								X	X	X	X	Х				PECL	h H <sub>2</sub> S		
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61		N-8	HAL	dr.	×		×													KS/SI	sd wit		
C. P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, (618) 244-3235 Phone (618) 244-1149 (618) (61	2864	An	N	EOA	X	X		X	X	X	X									MARI	eserve		
· · · · · · · · · · · · · · · · · · ·	, IL 6. 9 Fax	0	x-1 .	00-		Х	X	X	X	X	X				X	Х				REI	*Pre #Pre		
· · · · · · · · · · · · · · · · · · ·	ernon, 4-114		VOIN	01	X	X	X	X	X	×	×				×	X				)			
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· · · · · · · · · · · · · · · · · · ·	30x 1566, <sup>4</sup> (618) 244-	Ŷ		TIME	1130	1710	012/	1215	520	1430	0 45	1330	120	550	028	IONO				Time	Time	Time / 1020	
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ARDL, Inc OJECT Increased and a construction MPLERS: (Signature) MPLERS: (Signature) MPL			1	DAT	31/	3 71	311		311	3/1	3/1	3/10		-						Dat 3-lo	Dat	3/10	
	ARDL, Inc	PROJECT Carlyle Lake	+	9	CAR-1		1	CAR - 4	CAR – 13	CAR - 12	CAR – 15	CAR – KP – Marina	CAR – DW – Marina	CAR – BL – Marina	KAS-1	KAŞ-2				elinquished by: (Signature)	elinquished by: (Signature)	ignature) (MAC)	

GURCHASE ORDER NO: \_

	COOLER RECEIPT ARDL, INC			
	DL#: 8587 VARIale Lake + .	Cooler # $\frac{7}{2}$ Number of Coolers in Shipment: $\frac{27}{2}$ Date Received: $\frac{3}{2}\sqrt{2}$	2	-
	2			
1.	Did cooler come with a shipping slip (airbill, etc.)?		NO	
	If YES, enter carrier name and airbill number here:			
2.	Were custody seals on outside of cooler?	YES	NO	NIR
	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?	RES	NO	
5.	Were custody papers sealed in a plastic bag?	YES	NO	
6.	Were custody papers filled out properly (ink, signed, etc.)?		NO	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?		NO	N/A
8.	Was project identifiable from custody papers? If YES, enter project name a	t the top of this form	NO	N/A
9.	Was a separate container provided for measuring temperature? YES	NO Observed Cooler TempC Correction factor O	^	6
В.	LOG-IN PHASE: Date samples were logged-in: 03/11/20	(Signature) DCB		
10.	Describe type of packing in cooler:			
11.	Were all samples sealed in separate plastic bags?		NO	N/A
12.	Did all containers arrive unbroken and were labels in good condition?		NO	
13.	Were sample labels complete?		NO	
14.	Did all sample labels agree with custody papers?	YES	NO	
15.	Were correct containers used for the tests indicated?		NO	
16.	Was pH correct on preserved water samples?		NO	N/A
17.	Was a sufficient amount of sample sent for tests indicated?		NO	
18.	Were bubbles absent in VOA samples? If NO, list by sample #:	YES	NO	NA
19.	Was the ARDL project coordinator notified of any deficiencies?	YES	NO	NA
	Comments and/or Corrective Action:	Sample Transfer		
		Fraction Fraction		
$\vdash$		Area # Area #		
		By a By		
		By DCR By		•
		On OB/IV/ID On		
		Chain-of-Custody #		
(B	y: Signature) Date:	]		

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	<u>COOLER RECEIPT</u> ARDL, INC.	REPORT
ARI	DL#: <u>BSB7</u> ject: <u>CARIYICE KES</u> R	Cooler # Number of Coolers in Shipment:Z
Pro	ject: CARIYLET KIS R	Date Received: 310/20
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 3	10 12 (Signature) Arr
1.	Did cooler come with a shipping slip (airbill, etc.)?	YES NO
	If YES, enter carrier name and airbill number here:	Cours
2.	Were custody seals on outside of cooler?	
	How many and where?,Seal Date:	,Seal Name:
3.	Were custody seals unbroken and intact at the date and time of arrival?	
4.	Did you screen samples for radioactivity using a Geiger Counter?	
5.	Were custody papers sealed in a plastic bag?	
6.	Were custody papers filled out properly (ink, signed, etc.)?	
7.	Were custody papers signed in appropriate place by ARDL personnel?	
8.	Was project identifiable from custody papers? If YES, enter project name at	t the top of this form
9.	Was a separate container provided for measuring temperature? YES	NO X Observed Cooler TempC And Link Correction factor 0.0 C
B.	Nº 111 105	(Signature) DC IS
10.	Describe type of packing in cooler: <u>LOOSE</u> <u>LCE</u> <u>beac</u> Were all samples sealed in separate plastic bags?	ged lee
11.	Were all samples sealed in separate plastic bags?	) V YES (NO) N/A
12.	Did all containers arrive unbroken and were labels in good condition?	
13.	Were sample labels complete?	
14.	Did all sample labels agree with custody papers?	
15.	Were correct containers used for the tests indicated?	
16.	Was pH correct on preserved water samples?	
17.	Was a sufficient amount of sample sent for tests indicated?	
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:	Sample Transfer Fraction Fraction
		Fraction Fraction
		Area # Area #
-		By By
		DCB
		03/11/2020 on
		Chain-of-Custody #
(E	By: Signature) Date:	

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Environmental | Analytical | Management | Safety

# **Customer Name: SLCOE**

## Project Name: Carlyle Lake/Kaskaskia River

## Samples Received at ARDL: 5/20/20

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

<u>www.ardlinc.com</u>

Date: 6/15/20

Lab Name: ARDL, Inc.

ARDL Report No.: 8613

Customer	Date	Lab ID	
Sample No.	<u>Collected</u>	<u>Number</u>	Analyses Requested
CAR-1	5/20/20	8213-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	5/20/20	8213-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	5/20/20	8213-03	Metals(1), Inorganics(2)
CAR-4	5/20/20	8213-04	NP Pesticides, Inorganics(2)(3)
CAR-13	5/20/20	8213-05	NP Pesticides, Inorganics(2)
CAR-12	5/20/20	8213-06	NP Pesticides, Inorganics(2)(3)
CAR-15	5/20/20	8213-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	5/20/20	8213-08	E. Coli
CAR-DW-Marina	5/20/20	8213-09	E. Coli
CAR-BL-Marina	5/20/20	8213-10	E. Coli
KAS-1	5/20/20	8213-11	E. Coli , Inorganics(2)(3)(4)
KAS-2	5/20/20	8213-12	E. Coli , Inorganics(2)(3)(4)
CAR-CSA	5/20/20	8213-13	E. Coli

CASE NARRATIVE

(1) Including iron and manganese.

(2) Including ammonia, nitrate, orthophosphate, 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. The closing CCV passed criteria for all analytes.

### PREPARATION BLANK

The blank met acceptance criteria.

# LABORATORY CONTROL SAMPLE

The LCS analyses met recovery criteria.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Carlyle Lake/Kaskaskia River

# ARDL Report No.: 8613

# CASE NARRATIVE (Continued)

#### 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 STANDARD**

All internal standard criteria were met.

### SURROGATE

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 within acceptable limits.

# 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.

# **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

Page 2 of 2



# 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 8613

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

Lab Report No: 008613

Report Date: 06/02/2020

Project No.:	CARLYLE LAKE fied - IL100308	Analytical M	4		DES (827	70sim-mo	(ם)
Field ID:	CAR-1		ARDL	Lab No.:	00861	13-01	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0528	3005	
Sample Date:	05/20/2020		Receiv	ved Date:	05/20	0/2020	
Sample Time:	0845		Prep.	Date:	05/22	2/2020	
Matrix:	WATER		Analy	sis Date:	05/28	8/2020	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1123	18	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.200	0.200	ND		UG/L	1
Atrazine		0.200	0.200	3.52		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	2.78		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 RECOV	ERIES:	Lim	its		Rea	sults	

Triphenylphosphate	30-130	87%

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

(a) DOD-QSM Accredited Analyte.

Lab Report No: 008613	2013							·////////////////////////////////////		
Project Name: CARLYLE LAKE Project No:	LAKE						N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics )0308
ARDL No: 008613-01 Field ID: CAR-1 Received: 05/20/2020	)1 )20	Sampling Samplin Samplin	0 ש		CARLYLE LAKE 05/20/2020 0845			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.859	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
(a) Manganese	0.00400	0.00500		0.0787	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
Ammonia Nitrogen	0.0200	0.0300		0.238	MG/L	NONE	350.1	NA	05/28/20 (	05295328
Nitrate as Nitrogen	0.0190	0.0200		0.928	MG/L	NONE	GREEN	NA	05/22/20 (	05225296
Phosphorus	0.00800	0.0100		0.23	MG/L	365.2	365.2	06/02/20	06/02/20 (	06035343
Phosphorus, -ortho	0.00800	0.0100		0.122	MG/L	NONE	365.2	NA	05/21/20 (	05225295
Solids, Total Suspended		4.00		9.2	MG/L	NONE	160.2	NA	05/21/20 (	05265300
Solids, Volatile Suspen	л 4.0	4.00		ND	MG/L	NONE	160.4	NA	05/21/20 (	05265301
Total Organic Carbon	0.500	1.00		5.1	MG/L	NONE	415.1	NA	05/23/20 (	06125373

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-01, Inorganic Analyses

Lab Report No: 008613

Report Date: 06/02/2020

Project Name: Project No.:	CARLYLE LAKE	Ana Analytical Me	-	PESTICII	DES (827	0SIM-MO	D)
2	fied - IL100308	-	ethod: 3				
Field ID:	CAR-2-0		ARDL	Lab No.:	00861	.3-02	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0528	8008	
Sample Date:	05/20/2020		Recei	ved Date:	05/20	)/2020	
Sample Time:	1000		Prep.	Date:	05/22	2/2020	
Matrix:	WATER		Analy	sis Date:	05/28	3/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1121	8	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
				184 Anna	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	3.58		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	2.97		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	85%	ĺ

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

(a) DOD-QSM Accredited Analyte.

		ъ	400 Avi Mt.	ation Dr Vernon,	Drive; P.O. n, Illinois	Box 1566 62864	10			
Lab Report No: 008613	613						Я	Report Date:	: 06/12/2020	020
Project Name: CARLYLE LAKE Project No:	LAKE	2					N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	Lcs 00308
ARDL No: 008613-02 Field ID: CAR-2-0 Received: 05/20/2020	2 2 2 0 2 0	Sampling Samplin Samplin		Loc'n: CARLY Date: 05/20 Time: 1000	CARLYLE LAKE 05/20/2020 1000			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	год	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.256	MG/L	NONE	350.1	NA		05295328
Chlorophyll-a, Correcte Nitrate as Nitrogen	1.0 0.0190	1.00 0.0200		7.4 0.897	MG/CU.M. MG/L	10200H NONE	10200H GREEN	05/21/20 NA	05/26/20	05225296 05225296
Pheophytin-a	1.0	1.00		1.4	MG/CU.M.	10200H	10200H	05/21/20	05/26/20	05275306
Phosphorus	0.00800	0.0100		0.234	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0.00800	0.0100		0.115	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended	5.0	5.00		8.0	MG/L	NONE	160.2	NA	/20	05265300
Solids, Volatile Suspen	5.0	5.00		ND	MG/L	NONE	160.4	NA	05/21/20	05265301
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	05/23/20	06125373

ARDL, INC.

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-02, Inorganic Analyses

Lab Report No: 008613

CARLYLE LAKE

Project Name: Project No:

Report Date: 06/12/2020

NELAC Certified - IL100308

Analysis: Inorganics

ARDL No: 008613-03	e	Sampling		Loc'n: CARLY	CARLYLE LAKE			Matrix:	: WATER	
Field ID: CAR-2-10		Sam	Sampling Date:		05/20/2020			Moisture:	: NA	
Received: 05/20/2020	20	Sam	Sampling Time:	ime: 1020						
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	LOQ	Flag	Result	Units	Method	Method	Date	Date	Number
(a) Iron	0.0400	0.0500	Name of the American Control of the	0.854	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
(a) Manganese	0.00400	0.00500		0.0770	MG/L	3010A	6010C	05/22/20	05/28/20	P7370
Ammonia Nitrogen	0.0200	0.0300		0.242	MG/L	NONE	350.1	NA	05/28/20 (	05295328
Nitrate as Nitrogen	0.0380	0.0400	þ	1.34	MG/L	NONE	GREEN	NA	05/26/20 (	05225296
Phosphorus	0.00800	0.0100		0.304	MG/L	365.2	365.2	06/02/20	06/02/20 06035343	06035343
Phosphorus, -ortho	0.00800	0.0100		0.133	MG/L	NONE	365.2	NA	05/21/20 (	05225295
Solids, Total Suspended	10.0	10.0		137	MG/L	NONE	160.2	NA	05/21/20 (	05265300
Solids, Volatile Suspen	10.0	10.0		16.0	MG/L	NONE	160.4	NA	05/21/20 (	05265301
Total Organic Carbon	0.500	1.00		5.2	MG/L	NONE	415.1	NA	05/23/20 06125373	06125373

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-03, Inorganic Analyses

Lab Report No:	008613	Repo	ort Date	: 06/02/	2020		
Project Name: Project No.:	CARLYLE LAKE	Anal Analytical Me	-	PESTICII 270C	DES (827	70SIM-MO	D)
NELAC Certi:	fied - IL100308	Prep Me	ethod: 3	510C			
Field ID:	CAR-4		ARDL 1	Lab No.:	00863	13-04	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0528	3009	
Sample Date:	05/20/2020		Receiv	ved Date:	05/20	0/2020	
Sample Time:	1145		Prep.	Date:	05/22	2/2020	
Matrix:	WATER		Analy	sis Date:	05/28	3/2020	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1121	18	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	3.35		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	3.36		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 RECOV	ERIES:	Lim	its		Re	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

Page 1 of 1

104%

Lab Report No: 008613	613						· · · · · · · · · · · · · · · · · · ·			
Project Name: CARLYLE LAKE Project No:	LAKE						2	Analysis: VELAC Certif.	Analysis: Inorganics NELAC Certified - IL100308	1cs 00308
ARDL No: 008613-04 Field ID: CAR-4 Received: 05/20/2020	4 2 0	Sampling Samplin Samplin	ת ת	Loc'n: CARLY Date: 05/20 Time: 1145	CARLYLE LAKE 05/20/2020 1145			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	год	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon	0.0200 1.0 0.0190 1.0 0.00800 5.0 5.0	0.0300 1.00 0.0200 1.00 0.0100 5.00 5.00		ND 29.0 1.42 1.5 0.291 0.0316 5.5 8.5 5.1	MG/L MG/CU.M. MG/CU.M. MG/L MG/L MG/L MG/L MG/L MG/L	NONE 10200H NONE 10200H 365.2 NONE NONE NONE NONE	350.1 10200H GREEN 10200H 365.2 365.2 365.2 160.2 160.4 415.1	NA 05/21/20 NA 05/21/20 06/02/20 NA NA NA	05/28/20 05/26/20 05/26/20 05/22/20 05/21/20 05/21/20 05/21/20 05/21/20 05/21/20 05/21/20	05295328 05275306 05275306 05275306 06035343 05225295 05265300 05265301 05265301

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

ARDL, INC.

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-04, Inorganic Analyses

Page 1 of 1

Lab Report No: 008613

Report Date: 06/02/2020

Project Name: Project No.:		Analytical Me	ethod: 82		DES (827	0SIM-MO	D)
NELAC Certi:	fied - IL100308	Prep Me	ethod: 35	5100			
Field ID:	CAR-13		ARDL I	Lab No.:	00861	.3-05	
Desc/Location:	CARLYLE LAKE		Lab Fi	ilename:	E0528	8010	
Sample Date:	05/20/2020		Receiv	ved Date:	05/20	/2020	
Sample Time:	1400		Prep.	Date:	05/22	2/2020	
Matrix:	WATER		Analys	sis Date:	05/28	3/2020	
Amount Used:	1000 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1121	.8	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.200	0.200	ND		UG/L	1
Atrazine		0.200	0.200	3.68		UG/L	1
Metribuzin		0.200	0.200	0.740		UG/L	1
Alachlor		0.200	0.200	ND		UG/L	1
Metolachlor		0.200	0.200	7.54		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.

Lab Report No: 008613	613						Å	Report Date:	: 06/12/2020	020
Project Name: CARLYLE LAKE Project No:	LAKE						N	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics 00308
ARDL No: 008613-05 Field ID: CAR-13 Received: 05/20/2020	20	Sampling Samplin Samplin	רס רס		CARLYLE LAKE 05/20/2020 1400			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ΓΟΟ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Nitrate as Nitrogen	0.0200	0.0300		0.083	MG/L MG/L	NONE	350.1 Green	NA NA	05/28/20 05295328 05/26/20 05225296	05295328 05225296
Phosphorus	0.00800	0.0100		0.377	MG/L	365.2	365.2	06/02/20	06/02/20	06035343
Phosphorus, -ortho	0	0.0100		0.11	MG/L	NONE	365.2	NA	05/21/20	05225295
Solids, Total Suspended		10.0		93.0	MG/L	NONE	160.2	NA	05/21/20	05265300
solids, Volatile Suspen Total Organic Carbon	1U.U 0.500	1.00		10.0 5.5	MG/L MG/L	NONE	160.4 415.1	NA NA	05/23/20	05265301 06125373

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-05, Inorganic Analyses

Lab Report No: 008613

Report Date: 06/02/2020

Project No.:	CARLYLE LAKE fied - IL100308	Analytical M	-		DES (82 <sup>-</sup>	70SIM-MC	(םי
Field ID:	CAR-12		ARDL	Lab No.:	0086	13-06	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E052	8011	
Sample Date:	05/20/2020		Receiv	ved Date:	05/2	0/2020	
Sample Time:	1430		Prep.	Date:	05/2	2/2020	
Matrix:	WATER		Analy	sis Date:	05/2	8/2020	
Amount Used:	1000 mL			ument ID:			
Final Volume:	1 mL		QC Bat	tch:	B112	18	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
				49.499	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.200	0.200	ND		UG/L	1
Atrazine		0.200	0.200	4.41		UG/L	1
Metribuzin		0.200	0.200	0.750		UG/L	1
Alachlor		0.200	0.200	ND		UG/L	1
Metolachlor		0.200	0.200	7.59		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 RECOV	ERIES:	Lim	its		Re	sults	

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

30-130

(a) DOD-QSM Accredited Analyte.

