



May 8, 2019

Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

**Re: Application for Preliminary Permit  
Navajo Nation (NN) Salt Trail Canyon (STC) Pumped Storage Project (PSP)**

Dear Secretary Bose:

Pursuant to 18 CFR §§ 4.32 and 4.81 of the Federal Energy Regulatory Commission's (FERC) regulations, please find enclosed Pumped Hydro Storage LLC's "Application for Preliminary Permit" for the proposed Navajo Nation (NN) Salt Trail Canyon (STC) Pumped Storage Project (PSP). The proposed Project is a 2,800 MW PSP located approximately 16 miles northwest of Cameron, Arizona at the Little Colorado River in Navajo County, Arizona. Because this project uses flowing water from the Little Colorado River, this project is an open-loop pumped storage project.

The Project will involve the construction of new water storage, water conveyance, power generation facilities, a tunnel access road, and primary transmission lines. The project will alleviate the stress being placed on the Southwest electrical generating system due to renewable energy and will provide other benefits stated in our application.

Please call the undersigned if you have any questions or need additional information for the application.

With Regards,



Steve W. Irwin  
Manager, Pump Hydro Storage LLC

## VERIFICATION STATEMENT

This application for preliminary permit is executed in -

State of: Arizona  
County of: Maricopa  
By: Steve Irwin  
Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041  
(602) 696-3608  
[Swirwin7@gmail.com](mailto:Swirwin7@gmail.com)

Being duly sworn, deposes and says that the contents of this Preliminary Permit Application are true to the best of his knowledge or belief. The undersigned Applicant has signed the application on this 8 day of May 2019.

Applicant -

PUMPED HYDRO STORAGE LLC

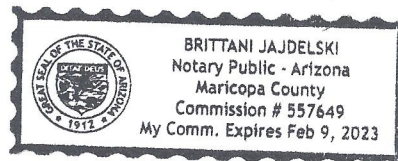
By:

  
Steve Irwin, Manager

Subscribed and sworn to before me, a Notary Public of the State of Arizona this 8 day of May 2019.

Notary:





**BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION**

**APPLICATION FOR PRELIMINARY PERMIT**

Navajo Nation (NN)  
Salt Trail Canyon (STC)  
Pumped Storage Project (PSP)  
Project No. \_\_\_\_\_

Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041  
(602) 696-3608

May 8, 2019

**TABLE OF CONTENTS**

INITIAL STATEMENT ..... 2

INFORMATION REQUIRED BY 18 CFR §4.32(a)..... 4

EXHIBIT 1 - DESCRIPTION OF THE PROPOSED PROJECT ..... 6

EXHIBIT 2 - DESCRIPTION OF PROPOSED STUDIES ..... 9

EXHIBIT 3 - PROJECT MAPS ..... 12

## INITIAL STATEMENT

*Pursuant to 18 CFR §4.81, each application for a preliminary permit must include the following initial statement and numbered exhibits containing the information and documents specified:*

*(a) Initial statement:*

### BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

#### *Application for Preliminary Permit*

(1) Pumped Hydro Storage LLC (Applicant) applies to the Federal Energy Regulatory Commission (FERC or Commission) for a preliminary permit for the proposed Navajo Nation (NN) Salt Trail Canyon (STC) Pumped Storage Project (the “Project”), as described in the attached exhibits. This application is made in order that the applicant may secure and maintain priority of application for a license for the Project under Part I of the Federal Power Act while obtaining the data and performing the acts required to determine the feasibility of the project and to support an application for a license.

