

**RECOVERY PROGRAM**  
**FY 2020-2024 SCOPE OF WORK for:**  
Hydrology and River Temperature

Recovery Program Project Number: 19

Note: Recovery Program FY20-21 scopes of work are drafted in May 2019. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

Lead agency: U.S Fish and Wildlife Service

Submitted By: Don Anderson  
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Date Last Modified: 6/14/2019 10:56 AM

<u>Category:</u>	<u>Expected Funding Source:</u>
<input type="checkbox"/> Ongoing Project	<input checked="" type="checkbox"/> Annual funds
<input checked="" type="checkbox"/> Ongoing-revised project	<input type="checkbox"/> Capital funds
<input type="checkbox"/> Requested new project	<input type="checkbox"/> Other (explain)
<input type="checkbox"/> Unsolicited proposal	

**I. Title of Proposal:** Recovery Program Hydrology Support

**II. Relationship to RIPRAP:**

General Recovery Program Support Action Plan:

I.A. Evaluate methods for defining habitat-flow needs and select methods most appropriate to specific stream reaches.

Green River Action Plan: Mainstem

I.A.3.d. Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, pursuant to the 1992 Biological Opinion and 2006 Record of Decision.

I.A.4., I.B.3. Legally protect identified flows.

I.D.1. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

I.D.2.f. Evaluate effect of baseflow variability on backwater maintenance and quality.

Yampa River Action Plan:

I.A.1.f Install, operate, and/or maintain stream flow monitoring gages.

I.B.2.a.2.(c). Deliver water for endangered fish.

Duchesne River Action Plan:

I.D. Coordinate reservoir operations.

I.F. Determine need and feasibility of additional gaging.

I.G. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

White River Action Plan:

I.A. Assess need for tributary management plan for the White River.

I.B.3. Develop and implement a White River Management Plan.

I.F. Evaluate and revise as needed, flow regimes to benefit endangered fish populations.

Colorado River Action Plan

I.A.3.a. Collect data for 15-MR PBO depletion accounting.

I.A.5. Provide and legally protect instream flows pursuant to Colorado River PBO

I.A.5.a. Deliver Ruedi flows to 15-Mile Reach

I.A.5.f. Pursuant to Wolford Mountain (Muddy Creek) Biological Opinion, deliver up to 6,000 acre-feet of water..

I.A.5.g. Coordinated Reservoir operations (CROS)

I.A.5.l. Coordinated Facilities operations (CFOPS)

I.A.6. Review implementation of RIPRAP items to determine timely compliance with applicable schedules (every 2 yrs. beginning in 2003).

I.B.4.c.2. Continue annual Aspinall Unit coordinating meetings.

Gunnison River Action Plan

I.C.3.e.(3). Deliver flows from Aspinall Unit pursuant to Aspinall Biological Opinion and record of decision.

I.D.1.a.(6). Evaluate effects of operations to meet the Proposed Action on the Gunnison River thermal regime.

I.E. Evaluate and revise, as needed, Gunnison River flow regimes to benefit endangered fish populations.

**III. Study Background/Rationale and Hypotheses:**

This proposal represents the U.S. Fish and Wildlife Service (Service) Hydrologist activities that support the Program Directors office, river temperature monitoring and ongoing research and monitoring activities. Activities are, for the most part, broken down by specific task with task descriptions, budgets, and deliverables.

**IV. Study Goals, Objectives, End Product:**

**Study Goal:** To support, identify, evaluate and protection of instream flows to benefit Colorado River endangered fish.

**Study Objectives:**

1. To negotiate contracts and leases of water for endangered fish.

2. To collect temperature and hydrological data in support of Recovery program research priorities.
3. To provide water management services to the Recovery Program to manage water for endangered fish augmentation.
4. To provide staff support to the Recovery Program Directors Office on an as-needed basis in the area of instream flow identification, delivery and protection.

## **V. Study Area:**

The Colorado and Green River Basin above Lake Powell.

## **VI. Study Methods/Approach:**

The Service Hydrologist provides hydrological and temperature information to Recovery Program researchers. In addition to this work a number of specific tasks (described below) are undertaken to support instream flows that promote endangered fish recovery on behalf of the Recovery Program.

## **VII. Task Descriptions and Schedule:**

Tasks will be completed November 1st of each year.

### **Task 1. Temperature Data Collection and Analysis:**

In coordination with the Grand Junction Fish and Wildlife Conservation Office (GJFWCO) in Grand Junction, Colorado and the Green River Basin Fish and Wildlife Conservation Office (GRBFWCO) in Vernal, Utah, water temperature data will be gathered systematically to support temperature monitoring and modeling, fish life stage monitoring and forecasting, and other monitoring and research efforts. Thermographs are currently installed at the following locations on the Gunnison, Uncompaghre, Colorado and Green rivers (asterisks denote those currently serviced by the Grand Junction FWCO):

