



OREGON WATER RESOURCE DEPARTMENT
WATER CONSERVATION, REUSE AND STORAGE
GRANT PROGRAM

I. Grant Information

Study Name: North Lateral Feasibility Study Phase I

Type of Grant Requested: X Water Conservation [] Reuse [] Above-Ground Storage
[] Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]
Note: A Water Conservation and Reuse study may be submitted as a joint application. All other applications must only include one application type.

Program Funding Dollars Requested: \$ 6,818.15 Total cost of planning study: \$ 13,636.30
Note: Request may not exceed \$250,000

II. Applicant Information

Table with 2 columns: Applicant Name: Arnold Irrigation District, Co-Applicant Name: (blank). Rows include Address, Phone, Fax, and Email for both applicant and co-applicant.

Table with 1 column: Principle Contact: Colin Wills. Rows include Address, Phone, Fax, and Email.

Certification:

I certify that this application is a true and accurate representation of the proposed work for a project planning study and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department grant and are prepared to conduct the planning study if awarded.

Applicant Signature: [Signature] Date: 4/5/2014

Print Name: Colin T. Wills Title: Field Supervisor

III. Planning Study Summary

Please give a brief summary of the planning study using no more than 150 words.

The Feasibility Study will comprehensively examine a section of AID's existing North Lateral. The AID North Lateral Phase 1 Project is comprised of an approximate 11,900-LF segment of the North Lateral open canal commencing at the diversion from the AID "Main" or Arnold Canal (just easterly of Brookwood Blvd. in Bend, OR) and winding northeasterly to the Parkway Screen of HWY 97(just northerly of Romaine Village Way near the Bend Parkway). Of late, diversion rates of 11cfs have been common to the North Lateral, and significant water losses have been roughly estimated at 40% plus in the Phase 1 segment, alone. The segment of open canal is located in a rocky, fractured basalt region of Central Oregon known for high seepage likelihood.

IV. Grant Specifics

Section A. Common Criteria

Instructions: Answer all questions in this section by typing the answer below the question. It is anticipated that completed applications will result in additional pages.

1. Describe your goal (which must be based on evaluating the feasibility of developing a water conservation, reuse or storage project) and how this study helps to achieve the goal.

For this feasibility project, located in the Bend, Oregon area, AID desires to refine its measurement of loss in this stretch of the North Lateral, and evaluate the best means to address the high loss area to conserve water. In 2010, preliminary loss study was conducted that identified about a 6cfs loss through this section of open canal. The North Lateral serves 32 acres in the project area and 168.8 acres beyond the project area or downstream. Now the District wants to determine if the feasibility of piping or lining the Project area is cost effective for the amount of water conserved.

2. Describe the water supply need(s) that the project associated with the planning study is intended to meet. Applicant should reference supporting documentation that would be available upon request.

Through piping or lining the Phase 1 of the North Lateral project area, AID can save as much as 6cfs of irrigation water. One option is to put the conserved water back instream permanently to increase the Middle Deschutes River flows during peak season.

3. Explain how the project associated with the planning study will meet the water supply need(s), and indicate what percentage of that need will be met. (For example: If your water supply need is 20,000 acre-feet of additional water and the project will supply 10,000 additional acre-feet, 50% of your need will be met).

When the project is complete, there will be up to 6cfs of water conserved. If the conserved water is permanently instreamed back to the Deschutes River, there will be additional 6cfs going towards the 250 cfs target flow set by Oregon Department of Fish & Wildlife.

4. Describe the technical aspects of the planning study and why your approaches are appropriate for accomplishing the goal of the planning study.

Task 1. Aerial Photography and Base Mapping

Download aerial photography and other available mapping from sources such as GIS, OSU database, ect. and import into AutoCAD to develop a reconnaissance-level base map for the project.

Task 2. Limited Field Survey – Recon Level

Perform a limited field GPS or engineer-level survey at a reconnaissance-level for development of a rough project profile and preliminary hydraulic analysis.

Task 3. Reconnaissance Plan and Profile at Report Size

Develop a reconnaissance-level plan and profile (in AutoCAD) of the project area overlaying aerial photography, existing diversions, weirs, headgates, and other key features.

Task 4. Water Loss Evaluation

Review existing AID diversion and seepage loss measurements performed historically by AID. Develop a seepage loss measurement plan for the 2014 irrigation season and implement the plan. This plan will likely involve ground- trothing existing diversion and in-canal weir measurement stations through field measurement with wading devices such as Doppler and/or Price-type meter.

Task 5. Hydraulic Evaluation

Based upon the expected peak diversion rate for the North Lateral, develop a reconnaissance-level hydraulic evaluation for piping the lateral. Given the elevation differential across the segment, this evaluation will include an evaluation of head produced and measures that may be required to dissipate energy in a piped system as well as insuring delivery head to all patrons located along the segment.

Task 6. Lining and Piping Considerations and Cost Estimating

Develop lining and piping alternatives using materials consistent with contemporary practices in Central Oregon. Evaluate approximate quantities and recon-level cost of such alternatives.