Triphenylphosphate

Sample 008613-06, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

87%

Report Date: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	ep Analysis Prep Analysis Run 10d Method Date Date Number	IE     350.1     NA     05/28/20     05295328       00H     10200H     05/21/20     05/26/20     05275306       RE     GREEN     NA     05/22/20     05275306       00H     10200H     05/21/20     05/22/20     05275306       10     10200H     05/21/20     05/22/20     05225296       10     10200H     05/21/20     05/22/20     06035343       10     365.2     NA     05/21/20     05225295       11     160.2     NA     05/21/20     05265300       11     NA     05/21/20     05265301       11     NA     05/21/20     05265301
			Prep Method	NONE 10200H NONE 10200H 365.2 NONE NONE NONE NONE
		CARLYLE LAKE 05/20/2020 1430	Units	MG/L MG/CU.M. MG/CU.M. MG/L MG/L MG/L MG/L MG/L MG/L
			Result	0.0769 4.5 1.84 ND 0.528 0.133 96.0 ND
		Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
		Sampl Samp Samp	ГОД	0.0300 1.00 1.00 0.0200 0.0100 0.0100 10.0 10.
513	LAKE	0	LOD	0.0200 1.0 0.0190 1.0 0.00800 0.00800 10.0 10.0
: No: 008613	CARLYLE LAKE	008613-06 CAR-12 05/20/2020	te	fen Correcte Correcte :rogen irtho Suspended Le Suspen Carbon
Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte Nitrate as Nitrogen Pheophytin-a Phosphorus Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-06, Inorganic Analyses

Lab Report No: 008613

Report Date: 06/02/2020

Project No.:	CARLYLE LAKE	Analytical Me	ethod: 82		DES (827	/OSIM-MO	D)
NELAC Certi:	fied - IL100308	Prep Me	ethod: 39	510C			
Field ID:	CAR-15		ARDL 1	Lab No.:	00861	L3-07	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E0528	3012	
Sample Date:	05/20/2020		Receiv	ved Date:	05/20	)/2020	
Sample Time:	1215		Prep.	Date:	05/22	2/2020	
Matrix:	WATER		Analys	sis Date:	05/28	3/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1121	L 8	
% Moisture:	NA		Level	•	LOW		
		******			Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	2.18		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	2.29		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
		Tim	• .				

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	91%

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

(a) DOD-QSM Accredited Analyte.

Sample 008613-07, NP PESTICIDES (8270SIM-MOD)

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864 Report No: 008613 Report Date: 06/12/2020	oject Name: CARLYLE LAKE Analysis: Inorganics Project No: NELAC Certified - IL100308	ARDL No: 008613-07 Sampling Loc'n: CARLYLE LAKE Matrix: WATER Field ID: CAR-15 Sampling Date: 05/20/2020 Moisture: NA Received: 05/20/2020 Sampling Time: 1215	Prep Analysis Prep Analysis Run Analyte LOD LOQ Flag Result Units Method Method Date Date Number	Ammonia Nitrogen0.02000.0300NDMG/LNONE350.1NA05/28/2005/28/2005/25/306Chlorophyll-a, Correcte1.01.001.0012.0MG/CU.M.10200H10200H05/21/2005/26/2005275306Nitrate as Nitrogen0.01900.02001.41MG/LNONEGREENNA05/22/2005275306Pheophytin-a1.01.001.00NDMG/LNONEGREENNA05/21/2005/26/2005275306Pheophytin-a1.01.000.0100NDMG/L10200H10200H05/21/2005/26/2005275306Phosphorus0.008000.01000.0291MG/L365.2365.206/02/2006/02/2006/035343Phosphorus, -ortho0.008000.01000.2295MG/LNONE365.2NA05/21/2005/265300Solids, Total Suspended6.676.676.676.67MG/LNONE160.2NA05/21/2005/265301Solids, Volatile Suspen6.676.676.67MG/LNONE160.2NA05/21/2005/265301Total Organic Carbon0.5001.000.5000.01000.05006/02/2006/22/2005/265301Solids, Volatile Suspen6.676.676.67MG/LNONE160.4NA05/21/2005/21/2005/21/20Total Organic Carbon0.5001.000.5001.000.5006/02/2005/21/
Lab Re	Project Name: Project No:	ARDL Field Receiv	A	Ammonia Nitr Chlorophyll- Nitrate as N Pheophytin-a Phosphorus, Solids, Tota Solids, Vola Total Organi

Sample 008613-07, Inorganic Analyses

Page 1 of 1

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		1	1	1	
	020	1ics .00308		Run Number	05265297
	e: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	.x: WATER e: NA	Analysis Date	05/20/20 05265297
	Report Date:	Analysis: ELAC Certifie	Matrix: Moisture:	Prep Date	NA
Q	R	IN		Analysis Method	1604
Box 156 62864				Prep Method	NONE
ARDL, INC. Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864			CARLYLE LAKE 05/20/2020 1200	Units	COL/100 ML
ARI ation D: Vernon,				Result	550
400 Avi Mt			Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
			Samr San San	год	1.00
	No: 008613	CARLYLE LAKE	008613-08 CAR-KP-MARINA 05/20/2020	e LOD	1.0
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008613-08, Inorganic Analyses

ARDL, INC. Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864	Report Date: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	CARLYLE LAKE Matrix: WATER 05/20/2020 Moisture: NA 1040	Prep Analysis Prep Analysis Run Units Method Method Date Date Number	COL/100 ML NONE 1604 NA 05/20/20 05265297
A 400 Aviation Mt. Vernon			Sampling Loc'n: CA Sampling Date: 05, Sampling Time: 10.	Flag Result	325
			San Sa Sa	ΓΟŎ	1.00
	Lab Report No: 008613	CARLYLE LAKE	008613-09 CAR-DW-MARINA 05/20/2020	te LOD	1.0
	Lab Report	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008613-09, Inorganic Analyses

Box 1566 62864	Report Date: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Date Number	NONE 1604 NA 05/20/20 05265297
ARDL, INC. 400 Aviation Drive; P.O. B. Mt. Vernon, Illinois 6			Sampling Loc'n: CARLYLE LAKE Sampling Date: 05/20/2020 Sampling Time: 1230	LOQ Flag Result Units	1.00 500 COL/100 ML
	Lab Report No: 008613	Project Name: CARLYLE LAKE Project No:	ARDL No: 008613-10 Field ID: CAR-BL-MARINA Received: 05/20/2020	Analyte LOD	E. Coliform 1.0

Sample 008613-10, Inorganic Analyses

Page 1 of 1

ARDL Report 8613 - Page 19 of 34

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

ARDL, INC.

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-11, Inorganic Analyses

Report Date: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Date Number	NONE         350.1         NA         05/28/20         05295328           10200H         10200H         05/21/20         05/26/20         05275306           NONE         1604         NA         05/26/20         05265297           NONE         1604         NA         05/26/20         05265297           351.2         351.2         06/01/20         06/02/20         06035345           NONE         354.1         NA         05/26/20         05265296           NONE         354.1         NA         05/21/20         05275306           NONE         354.1         NA         05/21/20         05275305           10200H         10200H         05/21/20         05275305           365.2         365.2         NA         05/21/20         05275305           365.2         365.2         NA         05/21/20         05265300           NONE         160.2         NA         05/21/20         05265300           NONE         160.4         NA         05/21/20         05265300           NONE         160.4         NA         05/21/20         05265301
		CARLYLE LAKE 05/20/2020 1030	Units M	MG/L MG/CU.M. 1 COL/100 ML MG/L 3 MG/L 3 MG/
		Loc'n: CARLY Date: 05/20 Time: 1030	Result	0.189 3.6 3.6 1.15 2.35 0.115 0.115 0.115 0.25 0.25 9.33
		Sampling Loc Sampling Da Sampling T:	Flag	
		Samr San San	LOQ	0.0300 1.00 1.00 0.200 0.0400 0.0200 1.00 0.0100 6.67 6.67
13	AKE	0	LOD	0.0200 1.0 1.0 0.190 0.0380 0.0380 0.0380 0.0200 0.0200 0.00800 6.67 6.67
Lab Report No: 008613	Project Name: CARLYLE LAKE Project No:	ARDL No: 008613-12 Field ID: KAS-2 Received: 05/20/2020	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte E. Coliform Kjeldahl Nitrogen Nitrate as Nitrogen Nitrite as Nitrogen Pheophytin-a Phosphorus Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen

(a) DOD and/or NELAC Accredited Analyte.

Sample 008613-12, Inorganic Analyses

566	Report Date: 06/12/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run d Method Date Date Number	1604 NA 05/20/20 05265297
Box 1566 62864				Prep Method	NONE
ARDL, INC. Aviation Drive; P.O. I Mt. Vernon, Illinois (			CARLYLE LAKE 05/20/2020 1600	Units	COL/100 ML
ARI ation D Jernon,				Result	75.0
400 Avia Mt. V			Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
7			Samp. Samj Samj	год	1.00
	No: 008613	CARLYLE LAKE	008613-13 CAR-CSA 05/20/2020	te LOD	1.0
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008613-13, Inorganic Analyses

#### METHOD BLANK REPORT ARDL, Inc. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864

Lab Report No: 008613

Report Date: 06/02/2020

Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analys: Analytical Metho Prep Metho		CICIDES (82	270SIM-MC	)D)
Field ID:	NA	1	ARDL Lab No	008	613-01B1	
Desc/Location:	NA	1	Lab Filenam	ne: E052	28003	
Sample Date:	NA	I	Received Da	ate: NA		
Sample Time:	NA	1	Prep. Date:	05/:	22/2020	
Matrix:	QC Material	i	Analysis Da	ate: 05/2	28/2020	
Amount Used:	1000 mL		Instrument	ID: AG5		
Final Volume:	1 mL	(	QC Batch:	B11	218	
<pre>% Moisture:</pre>	NA	:	Level:	LOW		
					Data	
Parameter		LOD	LOQ	Result	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 RECOV	ERIES:	Limits		R	esults	L
Triphenylphosph	ate	30-130			98%	

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

(a) DOD-QSM Accredited Analyte.

Mt. Vernon, IL 400 Aviation Drive; P.O. Box 1566 BLANK SUMMARY REPORT ARDL, INC.

Lab Report No: 008613

Project Name:

Report Date: 06/12/2020

62864

CARLYLE LAKE

NELAC Certified - IL100308

			ם לחבן ב		Dren	Analveic	Dren	Analvsis		OC Lab
Analyte	LOD	ГОД	Result	Units	Method	Method	Date	Date	Run	Number
(a) Arsenic	0.002	0.003	QN	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Cadmium	0.0008	0.002	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Lead	0.002	0.003	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
(a) Zinc	0.004	0.005	DN	MG/L	3010A	6010C	05/22/20	05/28/20	P7370	008612-09B1
Ammonia Nitrogen	0.020	0.030	ND	MG/L	NONE	350.1	NA	05/28/20 0	05295328	008613-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20 0	05275306	008613-02B1
E. Coliform	1.0	1.0	ND	COL/100 ML		1604	NA	05/20/20 0	05265297	008613-08B1
Kjeldahl Nitrogen	0.19	0.20	DN	MG/L	351.2	351.2	06/01/20		06035345	008608-01B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L		GREEN	NA	05/26/20 0	05225296	008613-03B1
Nitrite as Nitrogen	0.020	0.020	QN	MG/L		354.1	NA	05/21/20 0	05295330	008613-11B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	05/21/20	05/26/20 0	05275306	008613-02B1
Phosphorus	0.008	0.010	UN	MG/L		365.2	06/02/20	06/02/20 0	06035343	008613-01B1
Phosphorus, -ortho	0.008	0.010	ΠŊ	MG/L	NONE	365.2	NA	05/21/20 0	05225295	008613-03B1
Solids, Total Suspen	1.0	1.0	DN	MG/L	NONE	160.2	NA	05/21/20 0	05265300	008613-04B1
Solids, Volatile Sus	1.0	1.0	QN	MG/L	NONE	160.4	NA	05/21/20 0	05265301	008613-04B1
Total Organic Carbon	0.50	1.0	DN	MG/L	NONE	415.1	NA	05/23/20 0	06125373	008613-01B1

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008613

AI	ARDL, INC.	INC.	BLANK 400 A	K SPIKE/ Aviatior	SPIKE I Drive	DUPLICA P.O. F	BLANK SPIKE/SPIKE DUPLICATE REPORT 400 Aviation Drive; P.O. Box 1566		Mt. Vernon, IL		62864	
Lab Report No: 008613									ц	Report Date:		06/02/2020
Project Name: CARLYLE LAKE Project No.:	AKE		Anal	Analysis: NP	PESTICIDES		(8270SIM-MOD)	Ana	Analytical Method: Prep Method:	ical Method: Prep Method:	8270C 3510C	
Matrix: QC Material Amount Used: 1000 mL	rial			QC Batch: Level:	: B11218 LOW	218		Prep. Analy	Prep. Date: Analysis Date:	05/22/2020 : 05/28/2020	/2020 /2020	
		Spike	(e	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery			RPD
Parameter		Result	Lt Lt	Level	% Rec	Result	Level	* Rec	Limits	RPD		Limit
Trifluralin		3.28	~	4	82			-	30-130	-		-
Atrazine		3.72	~	4	93	ł	ł	ł	30-130	1		!
Metribuzin		3.41		4	85	ł	ł	ł	30-130	1		1
Alachlor		2.32	~	4	58		1		30-130	1		1
Metolachlor		3.77	~	4	94	ł	1	-	30-130	1		1
Chlorpyrifos		3.06	10	4	LL	a 	ł	ł	30-130	ł		1
Cyanazine		3.94		4	66	ł	4	1	30-130	ł		1
Pendimethalin		3.39	•	4	85	ł	1	-	30-130	1		
	SURRO	SURROGATE RECOVERIES:	RIES:		Spike %R		Duplicate %R	&R Limits	1			
	Triph	Triphenylphosphate	ite		89.8	8.		30-130				

ARDL Report 8613 - Page 25 of 34

'\*' indicates a recovery outside of standard limits. Spike Blanks for 008613-01, NP PESTICIDES (8270SIM-MOD)

(a) DOD-QSM Accredited Analyte.

