CITY AND BOROUGH OF WRANGELL
INCORPORATED MAY 30, 2008

P.O. BOX 531 (907)-874-2381
Wrangell, AK 99929 FAX (907)-874-3952
www.wrangell.com

October 7, 2016

Robert Chambers
Rural Development
800 W. Evergreen
Suite 201
Palmer, AK 99645

Re: Wrangell Water Treatment Improvement Project – SF424, Narrative and supporting forms

Dear Robert:

Enclosed please find the City and Borough of Wrangell's initial application for the Water Treatment Improvement Project.

Please let us know if there is anything else you need.

Sincerely,

Carol Rushmore
Economic Development Director

OMB Number: 4040-0004
Expiration Date: 03/31/2012

Application for Federal Assistance SF-424

* 1. Type of Submission:	* 2. Type of Application:	* If Revision, select appropriate letter(s):
☐ Preapplication	☑ New	
☑ Application	☐ Continuation	* Other (Specify)
☐ Changed/Corrected Application	☐ Revision	

* 3. Date Received:	4. Applicant Identifier:
Completed by Grants.gov upon submission.	

5a. Federal Entity Identifier:	* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:	7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Wrangell

* b. Employer/Taxpayer Identification Number (EIN/TIN):	* c. Organizational DUNS:
926000144	083353854

d. Address:

* Street 1:	PO Box 531
Street 2:	
* City:	Wrangell
County/Parish:	Wrangell
* State:	Alaska
Province:	
* Country:	USA: UNITED STATES
* Zip / Postal Code:	99929

e. Organizational Unit:

Department Name:	Division Name:
Wrangell Water Department	

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:		* First Name:	Amber
Middle Name:			
* Last Name:	Al-Haddad		
Suffix:			

Title: Public Works Director

Organizational Affiliation:
City and Borough of Wrangell

* Telephone Number:	907-874-3904	Fax Number:	(907) 874-2699

* Email: aal-haddad@wrangell.com

Application for Federal Assistance SF-424

9. Type of Applicant 1 - Select Applicant Type:

Municipal

Type of Applicant 2- Select Applicant Type:

Type of Applicant 3- Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

USDA Rural Development

11. Catalog of Federal Domestic Assistance Number:

10.760

CFDA Title:

*** 12. Funding Opportunity Number:**

*** Title:**

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Wrangell, Alaska

Add Attachments | Delete Attachments | View Attachments

*** 15. Descriptive Title of Applicant's Project:**

Water treatment plant improvements

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: AK-00; * b. Program/Project: AK-00;

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachments | Delete Attachments | View Attachments

17. Proposed Project:

* a. Start Date: 01-01-2017 * b. End Date: 12-31-2018

18. Estimated Funding ($):

* a. Federal	$6,383,119.00
* b. Applicant	
* c. State	
* d. Local	
* e. Other	
* f. Program Income	
* g. TOTAL	$6,383,119.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- ☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .
- ☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- ☑ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)**

☐ Yes ☑ No

If "Yes, provide explanation and attach.

Add Attachments | Delete Attachments | View Attachments

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☑ **** I AGREE**

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	
* First Name:	Jeff
Middle Name:	
* Last Name:	Jabusch
Suffix:	
* Title:	Borough Manager
*Telephone Number:	907-874-2381
Fax Number:	(907) 874-3952
* Email:	manager@wrangell.com
* Signature of Authorized Representative:	Completed by Grants.gov upon submission.
* Date Signed:	Completed by Grants.gov upon submission.

J. Jeff Jabusch 10-7-16

BUDGET INFORMATION - Construction Programs

OMB *Approval No. 4040-0008*
Expiration Date 07/30/2010

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	$ 94,425.00	$	$ 94,425.00
2. Land, structures, rights-of-way, appraisals, etc.	$ 0.00	$	$ 0.00
3. Relocation expenses and payments	$ 200,000.00	$	$ 200,000.00
4. Architectural and engineering fees	$ 492,110.00	$	$ 492,110.00
5. Other architectural and engineering fees	$ 0.00	$	$ 0.00
6. Project inspection fees	$ 295,300.00	$	$ 295,300.00
7. Site work	$ 0.00	$	$ 0.00
8. Demolition and removal	$ 0.00	$	$ 0.00
9. Construction	$ 4,721,000.00	$	$ 4,721,000.00
10. Equipment	$ 0.00	$	$ 0.00
11. Miscellaneous	$ 0.00	$	$ 0.00
12. SUBTOTAL *(sum of lines 1- 11)*	$ 5,802,835.00	$ 0.00	$ 5,802,835.00
13. Contingencies	$ 580,284.00	$	$ 580,284.00
14. SUBTOTAL	$ 6,383,119.00	$ 0.00	$ 6,383,119.00
15. Project (program) income	$	$	$ 0.00
16. TOTAL PROJECT COSTS (subtract #15 from #14)	$ 6,383,119.00	$ 0.00	$ 6,383,119.00