Task 7. Evaluation and Recommendation for Project

Develop project recommendations addressing canal water loss incorporating the reconnaissance level plans, cost estimates, and other project specific information compiles during the evaluation.

Task 8. Reporting

Compile the materials into a summary Conservation Project Evaluation report. When the study is complete, AID will be able to knowledgeably determine if a piping or lining project is feasible in the Project area. If determined that one of the options in the report developed by Black rock Consulting is feasible, AID will begin looking for funding and complete Phase 1.

5. Describe how the planning study will be performed. Include:

- a. General summary statement that describes the study progression.

Generally, the proposed evaluation is to review, further study, and confirm water loss estimates, to perform reconnaissance-level field elevation survey, to develop conceptual hydraulic evaluation, evaluate water conservation solutions such as lining and piping, develop reconnaissance-level cost estimates, and compile in a final summary.

- b. When the planning study could begin.

Depending if funding is awarded, June 2014.

- c. Listing of Key Tasks to be accomplished with each task having:

Task 1. Aerial Photography and Base Mapping: June – July 2014

- a. *Develop base mapping at 1"=200ft scale – Black Rock Consulting*
- b. *GIS Mapping and data collection will be provided to Black Rock Consulting to use in develop the mapping – AID/Black Rock Consulting*

Task 2. Limited Field Survey – Recon Level: July 2014

- a. *Collection of data on trees, turnouts, check structures and other appurtenances that may affect the design will be included in the mapping – AID/Black Rock Consulting*
- b. *Coordinate with Black Rock for Survey Planning – AID*

Task 3. Reconnaissance Plan and Profile at Report Size: July – August 2014

- a. *Data transfer to base maps and develop a reconnaissance-level plan and profile in AutoCAD of the project – Black Rock Consulting*

Task 4. Water Loss Evaluation: August 2014

- a. *Seepage loss measurements will be performed at least once during the 2014 irrigation season – AID/Black Rock Consulting*
- b. *Additional seepage loss measurements are recommended once at an early season period and again at peak season – AID*

Task 5. Hydraulic Evaluation: August – September 2014

- a. *Pipe diameter sizing calculations - Black Rock Consulting*
- b. *Energy Dissipation Considerations - Black Rock Consulting*

Task 6. Lining and Piping Considerations and Cost Estimating: September – October 2014

- a. *Project cost estimate from vendors will be compiled to develop the cost estimate for piping or lining the canal - Black Rock Consulting/AID*

Task 7. Evaluation and Recommendation for Project: September – October 2014

- a. *Recommendations addressing canal seepage/leakage and other project specific information compiled during evaluation - Black Rock Consulting*

Task 8. Reporting: October 2014

- a. *The final evaluation is to review and confirm water loss estimates, to perform recon-level field survey, to develop conceptual hydraulic evaluation, evaluate water conservation solutions such as lining or piping with cost estimates, and compile a final summary Conservation Project Evaluation Report – AID/ Black Rock Consulting*

6. Provide data and information on the associated project and the project's sources of water supply:
- a. The location of the associated project. (Include the basin, county, township, range and section.)
The Project is located in the Upper Deschutes Basin; Deschutes County; Township 18S, Range 12E, Section 17-19; Bend, Oregon. See attached mapping.
 - b. The name(s) and river mile(s) of the source water and what they are tributary to, if applicable.
The Deschutes River is a tributary to the Columbia River, AID's diversion is (Section 27, Township 18S, Range 11E; at approximate river mile 174.5) See attached map for Head Works Diversion
 - c. Whether the project will be off-channel or on-channel.
The project will be off-channel.
 - d. Water availability to meet project storage. (Typically, the Department evaluates new storage projects using a 50 percent water availability analysis.)
Not applicable to this project.
 - e. Proposed purposes and uses of stored water.
Not applicable to this project.
 - f. Environmental flow needs and water quality requirements of supply source water bodies.
Not applicable to this project.
7. What local, state or federal project permitting requirements/issues/approvals do you anticipate in order for the planning study to be conducted? If approvals are required, indicate whether you have obtained them. If you have not obtained the necessary permits/governmental approval, describe the steps you have taken to obtain them.
There are no permitting requirements/issues anticipated for the study to be conducted.

8. Describe the level of involvement, interest and/or commitment of different entities associated with the planning study (attach letters of support). Describe how these entities will benefit or be impacted by the planning study.

The Deschutes Basin Board of Control is made up of members from the local Central Oregon irrigation districts. Water conservation is a key topic of interest in the Deschutes Basin, among the Irrigation Districts, as water right holders they all support the responsibility an irrigation district shows in conserving water. This project through lining or piping would allow water to be conserved for the future. (See attached letter)

Arnold Irrigation District is committed to this study through in-kind and cash matching 50% of the project cost. The district is committed to being as efficient in delivering water to our patrons as possible, while conserving water for the Deschutes Basin and water rights holders downstream.