(2) *The location of the proposed project is:*

*State or territory:* Arizona  
*County:* Coconino  
*Township or nearby town:* Cameron, Arizona  
*Stream or body of water:* Little Colorado River

(3) *The exact name, business address, and telephone number of the applicant are:*

Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041  
(602) 696-3608

*The exact name and business address of each person authorized to act as agent for the applicant in this application are:*

Steve Irwin  
Manager  
Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041  
(602) 696-3608  
[Swirwin7@gmail.com](mailto:Swirwin7@gmail.com)

Justin Rundle, PE, CEM, CCM  
Member  
Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041  
(602) 300-7242  
[Justin\\_Rundle@yahoo.com](mailto:Justin_Rundle@yahoo.com)

- (4) Pumped Hydro Storage LLC is a limited liability company organized and existing under the law of the State of Arizona and is not claiming preference under Section 7(a) of the Federal Power Act.
- (5) The proposed term of the requested permit is 36 months.
- (6) *If there is any existing dam or other project facility, the applicant must provide the name and address of the owner of the dam and facility. If the dam is federally owned or operated, provide the name of the agency.*

There are no existing dams or other Project facilities that will be used for the proposed Project.

**INFORMATION REQUIRED BY 18 CFR §4.32(a)**

- (1) *For a preliminary permit or license, identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate, or maintain the project:*

Navajo Nation  
Office of the President  
100 Parkway, PO Box 7440  
Window Rock, AZ 86515

Pumped Hydro Storage LLC  
6514 S 41<sup>st</sup> Lane  
Phoenix, AZ 85041

- (2) *For a preliminary permit or a license, identify (providing names and mailing addresses):*

- (i) *Every county in which any part of the project, and any Federal facilities that would be used by the project, would be located:*

Coconino County  
James Jayne  
County Manager  
219 E. Cherry Ave.  
Flagstaff, AZ 86001

- (ii) *Every city, town, or similar local political subdivision:*

- (A) *In which any part of the project, and any Federal facilities that would be used by the project, would be located:*

None.

- (B) *That has a population of 5,000 or more people and is located within 15 miles of the project dam:*

None.

- (iii) *Every irrigation district, drainage district, or similar special purpose political subdivision:*

- (A) *In which any part of the project, and any Federal facilities that would be used by the project, would be located:*

None.

(B) *That owns, operates, maintains, or uses any project facilities or any Federal facilities that would be used by the project:*

None

(iv) *Every other political subdivision in the general area of the project that there is a reason to believe would likely be interested in, or affected by, the application:*

Navajo Nation  
Office of the President  
100 Parkway, PO Box 7440  
Window Rock, AZ 86515

Arizona Corporation Commission  
Utilities Division  
1200 W Washington Street  
Phoenix, AZ 85007

Grand Canyon National Park  
Supervisor's Office  
P.O. Box 129  
Grand Canyon, AZ 86023

Arizona Public Service  
400 N 5<sup>th</sup> Street  
Phoenix, AZ 85004

Salt River Project (SRP)  
1521 N Project Drive  
Tempe, AZ 85281

WAPA  
P.O. Box 6457  
Phoenix, AZ 85009

LADWP  
111 N Hope Street  
Los Angeles, CA 90012

(v) *All Indian tribes that may be affected by the project.*

Navajo Nation  
Office of the President  
100 Parkway, PO Box 7440  
Window Rock, AZ 86515



**EXHIBIT 1 - DESCRIPTION OF THE PROPOSED PROJECT**

18 CFR §4.81(b) Exhibit 1 must contain a description of the proposed project, specifying and including, to the extent possible:

- (1) *The number, physical composition, dimensions, general configuration and, where applicable, age and condition, of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, that would be part of the project:*

The Project will be located entirely on Navajo Nation lands. The lower concrete arch dam will be across the Little Colorado River, where the river has an approximate mean flow of 228 cfs. The upper concrete arch dam will be across a canyon at the plateau, as shown in Exhibit 3-2. Because of water flowing thru the lower dam, this is an open loop system.