FEDERAL FUNDING		
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X ____ %	$

Water Treatment Plant Improvements Project Narrative
City and Borough of Wrangell
October 5, 2016

The City and Borough of Wrangell (CBW) provides potable water to the community of Wrangell, serving approximately 2400 residents and all community businesses, including schools, the hospital, clinics, senior housing, local, state and federal offices, harbors, the airport, the community swimming pool, three seafood processors and visiting passenger cruise ships.

To supply potable water, Wrangell owns and operates a Class 2 Public Water System (PWS ID No. AK2120143), under which the current water treatment plant was constructed in 1999 and features an ozonation process followed by roughing filter, slow-sand filtration and disinfection. Soon after the plant came on-line, the CBW became unable to operate a number of the processes in accordance with the design, which has resulted in less effective water treatment and higher than expected O&M costs. In addition, the facility struggles to meet peak water demand in the summer when seafood processors and cruise ships become active and are supplied with the City's potable water. Further, with high organic concentrations in the raw water, we are faced with high disinfection by-product formation when chlorine is injected in the plant's filtered water, prior to storage and distribution.

The current water treatment system is fed by a surface water source. In the process of producing drinking water, Wrangell deals with these primary challenges:

1. Poor roughing filter performance.
2. Premature head loss development in the slow sand filters, leading to difficulty and an inordinate frequency in filter maintenance.
3. Average to below-average removal of organics from the water.
4. Relatively high chlorine consumption in the distribution system.
5. High levels of haloacetic acids in the distribution system.
6. Low slow filtration capacity and water storage volume relative to summer and winter water demands.

As required by Safe Drinking Water Act and other State and Federal regulations, the CBW's treated water must meet certain water quality standards established by EPA. Due to changing regulations, it is becoming increasingly difficult to meet the requirements for reducing the risk of health-related incidents in drinking water with our current treatment facility.

Since the water plant's inception there have been several major developments in Wrangell causing an increase in our demand and water consumption, by at least 20%. The resulting demand has required Wrangell to build extra water storage capacity, which has helped to some degree; however, the dramatic increase in water consumption has put unanticipated demands on the water plant with an added potential for health and safety risks.

As a result, the City and Borough of Wrangell is pursuing the design and construction of a state of the art water treatment plant to increase water treatment capacity, to improve the quality of Wrangell's drinking water, while meeting all current federal and state drinking water regulations for primary and secondary contaminant levels and disinfection processes, and to improve our production capacity to meet the community's growing water demand, as potable water is essential to the health and safety of Wrangell's residents, businesses and visitors.

The CBW's surface water source is comprised of two dammed reservoirs, an upper and a lower reservoir connected by an open drainage stream with a total volume of approximately 66,700,000 gallons. The reservoirs have thus far consistently supplied water to the community with no drought-related interruptions; however, with an increase in dry periods, the lakes' shorelines and mud banks become exposed, increasing erosion, which adversely affects the raw water quality. In general, Wrangell's raw water enters the plant from the lower reservoir with elevated levels of turbidity, organics, color, iron and manganese, as well as low pH and alkalinity levels.

The current filtration system design attempts to remove organics through ozonation and filtration, prior to chlorination; however, the current design and consistent high flow volumes do not allow enough organics to be removed. Remaining high organics and turbidity cause rapid clogging of the sand filter; therefore, water is not filtered fast enough to meet the increased demand. The filters must be scraped and cleaned every week, rather than quarterly according to the plant's O&M design. This continual filter cleaning does not allow the necessary development of biofilm on the top layer of sand where the primary biological treatment should occur.