9. Identify when matching funds will be secured and the term of matching funds availability.

Matching fund for this feasibility study will be secured through AID accounts, funding will be available May 2014.

10. Provide a description of the relevant professional qualifications and/or experience of the person(s) that will play key roles in performing the planning study. If the personnel have not been decided upon, include a description of the professional qualifications and/or experience of the person(s) you anticipate will play key roles in performing the planning study.

Juanita De Jarnett – AID Office Manager: Juanita has been at AID for 13 years with experience in all aspects of the office management, customer relations and water matters. She manages the accounts receivable aspects of the District, takes customer requests and relays them to the ditchriders and field supervisor as necessary. Juanita works closely with Geo-Spatial Solutions using their GIS Direct mapping program to complete transfer and lease maps. She is currently in the process of attaching a documentation layer relating to properties with water rights and areas with AID facilities to the mapping. She is in constant contact with customers regarding the beneficial use of their water rights and notifying them as needed of the requirements as specified by the State, assisting and completing transfers and instream leases as needed. Juanita has also served on the board of the Chaparral Water Control Board since 2012.

Colin Wills – AID Field Supervisor: Colin has been with AID for 7 years with experience in all aspects of operations, land use and easement issues, grant specialist, as well as overseeing the water daily data readings. Colin assists other staff members with recommendations and evaluations of future conservation projects and system improvements based on data collected and loss reports.

Shawn Gerdes – AID Secretary/Manager: Shawn has been with AID for 20 years, and District Manager for about 15 years. AS well as managing our district, Shawn is an active on many boards locally and within the State of Oregon some of these are: Deschutes Basin Board of Control as treasurer (DBBC), Deschutes Water Alliance (DWA) board member, Special Districts Association of Oregon (SDAO) board member and current President of Oregon Water Resource Congress (OWRC).

Kevin Crew – Black Rock Consulting, P.E., Principal: Kevin is a civil engineer with 27 years of experience in personnel management, project design and management, hydroelectric power feasibility and implementation, hydraulic analysis, construction management, and public presentations. Kevin has prepared water master plans and water conservation plans for agencies in Oregon. He plans, manages and designs domestic and irrigation water supply, hydropower, fish screens and passage, grading, sewer, and storm water facility projects. Mr. Crew has completed large and small multifaceted projects for the public sector, including the military, and for private developers. He is an experienced plan checker and has been in responsible charge of over \$175 million in water resources related projects.

Section B. Unique Criteria

Instructions: Answer the set of questions below that applies to the type of planning study that this grant will fund.

Water Conservation or **Reuse**

1. Water Conservation or Reuse projects that may result from this planning study are requested to be included in the Water Resources Department's "Inventory of Potential Conservation Opportunities". Though you may have already submitted this information earlier in the year through a separate survey, we ask that all applicants complete the information on the form provided at the end of this application.

I have filled out the application or I have not filled out the application.

2. Explain how the associated project will mitigate the need to develop new water supplies and/or use water more efficiently. Reference documentation and/or examples of the success of similar or comparable water conservation/reuse projects that would be available upon request.

Through lining or piping in this project area of Phase 1 loss of water will be decreased or eliminated by decreasing the amount of water needed for delivery to AID's patrons within the project reach. By decreasing the demand of water needed to deliver to existing patrons, the district will be using its water more efficiently as well as benefiting the Upper and Middle Deschutes Basin.

V. Match Funding Information

Applicants must demonstrate a minimum dollar-for-dollar match based on the total funding request. The match may include a) secured resources, b) previously expended resources, and/or c) pending resources. For secured funding, you must attach a letter of support from the match funding source that specially mentions the dollar amount shown in the “Amount/Dollar Value” column. For pending resources, documentation showing a request for the matching funds must accompany the application. For resources that have been previously expended, the expenditure must have occurred on or after July 1, 2013. Resources expended prior to July 1, 2013 are not eligible for match purposes.

The Type of matching funds may include:	The Status of matching funds may include:
<ul style="list-style-type: none"> The value of in-kind labor, equipment rental and materials essential to the planning study provided by the applicant or partner*. 	<ul style="list-style-type: none"> Secured funding commitments from other sources.
<ul style="list-style-type: none"> Cash is direct expenditures made in support of the planning study by the applicant. 	<ul style="list-style-type: none"> Associated and documented expenditures for the planning study from non-program sources incurred on or after July 1, 2013.
	<ul style="list-style-type: none"> Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

*"Partner" means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ One)	Status (✓ One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
<i>AID Labor, Staff/Benefits</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending	\$1,763.30	May 2014
<i>Engineering Contractual Services – Black Rock Consulting</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending	\$5,054.85	May 2014
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in kind	<input type="checkbox"/> secured <input type="checkbox"/> expended <input type="checkbox"/> pending		

VI. Project Planning Study Schedule

Estimated Project Duration: June to October 2014

Place an "X" in the appropriate column to indicate when each Key Task of the project will take place.