- Gunnison River above Blue Mesa Reservoir\*
- Gunnison River below the North Fork Confluence\* (aka “Austin”)
- Gunnison River above the Uncompaghre confluence\*
- Gunnison River at People’s Orchard\*
- Uncompaghre River Near Delta\*
- Colorado River at the Slide\*
- Colorado River at Palisade\*
- Colorado River at Rulison\*
- Colorado River at Walker\*
- Colorado River at Gold Bar\*
- Green River at Mitten Park (2 locations)
- Green River at Dinosaur National Monument Visitor Center
- Green River at Ouray Refuge
- Green River at Brown’s Park
- Yampa River at Craig
- Yampa River at Juniper Bridge
- Yampa River at Shepherd’s Crossing
- Yampa River at Echo Park

Two Gunnison River monitoring sites were discontinued in 2018 (one downstream of Crystal Reservoir, and one upstream of the North Fork Confluence.) For an explanation of what information they provided, and why they were discontinued, see Jana Mohrman's writeup (in process).

The thermographs will be checked periodically and calibrated with on-site temperature readings. Temperature data collection on the Colorado and Gunnison Rivers by the Grand Junction FWCO was consolidated in this Scope of Work beginning in FY99 and included in the budget table. The information for these gages can be found at: [www.fws.gov/mountain-prairie/riverdata/temperatures.html](http://www.fws.gov/mountain-prairie/riverdata/temperatures.html)

The temperature data, together with climatic, hydrologic, and stream geometry data, will be used to support ongoing research and future river temperature modeling and backwater studies. The temperature data from each of the thermographs will be made available on the Internet shortly after the data are collected. The temperature data along with the channel monitoring and sediment monitoring data will add to the Recovery Program Physical Data Repository.

## **Task 2. Hydrology Support for Upper Colorado River Basin Biological Opinions:**

The Service Hydrologist will help coordinate releases from Flaming Gorge Reservoir (Green River) and the Aspinall Unit (Gunnison River) for endangered fish, pursuant to the corresponding reservoir operation plans and the biological opinions of 2005 and 2009. Releases are monitored and researchers and administrators will be notified of important changes in planned releases. The Service Hydrologist will also schedule and monitor releases from Ruedi, Granby, Williams Fork and Wolford Mountain reservoirs for flow augmentation in the mainstem Colorado River pursuant to the 1999 15-Mile Reach programmatic biological opinion (PBO).

The Service Hydrologist will support activities identified in the Yampa River Management Plan and Programmatic Biological Opinion (2005) in managing the water from Elkhead Reservoir.

For the White River basin, the Service Hydrologist will continue coordinating efforts to develop a White River management plan that: 1) identifies historic and future depletion scenarios; 2) uses (and refines) the Recovery Program's draft endangered fish flow recommendations and current hydrology to identify the effects of past and future water development on endangered fish habitat; 3) develops flow recommendations for the White River and 4) identifies recovery actions needed to offset depletion effects. A federal-state cooperative or other agreement to implement the resultant management plan will constitute the federal action (likely via USFWS participation) that serves as the basis for a Section 7 consultation and development of a White River PBO.

## **Task 3. Hydrology Support for Other Scopes of Work:**

**Coordinates Reservoir Operations:** The Service Hydrologist will provide assistance to Bureau of Reclamation in implementing the annual coordinated reservoir operations (CROS) program. Monitoring activities will be implemented to identify the habitat benefits of coordinated reservoir activities. Operations will be coordinated with the Loveland and Grand Junction offices of Bureau of Reclamation, Denver Water, CWCB, and the State Engineer. Service Hydrologist activities will include: representing the Service at coordinated reservoirs work group meetings, assisting in scheduling public meetings, reviewing press

releases, representing the Recovery Program at public meetings, monitoring runoff, and participating in scheduling reservoir releases to enhance peaks.

The Service Hydrologist will continue working with the Water Acquisition Committee to describe and implement strategies for achieving flow recommendations which protect the environment and protect endangered fish. The Hydrologist will also coordinate efforts to evaluate and implement strategies to help ensure the protection and enhancement of instream flows for the endangered fishes over the long-term, i.e., beyond the life of the Colorado River Recovery Program and/or beyond the de-listing of one or more species.

#### **Task 4. USGS Gage Installation and Maintenance (See SOW #8)**

The Service Hydrologist will continue to work with the U.S. Geological Survey, Bureau of Reclamation, and Colorado Division of Wildlife to contract payments for Program gages.

#### **Task 5. Hydrology Support for the Water Acquisition Committee and Water Right Acquisition**

The Service Hydrologist chairs the Water Acquisition Committee (WAC) which oversees water concerns, water investigations, water-related agreements, and possible water leasing opportunities. Over the years, water right acquisition has become less of a Program focus, while access to stored water supplies and optimization of existing operations has become the focus of the WAC. The tasks listed below support the current mission of the WAC.

- Develops scopes of work for water studies, oversees contracts, and reviews the contracted work.
- Coordinates flow releases from Elkhead Reservoir to the Yampa River with the Colorado River District, the City of Craig, Tri-State Power, and the District Engineer's office, and holds a weekly Yampa River flow coordination call during summer months with interested parties.
- Supports the Utah Ecological Services Field Office in their involvement with the Flaming Gorge Technical Work Group to coordinate flows for critical habitat for the Green River.
- Prepares scopes of work and compiles annual reports for projects in support of WAC-endorsed activities. Annual reports will be submitted to the PDO in November of each year.