The project conceptual layout is shown in Exhibits 3-1 and 3-2 and are summarized below  
-

Line	Description	Value
1	Dams - Number	2
2	Lower Dam - Physical composition	Concrete arch
3	Lower Dam - Dimensions	1,000 ft x 140 ft high
4	Lower Dam Spillway - Composition	Rock tunnel by-pass
5	Lower Dam Spillway - Dimension	4,000 ft x 50' dia.
6	Upper Dam - Physical composition	Concrete arch
7	Upper Dam - Dimensions	500 ft x 240 ft high
8	Upper Dam Spillway	None
9	Penstocks - Number	2
10	Penstocks - Physical composition	Reinforced concrete
11	Penstocks - Dimensions	8,000 ft x 25 ft dia.
12	Powerhouses - Number	1
13	Powerhouses - Physical composition	Reinforced concrete
14	Powerhouses - Dimensions	900' L x 140' W x 140' H
15	Tailraces - Number	1
16	Tailraces - Physical Composition	Reinforced concrete
17	Tailraces - Dimension	900' L x 50' W x 30' H
18	Roadway Access Tunnel - Composition	Natural Rock / Concrete
19	Roadway Access Tunnel - Dimensions	10,000 ft x 30 ft dia.

- (2) *The estimated number, surface area, storage capacity, and normal maximum surface elevation (mean sea level) of any reservoirs, whether existing or proposed, that would be part of the project:*

The Project will consist of new lower and upper reservoirs with characteristics shown below and in Exhibits 3-1 and 3-2 -

Line	Description	Value	Units
1	Lower Reservoir		
2	Number	1	
3	Surface Area	150	acres
4	Storage Capacity	6,750	ac-ft
5	Max Surface Elev.	3,050	ft amsl
6	Upper Reservoir		
7	Number	1	
8	Surface Area	60	acres
9	Storage Capacity	6,000	ac-ft
10	Max Surface Elev.	5,360	ft amsl

- (3) *The estimated number, length, voltage, interconnections, and, where applicable, age and condition, of any primary transmission lines whether existing or proposed, that would be part of the project:*

As shown in Exhibit 3-1, the project will require a new double circuit 500 KV electric transmission line from the project switchyard near the powerhouse to the existing Moenkopi switchyard located about 2.5 miles southwest of Cameron, Arizona. The length of the proposed transmission lines is about 20 miles.

- (4) *The total estimated average annual energy production and installed capacity (provide only one energy and capacity value), the hydraulic head for estimating capacity and energy output, and the estimated number, rated capacity, and, where applicable, the age and condition, of any turbines and generators, whether existing or proposed, that would be part of the project works:*

The turbine-generator and energy production information are -

Line	Description	Value	Units
1	Est. annual energy	3,300	GWhr
2	Installed capacity	1,500	Kw
3	Hydraulic head	2,250	feet
4	Energy output	1,500	Kw
5	Energy storage	12,000	MWhr
6	Turbine-Generators		
7	Type	Pumping	
8	Number	6	
9	Rated capacity	250	kW

- (5) *All lands of the United States that are enclosed within the proposed project boundary described under paragraph (d)(3)(i) of this section, identified and tabulated on a separate sheet by legal subdivisions of a public land survey of the affected area, if available. If the project boundary includes lands of the United States, such lands must be identified on a completed land description form (FERC Form 587), provided by the Commission. The project location must identify any Federal reservation, Federal tracts, and townships of the public land surveys ... . A copy of the form must also be sent to the Bureau of Land Management state office where the project is located:*

No public lands will be used for this project.