Project Planning Study Key Tasks	2014				2015				2016 & Beyond
	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	
<i>1. Aerial Photography and Base Mapping</i>		X	X						
<i>2. Limited Field Survey</i>			X						
<i>3. Reconnaissance Plan and Profile</i>			X						
<i>4. Water Loss Evaluation</i>			X						
<i>5. Hydraulic Evaluation</i>			X						
<i>6. Lining/Piping Estimating</i>			X	X					
<i>7. Evaluation/Recommendation for Project</i>			X	X					
<i>8. Reporting</i>			X	X					

VII. Project Planning Study Budget

Section A

Please provide an estimated line item budget for the project planning study. An example would include: labor, materials, equipment, contractual services and administrative costs.

Line Items	Number of Units* (e.g. # of Hours)	Unit Cost (e.g. hourly rate)	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Staff Salary/Benefits	20	\$35.12	\$702.40			\$702.40
Water Use/Grant Specialist	10	\$30.28	\$302.80			\$302.80
Project Manager	10	\$75.81	\$758.10			\$758.10
Contractual: Engineering Services	61	\$145.00		\$5,054.85	\$3,790.15	\$8,845.00
Engineering Tech	34	\$82.00			\$2,788.00	\$2,788.00
Engineering Clerical	4	\$60.00			\$240.00	\$240.00
Administrative Costs**						
Total for Section A			\$1,763.30	\$5,054.85	\$6,818.15	\$13,636.30
Percentage for Section A			13	37%	50%	100%

* Note: The "Unit" should be per "hour" or "day" – not per "project" or "contract." $Units \times Unit\ Costs = Total\ Cost$

** Administrative Costs may not exceed 10% of the total funding requested from the Department

Section B

If Grant amount requested is \$50,000 or greater, you **MUST** complete Section B. Key Tasks in Section B should be the same as the Key Tasks in Section VI (Project Planning Study Schedule).

Project Planning Study Key Tasks	In-Kind Match	Cash Match Funds	OWRD Grant Funds	Total Cost
Total for Section B				

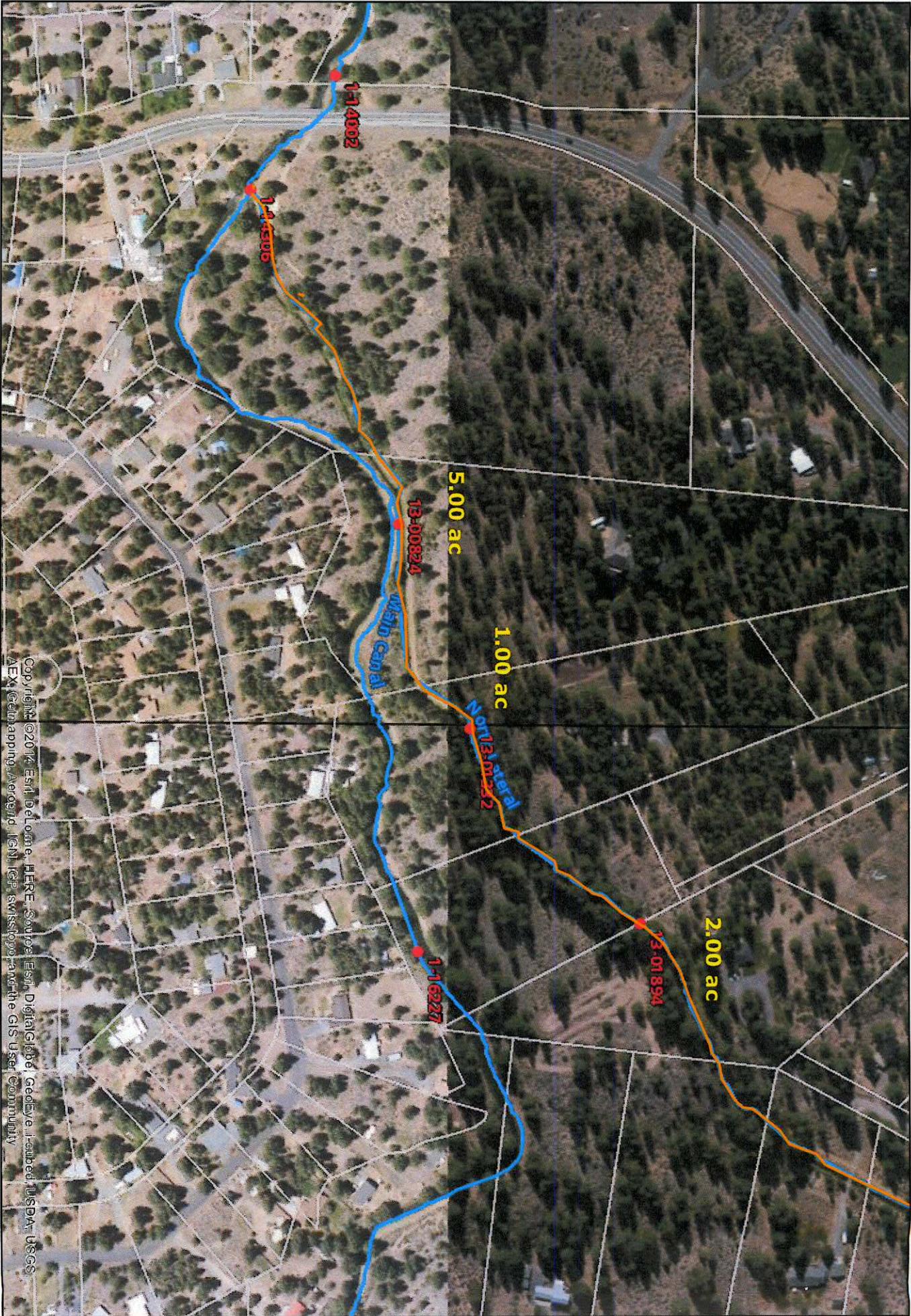
Totals in Section B must match the totals in Section A