Page l of l

Import No: 006613       Report Date: 06/12/2         Project Name:       CARLYLE LAKE         Project Name:       CARLYLE LAKE         Project Name:       CARLYLE LAKE         Project Name:       CARLYLE LAKE         Analyre       Los 1       <	AR	ARDL, INC.	400 Av	riation Drive; P.O.	400 Aviation Drive;	а; Р.О.	Box	1566	Mt. V	Vernon, IL	62864
S.       CARLYLE LAKE       NELAC Certified         ICS 1       ICS 1 <th></th> <th>08613</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>ate: 06/12/2020</th>		08613									ate: 06/12/2020
LGS 1         LGS 1         LGS 1         LGS 2         LGS 2         LGS 2         LGS 2         LGS 2         Rec         Mean         Analytical           Result         Level         % Rec         Result         Level         % Rec         Mean         Analytical           1.0         1.0         1.0         1.0         1.0         1.0         1.0         % Rec         Mean           1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         % Rec         Mean           0.11         1.0         1.0         1.0         1.0         1.0         1.0         1.0         % Rec         % Rec         Num           0.15         0.50         97           87-113          % 7370           0.10         1.0         1.0         1.0         1.0         1.0          % 86-113          % 7370           1.1         1.0         1.0         1.0         1.0          % 86-114         % 7370           1.1         1.0         1.0         1.0          90-114          % 7370           1.1         1	Project Name:	CARLYLE L	AKE							NELAC Ce.	
Result         Level         % Rec         Result         Level         % Rec         Limits         % Rec         Run           1.0         1.0         1.0         103           6         7-113          7-370           0.51         0.50         101           6         6-113          7-370           0.51         0.50         104           6         6-113          7-370           0.78         0.75         104           6         7-113          7-370           0.78         0.75         104           8113          7-370           1.0         1.0         1.0         104          1         8-113          7-370           1.1         1.10         1.10         100          1         8-113          7         7           1.1         1.10         1.00          1         8120          1         7         9         7         9         9         9		LCS 1	LCS 1	LCS 1	LCS 2	LCS 2	LCS 2	& Rec	Mean	Analytical	QC Lab
$1.0$ $1.0$ $1.0$ $103$ $$ $$ $8^{7}-113$ $$ $7^{7}70$ $0.51$ $0.50$ $97$ $$ $$ $8-113$ $$ $7^{7}370$ $0.78$ $0.50$ $97$ $$ $$ $8-113$ $$ $7^{7}370$ $0.78$ $0.75$ $104$ $$ $$ $8-113$ $$ $7^{7}370$ $1.0$ $1.0$ $1.0$ $104$ $$ $$ $8-113$ $$ $7^{7}370$ $1.0$ $1.0$ $1.0$ $1.0$ $104$ $$ $$ $8-116$ $$ $7^{7}370$ $1.0$ $1.0$ $1.0$ $100$ $$ $$ $$ $8-116$ $$ $7^{7}370$ $1.0$ $1.0$ $1.0$ $100$ $$ $$ $8-116$ $$ $7^{7}370$ $1.0$ $1.0$ $100$ $$ $$ $8-1120$ $$ $0.529536$ $0.99$ $1.0$ $99$ $$ $$ $80-120$ $$ $0.525536$ $0.94$ $0.10$ $94$ $$ $$ $80-120$ $$ $0.525536$ $0.94$ $0.10$ $94$ $$ $$ $16-120$ $$ $06035343$ $0.094$ $0.10$ $94$ $$ $$ $16-120$ $$ $06035343$ $0.094$ $0.10$ $94$ $$ $$ $16-120$ $$ $06035343$ $0.094$ $0.10$ $94$ $$ $$ $060126$ $06025343$ $10.7$ $0.10$ $94$ $$ <	Analyte	Result	Level	% Rec	Result	Level	% Rec	Limits	% Rec	Run	Number
0.51         0.50         101           8113 $7^{370}$ 0.48         0.50         97           8113 $7^{370}$ 0.78         0.55         104           8113 $7^{770}$ 1.0         1.0         104          1         9114 $7^{770}$ 1.0         1.0         104          1         9114 $7^{770}$ 1.0         1.0         100          1-0         1         9114 $7^{770}$ 1.0         1.0         100          1-0         1-         9120 $7^{770}$ 1.0         1.0         102          1-0         90-120 $95255295$ 0.094         0.10         94          76-120 $95255295$ 0.094         0.10         94          76-120 $95255295$ 187         20.0         94		1.0	1.0	103	E		1	87-113	1	P7370	008612-09C1
0.48         0.50         97           6-113          P7370           1.78         0.75         104           90-114          P7370           1.0         1.0         1.0         104           90-114          P7370           1.0         1.0         1.0         104           91          P7370           1.0         1.0         1.0         104           91          P7370           1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         91          91          91          91         91          91		0.51	0.50	101	1	ł	1	88-113	-	P7370	008612-09C1
0.78         0.75         104           90-114          F7370           1.0         1.0         104           87-115          F7370           1.0         1.0         104           87-115          F7370           1.0         1.0         100           80-120          87353           1.0         1.0         100           80-120          06035345           1.0         1.0         100          10         100          06035345           1.0         1.0         102           10          0535345           0.094         0.10         99           10         0535345           0.094         0.10         94           10         0535333           0.094         0.10         94           05353545         10.13           0.094         0.10         94           05353545         10.13         10.13         10.13 <td>a) Lead</td> <td>0.48</td> <td>0.50</td> <td>67</td> <td>!</td> <td>ł</td> <td></td> <td>86-113</td> <td>ł</td> <td>P7370</td> <td>008612-09C1</td>	a) Lead	0.48	0.50	67	!	ł		86-113	ł	P7370	008612-09C1
1.0       1	a) Manganese	0.78	0.75	104	1	ł		90-114		P7370	008612-09C1
1.0         1.0 <th1.0< th=""> <th1.0< th=""> <th1.0< th=""></th1.0<></th1.0<></th1.0<>	a) Zinc	1.0	1.0	104	ł	1	ł	87-115	1	P7370	008612-09C1
1         1.0         100           6013345           1.0         1.0         102          0         0          0603345           1.0         1.0         102          1.0         102          0         0           0.99         1.0         99          1.0         102          0	mmonia Nitrogen	1.0	1.0	100		ł		80-120		05295328	008613-01C1
1.0         1.0 <th1.0< th=""> <th1.0< th=""> <th1.0< th=""></th1.0<></th1.0<></th1.0<>	jeldahl Nitrogen	<del></del>	1.0	100	1	ł	1	80-120	ł	06035345	008608-01C1
0.99         1.0         99           80-120          0539530           0.68         0.67         103           80-120          06035343           0.094         0.10         94            0529530           18.7         20.0         94           10         90-120          06035343           18.7         20.0         94            10-120          0525595           18.7         20.0         94            06120          0612373	itrate as Nitrogen	1.0	1.0	102	ł	1	ł	80-120	1	05225296	008613-03C1
$ \begin{array}{rcccccccccccccccccccccccccccccccccccc$	itrite as Nitrogen	0.99	1.0	66	ł	1	ł	80-120	1	05295330	008613-11C1
0.094         0.10         94           80-120          0525295           18.7         20.0         94           76-120          06125373	hosphorus	0.68	0.67	103	ł	ł	1	80-120	1	06035343	008613-01C1
18.7 20.0 94 76-120 06125373	hosphorus, -ortho	0.094	0.10	94	ł			80-120	ł	05225295	008613-03C1
	otal Organic Carbon	18.7	20.0	94	-	ł		76-120	1	06125373	008613-01C1
	Total Organic Carbon	18.7	20.0	4	1	1	1	76-120	1	06125373	008613-01C1
(a) DOD and/or NELAC Accredited Analyte	(a) DOD and/or NI	ILAC Accredited And	lyte								

Page 1 of 1

Inorganic LCS Results for 008613

Lab Report No: 0	<b>ARDL, INC.</b> 008613	INC.	MATRIX SPIKE/SPIKE 400 Aviation Drive;	PIKE/SPI tion Dri	SPIKE/SPIKE DUPLICATE ation Drive; P.O. Box	CATE REPORT Box 1566		<b>Mt. Vernon, IL</b> Report	<b>IL</b> Report	<b>62864</b> Date:	06/02/2020
Project Name: CARLYLE LAKE Project No.:	LYLE LAKE		Analysis:	NP	PESTICIDES (8270SIM-MOD)	/OSIM-MOD)		Analytical Method: Prep Method:	ical Method: Prep Method:	1: 8270C 1: 3510C	
Field ID: CAR-1 Desc/Location: CARLYLE LAKE Sample Date: 05/20/2020 Sample Time: 0845 Matrix: WATER	CAR-1 CARLYLE LAKE 05/20/2020 0845 WATER		Prep. Amoun & Moi QC Ba' Level	Prep. Date: Amount Used: % Moisture: QC Batch: Level:	05/22/2020 1000 mL NA B11218 LOW		AR La Re An	ARDL Lab No.: Lab Filename: Received Date: Analysis Date:		008613-01 05/20/2020 05/28/2020	
		Sample	WS	MS	WS	MSD	MSD	MSD	% Rec		RPD
Parameter		Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin	u	QN	3.5	4	87.5	3.39	4	84.8	30-130	3.2	30
Atrazine	4	3.52	7.2	4	92	7.25	4	93.3 3	30-130	0.7	30
Metribuzin	u	UN	3.67	4	91.8	3.79	4	94.8 3	30-130	3.2	30
Alachlor		DN	2.23	4	55.8	2.26	4	56.5 3	30-130	1.3	30
Metolachlor	)r	2.78	6.54	4	94	6.48	4	92.5 3	30-130	6.0	30
Chlorpyrifos	os	DN	3.04	4	76	3.03	4	75.8 3	30-130	0.3	30
Cyanazine	61	UN	4.17	4	104.3	4.69	4	117.3 3	30-130	11.7	30
Pendimethalin	-in	DN	3.56	4	89	3.53	4	88.3	30-130	0.8	30
					10 6U	19 U.S.	en 11.				
	NNUC	SURRUGATE RECOVERTES:	KLES:		MS %K	MSD %K	*K LIMITS	S			

(a) DOD-QSM Accredited Analyte.

'nc' indicates sample >4X spike level.

'\*' indicates a recovery outside of standard limits.

Matrix Spikes for 008613-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

30-130

88

93

Triphenylphosphate

ARDL Report 8613 - Page 27 of 34

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

Lab Report No: 008613

Report Date: 06/12/2020

Project Name: CARLYLE LAKE

NELAC Certified - IL100308

	Sample	Sample	SM	SM	WS	MSD	MSD	MSD	% Rec		RPD		QC Lab
Analyte	Matrix	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit	Run	Number
(a) Iron	WATER	0.86	1.9	1.0	105	1.9	1.0	103	87-115	Ч	20	P7370	008613-01MS
(a) Manganese	WATER	0.079	0.60	0.50	105	0.60	0.50	104	90-114	Ч	20	P7370	008613-01MS
Ammonia Nitrogen	WATER	0.24	2.3	2.0	103	2.4	2.0	109	75-125	ŝ	20	05295328	008613-01MS
Kjeldahl Nitrogen	WATER	1.3	2.1	0.80	103	2.1	0.80	100	75-125	Ч	20	06035345	008613-11MS
Nitrate as Nitrogen	WATER	1.3	1.9	1.0	57 *	2.0	1.0	68 *	75-125	S	20	05225296	008613-03MS
Phosphorus	WATER	0.23	1.1	0.83	105	1.2	0.83	111	75-125	2	20	06035343	008613-01MS
Phosphorus, -ortho	WATER	0.13	0.22	0.10	06	0.24	0.10	110	75-125	6	20	05225295	008613-03MS
Total Organic Carbon	WATER	5.1	10.5	5.0	108	10.4	5.0	106	76-120	щ	20	06125373	008613-01MS

Inorganic Matrix Spikes for 008613

(a) DOD and/or NELAC Accredited Analyte.

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

	62864	
	IJ	
	Vernon,	
	Mt.	
SAMPLE DUPLICATE REPORT	400 Aviation Drive; P.O. Box 1566	
	INC.	
	ARDL,	

Lab Report No: 008613

Report Date: 06/12/2020

Project Name: CARLYLE LAKE

NELAC Certified - IL100308

q	r	02D1	02D1	04D1	04D1
QC Lab	Number	008613-02D1	008613-02D1	008613-04D1	008613-04D1
Analytical	Run	05275306	05275306	05265300	05265301
Mean	(Smp, D1, D2)	-			
Percent	Diff	18	19	12	9
	Units	MG/CU.M.	MG/CU.M.	MG/L	MG/L
Second	Duplicate			!	1
First	Conc'n Duplicate	6.2	1.7	64.0	9.0
Sample	Conc'n	7.4	1.4	56.5	8.5
	Analyte	Chlorophyll-a, Corrected	Pheophytin-a	Solids, Total Suspended	Solids, Volatile Suspend

(a) DOD and/or NELAC Accredited Analyte Sample Duplicates for 008613

Page 1 of 1

ARDL Report 8613 - Page 29 of 34



# Sample Receipt Information

Including as appropriate:

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

# ARDL Data Package 8613

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

ARDL Report 8613 - Page 30 of 34

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

(618) 244-3235 Phone (618) 244-1149 Fax

CHAIN OF CUSTODY RECORD

Ľ			-++7 (010)	211011 J CCZC-++Z (010)	U	(010)	4	44-1149 rax	L'AA											)					NDUDA	2 2	
	PROJECT Carlyle Lake			SA3						*	N-		4				9292		$\sim$					Id	RESERV	PRESERVATION	
	SAMPLERS: (Signature)					•	S	06			ELIA	1		Q	0.0	1/2/	3A							0	S E S	PECIFY	
	Ben breeting / An	d i letter	n)TrevisSchen	5		V is				N.	00	10	lic	SIA	N	\$0	_							ICEI	2 E *	ADDED AND FINAL pH IF KNOWN	0 /2
	SAMPLE NUMBER	DATE		ИО' OI СВУВВ СОМЬ		20,	Children	0,0		<u>20</u> 3	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	23		ON.	NAT	$\backslash$	$\searrow$			SA	REM C MPLE I	REMARKS OR SAMPLE LOCATION	z				
	CAR-1	5/20/2000 0845	0845	×	×		X	X	X	X	X	X												X	-		1
2	CAR - 2 - 0	_	1000	×	X	×	Х	X	X	Х														X			
3	CAR - 2 - 10		0201	×	X		Х	X	X		X													X	-		
5	CAR – 4		1145	X	X	×	X	X	X	X														X			
5	CAR - 13		1400	X	X		X	X	X	X														X			
9	CAR - 12		1430	X	X	X	X	X	X	X											e			X			
0	CAR - 15		1205	X	X	X	X	X	X	X														X			
3	CAR – KP – Marina		1200	X							$\sim$	X												X			
5	CAR – DW – Marina		0401	X							$\sim$	Ň												X			
0	CAR – BL – Marina		1230	X							~	X												X			
	KAS-1		0350	X	X	Х	×	X	X		$\sim$	X	X	X				Ruth	Ho		Denates		RMOI	X			
2	KAS-2		1030	X	X	Х	X	X	X		$\sim$	X	X	$\times$				1					RM36	X			
CAN	CAR-CSA		1600	$\boldsymbol{\lambda}$							~													$\succ$			
וחא			·																								
Rei				/	(																						
oort 8	8 Relinquished by: (Signature)	5/20/20	Time   615	Received by: (Signature)	oy: (S	ignatu	ure)	.2	REN	IARK	REMARKS/SPECIAL INSTRUCTIONS:	CIAI	SNI	TRU	CTIC	NS:	]							-	-	2	
613 -	Refinquished by (Signature)	Date /	Time /7.70	Received by: (Signature	by:(S	ignatı	ire)		*Pre #Pre	serve	*Preserved with H <sub>2</sub> SO <sub>4</sub> #Preserved with HNO <sub>3</sub>	H <sub>2</sub> SC HNO	3 3														
Pac	Received for Laboratory by:		Time	Shipping Ticket No.	<b>Ticket</b>	No.																					
1e 3	Valler brannung	05/2080	/72D																								
ىم 1 of ?	LIRCHASE ORDER NO																										
34																											

	COOLER RECEIPT ARDL, INC.		
81.13	ARDE, HO	Cooler # Blue (lof:	3)
ARDL #: 800		Number of Coolers in Shipmer	nt: 3
Project: Carlyle L	ake		
			VEQ CO
1. Did cooler come with a ship	pping slip (airbill, etc.)? r name and airbill number here: ARDL	Carrier	YES NO
			6
-	side of cooler?		
-	ere?,Seal Date:		
	ken and intact at the date and time of arrival?		
4. Did you screen samples fo	r radioactivity using a Geiger Counter?	l	
	ed in a plastic bag?Handdeliv	,	
	out properly (ink, signed, etc.)?		$\sim$
	ed in appropriate place by ARDL personnel?		$\frown$
8. Was project identifiable fro	m custody papers? If YES, enter project name a	t the top of this form	(.YES) NO N/A
9. Was a separate container	provided for measuring temperature? YES	NO Observed Cooler Temp Correcti	ion factor (), D C
B. LOG-IN PHASE: Date sar	mples were logged-in: 05/21/2020	(Signature) DCB	
10. Describe type of packing ir	cooler: Loose ce		
11. Were all samples sealed ir	n separate plastic bags?		
12. Did all containers arrive un	broken and were labels in good condition?		NO
13. Were sample labels compl	lete?		YES NO
14. Did all sample labels agree	e with custody papers?		YES NO
15. Were correct containers us	sed for the tests indicated?		YES NO
16. Was pH correct on preserv	ved water samples?		ES NO N/A
17. Was a sufficient amount of	f sample sent for tests indicated?		
18. Were bubbles absent in Ve	OA samples? If NO, list by sample #:		YES NO (N/A)
19. Was the ARDL project coo	ordinator notified of any deficiencies?		YES NO NA
Comments	and/or Corrective Action:	Sample Tra	ansfer
		Fraction Fi	action
		Area # A	rea #
		By By	у
		Deb	
		05/21/2020	n
		Chain-of-Custody #	
(By: Signature)	Date:	]	

	<u>COOLER RECEIPT I</u> ARDL, INC.		DRT			
	DL #: 8613	-	er # Red 1 (20	£3)		
ARL			ber of Coolers in Shipr			
Proj	ect. Carlyle Lake	Date	Received: <u>05/20</u>	0/2020	2	
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 05/20	olzóz				
1.	Did cooler come with a shipping slip (airbill, etc.)?			YES (	NO	
	If YES, enter carrier name and airbill number here: <u>ARDL</u>	Cou	rier			3 10-104
2.	Were custody seals on outside of cooler?			YES	<b>(()</b>	N/A
	How many and where?,Seal Date:		,Seal Name:	<u> </u>		•
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?	í		YES	NO	
5.	Were custody papers sealed in a plastic bag? Hand de livered	<b>(</b>		YES	NO	
6.	Were custody papers filled out properly (ink, signed, etc.)?				NO	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?			ES	)NO	N/A
8.	Was project identifiable from custody papers? If YES, enter project name at	t the top	of this form		NO	N/A
9.	Was a separate container provided for measuring temperature? YES	NO		o (	An	bienf
В.	LOG-IN PHASE: Date samples were logged-in: 05/21/2020	(Signatu				
10.	Describe type of packing in cooler: Loose lee					
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?				NO	
13.	Were sample labels complete?See Chain				$\bigcirc$	
14.	Did all sample labels agree with custody papers? See Chain			YES	NO	
15.	Were correct containers used for the tests indicated?				NO	
16.	Was pH correct on preserved water samples?			ÝE9	NO	N/A
17.	Was a sufficient amount of sample sent for tests indicated?				NO	
18.	Were bubbles absent in VOA samples? If NO, list by sample #:			YES	NO	NÃ
19.	Was the ARDL project coordinator notified of any deficiencies?			YES	NO	NÃ
	Comments and/or Corrective Action:	]	Sample			
R	iver Markers Missing From		Fraction	Fraction		
	1 i l i l i l i l i i i i i i i i i i i		Area #	Area #		
	have but on the	-	Walk-In	By		
	bottles.		OCB	Ly		
		1	On 5/2012020	On		
		-	05/20/2020			
			Chain-of-Custody #			
(E	y: Signature) Date:					

	COOLER RECEIPT REPORT				
	ARDL, INC.	17/2	021		
AR	DL #: 863 Cooler # P	20/2(3)	0+07		
		oolers in Ship			-
Pro	pject: W/y/e Lake Date Receive	ed: <u>05/20</u>	0/2020	)	
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened:	e) DCB			
1.	Did cooler come with a shipping slip (airbill, etc.)?		YES	$\bigcirc$	
	If YES, enter carrier name and airbill number here: ARDL Courier	<b>~</b>			
2.	Were custody seals on outside of cooler?		YES	NÒ	N/A
	How many and where?,Seal Date:,Seal Date:,Sead Date:,Sead Date:,Sead Date:,Sead Date:,Se	eal Name:			
3.	Were custody seals unbroken and intact at the date and time of arrival?		YES	NO	
4.	Did you screen samples for radioactivity using a Geiger Counter?		ĒES	) NO	
5.	Were custody papers sealed in a plastic bag? Hand deline de		YES	$\bigcirc$	)
6.	Were custody papers filled out properly (ink, signed, etc.)?			' 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	)	and the second se	NO '	
9.	Was a separate container provided for measuring temperature? YESNOObset	rved Cooler Tem	rection factor	CAN	1 bien
В.	LOG-IN PHASE: Date samples were logged-in: 05/21/2020 (Signature)	B	rection factor		
10.	Describe type of packing in cooler:				
11.	Were all samples sealed in separate plastic bags?		YES	$\bigcirc$	N/A
12.	Did all containers arrive unbroken and were labels in good condition?			NO	
13.	Were sample labels complete?		YES	NO	
14.	Did all sample labels agree with custody papers?			NO	
15.	Were correct containers used for the tests indicated?			NO	
16.	Was pH correct on preserved water samples?			<b>)</b> 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:	Sample	Transfer		
	Fraction		Fraction		
	Area #		Area #		
		K-1n	Du		
		8	Ву		
	On		On		
	05/	2/12020			
	Chain-	of-Custody #			
(E	By: Signature) Date:	-			



Environmental | Analytical | Management | Safety

### **Customer Name: SLCOE**

### **Project Name: Carlyle Lake**

Samples Received at ARDL: 7/29/20

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

<u>www.ardlinc.com</u>

Date: 9/11/20

Lab Name: ARDL, Inc.