#### **Task 6. General Support Activities:**

The Service Hydrologist will participate in technical discussions with the CWCB staff in an effort to identify appropriate instream flow targets for endangered fish. The work will include attending meetings, reviewing reports, providing comments, performing independent analyses, and reporting back to the Service and the WAC. This effort supports the flow filings outlined in the RIPRAP.

The Service Hydrologist will represent the Service and the Recovery Program as a representative at meetings with various water organizations. This may include meetings with basin roundtable groups, irrigation and water conservancy districts, river recreation interests, river conservation organizations, and others. It may also include attending major annual events involving water stakeholders, such as events of

the Colorado Water Congress, the Utah Water Users Association, the Wyoming Water Association, or the Colorado River Water Users Association.

One key role of the Service Hydrologist will be to represent the Service at meetings of the “HUP Managing Entities”, a group established to implement the Orchard Mesa Check Settlement and manage the ‘Historic Users Account’ at Green Mountain Reservoir. This will include attending annual kickoff and wrap-up meetings on the west slope, and participation in weekly conference calls beginning early in July and ending when irrigation ends in October. Each week, projected and actual river flows must be tracked, flow targets coordinated with Service biologists, and recommendations made on how best to release reservoir water secured by the Recovery Program and Program partners to meet targets and provide benefits to endangered fish.

The Service Hydrologist also will serve as Recovery Program liaison with the Utah Department of Natural Resources and The Nature Conservancy regarding potential additional instream flow protection and enhancement activities on the Price and Duchesne Rivers in Utah. Similarly, the Hydrologist will remain engaged in discussions with the State of Utah, the U.S. Fish & Wildlife Service Ecological Services Office, and environmental interests for the evaluation and development of strategies to address potential impacts of future water resources development along the Green River in Utah.

The Service Hydrologist will participate in updating the RIPRAP, developing Program Guidance, providing annual hydrology summaries, and other activities in support of the Program Directors office.

### **VIII. Deliverables, Due Dates, and Budget by Fiscal Year:**

Given the diverse and continually evolving nature of the issues identified and the follow-up work involved, some deliverables are hard to specify in advance. Annual progress presentations will be prepared for the Recovery Program and submitted to the WAC for consideration.

Deliverables that are direct products of the tasks outlined above include:

- A database of temperature data is updated each year for each thermograph, and maintained by the Recovery Program Database Manager. The data will be made available on the Recovery Program’s River Data Web Page (under ‘General’ / ‘Recovery Program Data’ / ‘River Temperature Data’ at: <https://www.fws.gov/mountain-prairie/riverdata/temperatures.html>)
- Each year a report is generated documenting releases from Green Mountain, Ruedi, Granby, and Wolford Mountain reservoirs and the Palisade Bypass Pipeline that describe release volumes to benefit the 15-Mile Reach for endangered fish habitat.
- A report will be prepared as necessary to document work on flow recommendations implementation. The Service Hydrologist will continue to coordinate the reviews by the Geomorphology Peer Review Panel, serve as Chair of the Water Acquisition Committee, develop annual updates for the RIPRAP, coordinate scopes of work, develop meeting agendas, distribute meeting material, and conduct meetings.
- Hydrologic updates will be presented at the Management Committee.

- Scopes of work will be prepared for projects under the purview of the WAC.

FY 2020

Budget \$187,866

FY 2021

Budget \$192,903

FY 2022

Budget \$196,735

FY 2023

Budget \$200,691

FY 2024

Budget \$204,724

IX. Budget Summary: *See attached budget template.*

X. **Reviewers:** Tom Chart, Kevin McAbee, Recovery Program Water Acquisition Committee.

**SUMMARY OF PROPOSED COSTS**

<b>Name of Servicing Agency:</b>	U.S. Fish and Wildlife Service, Region 6
<b>Project Name:</b>	Project 19 "Recovery Program Hydrology Support"