Combined, these raw water elements and treatment plant deficiencies result in the following consequences for Wrangell:

- With the modifications of the Surface Water Treatment Rule, consistent turbidity removal and disinfection are challenges to meet with the current treatment system.
- Poor removal of color, iron and manganese, as well as pH adjustment, present challenges to meet secondary contaminant objectives.
- Low pH, hardness and total dissolved solids indicate a corrosive tendency in the water, which is a concern addressed by the Lead and Copper Rule.
- Relatively high ultraviolet absorbance suggests that the chemistry of organic matter is largely hydrophilic, and therefore not yielding to removal by typical filtration methods.
- Poor organics removal leads to the generation of disinfection byproducts, which is a concern addressed by the Disinfectant/Disinfection Byproduct Rule.

Due to the slow rate at which our facility can produce treated water, Wrangell relies heavily on our two approximately 424,000 gallons each water storage tanks to offset the production versus demand rate differentials. Depending on the time of the year, the water's residence time spent

in the storage tanks can be less than a few hours to a couple of days. The low demand in certain sections of the distribution system could stretch this residence time considerably. The longer the residence time, the lower the water quality becomes, and the water within is at increased risk of becoming affected by on-going chemical reactions that occur in the distribution system, such as the corrosive action of low pH and the oxidation involving chlorine, both of which are primary health and safety concerns:

- Corrosive action of water with a low pH, when in contact with lead or copper-containing materials, can leach these substances into suspension and increase their concentrations in the drinking water used by consumers. While Wrangell's distribution system does not contain lead piping components, many residential and business services likely still contain materials with both lead and/or copper.
- Oxidation consumes chlorine and can create disinfection byproducts (DBPs), many of which are identified as carcinogenic substances. The generation of DBPs will generally occur as long as the disinfectant and organic precursors are present. The more precursors that can be removed from the water by the treatment process, the less the potential will be for generating DBPs.

CBW's water has generally complied with its monitoring and drinking water quality requirements, having no violations recorded since 2009. However, for disinfection byproduct sampling, over the course of the last two years, three haloacetic acids (HAA5) samples have exceeded the MCL of 0.060 mg/L and the locational running average was exceeded once. Attached to this application is ADEC's June 24, 2016 violation notice for Operational Evaluation Level of HAA5 exceedances.

Demand within the community has grown and surpassed the design limits of the plant. The plant was designed for a peak flow of 900 gpm. Immediately following construction, this was found to be lacking in production capability and therefore the max production was increased to its max 1,000 gpm, but without further modifications to the plant. We currently exceed the original design criteria by over .216 mgd in order to keep up with demand. Since the treatment plant was not designed to meet this higher demand, we are faced with elevated potential health issues, fire suppression issues and loss of economic resources.

The increase in our seafood processing output and marine services industries has placed an increase in water consumption and added strain on the water plant. In July 2011 alone, our storage capacity fell to critical levels 8 times, resulting in the potential shut down of seafood processors. As well, during the summers of 2014 and 2016, following the 2011 addition of a second 424,000 gallon treated water storage tank, the storage capacity level continued to reach critical levels. In July 2016 the treated water supply was at such critical low levels for several weeks that the City and Borough of Wrangell declared a Local Disaster and Emergency with a request for State assistance. The community was able to make it through these critical times only after one seafood processor redirected fish to another community, both processors made modifications to their processes, water sales to cruise ships were halted, water service to the

City's harbors and swimming pool was reduced, and mandated water conservation measures were implemented community-wide.

Had we not been able to provide the treated water, and without the drastic measures undertaken to reduce consumption the City was less than 24 hours away from this scenario, the Water Department was prepared to bypass the treatment plant in order to provide for basic water needs for all residents, for commercial and industrial use, and for fire suppression. This scenario would have resulted in delivery of water that could have been contaminated with disease causing organisms, and boil water notices would have been issued. Further this would have caused contamination of the entire water distribution system which would have created a severe public health hazard community wide and necessitated strenuous disinfecting and sampling of the entire water distribution system.

As the first step in the pursuit of an improved water treatment system, in 2015 Wrangell engaged in performing a water plant pilot study with CRW Engineering Group, LLC. The purpose of that project is to identify deficiencies in our current water treatment plant, evaluate methods for improving the treatment process, perform on-site pilot testing of the alternative selected from the evaluation and provide guidance for the acquisition of recommended water treatment improvements. As the pilot plant testing draws to an end, CRW will develop a Preliminary Engineering Report to identify their findings and develop preliminary design criteria based on recommendations for Wrangell's Water Treatment Plant Improvements project.