ARDL Report No.: 8633

## CASE NARRATIVE

ollected 7/29/20	<u>Number</u>	Analyses Requested
7/29/20	the second state of the se	,,,
1120120	8633-01	NP Pesticides, Metals(1), Inorganics(2)
7/29/20	8633-02	NP Pesticides, Inorganics(2)(3)
7/29/20	8633-03	Metals(1), Inorganics(2)
7/29/20	8633-04	NP Pesticides, Inorganics(2)(3)
7/29/20	8633-05	NP Pesticides, Inorganics(2)
7/29/20	8633-06	NP Pesticides, Inorganics(2)(3)
7/29/20	8633-07	NP Pesticides, Inorganics(2)(3)
7/29/20	8633-08	E Coli
7/29/20	8633-09	E Coli
7/29/20	8633-10	E Coli
7/29/20	8633-11	E Coli
	7/29/20 7/29/20 7/29/20 7/29/20 7/29/20 7/29/20 7/29/20 7/29/20 7/29/20	7/29/208633-027/29/208633-037/29/208633-047/29/208633-057/29/208633-067/29/208633-077/29/208633-087/29/208633-097/29/208633-10

(1) Including iron and manganese.

(2) Including ammonia, nitrate, orthophosphate, 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. The closing 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.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Carlyle Lake

## ARDL Report No.: 8633

# **CASE NARRATIVE (Continued)**

### INTERNAL STANDARD

All internal standard criteria were met.

### **SURROGATE**

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 all undetected, except for TOC. The data is flagged appropriately with a 'B' qualifier for the associated samples.

### 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, 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.
- B This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

### **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

Page 2 of 2

# 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 8633

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO ARDL Report 8633 - Page 3 of 31

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

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analytical Me	-		DES (82 <sup>-</sup>	70SIM-MO	(D)
Field ID:	CAR-1		ARDL 1	Lab No.:	00863	33-01	
Desc/Location:			Lab F:	ilename:	E0804	4005	
Sample Date:	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	0920		Prep.	Date:	07/3:	L/2020	
Matrix:	WATER		Analys	sis Date:	08/04	4/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B112	52	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	0.878		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	1.98		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	80%	
			]

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633

Report Date: 09/03/2020

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Project Name: Project No:	CARLYLE LAKE	AKE						4	Analysis: VELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: Field ID: Received:	008633-01 CAR-1 07/29/2020	0	Samp Sam Sam	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 07/29/2020 0920			Matrix: Moisture:	:: WATER :: NA	
Analyte	t Ø	LOD	год	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron		0.0400	0.0500		0.370	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
(a) Manganese		0.00400	0.00500		0.188	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
Ammonia Nitrogen	en	0.0200	0.0300		0.087	MG/L	NONE	350.1	NA	08/05/20	08115458
Nitrate as Nitrogen	rogen	0.0190	0.0200		0.079	MG/L	NONE	GREEN	NA	08/05/20	08135462
Phosphorus		0.00800	0.0100		0.39	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	rtho	0.00800	0.0100		0.283	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	Suspended	2.50	2.50		12.8	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	le Suspen	2.50	2.50		6.0	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	Carbon	0.500	1.00	Ю	5.3	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-01, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.:	CARLYLE LAKE	Anal Analytical Me	-	PESTICIE	DES (827	0SIM-MO	D)
5	5/						
NELAC Certi	fied - IL100308	Prep Me	ethod: 35	5100			
Field ID:	CAR-2-0		ARDL I	Lab No.:	00863	33-02	
Desc/Location:	CARLYLE LAKE		Lab F	llename:	E0804	1008	
Sample Date:	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	1110		Prep.	Date:	07/31	/2020	
Matrix:	WATER		Analys	sis Date:	08/04	1/2020	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1125	52	
% Moisture:	NA		Level	:	LOW		
					Data		Dilutior
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	0.838		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	1.88		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	70%	

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

(a) DOD-QSM Accredited Analyte.

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

> 008633 Lab Report No:

CARLYLE LAKE

Project Name: Project No:

09/03/2020 Report Date: NELAC Certified - IL100308

Analysis: Inorganics

ARDL No: 008633-02	0	Sampling	ing Lo	Loc'n: CARLY	CARLYLE LAKE			Matrix:	.: WATER	
Field ID: CAR-2-0		Samp	Sampling Date:		07/29/2020			Moisture:	: NA	
Received: 07/29/2020	20	Samp	Sampling Time:	ime: 1110						
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	ΓΟΟ	Flag	Result	Units	Method	Method	Date	Date	Number
Ammonia Nitrogen	0.0200	0.0300		DN	MG/L	NONE	350.1	NA	08/05/20 08115458	8115458
Chlorophyll-a, Correcte	1.0	1.00		22.7	MG/CU.M.	10200H	10200H	07/30/20	08/11/20 08135470	8135470
Nitrate as Nitrogen	0.0190	0.0200	Ы	ND	MG/L	NONE	GREEN	NA	08/05/20 08135462	8135462
Pheophytin-a	1.0	1.00		20.5	MG/CU.M.	10200H	10200H	07/30/20	08/11/20 08135470	8135470
Phosphorus	0.00800	0.0100		0.338	MG/L	365.2	365.2	08/17/20	08/18/20 08195493	8195493
Phosphorus, -ortho	0.00800	0.0100		0.242	MG/L	NONE	365.2	NA	07/30/20 07305429	7305429
Solids, Total Suspended	2.0	2.00		10.6	MG/L	NONE	160.2	NA	07/30/20 08045437	8045437
Solids, Volatile Suspen	2.0	2.00		7.4	MG/L	NONE	160.4	NA	07/30/20 08045438	8045438

08/06/20 08135481

NA

415.1

NONE

MG/L

5.5

ш

1.00

0.500

Total Organic Carbon

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-02, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 09/03/2020

Project Name: Project No:	CARLYLE LAKE	LAKE							Analysis ELAC Certi	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: Field ID: Received:	008633-03 CAR-2-10 07/29/2020	20	Samp. Sami Sami	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 07/29/2020 1130			Matrix: Moisture:	: WATER : NA	
Analyte	t e	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron		0.0400	0.0500		1.41	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
(a) Manganese		0.00400	0.00500		0.870	MG/L	3010A	6010C	08/03/20	08/03/20	P7401
Ammonia Nitrogen	en	0.0200	0.0300		0.419	MG/L	NONE	350.1	NA	08/05/20	08115458
Nitrate as Nitrogen	rogen	0.0190	0.0200		0.027	MG/L	NONE	GREEN	NA	08/05/20	08135462
Phosphorus		0.00800	0.0100		0.533	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	rtho	0.00800	0.0100		0.278	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	Suspended	2.0	2.00		25.2	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	le Suspen	2.0	2.00		6.4	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	Carbon	0.500	1.00	щ	4.9	MG/L	NONE	415.1	NA	08/06/20 (	08135481

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-03, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analytical Me			DES (827	0SIM-MO	D)
Field ID:	CAR-4		ARDL 1	Lab No.:	00863	33-04	
Desc/Location:			Lab Fi	lename:	E0804	1009	
Sample Date:	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	1315		Prep.	Date:	07/33	L/2020	
Matrix:	WATER		Analys	sis Date:	08/04	1/2020	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1125	52	
% Moisture:	NA		Level	:	LOW		
				······································	Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	0.563		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	2.56		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	
17	Triphenylphosphate	30-130	74%	
_				

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633

Report Date: 09/03/2020

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Project Name: CARLYLE LAKE Project No:	LAKE						И	Analysis IELAC Certi	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008633-04 Field ID: CAR-4 Received: 07/29/2020	04 020	Sampl Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 07/29/2020 1315			Matrix: Moisture:	: WATER : 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	08/05/20 08115458	08115458
Chlorophyll-a, Correcte	e 1.0	1.00		17.6	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00	Ŀ	27.3	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.312	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	0.00800	0.0100		0.112	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	1 2.0	2.00		16.6	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	n 2.0	2.00		5.8	MG/L	NONE	160.4	NA	07/30/20	08045438
Total Organic Carbon	0.500	1.00	д	5.9	MG/L	NONE	415.1	NA	08/06/20	08135481

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-04, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 08/05/2020

Project No.:	CARLYLE LAKE fied - IL100308	Analytical Me	~		DES (827	70SIM-MO	D)
Field ID:	CAR-13		ARDL 1	Lab No.:	00863	33-05	
Desc/Location:	CARLYLE LAKE		Lab F:	llename:	E0804	4010	
Sample Date:	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	1500		Prep.	Date:	07/33	1/2020	
Matrix:	WATER		Analys	sis Date:	08/04	4/2020	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B112	52	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	0.563		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	2.41		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	86%

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633

Project Name: CARLYLE LAKE

Report Date: 09/03/2020

Analysis: Inorganics

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Project No:							N	ELAC Certi	NELAC Certified - IL100308	00308
ARDL No: 008633-05	5	Sampl	Sampling Loc'n:		CARLYLE LAKE			Matrix:	: WATER	
Field ID: CAR-13 Received: 07/29/2020	20	Samp Samp	Sampling Date: Sampling Time:	tte: 07/29/2020 .me: 1500	/2020			Moisture:	: NA	
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	LOQ	Flag	Result	Units	Method	Method	Date	Date	Number
Ammonia Nitrogen	0.0200	0.0300		QN	MG/L	NONE	350.1	NA	08/05/20 08115458	08115458
Nitrate as Nitrogen	0.0190	0.0200		1.88	MG/L	NONE	GREEN	NA	08/05/20 08135462	08135462
Phosphorus	0.00800	0.0100		0.325	MG/L	365.2	365.2	08/17/20	08/18/20 08195493	08195493
Phosphorus, -ortho	0.00800	0.0100		0.0654	MG/L	NONE	365.2	NA	07/30/20 07305429	07305429
Solids, Total Suspended	2.0	2.00		31.4	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	2.0	2.00		4.8	MG/L	NONE	160.4	NA	07/30/20 08045438	08045438
Total Organic Carbon	0.500	1.00	В	4.0	MG/L	NONE	415.1	NA	08/06/20 08135481	08135481

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-05, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.:		Anal Analytical Me	-	P PESTICII 270C	DES (827	70SIM-MO	D)
NELAC Certi	fied - IL100308	Prep Me	ethod: 35	510C			
Field ID:	CAR-12		ARDL I	Lab No.:	00863	33-06	
Desc/Location:	CARLYLE LAKE		Lab F	ilename:	E0804	4011	
Sample Date:	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	1420		Prep.	Date:	07/32	L/2020	
Matrix:	WATER		Analys	sis Date:	08/04	4/2020	
Amount Used:	800 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B1125	52	
% Moisture:	NA		Level	:	LOW		
					Data	<u></u>	Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	0.550		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	2.43		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.

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Page 1 of 1

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

Lab Report No: 008633

CARLYLE LAKE

Project Name: Project No:

Report Date: 09/03/2020

Analysis: Inorganics NELAC Certified - IL100308

	6	[Samp]	Sampling Loc'n:		CARLYLE LAKE			Matrix:		
Field ID: CAR-12 Received: 07/29/2020	20	Sam Sam	Sampling Date: Sampling Time:		07/29/2020 1420			Moisture:	: NA	
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	ГОД	Flag	Result	Units	Method	Method	Date	Date	Number
Ammonia Nitrogen	0.0200	0.0300		QN	MG/L	NONE	350.1	NA	08/05/20 08115458	8115458
Chlorophyll-a, Correcte	1.0	1.00		8.5	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Nitrate as Nitrogen	0.0190	0.0200		1.88	MG/L	NONE	GREEN	NA	08/05/20	08135462
Pheophytin-a	1.0	1.00		9.8	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470
Phosphorus	0.00800	0.0100		0.247	MG/L	365.2	365.2	08/17/20	08/18/20 (	08195493
Phosphorus, -ortho	0.00800	0.0100		0.068	MG/L	NONE	365.2	NA	07/30/20 (	07305429
Solids, Total Suspended	2.44	2.44		65.6	MG/L	NONE	160.2	NA	07/30/20 (	08045437
Solids, Volatile Suspen	2.44	2.44		6.83	MG/L	NONE	160.4	NA	07/30/20 (	08045438
Total Organic Carbon	0.500	1.00	В	4.1	MG/L	NONE	415.1	NA	08/06/20 (	08135481

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-06, Inorganic Analyses

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

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analytical Me	-		DES (82 <sup>-</sup>	70SIM-MO	D)
Field ID:	CAR-15		ARDL 1	Lab No.:	00863	33-07	
Desc/Location:	CARLYLE LAKE			ilename:		4012	
*	07/29/2020		Receiv	ved Date:	07/29	9/2020	
Sample Time:	1330		Prep.	Date:	07/3:	1/2020	
Matrix:	WATER		Analy	sis Date:	08/04	4/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	cch:	B112	52	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	0.522		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	2.37		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	75%	İ

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: 008633

CARLYLE LAKE

Project Name:

Report Date: 09/03/2020

Analysis: Inorganics

L

I

L

08/06/20 08135481

NA

415.1

NONE

MG/L

5.7

р

1.00

0.500

Total Organic Carbon

Project No:								Z	NELAC Certified - IL100308	fied - IL	00308
ARDL No: Field ID: Received:	008633-07 CAR-15 07/29/2020	0	Samp] Samp Samp	Sampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 07/29/2020 1330			Matrix: Moisture:	: WATER : NA	
Analyte	te	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	en	0.0200	0.0300		DN	MG/L	NONE	350.1	NA	08/05/20	08/05/20 08115458
Chlorophyll-a, Correcte	Correcte	1.0	1.00		23.8	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08/11/20 08135470
Nitrate as Nitrogen	rogen	0.0190	0.0200		DN	MG/L	NONE	GREEN	NA	08/05/20	08/05/20 08135462
Pheophytin-a		1.0	1.00		19.1	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08/11/20 08135470
Phosphorus		0.00800	0.0100		0.325	MG/L	365.2	365.2	08/17/20	08/18/20	08195493
Phosphorus, -ortho	rtho	0.00800	0.0100		0.112	MG/L	NONE	365.2	NA	07/30/20	07305429
Solids, Total Suspended	Suspended	2.86	2.86		23.7	MG/L	NONE	160.2	NA	07/30/20	08045437
Solids, Volatile Suspen	le Suspen	2.86	2.86		8.0	MG/L	NONE	160.4	NA	07/30/20	07/30/20 08045438

(a) DOD and/or NELAC Accredited Analyte.

