STATE OF ALASKA
ALASKA CLEAN/DRINKING WATER FUND
GREEN PROJECT ASSESSMENT FORM

As applicable under the EPA annual capitalization grants provided to the Alaska Clean Water Fund (ACWF) and Alaska Drinking Water Fund (ADWF) loan programs, a portion of funds appropriated shall be for projects to address green infrastructure, water or energy efficiency improvements or other environmentally innovative activities.” To meet this condition under the federal grant for administering these funds, this assessment form is provided to document this eligibility or what is termed a “Categorical” or “Business Case” justification, which will be reviewed by DEC for provisional compliance. For more information on green infrastructure development, please review the following EPA web site:

http://cfpub.epa.gov/npdes/home.cfm?program_id=298

For those projects requiring a “Business Case,” Part 2 will require completion to qualify a “traditional project” as green; justification is broken down into two parts, technical and financial. The technical part should use information from a variety of sources such as maintenance or operation records, engineering studies, project plans or other applicable documentation to identify problems (including any data on water and/or energy inefficiencies) in the existing facility, and that clarifies the technical benefits from the project in water and/or energy efficiency terms. Financial justification needs to show estimated savings to a project based on the technical benefits, and demonstrate that the green component of the project provides a substantial savings and environmental benefit.

For more information and assistance in completing this assessment form, please contact the Municipal Matching Grants & Loans program in Anchorage at 907-269-7673, or in Juneau at 907-465-5300.

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GENERAL INFORMATION

Name of Community  **Petersburg Borough**

Address  **P.O. Box 329**  **Petersburg, AK 99833**

Contact Name  **Chris Cotta**  Title  **Works Dir.**  Telephone (907) **772-4430**

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PROJECT INFORMATION

Project Name  **Scow Bay 1 Pump Station Upgrade**  Location  **Petersburg, AK**

Project Type:  _____ New Construction  **X**  Upgrades

_____ Stormwater Infrastructure  **X**  Energy Efficiency Project

_____ Water Efficiency Project  ____ Innovative Environmental Project
PART 1 – GREEN PROJECT CATEGORY & COSTS

Identify the most appropriate “Green” Clean Water or Drinking Water category project type. Note, any selection with (BC) at the end will require a Business Case demonstration.

ENERGY EFFICIENCY – the use of improved technologies and practices to reduce the energy consumption of water quality projects.

____ Wastewater/water utility energy audits  ____ Clean power for public owned facilities

____ Leak detection equipment  ____ Retrofits/upgrades to pumps & treatment processes (BC)

____ Replace/rehabilitation of distribution (BC)  ____ Other: ______________________________ (BC)

WATER EFFICIENCY – the use of improved technologies and practices to deliver equal or better services with less water.

____ Water meters  ____ Fixture Retrofit  ____ Landscape/Irrigation

____ Graywater or other water recycling  ____ Replace/rehabilitation of distribution (BC)

____ Leak detection equipment  ____ OTHER: ______________________________ (BC)

GREEN INFRASTRUCTURE – Practices that manage and treat stormwater and that maintain and restore natural hydrology by infiltrating, evapotranspiring and capturing and using stormwater.

____ Green Streets  ____ Water harvesting and reuse

____ Porous pavement, bioretention, trees, green roofs, water gardens, constructed wetlands

____ Hydromodification for riparian buffers, floodplains, and wetlands

____ Downspout disconnection to remove stormwater from combined sewers and storm sewers

____ OTHER: ______________________________ (BC)

ENVIRONMENTALLY INNOVATIVE PROJECTS – Demonstrate new/innovative approaches to managing water resources in a more sustainable way. This may include projects that achieve pollution prevention or pollutant removal with reduced costs and projects that foster adaptation of water protection programs and practices to climate change.

____ Wetland restoration  ____ Decentralized wastewater treatment solutions

____ Water reuse  ____ Green stormwater infrastructure  ____ Water balance approaches

____ Adaptation to climate change  ____ Integrated water resource management

____ OTHER: ______________________________ (BC)
PROJECT & GREEN COMPONENT COSTS

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<tr>
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PART 2 – PROJECT “BUSINESS CASE” TECHNICAL/FINANCIAL ASSESSMENT

TECHNICAL ANALYSIS OF BENEFITS*

In addition to this form, a supporting technical and financial analysis is required to verify energy and water saving efficiencies for any green component of the project. For green infrastructure and innovative environmental type projects, the analysis should include any applicable efficiency and environmental benefits. For assisting MGL in evaluating “Business Case” assessments of water main, meter, and pump facility replacement type projects, the attached form titled “ADWF - Water/Energy Efficiency Determination - Water Main Replacement/Meter/Pump Facility” is required to be completed. Once the form is complete along with any supporting documentation, please submit documentation to the MGL program for review and concurrence. Note, only water/energy efficiencies that achieve a 20% or greater increase in efficiency will categorically qualify as a Green project.

CERTIFICATION STATEMENT:

I certify the above information is current and accurate.

Name: Chris Cotta
Title: Asst. Public Works Dir.
Signature: Chris Cotta
Date: 9/19/14

Submit Completed Form to:
Alaska Department of Environmental Conservation
Municipal Matching Grants & Loans
555 Cordova Street
Anchorage, AK 99501-2617
Green Project Business Case

Petersburg Borough – Scow Bay 1 Pump Station Upgrade

Business Case Summary

The Scow Bay 1 Pump Station Upgrade project is a key piece of Petersburg’s overall wastewater capital project plan. Among the primary goals of the project are pollution prevention and energy efficiency.