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
	10/1/2019		9/30/2020		10/1/2021		10/1/2022		10/1/2023		
	Through		Through		Through		Through		Through		
Enter the BEGINNING dates for each year ----->	9/29/2020		9/30/2021		9/30/2022		9/30/2023		9/29/2024		
Enter the ENDING dates for each year ----->											
<b>DIRECT LABOR AND FRINGE BENEFIT COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Direct Labor - Hourly	\$	175,307.00	\$	180,053.00	\$	183,633.00	\$	187,323.00	\$	191,072.00	\$ 917,388.00
Fringe Benefits - Hourly	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Direct Labor & Fringe Benefits:	\$	175,307.00	\$	180,053.00	\$	183,633.00	\$	187,323.00	\$	191,072.00	\$ 917,388.00
<b>OTHER DIRECT COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Materials and Supplies	\$	1,113.04	\$	1,136.17	\$	1,160.32	\$	1,184.50	\$	1,200.78	\$ 5,794.81
Travel Costs	\$	4,330.00	\$	4,419.00	\$	4,508.00	\$	4,598.00	\$	4,712.00	\$ 22,567.00
Equipment	\$	1,644.00	\$	1,680.00	\$	1,704.00	\$	1,740.00	\$	1,776.00	\$ 8,544.00
Contractors	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Other Direct Costs:	\$	7,087.04	\$	7,235.17	\$	7,372.32	\$	7,522.50	\$	7,688.78	\$ 36,905.81
<b>INDIRECT/OVERHEAD COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Subtotal of Labor and Other Direct Costs:	\$	182,394.04	\$	187,288.17	\$	191,005.32	\$	194,845.50	\$	198,760.78	\$ 954,293.81
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	
<i>P.L. 112-270 Indirect Rate for Recovery Programs</i> 3.00%	\$	5,471.82	3.00%	\$ 5,618.65	3.00%	\$ 5,730.16	3.00%	\$ 5,845.37	3.00%	\$ 5,962.82	\$ 28,628.81
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	
	\$	-	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	\$ -
Subtotal of Indirect/Overhead Costs:	\$	5,471.82	\$	5,618.65	\$	5,730.16	\$	5,845.37	\$	5,962.82	\$ 28,628.81
<b>GRAND TOTAL:</b>	\$	187,865.86	\$	192,906.82	\$	196,735.48	\$	200,690.87	\$	204,723.60	\$ 982,922.62



**SUMMARY OF DIRECT LABOR & FRINGE BENEFIT**

Enter Escalation Rates ----->	Yr 2 Escalation Rate	2.00%
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\*Wage Rate is inclusive of benefits because of varying fringe

	Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Weekly Rate	YEAR 1					YEAR 2				
							10/1/2019		Through	9/29/2020		9/30/2020		Through	9/30/2021	
							# of Weeks	Weekly Rate*	Salary Cost	Fringe Rate	Fringe Cost	# of Weeks	Weekly Rate*	Salary Cost	Fringe Rate	Fringe Cost
1	SOW 19 - Task 1	Principle Investigator	13	10	Denver	\$ 3,219.00	3.0	\$ 3,219.00	\$ 9,657.00	0.00%	\$ -	3.0	\$ 3,283.00	\$ 9,850.00	0.00%	\$ -
2	SOW 19 - GJ FWCC	Project Leader	14	8	Rest of US	\$ 3,480.40	0.4	\$ 3,480.40	\$ 1,392.00	0.00%	\$ -	0.7	\$ 3,550.00	\$ 2,485.00	0.00%	\$ -
3	SOW 19 - GJ FWCC	Admin Officer	9	8	Rest of US	\$ 1,714.00	0.4	\$ 1,714.00	\$ 686.00	0.00%	\$ -	0.5	\$ 1,748.00	\$ 874.00	0.00%	\$ -
4	SOW 19 - GJ FWCC	Fishery Biologist	11	8	Rest of US	\$ 2,192.51	0.4	\$ 2,192.51	\$ 877.00	0.00%	\$ -	0.4	\$ 2,236.00	\$ 895.00	0.00%	\$ -
5	SOW 19 - GJ FWCC	Biological Technician	7	5	Rest of US	\$ 1,482.40	4.0	\$ 1,482.40	\$ 5,930.00	0.00%	\$ -	4.0	\$ 1,512.00	\$ 6,048.00	0.00%	\$ -
6	SOW 19 - Task 2	Principle Investigator	13	10	Denver	\$ 3,219.00	11.0	\$ 3,219.00	\$ 35,409.00	0.00%	\$ -	11.0	\$ 3,283.00	\$ 36,117.00	0.00%	\$ -
7	SOW 19 - Task 3	Principle Investigator	13	10	Denver	\$ 3,219.00	6.0	\$ 3,219.00	\$ 19,314.00	0.00%	\$ -	6.0	\$ 3,283.00	\$ 19,700.00	0.00%	\$ -
8	SOW 19 - Task 4	Principle Investigator	13	10	Denver	\$ 3,219.00	7.0	\$ 3,219.00	\$ 22,533.00	0.00%	\$ -	7.0	\$ 3,283.00	\$ 22,984.00	0.00%	\$ -
9	SOW 19 - Task 5	Principle Investigator	13	10	Denver	\$ 3,219.00	11.7	\$ 3,219.00	\$ 37,662.00	0.00%	\$ -	11.7	\$ 3,283.00	\$ 38,416.00	0.00%	\$ -
10	SOW 19 - Task 6	Principle Investigator	13	10	Denver	\$ 3,219.00	13.0	\$ 3,219.00	\$ 41,847.00	0.00%	\$ -	13.0	\$ 3,283.00	\$ 42,684.00	0.00%	\$ -
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							<b>56.90</b>		<b>\$ 175,307.00</b>		<b>\$ -</b>	<b>57.30</b>		<b>\$ 180,053.00</b>		<b>\$ -</b>

**SUMMARY OF DIRECT LABOR & FRINGE BENEFIT**

Yr 3 Escalation Rate	2.00%
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Yr 4 Escalation Rate	2.00%
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\*Wage Rate is inclusive of benefits because of varying fringe

	Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Weekly Rate	YEAR 3					YEAR 4				
							10/1/2021		Through	9/30/2022		10/1/2022		Through	9/30/2023	
							# of Weeks	Weekly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Weeks	Weekly Rate*	Salary Cost	Fringe Rate	Fringe Cost
1	SOW 19 - Task 1	Principle Investigator	13	10	Denver	\$ 3,219.00	3.0	\$ 3,349.00	\$ 10,046.00	0.00%	\$ -	3.0	\$ 3,416.00	\$ 10,248.00	0.00%	\$ -
2	SOW 19 - GJ FWCC	Project Leader	14	8	Rest of US	\$ 3,480.40	0.7	\$ 3,621.00	\$ 2,535.00	0.00%	\$ -	0.7	\$ 3,693.00	\$ 2,585.00	0.00%	\$ -
3	SOW 19 - GJ FWCC	Admin Officer	9	8	Rest of US	\$ 1,714.00	0.5	\$ 1,783.00	\$ 891.00	0.00%	\$ -	0.5	\$ 1,819.00	\$ 909.00	0.00%	\$ -
4	SOW 19 - GJ FWCC	Fishery Biologist	11	8	Rest of US	\$ 2,192.51	0.4	\$ 2,281.00	\$ 912.00	0.00%	\$ -	0.4	\$ 2,327.00	\$ 931.00	0.00%	\$ -
5	SOW 19 - GJ FWCC	Biological Technician	7	5	Rest of US	\$ 1,482.40	4.0	\$ 1,542.00	\$ 6,169.00	0.00%	\$ -	4.0	\$ 1,573.00	\$ 6,291.00	0.00%	\$ -
6	SOW 19 - Task 2	Principle Investigator	13	10	Denver	\$ 3,219.00	11.0	\$ 3,349.00	\$ 36,835.00	0.00%	\$ -	11.0	\$ 3,416.00	\$ 37,576.00	0.00%	\$ -
7	SOW 19 - Task 3	Principle Investigator	13	10	Denver	\$ 3,219.00	6.0	\$ 3,349.00	\$ 20,092.00	0.00%	\$ -	6.0	\$ 3,416.00	\$ 20,496.00	0.00%	\$ -
8	SOW 19 - Task 4	Principle Investigator	13	10	Denver	\$ 3,219.00	7.0	\$ 3,349.00	\$ 23,441.00	0.00%	\$ -	7.0	\$ 3,416.00	\$ 23,912.00	0.00%	\$ -
9	SOW 19 - Task 5	Principle Investigator	13	10	Denver	\$ 3,219.00	11.7	\$ 3,349.00	\$ 39,179.00	0.00%	\$ -	11.7	\$ 3,416.00	\$ 39,967.00	0.00%	\$ -
10	SOW 19 - Task 6	Principle Investigator	13	10	Denver	\$ 3,219.00	13.0	\$ 3,349.00	\$ 43,533.00	0.00%	\$ -	13.0	\$ 3,416.00	\$ 44,408.00	0.00%	\$ -
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21						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
22						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
23						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
24						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
25						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
26						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
27						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
28						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
29						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
30						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
31						\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
							<b>57.30</b>		<b>\$ 183,633.00</b>		<b>\$ -</b>	<b>57.30</b>		<b>\$ 187,323.00</b>		<b>\$ -</b>

**SUMMARY OF DIRECT LABOR & FRINGE BENEFIT**

Yr 5 Escalation Rate	2.00%
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\*Wage Rate is inclusive of benefits because of varying fringe