Sample 008633-07, Inorganic Analyses

10	Report Date: 09/03/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 07/29/20 07315434	
Box 1566 62864				Prep Method	NONE	
ARDL, INC. Aviation Drive; P.O. Mt. Vernon, Illinois			CARLYLE LAKE 07/29/2020 1320	Units	COL/100 ML	
AR ) Aviation D Mt. Vernon,				Result	75.0	
400 Avi Mt.			Sampling Loc'n: Sampling Date: Sampling Time:	Flag		
			S San San	ΓΟŌ	1.00	
	No: 008633	CARLYLE LAKE	008633-08 CAR-KP MARINA 07/29/2020	te LOD	1.0	
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform	

Sample 008633-08, Inorganic Analyses

Q	Report Date: 09/03/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 07/29/20 07315434	
Box 1566 62864				Prep Method	NONE	
ARDL, INC. Aviation Drive; P.O. ft. Vernon, Illinois			CARLYLE LAKE 07/29/2020 1157	Units	COL/100 ML	
AR ation D Vernon,				Result	31.0	
400 Avi Mt.			Sampling Loc'n: Sampling Date: Sampling Time:	Flag		
			San Sar Sar	ΓΟŌ	1.00	
	. No: 008633	CARLYLE LAKE	008633-09 CAR-DW MARINA 07/29/2020	te LOD	1.0	
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform	

Sample 008633-09, Inorganic Analyses

	Report Date: 09/03/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 07/29/20 07315434	
Box 1566 62864				Prep A Method N	NONE	
			LE LAKE /2020	Units	COL/100 ML	
ARD ation Dr Vernon,	n Dri on, I 07/29/ 1530					
400 Avi Mt.	Sampling Loc'n: CARL Sampling Loc'n: CARL Sampling Time: 1530 Sampling Time: 1530 0 Flag Result					
			Sam Sau Sau	ΓΟŐ	1.00	
	No: 008633	CARLYLE LAKE	008633-10 CAR-BL MARINA 07/29/2020	LOD	1.0	
	Lab Report No: 008633	Project Name: ( Project No:	ARDL No: ( Field ID: ( Received: (	Analyte	E. Coliform	

Sample 008633-10, Inorganic Analyses

566	Report Date: 09/03/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	o Analysis Prep Analysis Run od Method Date Date Number	I 1604 NA 07/29/20 07315434
Box 1566 62864				Prep Method	NONE
ARDL, INC. Aviation Drive; P.O. Mt. Vernon, Illinois			YLE LAKE 29/2020 3	Units	COL/100 ML
AR ation D /ernon,	CARLYL 07/29/ 1143 sult 2.0				
400 Avia Mt. V			Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
4			Sampl Samp Samp	ГОД	1.00
	Lab Report No: 008633	CARLYLE LAKE	008633-11 CAR-CSA MARINA 07/29/2020	LOD	1.0
	Lab Report	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008633-11, Inorganic Analyses

### METHOD BLANK REPORT ARDL, Inc. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864

Lab Report No: 008633

Report Date: 08/05/2020

Project Name: Project No.:	CARLYLE LAKE	Analys Analytical Meth	sis: NP PEST nod: 8270C	CICIDES (82	270SIM-MC	(
NELAC Certi	fied - IL100308	Prep Meth	od: 3510C			
Field ID:	NA	4444	ARDL Lab No	o.: 008	533-01B1	
Desc/Location:	NA		Lab Filenam	ne: E080	04003	
Sample Date:	NA		Received Da	ate: NA		
Sample Time:	NA		Prep. Date:	07/3	31/2020	
Matrix:	QC Material		Analysis Da	ate: 08/0	04/2020	
Amount Used:	1000 mL		Instrument	ID: AG5		
Final Volume:	1 mL		QC Batch:	B112	252	
<pre>% Moisture:</pre>	NA		Level:	LOW		
					Data	<u></u>
Parameter		LOD	LOQ	Result	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 RECOV	ERIES:	Limits	3	R	esults	

SURROGATE RECOVERIES:	Limits	Results	
Triphenylphosphate	30-130	87%	İ
			i
			1

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008633

CARLYLE LAKE

Project Name:

Report Date: 09/03/2020

NELAC Certified - IL100308

			Blank		Prep	Analysis	Prep	Analysis		QC Lab
Analyte	LOD	ТОО	Result	Units	Method	Method	Date	Date	Run	Number
(a) Iron	0.040	0.050	DN	MG/L	3010A	6010C	08/03/20	08/03/20	P7401	008633-01B1
(a) Manganese	0.004	0.005	DN	MG/L	3010A	6010C	08/03/20	08/03/20	P7401	008633-01B1
Ammonia Nitrogen	0.020	0.030	DN	MG/L	NONE	350.1	NA	08/05/20	08115458	008633-01B1
Chlorophyll-a, Corre	1.0	1.0	ΟN	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470	008633-04B1
E. Coliform	1.0	1.0	DN	COL/100 ML	NONE	1604	NA	07/29/20 07315434	07315434	008633-08B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	08/05/20 08135462	08135462	008633-02B1
Pheophytin-a	1.0	1.0	QN	MG/CU.M.	10200H	10200H	07/30/20	08/11/20	08135470	008633-04B1
Phosphorus	0.008	0.010	DN	MG/L	365.2	365.2	08/17/20	08/18/20	08195493	008632-01B1
Phosphorus, -ortho	0.008	0.010	DN	MG/L	NONE	365.2	NA	07/30/20	07/30/20 07305429	008633-04B1
Solids, Total Suspen	1.0	1.0	UN	MG/L	NONE	160.2	NA	07/30/20	08045437	008632-01B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	07/30/20	08045438	008632-01B1
Total Organic Carbon	0.50	1.0	0.84	MG/L	NONE	415.1	NA	08/05/20 08135481	08135481	008632-02B1

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008633

	ARDL, INC.	INC.	BLANK 400 Av	5	SPIKE D Drive;	UPLICATE P.O. Bo	SPIKE/SPIKE DUPLICATE REPORT iation Drive; P.O. Box 1566	Mt. Ve	Mt. Vernon, IL	L 62864	
Lab Report No:	: 008633								Rep	Report Date:	08/05/2020
Project Name: CARLYLE LAKE Project No.:	CARLYLE LAKE		Ane	Analysis: NP P	ESTICIDE	NP PESTICIDES (8270SIM-MOD)	( dom-m:	Analy	tical Method: Prep Method:	Analytical Method: 8270C Prep Method: 3510C	00
Matrix: Amount Used:	QC Material 1000 mL			QC Batch: Level:	B11252 LOW	:52		Prep. I Analysi	Prep. Date: Analysis Date:	07/31/2020 08/04/2020	0 0
			Spike	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery		RPD
щ	Parameter	R	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Tr	Trifluralin		3.22	4	81		1	1	30-130	-	
	Atrazine	. ,	3.13	4	78		{		30-130	1	1
ž	Metribuzin	. ,	3.11	4	78	1	1		30-130	1	-
	Alachlor	.,	3.23	4	81	1	1	1	30-130	1	
Me	Metolachlor	. ,	3.34	4	84	ł		1	30-130	1	1
Ch	Chlorpyrifos		3.31	4	83	1	1	1	30-130	1	1
0	Cyanazine	. ,	3.34	4	84	1			30-130		
Pen	Pendimethalin	.,	3.33	4	83	ł	1	ł	30-130	ł	1
	SUR SUR	SURROGATE RECOVERIES: Triphenylphosphate	COVERIES: sphate		Spike %R 81		Duplicate %R % 	&R Limits 30-130			

(a) DOD-QSM Accredited Analyte.'\*' indicates a recovery outside of standard limits.

Spike Blanks for 008633-01, NP PESTICIDES (8270SIM-MOD)

AR	ARDL, INC.	400 A1	400 Aviation Drive; P.O.	ı Driv∈	; P.O.	. Box 1566	L566	Mt. V	Vernon, IL	. 62864
Lab Report No: 00	008633								Report Date:	ate: 09/03/2020
Project Name:	CARLYLE LAKE	LAKE							NELAC Certified	rtified - 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	104	1	1		87-115		P7401	008633-01C1
(a) Manganese	0.81	0.75	108	!	ł	!	90-114		P7401	008633-01C1
Ammonia Nitrogen	1.0	1.0	104	ł	ł	ł	80-120	ł	08115458	008633-01C1
Nitrate as Nitrogen	0.93	1.0	93	ł	ł	1	80-120	ł	08135462	008633-02C1
Phosphorus	0.67	0.67	101	ł	8	-	80-120	ł	08195493	008632-01C1
Phosphorus, -ortho	0.10	0.10	102	ł	ł		80-120	ł	07305429	008633-04C1
Total Organic Carbon	20.0	20.0	100	ł	1	1	76-120	}	08135481	008632-02C1
NOTE: Any values tabulated above marked with an	abulated above m	arked with	an asteris	asterisk are outside of acceptable limits.	ide of acc	eptable li	mits.			
(a) DOD and/or NELAC Accredited Analyte	AC Accredited An	alyte								

Inorganic LCS Results for 008633

ARDL, INC.	INC.	MATRIX SPIKE/ 400 Aviation	SPIKE/SU ation D1	SPIKE/SPIKE DUPLICATE ation Drive; P.O. Box	CATE REPORT Box 1566		Mt. Vernon, IL	n, IL	62864	
Lab Report No: 008633								Report	Date:	08/05/2020
Project Name: CARLYLE LAKE Project No.:		Analysis:	NP	PESTICIDES (8270SIM-MOD)	70SIM-MOD)		Analytical Prep	ical Method: Prep Method:	1: 8270C 1: 3510C	
Field ID: CAR-1		ЪЧ	Prep. Date:	07/31/2020	0	R +	ARDL Lab No.:		008633-01	
		AIII 9%	Amount Usea: % Moisture:						07/29/2020	
sample Time: 0920 Matrix: WATER		Le L	QC Batch: Level:	B11252 LOW		A	Analysis D	Date: 08/(	08/04/2020	
	Sample	MS	WS	MS	MSD	MSD	MSD	% Rec		RPD
Parameter	Result	Result	t Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin	QN	3.64	4.44	82	3.72	4.44	83.8	30-130	2.1	30
Atrazine	0.878	4.52	4.44	82	4.46	4.44	80.5	30-130	1.5	30
Metribuzin	DN	3.73	4.44	84	3.7	4.44	83.3	30-130	0.9	30
Alachlor	DN	3.5	4.44	78.8	3.6	4.44	81	30-130	2.8	30
Metolachlor	1.98	5.4	4.44	LL	5.52	4.44	79.8	30-130	2.2	30
Chlorpyrifos	QN	3.57	4.44	80.3	3.61	4.44	81.3	30-130	1.2	30
Cyanazine	DN	3.87	4.44	87	3.82	4.44	86	30-130	1.2	30
Pendimethalin	QN	3.98	4.44	89.5	3.91	4.44	88	30-130	1.7	30
	SURROGATE RECOVERIES:	ERIES:		MS &R	MSD &R	%R Limits	its			
Tri	Triphenylphosphate	ate		82	82	30-130	0			

(a) DOD-QSM Accredited Analyte.

'nc' indicates sample >4X spike level.

'\*' indicates a recovery outside of standard limits.

Matrix Spikes for 008633-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

ARDL Report 8633 - Page 25 of 31

	62864
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	Vernon,
<b>REPORT</b>	Mt.
ATE	1566
DUPLICATE	Box
	Р.О.
X SPIKE/SPIKE	Drive;
MATRIX SP	400 Aviation
~	400 2
	INC.
	ARDL,

Lab Report No: 008633

CARLYLE LAKE

Project Name:

Report Date: 09/03/2020

IL100308	
I	
Certified	
NELAC	

	Sample	Sample	MS	WS	SM	MSD	MSD	MSD	% Rec		RPD		QC Lab
Analyte	Matrix	Result	Result	Level	\$ Rec	Result	Level	* Rec	Limits	RPD	Limit	Run	Number
(a) Iron	WATER	0.37	1.5	1.0	108	1.5	1.0	112	87-115	2	20	P7401	008633-01MS
(a) Manganese	WATER	0.19	0.72	0.50	107	0.72	0.50	106	90-114	Ч	20	P7401	008633-01MS
Ammonia Nitrogen	WATER	0.087	1.9	2.0	92	1.9	2.0	06	75-125	7	20	08115458	008633-01MS
Nitrate as Nitrogen	WATER	UN	0.72	1.0	72 *	0.73	1.0	73 *	75-125	2	20	08135462	008633-02MS
Phosphorus	WATER	0.34	1.2	0.83	100	1.2	0.83	101	75-125	г	20	08195493	008633-02MS
Phosphorus, -ortho	WATER	0.11	0.22	0.10	111	0.22	0.10	105	75-125	e	20	07305429	008633-04MS

Inorganic Matrix Spikes for 008633

(a) DOD and/or NELAC Accredited Analyte.

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

Page 1 of 1

ARDL Report 8633 - Page 26 of 31

	62864
	IJ
	Vernon,
	Mt.
SAMPLE DUPLICATE REPORT	400 Aviation Drive; P.O. Box 1566
	INC.
	ARDL,

Lab Report No: 008633

09/03/2020 Report Date:

> CARLYLE LAKE Project Name:

NELAC Certified - IL100308

QC Lab Number	008633-04D1	008633-04D1	008633-04D1	008633-04D1	
Analytical Run	08135470	08135470	08045437	08045438	
Mean (Smp,D1,D2)	1		1		
Percent Diff	9	30*	ω	10	
Units	MG/CU.M.	MG/CU.M.	MG/L	MG/L	
Second te Duplicate	8	!	1	1	
Sample First Conc'n Duplicate I	16.5	20.1	18.0	6.4	
Sample Conc'n	17.6	27.3	16.6	5.8	
Analyte	Chlorophyll-a, Corrected	Pheophytin-a	Solids, Total Suspended	Solids, Volatile Suspend	

I

See Case Narrative for exceptions. \* indicates that agreement between duplicates is greater than 20%.
 (a) DOD and/or NELAC Accredited Analyte
 Sample Duplicates for 008633



# Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8633

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

ARDL, Inc.

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

3633

	COOLER RECEIPT	REPO	DRT			012020
	ARDL, INC	<u>.</u>	~	Z	)712 1	)CB
AR	DL#: <u>8633</u> ject: <u>Carlyle Lake</u>	Coo Nun	DRT ler # <u>IBlue</u> (1 nber of Coolers in Shipi	of 3 nent: B	· ·2 '	07/29/2020 DCB
Pro	ject: Carlyle Lake		e Received: <u>07/29</u>			
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened	9/202	O(Signature)			
1.	Did cooler come with a shipping slip (airbill, etc.)?	••••••		YES	NO	
	If YES, enter carrier name and airbill number here: ARDL (	Couri	er-Valeria	Ľ		
2.	Were custody seals on outside of cooler?			YES (	NO	N/A
	How many and where?,Seal Date	э:	,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 - aud delive	ered		YES (	NO	
6.	Were custody papers filled out properly (ink, signed, etc.)?				NO	N/A
7.	Were custody papers signed in appropriate place by ARDL personnel?				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	/	Observed Cooler Tem	p. 3.4 c	50	_
В.	LOG-IN PHASE: Date samples were logged-in: 07/29/2020	_(Signat	ure) DCB	rection factor_(	).(	
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?				NO	
13.	Were sample labels complete?			ÉS	NO	
14.	Did all sample labels agree with custody papers?				NO	
15.	Were correct containers used for the tests indicated?				NO	
16.	Was pH correct on preserved water samples?			YES	NO	N/A
17.	Was a sufficient amount of sample sent for tests indicated?				NO	
18.	Were bubbles absent in VOA samples? If NO, list by sample #:		18.01	YES	NO (	NA
19.	Was the ARDL project coordinator notified of any deficiencies?			YES	NO (	NA
	Comments and/or Corrective Action:		Sample	Transfer		,
			Fraction	Fraction		
			<i>F</i> [] Area #	Area #		
			walk-In			
			NOR	Ву		
		-	On	On		
		_	07/29/2020			
			Chain-of-Custody #	1	Commission of the local data	
(E	By: Signature) Date:		-			

	COOLER RECEIPT		<u>रा</u>	Ĩ	07/29/2	2020
	ARDL, INC	<u>).</u>				
ARI	DL #: 8633	Coole	r # <u>ZBlue (</u> Z per of Coolers in Shipn	2 of as	2 07/2	9/2020 CB
	o $(1)$ $(1)$	Numb	er of Coolers in Shipn	nent: <u> </u>	<u> </u>	a)
Pro	ect: Carlyle Lake	Date	Received: <u>07/2</u>	712020		
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened:	29/2020	(Signature)CB			
1.	Did cooler come with a shipping slip (airbill, etc.)?			YES 7	<ul><li>W</li></ul>	
	If YES, enter carrier name and airbill number here: ARDL	Cour	ver-Valen	è		
2.	Were custody seals on outside of cooler?			YES (	NO N/A	
	How many and where?,Seal Date	e:	"Seal Name:			
3.	Were custody seals unbroken and intact at the date and time of arrival?			YES I	NO (NA)	
4.	Did you screen samples for radioactivity using a Geiger Counter?				NO	
5.	Were custody papers sealed in a plastic bag fand de live	100		YES (	NÒ	
6.	Were custody papers filled out properly (ink, signed, etc.)?				NO N/A	
7.	Were custody papers signed in appropriate place by ARDL personnel?				NO N/A	
8.	Was project identifiable from custody papers? If YES, enter project name a	at the top o	f this form		NO N/A	
9.	Was a separate container provided for measuring temperature? YES V	NO	Observed Cooler Temp	o. <u>1,4</u> c ection factor_()	D G	
В.	LOG-IN PHASE: Date samples were logged-in: 0712912020	_(Signatur	BCB CON		0	
10.	Describe type of packing in cooler: $LOOSE / CE$					
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?				NO	
13.	Were sample labels complete?				NO	
14.	Did all sample labels agree with custody papers?	••••••		YÉS	NO	
15.	Were correct containers used for the tests indicated?			ÉS	NO	
16.	Was pH correct on preserved water samples?			ÉS	NO N/A	
17.	Was a sufficient amount of sample sent for tests indicated?				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/Å)	)
	Comments and/or Corrective Action:		Sample			
			Fraction	Fraction /		
-			Area #	Area #		
			Walk-11	Ву		
			DCB			
			On the leader of the	On .		
		L	07/29/2020			
			Chain-of-Custody #	Carried Street S		
(E	By: Signature) Date:					



Environmental | Analytical | Management | Safety

# **Customer Name: SLCOE**

# Project Name: Carlyle Lake/Kaskaskia River

# Samples Received at ARDL: 10/22/20

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

www.ardlinc.com

Date: 11/24/20

Lab Name: ARDL, Inc.