To add a project to the inventory of potential conservation opportunities, please provide the following information for each conservation project.

This is a <input checked="" type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	North Lateral Conservation Project Phase 1
Project Description	Piping or Line high loss area of open canal of Phase 1
Estimated Future Savings	6 cfs of irrigation water
Seasonality	Peak irrigation season
Estimated Future Costs	Not available until feasibility study is complete, and bids are in.
Implementation Schedule	Not yet, coordinating cost and savings estimate after feasibility study, then will seek funding if project is feasible.
What are the barriers to implementation, e.g. funding?	Feasibility Study not complete or project bidding. Grants or secured funding not yet acquired.
This is a <input type="checkbox"/> Capital Conservation Project <input type="checkbox"/> Programmatic Conservation Project	
Project #/Name	
Project Description	
Estimated Future Savings	
Seasonality	
Estimated Future Costs	
Implementation Schedule	
What are the barriers to implementation, e.g. funding?	

- Include this form with your application -

North Lateral Section 1

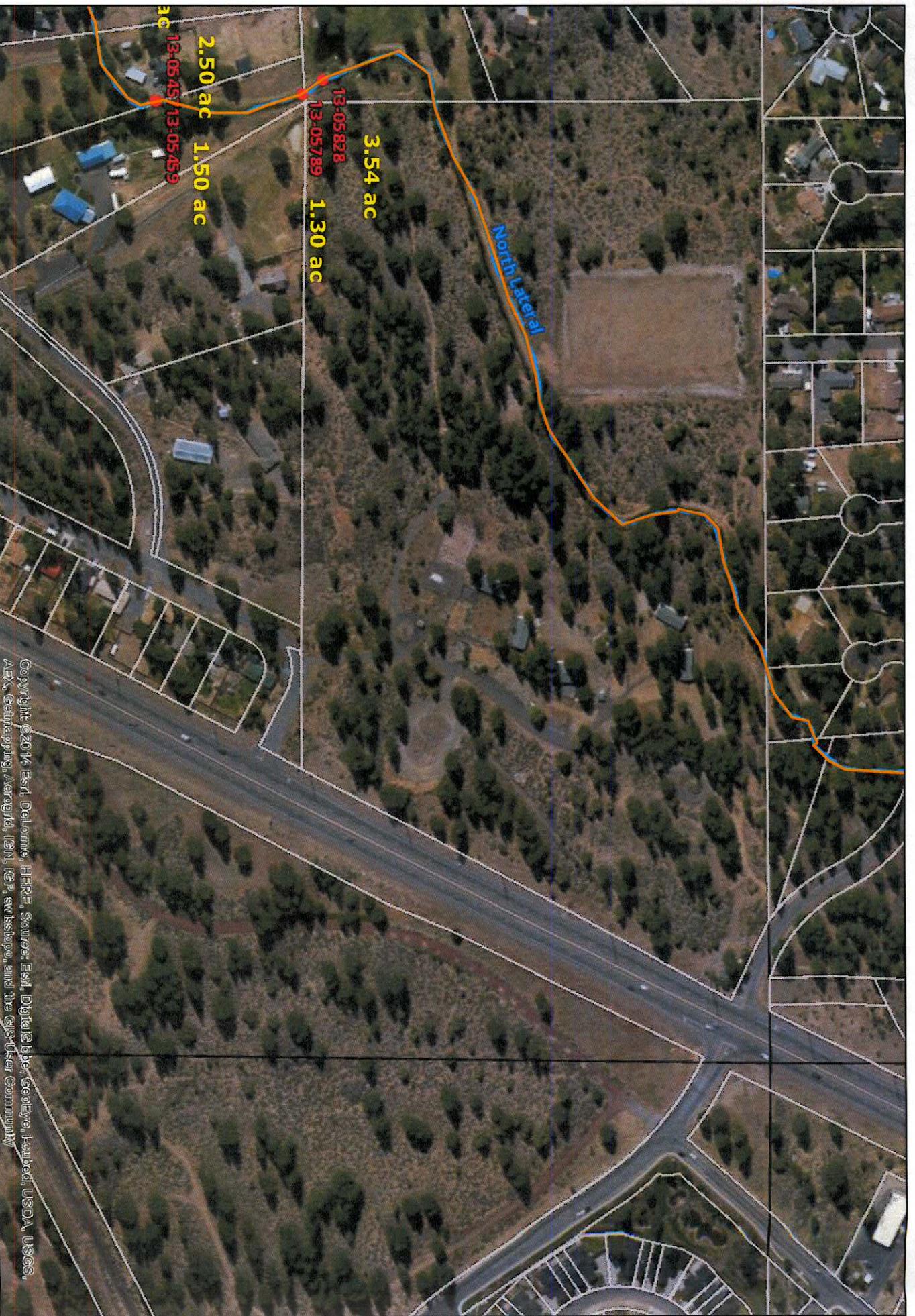


Author: Juanita De Jarnett
Organization: Arnold Irrigation District

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North Lateral Section 3



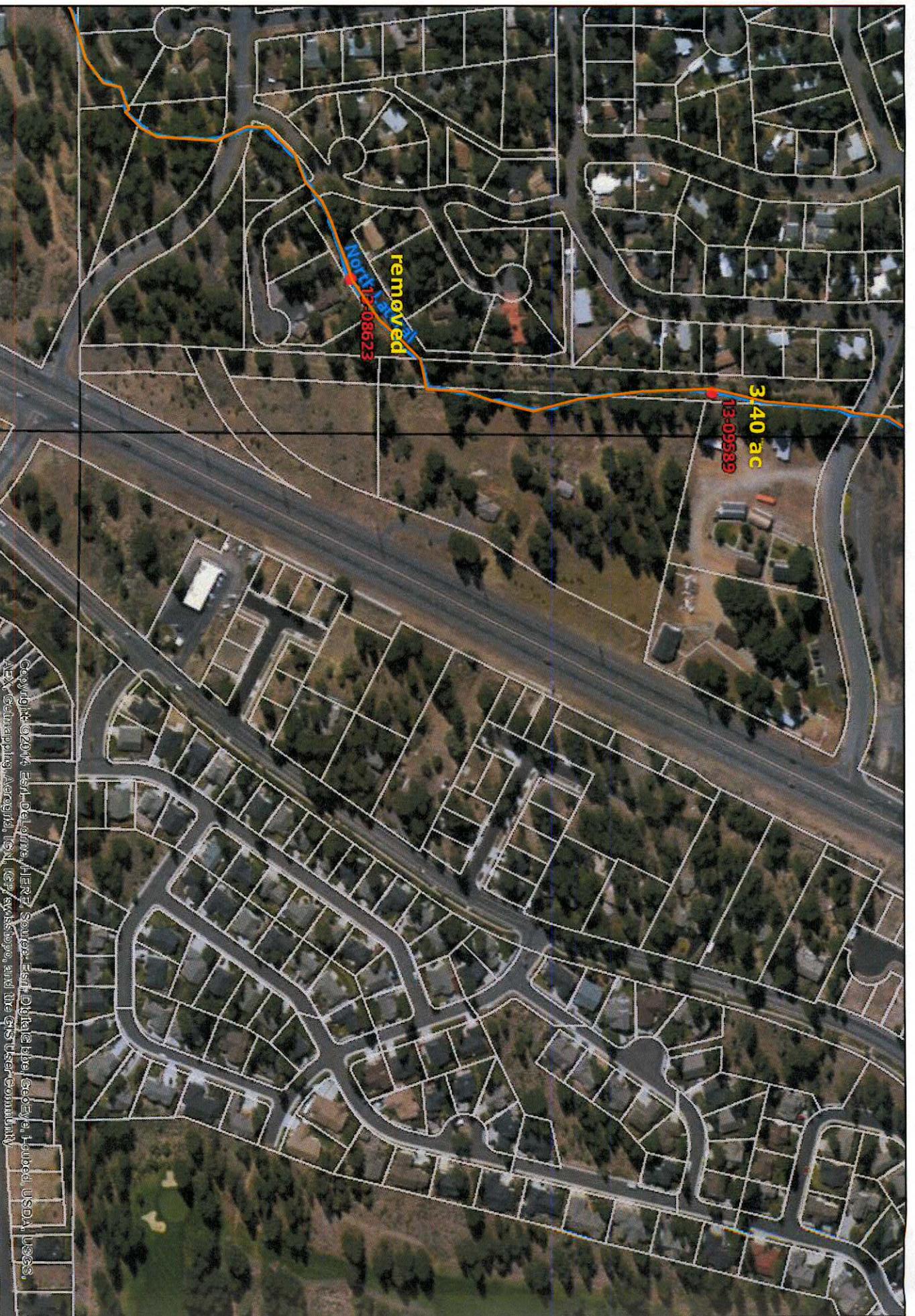
Author: Juanita De Jarrett
Organization: Arnold Irrigation District