Due to past efforts to expand the sanitary sewer collection system, the infrastructure at Scow Bay Pump Station #1 is being pushed above its design criteria. Inadequate wet well storage capacity and inefficient/worn pumps are causing the station to pump continuously during storm events as well as surcharging of the collection system until the pumps can catch up. In heavy storm events, bypass of the station to the environment has occurred to protect its electrical components from flooding. Replacement with a properly sized and rated submersible pump station is desired.

A second major goal of the project is to increase energy efficiency of the pumping system. Pumps at Scow Bay 1 were installed in 1990 and have lost significant efficiency over the years. Often both pumps must run to keep up with system flows. The control system uses “across the line” starters, with no control over pump speed once the pump is energized. Current efficiency of the pumps at Scow Bay 1 Pump Station is estimated at 25%. Planned pump station upgrades include complete replacement of the pump station, with all new high efficiency pumps and intelligent electronic control system featuring variable frequency drives.

Existing pumps at Scow Bay 1 Pump Station are (2 ea.) 5 hp Hydromatic 40 MPC with 9 5/32” impellers. New pumps will be (2 ea.) 5 hp Flygt model 3102s with model 462 impellers. Pump curves for the new pumps are attached for reference.

Technical and Financial Analysis

At Scow Bay 1 Pump Station, the pumps are worn to the point that the original pump curves aren’t of much use in calculating flow rates and pump efficiencies. In addition, many parts of the pumps are no longer original. Taking these things into account, Public Works has calculated pump efficiencies using observed flow data (gathered through draw down testing) and the electrical usage of the pump station. A summary of the electrical costs for the Scow Bay 1 Pump Station are attached. Following are the efficiency numbers for existing pumps:

Operating Cost = $58.19/month (calendar year 2013)
Flow = 45,000 gals per day
Total Dynamic Head = 31.5 ft
System Horsepower Requirements = (31.5 ft of TDH*220 gpm)/3960 = 1.75 hp
Existing HP usage = (17.47 kw/day)/(3.4 hours/day runtime)/(.746 kw/hp) = 6.9 hp
Existing Efficiency = 1.75 hp required/6.9 hp used = 25%
Upgrades to the pump station will result in much higher pump efficiencies. Power usage for the new pump station is estimated as follows:

New Total Dynamic Head = 40 ft
New HP Requirement = (40 ft*280 gpm)/3960 = 2.83 hp
New HP Usage = 2.83 hp required/68% efficiency for new pumps = 4.16 hp
New KW = 4.16 hp*.746 kw/hp = 3.1 kw
New Electric Usage = (45,000 gpd/280 gpm)/60 min/hr = 2.7 hrs/day runtime
New Operating Cost = 3.1 kw*2.7 hr/day*30 day/month*.111 per kwh = $27.87/month

To summarize the above calculations:

Present electrical cost $58.19/month avg
Anticipated post-construction electric cost $27.87/month avg
Difference: Decrease of $30.32/month or 52% overall

As the preceding analysis illustrates, the Borough expects power usage to decrease sharply as a result of the pumping system upgrades at Scow Bay Pump Station 1. Additional savings are anticipated through use of variable frequency drives to optimize system efficiency.

Attachments: Power usage history for Scow Bay Pump Station 1 (1 page)
Scow Bay 1 Pump Station pump curve data (6 pages)
## Usage History

**PETERSBURG BOROUGH**  
Account 37158  
**192 MITKOF HIGHWAY**  
**ELEC**

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Maximum: 731 $81.14  
Minimum: 258 $28.64  
Monthly Average: 495 $54.96  
Avg Cost/Usage: 0.1110

2013 total electric cost $698.32  
2013 total electric use 6291 kwh  
Cost per kwh $0.111
NP 3102 MT 3- 462
Technical specification

Installation: P - Semi permanent, Wet

Note: Picture might not correspond to the current configuration.

General
Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Impeller
Impeller material: Grey cast iron
Discharge Flange Diameter: 100 mm
Suction Flange Diameter: 100 mm
Impeller diameter: 182 mm
Number of blades: 2

Motor
Motor #: N3102.181.18-11-4AL-W 5hp
Frequency: 60 Hz
Rated voltage: 460 V
Number of poles: 4
Phases: 3
Rated power: 5 hp
Rated current: 6.8 A
Starting current: 42 A
Rated speed: 1745 1/min
Power factor: 1/1 Load: 0.81
3/4 Load: 0.75
1/2 Load: 0.63
Efficiency: 1/1 Load: 85.0 %
3/4 Load: 85.0 %
1/2 Load: 83.5 %

Configuration
### Duty Analysis

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Curve according to ISO 9006 grade 2 annexe 1 or 2.

### NP 3102 MT 3- 462

#### VFD Analysis

![Graph showing pump performance characteristics](image)

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- Curve according to ISO 00006: grade 3 annexe 1 or 2
NP 3102 MT 3~462
Dimensional drawing

* Dimensions to ends of guide bars

Depth of dish
NP3102MT

Weight

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