# ARDL Report No.: 8670

# CASE NARRATIVE

<u>Customer</u> Sample No.	<u>Date</u> Collected	<u>Lab ID</u> <u>Number</u>	Analyses Requested
CAR-1	10/22/20	8670-01	NP Pesticides, Metals(1), Inorganics(2)
CAR-2-0	10/22/20	8670-02	NP Pesticides, Inorganics(2)(3)
CAR-2-10	10/22/20	8670-03	Metals(1), Inorganics(2)
CAR-4	10/22/20	8670-04	NP Pesticides, Inorganics(2)(3)
CAR-13	10/22/20	8670-05	NP Pesticides, Inorganics(2)
CAR-12	10/22/20	8670-06	NP Pesticides, Inorganics(2)(3)
CAR-15	10/22/20	8670-07	NP Pesticides, Inorganics(2)(3)
CAR-KP-Marina	10/22/20	8670-08	E Coli
CAR-DW-Marina	10/22/20	8670-09	E Coli
CAR-BL-Marina	10/22/20	8670-10	E Coli
CAR-CSA-Marina	10/22/20	8670-11	E Coli
KAS-1	10/22/20	8670-12	E. Coli, Inorganics(2)(3)(4)
KAS-2	10/22/20	8670-13	E. Coli, Inorganics(2)(3)(4)

(1) Including iron and manganese.

(2) Including ammonia, nitrate, orthophosphate, 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**

Trifluralin was 22.4% high and pendamethalin was 22.2% high in the CCV. The closing CCV passed criteria for all analytes. No trifluralin or pendamethalin was detected in any field sample.

## PREPARATION BLANK

The blank met acceptance criteria.

<u>LABORATORY CONTROL SAMPLE</u> The LCS analyses met recovery criteria.

MATRIX SPIKE

The matrix spike and matrix spike duplicate met recovery criteria.

"Test everything, keep the good" 1 Thes. 5:21

# Project Name: Carlyle Lake/Kaskaskia River

# ARDL Report No.: 8670

# **CASE NARRATIVE (Continued)**

## DUPLICATE

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

## INTERNAL STANDARD

All internal standard criteria were met.

## **SURROGATE**

All surrogate recovery criteria were met.

## **INORGANIC FRACTION**

TOC and TKN 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 TOC. 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, 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

Page 2 of 2

# 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 8670

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

Lab Report No: 008670

Report Date: 10/30/2020

Project Name: Project No.:	CARLYLE LAKE	Anal Analytical Me		PESTICIE	DES (827	0SIM-MO	D)
	fied - IL100308		ethod: 3				
Field ID:	CAR-1			Lab No.:	00867		
Desc/Location:			Lab F:	ilename:	E1028	8016	
Sample Date:	10/22/2020		Receiv	ved Date:	10/22	2/2020	
Sample Time:	1045		Prep.	Date:	10/27	/2020	
Matrix:	WATER		Analy	sis Date:	10/28	3/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1128	32	
% Moisture:	NA		Level	:	LOW		
					Data		Dilutior
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	0.433		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	0.456		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	81%

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

(a) DOD-QSM Accredited Analyte.

Lab Report No: 008	07.9800						4	אפיטיו שמופי	0707/07/TT .	070
Project Name: CARLYLE LAKE Project No:	LAKE							Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	ics )0308
ARDL No: 008670-01 Field ID: CAR-1 Received: 10/22/2020	01 020	Sampling Samplin Samplin	<u>ה</u> מים ר	Loc'n: CARLYLE LA Date: 10/22/2020 Time: 1045	CARLYLE LAKE 10/22/2020 1045			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ĽOŎ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.583	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
(a) Manganese	0.00400	0.00500		0.139	MG/L	3010A	6010C	10/30/20	11/04/20	P7448
Ammonia Nitrogen	0.0200	0.0300	ŗ	0.0201	MG/L	NONE	350.1	NA	10/26/20 ]	10275658
Nitrate as Nitrogen	0.0190	0.0200		0.028	MG/L	NONE	GREEN	NA	10/26/20 ]	10295666
Phosphorus	0.00800	0.0100		0.273	MG/L	365.2	365.2	10/26/20	10/27/20 ]	10285665
Phosphorus, -ortho	0.00800	0.0100		0.141	MG/L	NONE	365.2	NA	10/23/20 1	10265656
Solids, Total Suspended	d 4.0	4.00		20.0	MG/L	NONE	160.2	NA	10/26/20 ]	10285663
Solids, Volatile Suspen	n 4.0	4.00		4.8	MG/L	NONE	160.4	NA	10/26/20 ]	10285664
Total Organic Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20 ]	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-01, Inorganic Analyses

Lab Report No:	008670	Rep	ort Date:	: 10/30/	2020		
Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analytical M			DES (82	70SIM-MO	D)
Field ID:	CAR-2		ARDL 1	Lab No.:	0086	70-02	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E1028	3019	
Sample Date:	10/22/2020		Receiv	ved Date:	10/22	2/2020	
Sample Time:	1130		Prep.	Date:	10/2	7/2020	
Matrix:	WATER		Analy	sis Date:	10/28	3/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B112	32	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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	0.478		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 RECOV	ERTES	T.in	nits		Re	sults	
Triphenylphosph			130			81%	
		00					

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

(a) DOD-QSM Accredited Analyte.

Lab Report No: (	008670						Ц	Report Date:	: 11/23/2020	020
Project Name: CARLYI Project No:	CARLYLE LAKE						Z	Analysis: Inorganics NELAC Certified - IL100308	: Inorganics fied - IL1003	lics 00308
	0-02	Sampl	Sampling Loc'n:		CARLYLE LAKE			Matrix:		
Field ID: CAR-2-0 Received: 10/22/2020	-0 /2020	Samp Samp	Sampling Date: Sampling Time:		10/22/2020 1130			Moisture:	. NA	
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	ТоÕ	Flag	Result	Units	Method	Method	Date	Date	Number
Ammonia Nitrogen	0.0200	0.0300		QN	MG/L	NONE	350.1	NA	10/26/20	10275658
Chlorophyll-a, Correcte	cte 1.0	1.00		53.6	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		DN	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a	1.0	1.00	Ŀ	15.7	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.26	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.128	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	ded 4.0	4.00		15.2	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	cen 4.0	4.00		4.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00	Ŀ	18.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-02, Inorganic Analyses

ARDL, INC. Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864	Report Date: 11/23/2020	Analysis: Inorganics NELAC Certified - IL100308	n: CARLYLE LAKE Matrix: WATER e: 10/22/2020 Moisture: NA e: 1140	Prep Analysis Prep Analysis Run Result Units Method Method Date Date Number	3.88MG/L3010A6010C10/30/2011/04/20P74480.430MG/L3010A6010C10/30/2011/04/20P7448NDMG/LNONE350.1NA10/26/2010275658NDMG/LNONE355.210/30/2011/04/20102756566NDMG/LNONEGREENNA10/26/201027565660.602MG/LNONEGREENNA10/26/2010285665560.13MG/LNONE365.2365.2NA10/26/2010285665637.2MG/LNONE160.2NA10/26/201028566566.8MG/LNONE160.2NA10/26/201028566566.8MG/LNONE160.4NA10/26/2010285665617.0MG/LNONE160.2NA10/26/2010285665617.0MG/LNONE415.1NA11/06/2011235716
400 Aviat Mt. Ve			Sampling Loc'n: Sampling Date: Sampling Time:	LOQ Flag F	0.0500 0.00500 0.0300 0.0100 0.0100 4.00 4.00 1.00
	10	AKE	0	LOD	0.0400 0.00400 0.0200 0.0190 0.00800 4.0 4.0 0.500
	Lab Report No: 008670	Project Name: CARLYLE LAKE Project No:	ARDL No: 008670-03 Field ID: CAR-2-10 Received: 10/22/2020	Analyte	<ul> <li>(a) Iron</li> <li>(a) Manganese Ammonia Nitrogen</li> <li>Amtoria Nitrogen</li> <li>Nitrate as Nitrogen</li> <li>Phosphorus, -ortho</li> <li>Phosphorus, -ortho</li> <li>Solids, Total Suspended</li> <li>Solids, Volatile Suspen</li> <li>Total Organic Carbon</li> </ul>

Sample 008670-03, Inorganic Analyses

Lab Report No: 008670

Report Date: 10/30/2020

Project Name: Project No.:	CARLYLE LAKE	Ana Analytical M		PESTICIE 270C	DES (827	0SIM-MO	D)
	fied - IL100308	-	ethod: 35				
Field ID:	CAR-4		ARDL I	Lab No.:	00867	0-04	
Desc/Location:	CARLYLE LAKE		Lab F	ilename:	E1028	3020	
Sample Date:	10/22/2020		Receiv	ved Date:	10/22	2/2020	
Sample Time:	1250		Prep.	Date:	10/27	/2020	
Matrix:	WATER		Analys	sis Date:	10/28	3/2020	
Amount Used:	900 mL		Instru	ument ID:	AG5		
Final Volume:	1 mL		QC Bat	tch:	B1128	32	
% Moisture:	NA		Level	:	LOW		
					Data		Dilutior
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.222	0.222	ND		UG/L	1
Atrazine		0.222	0.222	0.267		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	57%	

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

(a) DOD-QSM Accredited Analyte.

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

008670 Lab Report No:

Report Date: 11/23/2020

Project Name: Project No:	CARLYLE LAKE	AKE						Z	Analysis: ELAC Certifie	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: Field ID: Received:	008670-04 CAR-4 10/22/2020	<b>1</b> 0	Sampling Samplin Samplin	00		CARLYLE LAKE 10/22/2020 1250			Matrix: Moisture:	: WATER : NA	
Analyte	- D	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	ne	0.0200	0.0300		QN	MG/L	NONE	350.1	NA		10275658
Chlorophyll-a, Correcte	Correcte	1.0	1.00		59.0	MG/CU.M.	10200Н	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	rogen	0.0190	0.0200		UN	MG/L	NONE	GREEN	NA	10/26/20	10295666
Pheophytin-a		1.0	1.00		15.3	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus		0.00800	0.0100		0.39	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	rtho	0.00800	0.0100		0.104	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	Suspended	4.0	4.00		39.2	MG/L	NONE	160.2	NA	10/26/20	10285663
Solids, Volatile Suspen	le Suspen	4.0	4.00		8.0	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-04, Inorganic Analyses

Lab Report No: 008670

Report Date: 10/30/2020

Project Name: Project No.: NELAC Certi	CARLYLE LAKE fied - IL100308	Analytical M	-		DES (82 <sup>-</sup>	70SIM-MO	D)
Field ID:	CAR-13		ARDL 1	Lab No.:	0086	70-05	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E1028	3021	
Sample Date:	10/22/2020		Recei	ved Date:	10/22	2/2020	
Sample Time:	1400		Prep.	Date:	10/2	7/2020	
Matrix:	WATER		Analy	sis Date:	10/2	8/2020	
Amount Used:	800 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Bai	tch:	B112	82	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	'ERIES:	Lim	its		Re	sults	
Iriphenylphosph	ate	30-	130			68%	

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670

Report Date: 11/23/2020

Project Name: CARLYLE LAKE Project No:	LAKE						N	Analysis ELAC Certi	Analysis: Inorganics NELAC Certified - IL100308	ics 00308
ARDL No: 008670-05 Field ID: CAR-13 Received: 10/22/2020	20	Sampling Samplin Samplin	ampling Loc'n: Sampling Date: Sampling Time:		CARLYLE LAKE 10/22/2020 1400			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen Nitrate as Nitrogen Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon	0.0200 0.0190 0.00800 0.00800 10.0 10.0 0.500	0.0300 0.0200 0.0100 10.0 10.0 1.00		ND 0.519 0.749 0.161 401 26.0 26.0	л л л л л л л л л л л л л л л л л л л	NONE NONE 365.2 NONE NONE NONE NONE	350.1 GREEN 365.2 365.2 365.2 160.4 415.1	NA NA NA NA NA NA NA NA NA	10/26/20 10275658 10/26/20 10295666 10/27/20 10285665 10/23/20 10285665 10/26/20 10285663 10/26/20 10285664 11/06/20 11235716	10275658 10295666 10285665 10285665 10285663 10285664 11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-05, Inorganic Analyses

Lab Report No:	008670	Repo	ort Date	: 10/30/	2020		
Project Name: Project No.:	CARLYLE LAKE	Ana Analytical Me	-	PESTICIE 270C	DES (82	70SIM-MO	D)
NELAC Certi	fied - IL100308	Prep Me	ethod: 3	510C			
Field ID:	CAR-12		ARDL 1	Lab No.:	0086	70-06	
Desc/Location:	CARLYLE LAKE		Lab F	ilename:	E1028	3022	
Sample Date:	10/22/2020		Receiv	ved Date:	10/22	2/2020	
Sample Time:	1445		Prep.	Date:	10/2	7/2020	
Matrix:	WATER		Analy	sis Date:	10/2	8/2020	
Amount Used:	900 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B112	82	
<pre>% Moisture:</pre>	NA		Level	:	LOW		
<u></u>					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	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 RECOV	TERIES •	T.im	its		Re	sults	
Triphenylphosph			130			76%	
TTTPHCHITEHOPPH		50	200				

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

(a) DOD-QSM Accredited Analyte.

008670 Lab Report No: CARLYLE LAKE

Project Name:

Report Date: 11/23/2020

Analysis: Inorganics

Project No:							N	ELAC Certi	NELAC Certified - IL100308	0308
ARDL No: 008670-06 Field ID: CAR-12 Possived: 10/22/2020	2 2 2	Samp1 Samp	Sampling Loc'n: Sampling Date:		CARLYLE LAKE 10/22/2020 1445			Matrix: Moisture:	: WATER : NA	
	0	4								
						Prep	Analysis	Prep	Analysis	Run
Analyte	LOD	TOQ	Flag	Result	Units	Method	Method	Date	Date	Number
Ammonia Nitrogen	0.0200	0.0300		QN	MG/L	NONE	350.1	NA	10/26/20 10275658	.0275658
Chlorophyll-a, Correcte	1.0	1.00		95.3	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Nitrate as Nitrogen	0.0190	0.0200		0.027	MG/L	NONE	GREEN	NA		10295666
Pheophytin-a	1.0	1.00		14.8	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668
Phosphorus	0.00800	0.0100		0.394	MG/L	365.2	365.2	10/26/20	10/27/20	10285665
Phosphorus, -ortho	0.00800	0.0100		0.0991	MG/L	NONE	365.2	NA	10/23/20	10265656
Solids, Total Suspended	6.67	6.67		56.0	MG/L	NONE	160.2	NA	10/26/20 :	10285663
Solids, Volatile Suspen	6.67	6.67		10.7	MG/L	NONE	160.4	NA	10/26/20	10285664
Total Organic Carbon	0.500	1.00		19.0	MG/L	NONE	415.1	NA	11/06/20	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-06, Inorganic Analyses

Lab Report No:	008670	Rep	ort Date	: 10/30/	2020		
Project No.:	CARLYLE LAKE fied - IL100308	Analytical M			DES (82	70SIM-MO	D)
Field ID:	CAR-15		ARDL 1	Lab No.:	0086	70-07	
Desc/Location:	CARLYLE LAKE		Lab F:	ilename:	E102	8023	
Sample Date:	10/22/2020		Recei	ved Date:	10/2:	2/2020	
Sample Time:	1300		Prep.	Date:	10/2	7/2020	
Matrix:	WATER		Analy	sis Date:	10/2	8/2020	
Amount Used:	800 mL		Instr	ument ID:	AG5		
Final Volume:	1 mL		QC Ba	tch:	B112	82	
% Moisture:	NA		Level	:	LOW		
					Data		Dilution
Parameter		LOD	LOQ	Result	Flag	Units	Factor
Trifluralin		0.250	0.250	ND		UG/L	1
Atrazine		0.250	0.250	0.388		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	0.350		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 RECOV	ERIES:	Lim	its		Re	sults	
Triphenylphosph	ate	30-	130			738	

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

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-07, Inorganic Analyses

	Report Date: 11/23/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 10/22/20 10265657
Box 1566 62864				Prep A Method	NONE
			CARLYLE LAKE 10/22/2020 1310	Units	COL/100 ML
ARDL, INC. 400 Aviation Drive; P.O Mt. Vernon, Illinois				Result	375
			Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
7			Samp. Samı Samı	ГОД	1.00
	No: 008670	CARLYLE LAKE	008670-08 CAR-KP-MARINA 10/22/2020	te LOD	1.0
	Lab Report No:	Project Name: CARLYLE LAKE Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008670-08, Inorganic Analyses

90	Report Date: 11/23/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Analysis Prep Analysis Run Method Date Date Number	1604 NA 10/22/20 10265657	
Box 1566 62864				Prep Method	L NONE	
ARDL, INC. Aviation Drive; P.O. Mt. Vernon, Illinois			CARLYLE LAKE 10/22/2020 1155	Units	COL/100 ML	
AR Lation D Vernon,				Result	2450	
400 Avi Mt.			Sampling Loc'n: Sampling Date: Sampling Time:	Flag		
			S S S S S S S	LOQ	1.00	
	Lab Report No: 008670	CARLYLE LAKE	008670-09 CAR-DW-MARINA 10/22/2020	e LOD	1.0	
	Lab Report	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform	