Date Created: March 27, 2014

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North Lateral Section 4



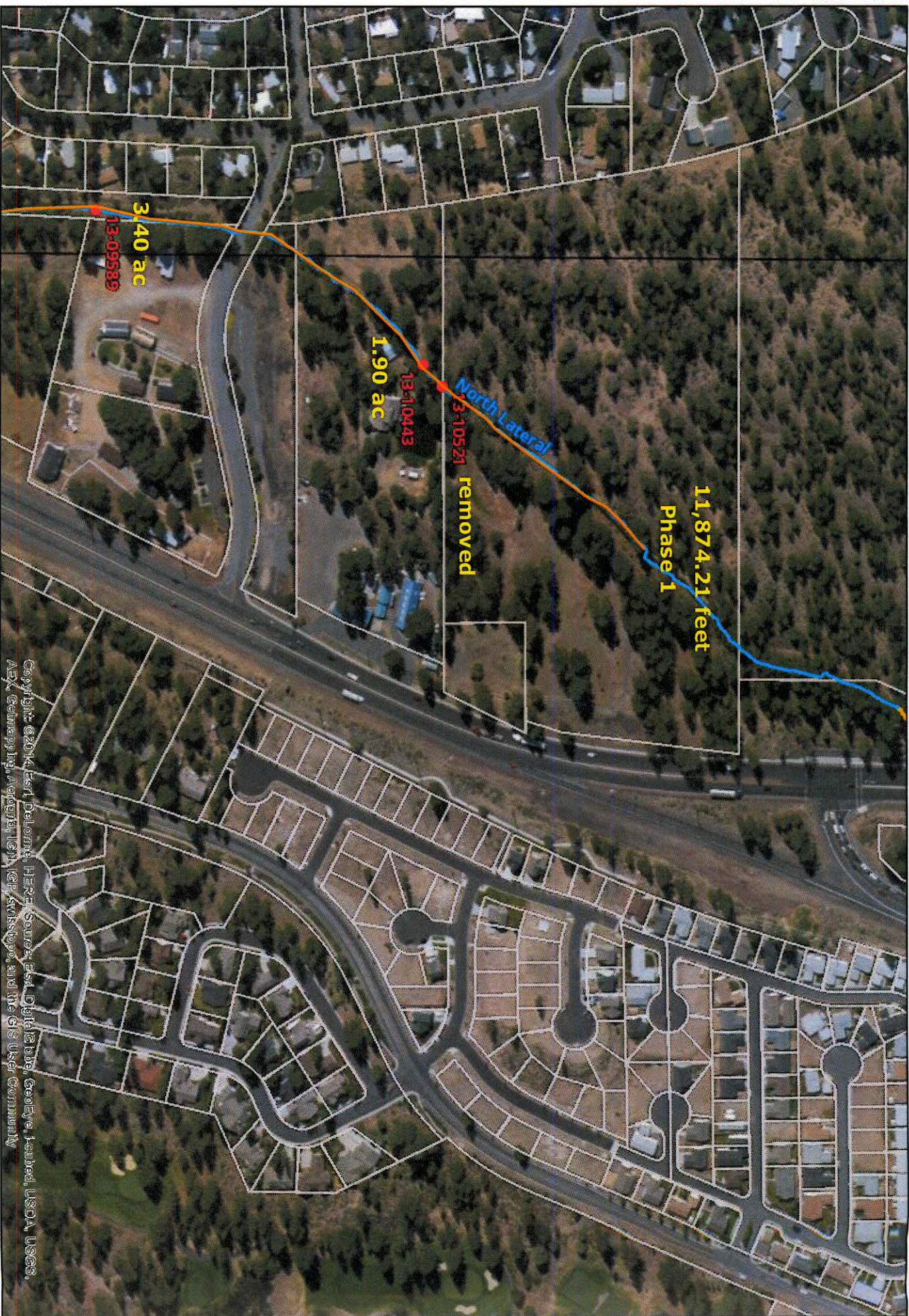
Author: Juanita De Jannek
Organization: Arnold Irrigation District