							YEAR 5							
							10/1/2023	Through	9/29/2024		Total Salary Cost	Total Fringe Cost	Total Labor Cost	
Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Weekly Rate	# of Weeks	Weekly Rate*	Salary Cost	Fringe Rate	Fringe Cost				
1	SOW 19 - Task 1	Principle Investigator	13	10	Denver	\$ 3,219.00	3.0	\$ 3,484.00	\$ 10,453.00	0.00%	\$ -	\$ 50,254.00	\$ -	\$ 50,254.00
2	SOW 19 - GJ FWCC	Project Leader	14	8	Rest of US	\$ 3,480.40	0.7	\$ 3,767.00	\$ 2,637.00	0.00%	\$ -	\$ 11,634.00	\$ -	\$ 11,634.00
3	SOW 19 - GJ FWCC	Admin Officer	9	8	Rest of US	\$ 1,714.00	0.5	\$ 1,855.00	\$ 928.00	0.00%	\$ -	\$ 4,288.00	\$ -	\$ 4,288.00
4	SOW 19 - GJ FWCC	Fishery Biologist	11	8	Rest of US	\$ 2,192.51	0.4	\$ 2,374.00	\$ 949.00	0.00%	\$ -	\$ 4,564.00	\$ -	\$ 4,564.00
5	SOW 19 - GJ FWCC	Biological Technician	7	5	Rest of US	\$ 1,482.40	4.0	\$ 1,604.00	\$ 6,418.00	0.00%	\$ -	\$ 30,856.00	\$ -	\$ 30,856.00
6	SOW 19 - Task 2	Principle Investigator	13	10	Denver	\$ 3,219.00	11.0	\$ 3,484.00	\$ 38,328.00	0.00%	\$ -	\$ 184,265.00	\$ -	\$ 184,265.00
7	SOW 19 - Task 3	Principle Investigator	13	10	Denver	\$ 3,219.00	6.0	\$ 3,484.00	\$ 20,906.00	0.00%	\$ -	\$ 100,508.00	\$ -	\$ 100,508.00
8	SOW 19 - Task 4	Principle Investigator	13	10	Denver	\$ 3,219.00	7.0	\$ 3,484.00	\$ 24,390.00	0.00%	\$ -	\$ 117,260.00	\$ -	\$ 117,260.00
9	SOW 19 - Task 5	Principle Investigator	13	10	Denver	\$ 3,219.00	11.7	\$ 3,484.00	\$ 40,767.00	0.00%	\$ -	\$ 195,991.00	\$ -	\$ 195,991.00
10	SOW 19 - Task 6	Principle Investigator	13	10	Denver	\$ 3,219.00	13.0	\$ 3,484.00	\$ 45,296.00	0.00%	\$ -	\$ 217,768.00	\$ -	\$ 217,768.00
11					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
12					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
13					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
14					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
15					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
16					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
17					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
18					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
19					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
20					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
21					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
22					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
23					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
24					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
25					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
26					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
27					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
28					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
29					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
30					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
31					\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -	\$ -
							<b>57.30</b>		<b>\$ 191,072.00</b>		<b>\$ -</b>	<b>\$ 917,388.00</b>	<b>\$ -</b>	<b>\$ 917,388.00</b>

# SUMMARY OF MATERIALS AND SUPPLIES

<b>SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES</b>
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Yr 2 Escalation Rate	2.00%
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	Task # or I	Item Description	Rationale for Proposed Cost	Year 1			Year 2		
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	SOW 19 Task 1 (PI and GJ FWCO)	Logger anchoring replacement supplies, such as cables, clamps, weights.	Past costs	\$ 720.00	1	\$ 720.00	\$ 734.00	1	\$ 734.00
2	Task 1 (PI and GJ)	Mileage rate on vehicle to retrieve/download/redeploy thermographs (792 total miles)	<a href="http://www.gsa.gov/portal/category">http://www.gsa.gov/portal/category</a>	\$ 0.42	792	\$ 332.64	\$ 0.43	792	\$ 340.56
3	Task 1 (PI and GJ FWCO)	rate on vehicle to retrieve/download/redeploy thermographs (monthly rate of \$453/month divided by 30 days = \$15.10/day) - vehicle used for 4 total days in	<a href="http://www.gsa.gov/portal/category">http://www.gsa.gov/portal/category</a>	\$ 15.10	4	\$ 60.40	\$ 15.40	4	\$ 61.61
4				\$ -	0	\$ -	\$ -	0	\$ -
5				\$ -	0	\$ -	\$ -	0	\$ -
6				\$ -	0	\$ -	\$ -	0	\$ -
7				\$ -	0	\$ -	\$ -	0	\$ -
8				\$ -	0	\$ -	\$ -	0	\$ -
9				\$ -	0	\$ -	\$ -	0	\$ -
10				\$ -	0	\$ -	\$ -	0	\$ -
11				\$ -	0	\$ -	\$ -	0	\$ -
12				\$ -	0	\$ -	\$ -	0	\$ -
13				\$ -	0	\$ -	\$ -	0	\$ -
14				\$ -	0	\$ -	\$ -	0	\$ -
15				\$ -	0	\$ -	\$ -	0	\$ -
16				\$ -	0	\$ -	\$ -	0	\$ -
17				\$ -	0	\$ -	\$ -	0	\$ -
18				\$ -	0	\$ -	\$ -	0	\$ -
19				\$ -	0	\$ -	\$ -	0	\$ -
20				\$ -	0	\$ -	\$ -	0	\$ -
21				\$ -	0	\$ -	\$ -	0	\$ -
22				\$ -	0	\$ -	\$ -	0	\$ -
23				\$ -	0	\$ -	\$ -	0	\$ -
24				\$ -	0	\$ -	\$ -	0	\$ -
25				\$ -	0	\$ -	\$ -	0	\$ -
26				\$ -	0	\$ -	\$ -	0	\$ -
27				\$ -	0	\$ -	\$ -	0	\$ -
29				\$ -	0	\$ -	\$ -	0	\$ -
30				\$ -	0	\$ -	\$ -	0	\$ -
<b>TOTAL:</b>						<b>\$ 1,113.04</b>	<b>\$ 1,136.17</b>		