Sample 008670-09, Inorganic Analyses

	Report Date: 11/23/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Run Date Date Number	NA 10/22/20 10265657
Q	Repo	I NEL <i>I</i>	4	Analysis Method	1604
Box 1566 62864				Prep Method	NONE
ARDL, INC. Aviation Drive; P.O. F ft. Vernon, Illinois (			CARLYLE LAKE 10/22/2020 1500	Units	COL/100 ML
ARI ation Dı Vernon,				Result	1130
400 Avi Mt.			Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
•			Samp Sam Sam	год	1.00
	No: 008670	CARLYLE LAKE	008670-10 CAR-BL-MARINA 10/22/2020	ELOD	1.0
	Lab Report No:	Project Name: ( Project No:	ARDL No: ( Field ID: ( Received: 1	Analyte	E. Coliform

Sample 008670-10, Inorganic Analyses

Box 1566 62864	Report Date: 11/23/2020	Analysis: Inorganics NELAC Certified - IL100308	Matrix: WATER Moisture: NA	Prep Analysis Prep Analysis Run Method Method Date Number	NONE 1604 NA 10/22/20 10265657
ARDL, INC. Aviation Drive; P.O. B Mt. Vernon, Illinois 6			CARLYLE LAKE 10/22/2020 1143	ilt Units	199 COL/100 ML
400 Aviatic Mt. Vern			Sampling Loc'n: Sampling Date: Sampling Time:	LOQ Flag Result	1.00 19
	No: 008670	CARLYLE LAKE	008670-11 CAR-CSA-MARINA 10/22/2020	e LOD	1.0
	Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	E. Coliform

Sample 008670-11, Inorganic Analyses

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

Lab Report No: 008670

CARLYLE LAKE

Project Name: Project No:

Report Date: 11/23/2020

Analysis: Inorganics NELAC Certified - IL100308

ARDL No: 008670-12 Field ID: KAS-1 Received: 10/22/2020	2 2	Sampling Sampling Sampling		Loc'n: CARL Date: 10/2 Time: 0745	CARLYLE LAKE 10/22/2020 0745			Matrix: Moisture:	: WATER : NA	
Analyte	LOD	ГОД	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0200	0.0300		0.163	MG/L	NONE	350.1	NA	10/26/20 1	10275658
Chlorophyll-a, Correcte	1.0	1.00		20.9	MG/CU.M.	10200H	10200H	10/23/20	10/28/20 1	10295668
E. Coliform	1.0	1.00		104	COL/100 ML	NONE	1604	NA	10/22/20 1	L0265657
Kjeldahl Nitrogen	0.190	0.200		DN	MG/L	351.2	351.2	11/10/20	11/11/20 1	11185698
Nitrate as Nitrogen	0.0190	0.0200		0.172	MG/L	NONE	GREEN	NA	10/26/20 1	0295666
Nitrite as Nitrogen	0.0200	0.0200		0.023	MG/L	NONE	354.1	NA	10/23/20 1	0265655
Pheophytin-a	1.0	1.00		9.6	MG/CU.M.	10200H	10200H	10/23/20	10/28/20 1	10295668
Phosphorus	0.00800	0.0100		0.20	MG/L	365.2	365.2	10/26/20	10/27/20 1	10285665
Phosphorus, -ortho	0.00800	0.0100		0.068	MG/L	NONE	365.2	NA	10/23/20 1	10265656
Solids, Total Suspended	4.0	4.00		16.8	MG/L	NONE	160.2	NA	10/26/20 1	0285663
Solids, Volatile Suspen	4.0	4.00		QN	MG/L	NONE	160.4	NA	10/26/20 1	0285664
Total Organic Carbon	0.500	1.00		24.0	MG/L	NONE	415.1	NA	11/06/20 1	11235716

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-12, Inorganic Analyses

	ω		Run mber	10275658 10295668 10265657 11185698 10295666 10285665 10285665 10285663 10285663 10285663 10285663
2020	ganics IL100308		NN	
: 11/23/2020	: Inorganics fied - IL1003	: WATER : NA	Analysis Date	10/26/20 10/28/20 10/22/20 11/11/20 10/26/20 10/23/20 10/28/20 10/28/20 10/26/20 10/26/20 11/06/20
Report Date:	Analysis: Inor NELAC Certified -	Matrix: Moisture:	Prep Date	NA NA NA 10/23/20 NA NA 10/23/20 10/26/20 NA NA NA NA
ŭ	IN		Analysis Method	350.1 10200H 1604 351.2 GREEN 354.1 10200H 365.2 365.2 365.2 160.4 415.1
			Prep Method	NONE 10200H NONE 351.2 NONE NONE 10200H 365.2 NONE NONE NONE NONE
		CARLYLE LAKE 10/22/2020 0930	Units	MG/L MG/CU.M. COL/100 ML MG/L MG/L MG/L MG/L MG/L MG/L MG/L MG
			Result	0.0312 25.4 12600 1.2 0.709 5.7 0.797 0.797 0.491 22.7 6.67 25.0
		Sampling Loc'n: Sampling Date: Sampling Time:	Flag	
		Samp Sam Sam	Тоб	0.0300 1.00 1.00 0.200 0.0200 0.0200 1.00 0.0100 6.67 6.67 1.00
270	AKE		ГОД	0.0200 1.0 1.0 0.190 0.0190 0.0200 1.0 0.00800 0.00800 6.67 6.67 0.500
: No: 008670	CARLYLE LAKE	008670-13 KAS-2 10/22/2020	te	gen Correcte ogen irogen irogen irogen irogen irtho Suspended Le Suspen Carbon
Lab Report No:	Project Name: Project No:	ARDL No: Field ID: Received:	Analyte	Ammonia Nitrogen Chlorophyll-a, Correcte E. Coliform Kjeldahl Nitrogen Nitrate as Nitrogen Nitrite as Nitrogen Pheophytin-a Phosphorus Phosphorus, -ortho Solids, Total Suspended Solids, Volatile Suspen Total Organic Carbon

(a) DOD and/or NELAC Accredited Analyte.

Sample 008670-13, Inorganic Analyses

#### METHOD BLANK REPORT ARDL, Inc. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, Illinois 62864

Lab Report No: 008670

Report Date: 10/30/2020

Project No.:	CARLYLE LAKE fied - IL100308	Analytical Meth	sis: NP PEST nod: 8270C nod: 3510C	TCIDES (82	270SIM-MO	)
Field ID:	NA		ARDL Lab No	• 0086	570-01B1	
Desc/Location:			Lab Filenam		28014	
Sample Date:	NA		Received Da		10011	
Sample Time:	NA		Prep. Date:		27/2020	
Matrix:	OC Material		Analysis Da		28/2020	
Amount Used:	1000 mL		Instrument			
Final Volume:	1 mL		OC Batch:	B112	282	
% Moisture:	NA		Level:	LOW		
			Annue an Annue		Data	<u></u>
Parameter		LOD	LOQ	Result	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
		T	· · · · · · · ·		esults	
SURROGATE RECOV		Limit 30-13		K	esuits 87%	
Iriphenylphosph	ale	30-13	U		0/6	

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

(a) DOD-QSM Accredited Analyte.

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

Lab Report No: 008670

Report Date: 11/23/2020

Project Name: CARLYLE LAKE

NELAC Certified - IL100308

Analyte	LOD	ТОД	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	QN	MG/L	3010A	6010C	10/30/20	11/04/20	P7448	008670-01B1
(a) Manganese	0.004	0.005	UN	MG/L	3010A	6010C	10/30/20	11/04/20	P7448	008670-01B1
Ammonia Nitrogen	0.020	0.030	DN	MG/L	NONE	350.1	NA	10/26/20	10275658	008670-01B1
Chlorophyll-a, Corre	1.0	1.0	QN	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668	008670-02B1
E. Coliform	1.0	1.0	QN	COL/100 ML	NONE	1604	NA	10/22/20	10265657	008670-08B1
Kjeldahl Nitrogen	0.19	0.20	QN	MG/L	351.2	351.2	11/10/20	11/11/20	11185698	008669-12B1
Nitrate as Nitrogen	0.019	0.020	QN	MG/L	NONE	GREEN	NA	10/26/20	10295666	008670-02B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	10/23/20	10265655	008670-12B1
Pheophytin-a	1.0	1.0	QN	MG/CU.M.	10200H	10200H	10/23/20	10/28/20	10295668	008670-02B1
Phosphorus	0.008	0.010	ND	MG/L	365.2	365.2	10/26/20	10/27/20	10285665	008669-02B1
Phosphorus, -ortho	0.008	0.010	ND	MG/L	NONE	365.2	NA	10/23/20	10265656	008670-03B1
Solids, Total Suspen	1.0	1.0	QN	MG/L	NONE	160.2	NA	10/26/20	10285663	008670-01B1
Solids, Volatile Sus	1.0	1.0	QN	MG/L	NONE	160.4	NA	10/26/20	10285664	008670-01B1
Total Organic Carbon	0.50	1.0	QN	MG/L	NONE	415.1	NA	11/06/20	11235716	008669-01B1

(a) DOD and/or NELAC Accredited Analyte Inorganic Method Blanks for 008670

	ARDL,	ARDL, INC.	400 Av	Aviation Driv	Drive;	iation Drive; P.O. Box 1566	ox 1566	Mt. V	Mt. Vernon, IL		62864	
Lab Report No:	008670								Re	Report Date:		10/30/2020
Project Name: CARLYLE LAKE Project No.:	CARLYLE LAKE		Ana	Analysis: NP	PESTICIDES	ES (8270SIM-MOD)	IM-MOD)	Anal	Analytical   Prep	ical Method: Prep Method:	8270C 3510C	
Matrix: Amount Used:	QC Material 1000 mL			QC Batch: Level:	: B11282 LOW	282		Prep. Analy∶	Prep. Date: Analysis Date:	10/27/2020 : 10/28/2020	2020	
		SF	Spike	Spike	Spike	Duplicate	Duplicate	Duplicate	Recovery		RPD	
Ω.	Parameter	Rea	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit	it
Tr	Trifluralin	3	3.43	4	86	-	1	1	30-130	-		
	Atrazine	Ε	3.39	4	85	-	1	1	30-130	;	1	
M	Metribuzin	(-)	3.3	4	83		1		30-130			
	Alachlor	.,	3.3	4	83	44 M			30-130	1	1	
Me	Metolachlor	Э.	3.43	4	86	1	1		30-130	1	1	
Ch.	Chlorpyrifos	Ю	3.39	4	85	1	1	ł	30-130	ł		
0 <sup>°</sup>	Cyanazine	(1)	3.5	4	88		1	1	30-130	ł	1	
Pen	Pendimethalin	З.	3.66	4	92	1	ł	ł	30-130	1	1	
	SUF	SURROGATE RECOVERIES:	OVERIES:		Spike %R	а 4 4 4 5 5 5	Duplicate %R %	%R Limits				
	Tri	Triphenylphosphate	phate		81.5	.5		30-130				

BLANK SPIKE/SPIKE DUPLICATE REPORT

(a) DOD-QSM Accredited Analyte.

'\*' indicates a recovery outside of standard limits. Spike Blanks for 008670-01, NP PESTICIDES (8270SIM-MOD)

AR	ARDL, INC.	400 A1	400 Aviation Drive; P.O.	ı Drive	; Р.О.	Box 1566	200	Mt. V	Vernon, IL	т 07004
Lab Report No: 00	008670								Report I	Date: 11/23/2020
Project Name:	CARLYLE LAKE	LAKE							NELAC C	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	L QC Lab Number
(a) Iron	4.7	5.0	94	1	1		87-115	1	P7448	008670-01C1
(a) Manganese	0.76	0.75	101	ł	ł	1	90-114	ł	P7448	008670-01C1
Ammonia Nitrogen	0.98	1.0	98	ł	ł	ł	80-120	!	10275658	008670-01C1
Kjeldahl Nitrogen	10.0	10.0	100	ł	ł	ł	80-120	1	11185698	008669-12C1
Nitrate as Nitrogen	0.92	1.0	92	ł	ł	1	80-120	ł	10295666	008670-02C1
Nitrite as Nitrogen	1.0	1.0	102	ł	ł	ł	80-120	1	10265655	008670-12C1
Phosphorus	0.65	0.67	97	1	1	1	80-120	ł	10285665	008669-02C1
Phosphorus, -ortho	0.094	0.10	94	ł	ł	ł	80-120	1	10265656	008670-03C1
Total Organic Carbon	18.7	20.0	94	ł	ł	ł	76-120	;	11235716	008669-01C1
NOTE: Any values t	NOTE: Any values tabulated above marked with an	narked with		asterisk are outside of	ide of acc	acceptable limits.	mits.			
(a) DOD and/or NELAC Accredited Analyte	LAC Accredited Ar	lalyte								

Inorganic LCS Results for 008670

Lab Report No: (	<b>ARDL, INC.</b> 008670	INC.	MATRIX 400 Avi	SPIKE/SPIKE iation Drive;	SPIKE DUPLI Drive; P.O.	DUPLICATE REPORT P.O. Box 1566		<b>Mt. Vernon, IL</b> Repoi	, <b>IL</b> Report	<b>62864</b> Date:	10/30/2020
Project Name: CARLYLE LAKE Project No.:	RLYLE LAKE		Analysis:	NP	PESTICIDES (82	(8270SIM-MOD)		Analytical Method: Prep Method:	ical Method: Prep Method:	d: 8270C d: 3510C	
:. 	CAR-1 CARLYLE LAKE 10/22/2020		Pre Amo	Prep. Date: Amount Used: & Moisture:	10/27/2020 900 mL NA	0	КЧК	ARDL Lab No.: Lab Filename: Received Date:		008670-01 10/22/2020	
Sample Time: 10 Matrix: WI	1045 WATER		QC Lei	QC Batch: Level:	B11282 LOW		A	Analysis Date:		10/28/2020	
		Sample	WS	SM	SW	MSD	MSD	MSD	% Rec		RPD
Parameter	г	Result	Result	t Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit
Trifluralin	lin	QN	3.67	4.44	82.5	3.64	4.44	82	30-130	0.6	30
Atrazine	ле	0.433	3.98	4.44	79.8	3.97	4.44	79.5	30-130	0.3	30
Metribuzin	zin	UN	3.49	4.44	78.5	3.53	4.44	79.5	30-130	1.3	30
Alachlor	or	DN	3.37	4.44	75.8	3.44	4.44	77.5	30-130	2.3	30
Metolachlor	lor	0.456	3.98	4.44	79.3	3.97	4.44	79	30-130	0.3	30
Chlorpyrifos	lfos	UN	3.46	4.44	77.8	3.56	4.44	80	30-130	2.9	30
Cyanazine	le	UN	3.74	4.44	84.3	3.79	4.44	85.3	30-130	1.2	30
Pendimethalin	alin	QN	3.77	4.44	84.8	3.81	4.44	85.8	30-130	1.2	30
	SURRO	SURROGATE RECOVERIES:	CRIES:		MS %R	MSD %R	%R Limits	its			

(a) DOD-QSM Accredited Analyte.

'nc' indicates sample >4X spike level.

'\*' indicates a recovery outside of standard limits. Matrix Spikes for 008670-01, NP PESTICIDES (8270SIM-MOD)

Page 1 of 1

30-130

LL

78

Triphenylphosphate

ARDL Report 8670 - Page 27 of 33

	62864
	, II
	Vernon,
REPORT	Mt.
DUPLICATE	Box 1566
	P.O. B
K SPIKE/SPIKE	Drive;
MATRIX SI	Aviation
	400
	INC.
	ARDL,

Lab Report No: 008670

CARLYLE LAKE

Project Name:

Report Date: 11/23/2020

NELAC Certified - IL100308

	Sample	Sample	SM	WS	SM	MSD	MSD	MSD	% Rec		RPD		QC Lab
Analyte	Matrix	Result	Result	Level	% Rec	Result	Level	% Rec	Limits	RPD	Limit	Run	Number
(a) Iron	WATER	0.58	1.6	1.0	101	1.5	1.0	94	87-115	4	20	P7448	008670-01MS
(a) Manganese	WATER	0.14	0.64	0.50	100	0.62	0.50	97	90-114	2	20	P7448	008670-01MS
Ammonia Nitrogen	WATER	J 0.020	2.0	2.0	97	2.0	2.0	66	75-125	7	20	10275658	008670-01MS
Nitrate as Nitrogen	WATER	ND	0.84	1.0	84	0.81	1.0	81	75-125	m	20	10295666	008670-02MS
Phosphorus	WATER	0.27	1.2	0.83	107	1.2	0.83	109	75-125	2	20	10285665	008670-01MS
Phosphorus, -ortho	WATER	0.13	0.23	0.10	102	0.23	0.10	96	75-125	т	20	10265656	008670-03MS
Total Organic Carbon	WATER	18.0	17.2	5.0	*	17.0	5.0	*	76-120	ы	20	11235716	008670-02MS

Inorganic Matrix Spikes for 008670

(a) DOD and/or NELAC Accredited Analyte.