Date Created: March 27, 2014

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North Lateral Section 5

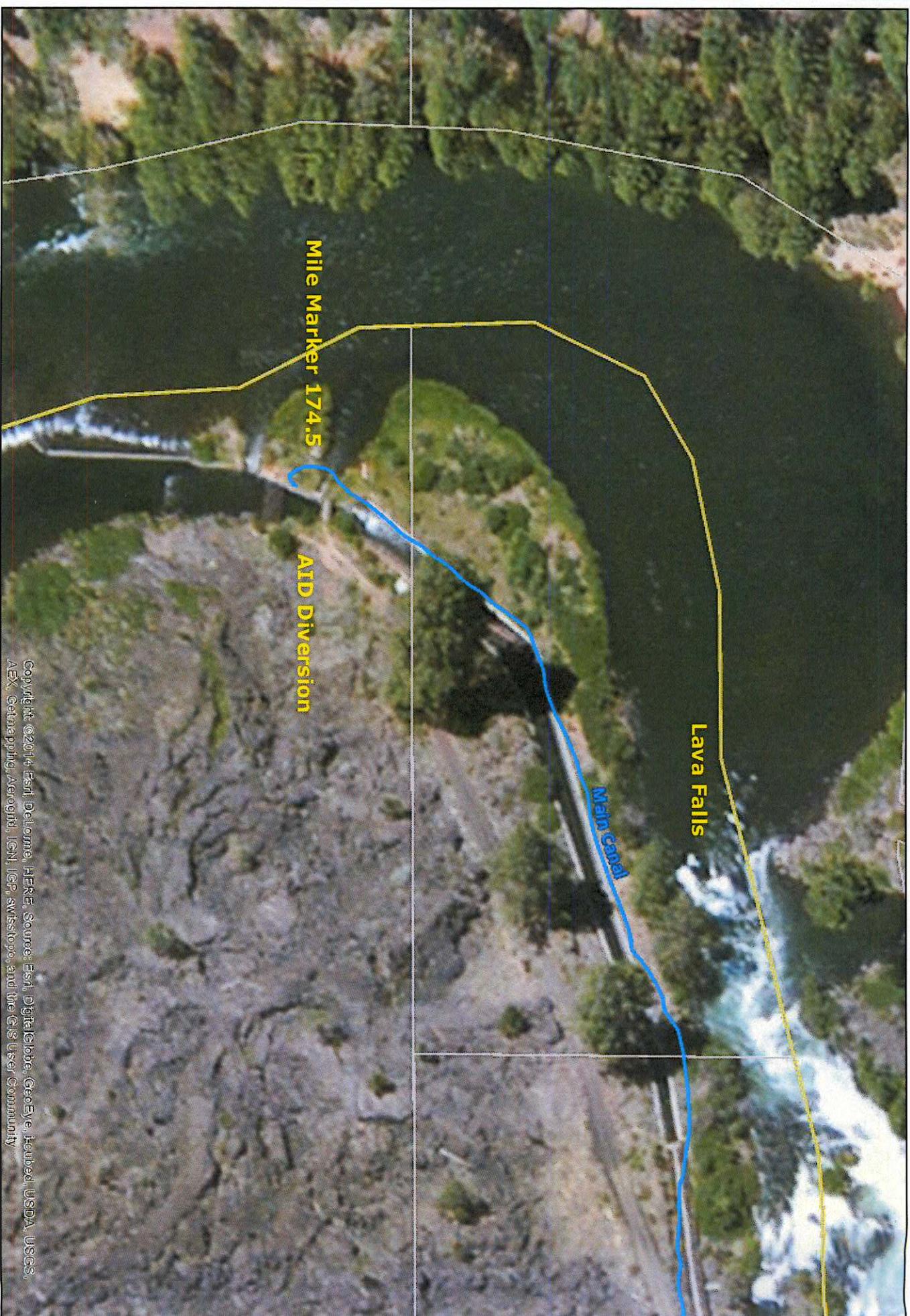


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Date Created: March 27, 2014

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AID Diversion



Lava Falls

Main Canal

Mile Marker 174.5

AID Diversion

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Date Created: April 11, 2014



Author: Juanita De Jarnett
Organization: Arnold Irrigation District



Deschutes Basin Board of Control



April 8, 2014

Oregon Water Resources Department
Attn: Nancy Pustis
725 Summer Street NE, Suite A
Salem OR 97301

RE: Letter of Support for Arnold Irrigation District's North Lateral Phase 1 Feasibility Study

To Whom It May Concern:

We wish to express our strong support for Arnold Irrigation District's (AID) North Lateral Feasibility Study project. We are all stakeholders in the Deschutes Basin and deeply committed to the wise long-term management of the area's water resources including water conservation.

The study is comprised of an approximate 11,900-LF segment of the North Lateral open canal commencing at the diversion from the Arnold Canal (just easterly of Brookwood Boulevard, Bend, OR) and winding northeasterly to the Parkway Screen of HWY 97 (just northerly of Romaine Village Way near the Bend Parkway). The overall goals are to conserve water through system improvements in this high water loss area.

As the communities in Central Oregon grow, it is essential that AID pursue the most prudent management of its water resources. By integrating conservation and improvements to water delivery efforts, the district will up hold its responsibility to its patrons as well the natural environment for many years to come. We are confident that the grant funds requested by the district for Phase 1 project would substantially assist the district in meeting these goals.

Sincerely,

Mike Britton
Chairman

PO Box 919 - Madras, OR 97741

DBBC Member Districts

*Arnold Irrigation District • Central Oregon Irrigation District • North Unit Irrigation District • Ochoco Irrigation District
Swalley Irrigation District • Three Sisters Irrigation District • Tumalo Irrigation District*

Chairman: Mike Britton - (541) 475-3625 - mbritton@northunitid.com