# SUMMARY OF MATERIALS AND SUPPLIES

<b>SUMMARY OF MATERIALS, SUPPLIES</b>	Yr 3 Escalation Rate	2.00%	Yr 4 Escalation Rate	2.00%
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	Task # or I	Item Description	Year 3			Year 4			
			Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	
1	SOW 19 Task 1 (PI and GJ FWCO)	Logger anchoring replacement supplies, such as cables, clamps, weights.	\$ 749.00	1	\$ 749.00	\$ 764.00	1	\$ 764.00	
2	Task 1 (PI and GJ)	Mileage rate on vehicle to retrieve/download/redeploy thermographs (792 total miles)	\$ 0.44	792	\$ 348.48	\$ 0.45	792	\$ 356.40	
3	Task 1 (PI and GJ FWCO)	rate on vehicle to retrieve/download/redeploy thermographs (monthly rate of \$453/month divided by 30 days = \$15.10/day) - vehicle used for 4 total days in	\$ 15.71	4	\$ 62.84	\$ 16.02	4	\$ 64.10	
4			\$ -	0	\$ -	\$ -	0	\$ -	
5			\$ -	0	\$ -	\$ -	0	\$ -	
6			\$ -	0	\$ -	\$ -	0	\$ -	
7			\$ -	0	\$ -	\$ -	0	\$ -	
8			\$ -	0	\$ -	\$ -	0	\$ -	
9			\$ -	0	\$ -	\$ -	0	\$ -	
10			\$ -	0	\$ -	\$ -	0	\$ -	
11			\$ -	0	\$ -	\$ -	0	\$ -	
12			\$ -	0	\$ -	\$ -	0	\$ -	
13			\$ -	0	\$ -	\$ -	0	\$ -	
14			\$ -	0	\$ -	\$ -	0	\$ -	
15			\$ -	0	\$ -	\$ -	0	\$ -	
16			\$ -	0	\$ -	\$ -	0	\$ -	
17			\$ -	0	\$ -	\$ -	0	\$ -	
18			\$ -	0	\$ -	\$ -	0	\$ -	
19			\$ -	0	\$ -	\$ -	0	\$ -	
20			\$ -	0	\$ -	\$ -	0	\$ -	
21			\$ -	0	\$ -	\$ -	0	\$ -	
22			\$ -	0	\$ -	\$ -	0	\$ -	
23			\$ -	0	\$ -	\$ -	0	\$ -	
24			\$ -	0	\$ -	\$ -	0	\$ -	
25			\$ -	0	\$ -	\$ -	0	\$ -	
26			\$ -	0	\$ -	\$ -	0	\$ -	
27			\$ -	0	\$ -	\$ -	0	\$ -	
29			\$ -	0	\$ -	\$ -	0	\$ -	
30			\$ -	0	\$ -	\$ -	0	\$ -	
					<b>\$ 1,160.32</b>				<b>\$ 1,184.50</b>

# SUMMARY OF MATERIALS AND SUPPLIES

<b>SUMMARY OF MATERIALS, SUPPLIES</b>	Yr 5 Escalation Rate	2.00%
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	Task # or I	Item Description	Year 5			TOTAL
			Unit Price	Unit Quantity	Subtotal	
1	SOW 19 Task 1 (PI and GJ FWCO)	Logger anchoring replacement supplies, such as cables, clamps, weights.	\$ 779.00	1	\$ 779.00	\$ 3,746.00
2	Task 1 (PI and GJ)	Mileage rate on vehicle to retrieve/download/redeploy thermographs (792 total miles)	\$ 0.45	792	\$ 356.40	\$ 1,734.48
3	Task 1 (PI and GJ FWCO)	rate on vehicle to retrieve/download/redeploy thermographs (monthly rate of \$453/month divided by 30 days = \$15.10/day) - vehicle used for 4 total days in	\$ 16.34	4	\$ 65.38	\$ 314.33
4			\$ -	0	\$ -	\$ -
5			\$ -	0	\$ -	\$ -
6			\$ -	0	\$ -	\$ -
7			\$ -	0	\$ -	\$ -
8			\$ -	0	\$ -	\$ -
9			\$ -	0	\$ -	\$ -
10			\$ -	0	\$ -	\$ -
11			\$ -	0	\$ -	\$ -
12			\$ -	0	\$ -	\$ -
13			\$ -	0	\$ -	\$ -
14			\$ -	0	\$ -	\$ -
15			\$ -	0	\$ -	\$ -
16			\$ -	0	\$ -	\$ -
17			\$ -	0	\$ -	\$ -
18			\$ -	0	\$ -	\$ -
19			\$ -	0	\$ -	\$ -
20			\$ -	0	\$ -	\$ -
21			\$ -	0	\$ -	\$ -
22			\$ -	0	\$ -	\$ -
23			\$ -	0	\$ -	\$ -
24			\$ -	0	\$ -	\$ -
25			\$ -	0	\$ -	\$ -
26			\$ -	0	\$ -	\$ -
27			\$ -	0	\$ -	\$ -
29			\$ -	0	\$ -	\$ -
30			\$ -	0	\$ -	\$ -
					<b>\$ 1,200.78</b>	<b>\$ 5,794.81</b>

# SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	
<b>From-To</b>	Denver-Rest of US	Denver-Rest of US	Denver-Rest of US	Denver-Rest of US	Denver-Rest of US	
<b>Reason</b>	Deploy and retrieve thermographs (Task 1), reservoir ops meetings (Tasks 2 & 3), water user/stakeholder	Deploy and retrieve thermographs (Task 1), reservoir ops meetings (Tasks 2 & 3), water user/stakeholder	Deploy and retrieve thermographs (Task 1), reservoir ops meetings (Tasks 2 & 3), water user/stakeholder	Deploy and retrieve thermographs (Task 1), reservoir ops meetings (Tasks 2 & 3), water user/stakeholder	Deploy and retrieve thermographs (Task 1), reservoir ops meetings (Tasks 2 & 3), water user/stakeholder	
<b># of Days (include travel days)</b>	20	20	20	20	20	
<b>Airfare</b>	\$ -					
<b>Lodging (Per Night)</b>	\$ 96.00	\$ 98.00	\$ 100.00	\$ 102.00	\$ 104.00	
<b>MI&amp;E Per Day</b>	\$ 57.00	\$ 58.00	\$ 59.00	\$ 60.00	\$ 62.00	
<b>Auto Rental Per Day</b>	\$ -					
<b>Total Per Trip</b>	\$ 3,060.00	\$ 3,120.00	\$ 3,180.00	\$ 3,240.00	\$ 3,320.00	
<b>No. of persons</b>	1	1	1	1	1	
<b>SUBTOTAL =</b>	\$ 3,060.00	\$ 3,120.00	\$ 3,180.00	\$ 3,240.00	\$ 3,320.00	\$ 15,920.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	
<b>From-To</b>	Denver - St. George Utah	Denver - St. George Utah	Denver - St. George Utah	Denver - St. George Utah	Denver - St. George Utah	
<b>Reason</b>	Utah Water Users Meeting	Utah Water Users Meeting	Utah Water Users Meeting	Utah Water Users Meeting	Utah Water Users Meeting	
<b># of Days (include travel days)</b>	4	4	4	4	4	
<b>Airfare</b>	\$ 518.00	\$ 531.00	\$ 544.00	\$ 558.00	\$ 572.00	
<b>Lodging (Per Night)</b>	\$ 96.00	\$ 98.00	\$ 100.00	\$ 102.00	\$ 104.00	
<b>MI&amp;E Per Day</b>	\$ 57.00	\$ 58.00	\$ 59.00	\$ 60.00	\$ 62.00	
<b>Auto Rental Per Day</b>	\$ 35.00	\$ 36.00	\$ 37.00	\$ 38.00	\$ 39.00	
<b>Total Per Trip</b>	\$ 1,270.00	\$ 1,299.00	\$ 1,328.00	\$ 1,358.00	\$ 1,392.00	
<b>No. of persons</b>	1	1	1	1	1	
<b>SUBTOTAL =</b>	\$ 1,270.00	\$ 1,299.00	\$ 1,328.00	\$ 1,358.00	\$ 1,392.00	\$ 6,647.00

# SUMMARY OF EQUIPMENT COSTS

## SUMMARY OF EQUIPMENT

Enter Escalation Rates ----->

Yr 2 Escalation Rate	2.00%	Yr 3 Escalation Rate	2.00%
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	Task #	Item Description	Rationale for Proposed Cost	Year 1			Year 2			Year 3		
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	Task 1	Replacement Thermographs (PI and GJ FWCO)	Each year some thermographs need to be replaced: <a href="http://www.onsetcomp.com/products/data-loggers">www.onsetcomp.com/products/data-loggers</a>	\$ 137.00	12	\$ 1,644.00	\$ 140.00	12	\$ 1,680.00	\$ 142.00	12	\$ 1,704.00
2				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
3				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
4				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
5				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
6				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
7				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
8				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
9				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
10				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
11				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
12				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
13				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
14				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
15				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
16				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
17				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
18				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
19				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
20				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
21				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
22				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
23				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
24				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
25				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
26				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
27				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
28				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
29				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
30				\$ -	0	\$ -	\$ -	0	\$ -	\$ -	0	\$ -
<b>TOTAL:</b>						<b>\$ 1,644.00</b>			<b>\$ 1,680.00</b>			<b>\$ 1,704.00</b>



# SUMMARY OF EQUIPMENT COSTS

<b>SUMMARY OF</b>	Yr 4 Escalation Rate	2.00%	Yr 5 Escalation Rate	2.00%
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	Task #	o	Item Description	Year 4			Year 5			TOTAL
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	
1	Task 1		Replacement Thermographs (PI and GJ FWCO)	\$ 145.00	12	\$ 1,740.00	\$ 148.00	12	\$ 1,776.00	\$ 8,544.00
2				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
3				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
4				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
5				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
6				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
7				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
8				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
9				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
10				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
11				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
12				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
13				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
14				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
15				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
16				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
17				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
18				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
19				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
20				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
21				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
22				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
23				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
24				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
25				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
26				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
27				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
28				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
29				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
30				\$ -	0	\$ -	\$ -	0	\$ -	\$ -
				<b>\$ 1,740.00</b>					<b>\$ 1,776.00</b>	<b>\$ 8,544.00</b>