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

364	11/23/2020	ed - IL100308	QC Lab Number	008670-02D1 008670-02D1 008670-01D1 008670-01D1
10n, IL 62864	Report Date:	NELAC Certified	Analytical Run	10295668 10295668 10285663 10285664
T 6 Mt. Vernon,			Mean (Smp,D1,D2)	
TE REPOR Box 156			Percent Diff	まま * こ ら
SAMPLE DUPLICATE REPORT ation Drive; P.O. Box 1566			Units	MG/CU.M. MG/L MG/L
SAMPLE stion Dri			Second Duplicate	
400 Avia			First Duplicate	47.2 19.6 19.6 1.4
INC.	0	LE LAKE	Sample Conc'n	53.6 15.7 4.8 8.4
ARDL, INC.	Lab Report No: 008670	Project Name: CARLYLE	Analyte	Chlorophyll-a, Corrected Pheophytin-a Solids, Total Suspended Solids, Volatile Suspend

See Case Narrative for exceptions. \* indicates that agreement between duplicates is greater than 20%.
 (a) DOD and/or NELAC Accredited Analyte
 Sample Duplicates for 008670

# Sample Receipt Information

Including as appropriate:

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

ARDL Data Package 8670

N:\ARDL Case Narratives\ARDL Data Package Contents.pdf - Revised June 21, 2019

Authorized By: DSD-QAO

CHAIN OF CUSTODY RECORD	PRESERVATION	SPECIFY SPECIFY CHERUICALS ADDED AND FINAL PH IF KNOWN	REMARKS OR SAMPLE LOCATION	X	X	X	X	X	X	X	X	X	X	X	X	X						
Vernon, IL 62864 244-1149 Fax		11. 1.0.	FS. 60,000 20 20 4 4 4 20 20 000 000 000 000 00	X X X X X X X	X X X X	X X X X	X X X X		X X X X					X	X X X X X X X				· 3	e) *Preserved with H2O4 #Preserved with HNO3		
P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864 (618) 244-3235 Phone (618) 244-1149 Fax		CONTAIN	COMP GRAB NO. OF	×	XX	X	X X	X	XX	X X X		X	×	X	XX	X X X			Beceived by: (Signature)	Received by: (Signature)	Shipping Ticket No.	
			DATE	جهما مطرطما	2211 1	07 11	0551	0041	5445	1300	1210	ار جح	Isao	2 711	0>45	1 093			Date Time		1 8	
ARDL, Inc.	PROJECT Carlyle Lake	SAMPLERS: (Signature)	SAMPLE NUMBER	I CAR-1	<b>Z</b> CAR - 2 - 0	3 CAR-2-10	$\eta$ CAR-4	5 CAR-13	6 CAR-12	7 CAR - 15	Z CAR – KP – Marina	$\varphi$ CAR – DW – Marina	10 CAR – BL – Marina	// CAR – CSA - Marina	/2 KAS-1	KAS-2	RDL	Rei	to Relinquished by: (Signature)	02 Relfiguished by/(Signature)	Bade (Signature) by:	31 of 33

ARDL #       B6670       Cooler # Bed_1		<u>COOLER RECEIPT R</u> ARDL, INC.	EPORT	
Number of Coolers in Shipment:       2         Project:       CACHAIC LAKE/Kg\$Ka\$Ki4       Date Received:       10/22/2020         PRELIMINARY EXAMINATION PHASE:       Date Received:       10/22/2020         If YES, enter carrier name and arbiil number here.       ARDL       Covriet.       Vec         If YES, enter carrier name and arbiil number here.       ARDL       Covriet.       Vec         If YES, enter carrier name and arbiil number here.       ARDL       Covriet.       Vec         If YES, enter carrier name and arbiil number here.       ARDL       Covriet.       Vec         Were custody seals on outside of cooler?       YES       YES       YES       NA         Were custody seals on outside of cooler?       YES       YES       YES       NA         Were custody papers sealed in a plastic bag?       Hourd Act//VecLed       YES       YES       NO       NA         Were custody papers signed in appropriate place by ARDL personne?       YES       NO       NA         Were custody papers sealed in a plastic bag?       YES_NO       NO       NA         Were custody papers?       If Add Activected       YES       NO       NA         Was project identifiable from custody papers?       YES_NO       NA       YES       NO       NA <t< td=""><td></td><td>0</td><td>Coolor # Rpd 1</td><td></td></t<>		0	Coolor # Rpd 1	
PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 1/23/2020 (Signature) UCB         Did cooler come with a shipping sitp (arbiil, etc.)?       YES         If YES, enter carrier name and airbil number here: AKDL Covriet - Vuleue       YES         Were custody seals on outside of cooler?       YES         How many and where?       Seal Date:       Seal Name:         Were custody seals on outside of cooler?       YES       NO         Did you screen samples for radioactivity using a caper Counter?       YES       NO         Were custody papers saled in a plastic bag?       HALH d. L/LVELLd.       YES       NO         Were custody papers saled in a plastic bag?       HALH d. L/LVELLd.       YES       NO         Were custody papers saled in a plastic bag?       HES, enter project name at the top of this form.       YES       NO       NA         Were custody papers saled in a plastic bag?       If YES, enter project name at the top of this form.       YES       NO       NA         Was project identifiable from custody papers?       If YES       NO       Coster term.       Z.Z.       S.C.       Term?         10. Describe type of packing in cooler.       LOC 32E       ICC       NO       NA         12. Did all containers arrive unbroken and were labels in good condition?       Term       Term       NO			Number of Coolers in Shipment: Z	
PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 1/23/2020 (Signature) UCB         Did cooler come with a shipping sitp (arbiil, etc.)?       YES         If YES, enter carrier name and airbil number here: AKDL Covriet - Vuleue       YES         Were custody seals on outside of cooler?       YES         How many and where?       Seal Date:       Seal Name:         Were custody seals on outside of cooler?       YES       NO         Did you screen samples for radioactivity using a caper Counter?       YES       NO         Were custody papers saled in a plastic bag?       HALH d. L/LVELLd.       YES       NO         Were custody papers saled in a plastic bag?       HALH d. L/LVELLd.       YES       NO         Were custody papers saled in a plastic bag?       HES, enter project name at the top of this form.       YES       NO       NA         Were custody papers saled in a plastic bag?       If YES, enter project name at the top of this form.       YES       NO       NA         Was project identifiable from custody papers?       If YES       NO       Coster term.       Z.Z.       S.C.       Term?         10. Describe type of packing in cooler.       LOC 32E       ICC       NO       NA         12. Did all containers arrive unbroken and were labels in good condition?       Term       Term       NO	Pro	ect: Carlyle Lake/Kaskaskia		
Did cooler come with a shipping slip (aibili, etc.)?	A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 10/23/2	262 D (Signature) DCB ,	
Were custody seals on outside of cooler?       YES       YES       YES       NA         How many and where?	1.	Did cooler come with a shipping slip (airbill, etc.)?	YES KO	
Were custody seals on outside of cooler?       YES       YES       YES       NA         How many and where?		If YES, enter carrier name and airbill number here: <u>ARDL</u> Cov.	rier-Valein	
Were custody seals unbroken and intact at the date and time of artival?       YES       NO         Did you screen samples for radioactivity using a Geiger Counter?       YES       NO         Were custody papers sealed in a plastic bag?       YES       NO         Were custody papers silled out properly (ink, signed, etc.)?       YES       NO         Were custody papers signed in appropriate place by ARDL personnel?       YES       NO         Was project identifiable from custody papers?       IYES       NO       NA         Was a separate container provided for measuring temperature?       YES       NO       Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.       Survey & Coler Temp.       Z.Z.	2.	•		
Did you screen samples for radioactivity using a Geiger Counter?   Were custody papers sealed in a plastic bag?   Were custody papers signed in appropriate place by ARDL personnel?   Were custody papers signed in appropriate place by ARDL personnel?   Was project identifiable from custody papers? If YES, enter project name at the top of this form.   Were custody napers signed in appropriate place by ARDL personnel?   Was a separate container provided for measuring temperature?   YES		How many and where?,Seal Date:,	,Seal Name:	
Were custody papers sealed in a plastic bag?   Were custody papers filled out properly (ink, signed, etc.)? (ES) NO   Were custody papers signed in appropriate place by ARDL personnel? (ES) NO   Was project identifiable from custody papers? If YES, enter project name at the top of this form   Was a separate container provided for measuring temperature? YES   NO NA   Was a separate container provided for measuring temperature? YES   NO NA   UOG-IN PHASE: Date:   No NA Surge (C) Correction factor Correction factor Correction factor Correction factor Surge (C) No	3.	Were custody seals unbroken and intact at the date and time of arrival?		>
b. Were custody papers filled out property (ink, signed, etc.)?	4.			.'
Were custody papers signed in appropriate place by ARDL personnel?       (E)       NO       N/A         Was project identifiable from custody papers? If YES, enter project name at the top of this form.       (YES)       NO       N/A         Was a separate container provided for measuring temperature?       YESNOObserved Cooler Temp.       Z.Z       Correction factor       Supple Correction factor       Suple Correction factor       Supple C	5.	Were custody papers sealed in a plastic bag? Hand deliver	edYes NO	
Was project identifiable from custody papers? If YES, enter project name at the top of this form. YES NO N/A   Was a separate container provided for measuring temperature? YES NO Observed Cooler Temp. Z.Z. Correction factor NA   10 Use and la containers arrive unbroken and were labels in good condition? Cress NO NA NA   12 Did all containers arrive unbroken and were labels in good condition? Cress NO NA   13 Were sample labels agree with custody papers? Cress NO NA   14 Did all sample sent for tests indicated? Cress NO NA   15 Were bubbles absent in VOA samples? <td< td=""><td>6.</td><td>Were custody papers filled out properly (ink, signed, etc.)?</td><td></td><td></td></td<>	6.	Were custody papers filled out properly (ink, signed, etc.)?		
Was a separate container provided for measuring temperature? YESNOObserved Cooler TempZ.2Structure Correction factorCorrection factorCorrective for tests indicated?Correction factorCorrection	7.	Were custody papers signed in appropriate place by ARDL personnel?		
Was a separate container provided for measuring temperature?       YESNOLObserved Cooler TempL22GTCCP         I_OG_IN PHASE: Date samples were logged-in:_[D/23/2020	8.	Was project identifiable from custody papers? If YES, enter project name at the		
3. LOG-IN PHASE: Date samples were logged-in: 10/23/2026 (Signature) DCB         10. Describe type of packing in cooler: Lowse / Ce         11. Were all samples sealed in separate plastic bags?         12. Did all containers arrive unbroken and were labels in good condition?         13. Were sample labels complete?         14. Did all sample labels agree with custody papers?         15. Were correct containers used for the tests indicated?         16. Was pH correct on preserved water samples?         17. Was a sufficient amount of sample sent for tests indicated?         18. Were bubbles absent in VOA samples? If NO, list by sample #YES NO         19. Was the ARDL project coordinator notified of any deficiencies?         19. Was the ARDL project coordinator notified of any deficiencies?         19. Was the ARDL project coordinator notified of any deficiencies?         19. Was the ARDL project coordinator notified of any deficiencies?         10. DCB         11. Praction         12. Praction         13. Were Signature)         14. Did signature)         15. Date:	9.	Was a separate container provided for measuring temperature? YES	NO V Observed Cooler Temp. L.L C Tem	$\varphi$
11. Were all samples sealed in separate plastic bags?       YES       YES       NA         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         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       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NVA         19. Was the ARDL project coordinator notified of any deficiencies?       On       Interventing the stenting the stentified the stenting the stenting the stent	В.	LOG-IN PHASE: Date samples were logged-in: 10/23/2026 (S		,
12. Did all containers arrive unbroken and were labels in good condition?       Image: Signature       Image: Signature       Image: Signature       NO         13. Were sample labels complete?       Image: Signature       Image: Signature       Image: Signature       NO         13. Were sample labels complete?       Image: Signature       Image: Signature       Image: Signature       NO         13. Were sample labels complete?       Image: Signature       Image: Signature       Image: Signature       NO         13. Were sample labels apree with custody papers?       Image: Signature       Image: Signature       NO         14. Did all sample labels apree with custody papers?       Image: Signature       Image: Signature       NO         15. Were correct containers used for the tests indicated?       Image: Signature       Image: Signature       NO       N/A         16. Was pH correct on preserved water samples?       If NO, list by sample #:	10.	Describe type of packing in cooler: LOOSE Ce		
13. Were sample labels complete?       Image: Signature)       Image: Signature) <td>11.</td> <td>Were all samples sealed in separate plastic bags?</td> <td></td> <td></td>	11.	Were all samples sealed in separate plastic bags?		
14. Did all sample labels agree with custody papers?       Image: No         15. Were correct containers used for the tests indicated?       Image: No         16. Was pH correct on preserved water samples?       Image: No         17. Was a sufficient amount of sample sent for tests indicated?       Image: No         18. Were bubbles absent in VOA samples? If NO, list by sample #       YES       NO         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NIA         Image: No       Image: No       NA         Image: No       Image: No       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       NO       NIA         Image: No       Image: No       NO         Image: No       NO       NIA         Image: No       Image: No       NO         Image: No       Image: No       Image: No         Image: No       Image: No       Image: No         Image: No       Image: No       Image: No      <	12.	Did all containers arrive unbroken and were labels in good condition?		
15. Were correct containers used for the tests indicated?       Image: No         16. Was pH correct on preserved water samples?       Image: No         17. Was a sufficient amount of sample sent for tests indicated?       Image: No         18. Were bubbles absent in VOA samples? If NO, list by sample #YES       NO         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO         Image: No       NA         Image: No       Image: No       NA         Image: No       NA       Image: No       NA         Image: No       NO       NA       NO         Image: No       NO       NA       NA         Image: No       NA       NO       NA         Image: No       NA       NA       NA         Image: No       Image: No       NA       NA         Image: No       Image: No       Image: No	13.	Were sample labels complete?	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       N/A         18. Were bubbles absent in VOA samples? If NO, list by sample #YES       YES       NO       N/A         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       N/A         Image: Comments and/or Corrective Action:       YES       NO       N/A         Image: Comments and/or Corrective Action:       Fraction       Fraction       Fraction         Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Fraction       Fraction         Image: Comments and/or Corrective Action:         Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comments and/or Corrective Action:       Image: Comm	14.	Did all sample labels agree with custody papers?		
17. Was a sufficient amount of sample sent for tests indicated?       NO         18. Were bubbles absent in VOA samples? If NO, list by sample #:YES       NO         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         19. Was the ARDL project coordinator notified of any deficiencies?       YES       NO       NA         10. Area #       Area #       Area #       By       By       By       D       D         10. D23/2020       On       On       On       On       D       D       D         (By: Signature)       Date:       Date:       Date:       Chain-of-Custody #	15.	Were correct containers used for the tests indicated?		
18. Were bubbles absent in VOA samples? If NO, list by sample #YES NO (NA)         19. Was the ARDL project coordinator notified of any deficiencies?	16.	Was pH correct on preserved water samples?		
19. Was the ARDL project coordinator notified of any deficiencies?       YES NO NA         Comments and/or Corrective Action:       Sample Transfer         Fraction       Fraction         Area #       Area #         Wa Ik - IM       By         D CB       On         On       On         [b] 23/2020       Chain-of-Custody #	17.	Was a sufficient amount of sample sent for tests indicated?	NO	
Comments and/or Corrective Action:         Sample Transfer         Fraction       Fraction         Area #       Area #         Walk-lw       By         By       D CB         On       On         [By: Signature)       Date:	18.	Were bubbles absent in VOA samples? If NO, list by sample #:	YES NO (N/A	>
Fraction       Fraction         Area #       Area #         Wa   k - 1/h       By         By       D CB         On       On         [b] 23/2020       On         Chain-of-Custody #	19.	Was the ARDL project coordinator notified of any deficiencies?		)
All       Area #         Area #       Area #         Walk-lh       By         DCB       On         On       On         [b]/23/2020       On         Chain-of-Custody #		Comments and/or Corrective Action:		
Walk-In       By       DCB       On       Id/23/2020       Chain-of-Custody #			A A A A A A A A A A A A A A A A A A A	
By         By         By           On         On         On           Ib/23/2026         On         On           (By: Signature)         Date:         Chain-of-Custody #			Area # Area #	
DCB         On           On         01/23/2026         0n           (By: Signature)         Date:         Chain-of-Custody #				
(By: Signature)         Date:			DCB	
(By: Signature) Date:		•		
(By: Signature) Date:				I
	-		Chain-of-Custody #	
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	COOLER RECEIPT REPORT ARDL, INC.			
	DL #:			
ARI	DL #: <u>SOFO</u> Cooler # <u>NECI C</u> Number of Coolers in Ship	- ment: 7		
Pro	ject: <u>Carlyle Lake/Kaskaskig</u> Date Received: <u>10/22/</u>			-
A.	PRELIMINARY EXAMINATION PHASE: Date cooler was opened: 10/23/2070 (Signature) DCB		,	
1.	Did cooler come with a shipping slip (airbill etc.)?	YES (	NO	,
	If YES, enter carrier name and airbill number here: <u>ARDL</u> Covrier - 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?		NO	
5.	Did you screen samples for radioactivity using a Geiger Counter?	YES	$\odot$	)
6.	Were custody papers filled out properly (ink, signed, etc.)?	TES	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		NO	N/A
9.	Was a separate container provided for measuring temperature? YESNOObserved Cooler Tem	р. <u>1,9</u>	37	emp
В.	LOG-IN PHASE: Date samples were logged-in: 10/23/2020 (Signature) DCB	ection factor <u>C</u>	0.0	
10.	Describe type of packing in cooler: <u>LOOSE   ce</u>			
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?		NO	
15.	Were correct containers used for the tests indicated?		NO	
16.	Was pH correct on preserved water samples?	(FE)	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: Sample	Transfer		
	Fraction	Fraction		
-		Area #		
	Walls - In			
	By	Ву		•
-	On On	On		
_	10/23/2020			
	Chain-of-Custody #			
(E	By: Signature) Date:			

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