- (6) *Any other information demonstrating in what manner the proposed project would develop, conserve, and utilize in the public interest the water resources of the region:*

The proposed project will develop, conserve, and utilize water resources to benefit the public by –

- Reducing the “duck curve” that is developing for energy demand due to renewable energy sources
- Promoting green, renewable power by providing a means to store energy
- Reducing our carbon footprint by providing a means to store excess energy or energy produced by nuclear power
- Providing approximately \$3 B in investment to create jobs and stimulate the Navajo Nation and Arizona economy
- Increasing electrical distribution system reliability and resiliency
- Adding peaking capacity available in 15 minutes for emergencies
- Reducing thermal generation reserve requirements
- Reducing electrical pricing volatility by balancing energy consumption
- Providing a paved road from Highway 89 to the Salt Canyon, promoting the Navajo Nation resources by making this area more accessible to the community
- Providing an access tunnel to the Little Colorado River that can be used for tourism
- Providing potable water and electric to a remote location on the Navajo Nation lands
- The project location is remote and cannot be seen by the public from any roads

## EXHIBIT 2 - DESCRIPTION OF PROPOSED STUDIES

18 CFR §4.81(c) Exhibit 2 is a description of studies conducted or to be conducted with respect to the proposed project, including field studies. Exhibit 2 must supply the following information:

(1) *General requirement. For any proposed project, a study plan containing a description of:*

(i) *Any studies, investigations, tests, or surveys that are proposed to be carried out, and any that have already taken place, for the purposes of determining the technical, economic, and financial feasibility of the proposed project, taking into consideration its environmental impacts, and of preparing an application for a license for the project:*

Studies the Applicant proposed to initiate include –

- 1) Engineering feasibility and economic studies – to confirm the feasibility of the project.
- 2) Water supply studies – to confirm water is available to fill the reservoir and to maintain the water lost thru evaporation.
- 3) Geotechnical studies – to confirm the geology and sub-surface conditions at the upper reservoir, lower reservoir, and powerhouse.
- 4) Environmental studies – to identify if any rare, endangered, or threatened species are affected by the project implementation.
- 5) Cultural and tribal studies – to confirm if the project would impact cultural or tribal resources.

(ii) *The approximate locations and nature of any new roads that would be built for the purpose of conducting the studies:*

No new roads will be built to conduct any of the proposed studies - access to the lower reservoir for studies will be by helicopter.

(2) *Work plan for new dam construction. For any development within the project that would entail new dam construction, a work plan and schedule containing:*

(i) *A description, including the approximate location, of any field study, test, or other activity that may alter or disturb lands or waters in the vicinity of the proposed project, including floodplains and wetlands; measures that would be taken to restore the altered or disturbed areas:*

Geotechnical studies at the dams, reservoirs, and tunnel locations will be conducted by borehole drilling samples and test pits. Measures will be taken to avoid or minimize disturbance at the drilling locations, and test pits will be backfilled to return the site as much as possible to natural. The methods to mitigate disturbances will be coordinated with the Navajo Nation Council.

- (ii) *A proposed schedule (a chart or graph may be used), the total duration of which does not exceed the proposed term of the permit, showing the intervals at which the studies, investigations, tests, and surveys, identified under this paragraph are proposed to be completed.*

The Applicant will require three years (36 months) to conduct studies and submit the final pre-application document (PAD) and notice of intent (NOI). The proposed schedule for the project –

	Start Month	End Month
Task 1 – Continue with engineering feasibility study	0	36
Task 2 – Meet with the Navajo Nation for discussions	0	12
Task 3 – Environmental, cultural, and tribal studies	12	34
Task 4 – Geotechnical and water supply studies	12	34
Task 5 – Engineering design with economic studies	24	36
Task 6 – Organize PAD / NOI	34	36
Task 7 – Submit PAD / NOI application	36	36

- (3) *Waiver. The Commission may waive the requirements of paragraph (c)(2) pursuant to 18 CFR §385.207 of this chapter, upon a showing by the applicant that the field studies, tests, and other activities to be conducted under the permit would not adversely affect cultural resources or endangered species and would cause only minor alterations or disturbances of lands and waters and that any land altered or disturbed would be adequately restored.*

The Applicant does not intend to apply for a waiver for the requirements of 18 CFR §4.81(c)(2) pursuant to 18 CFR §385.207.

- (4) *Exhibit 2 must contain a statement of costs and financing, specifying and including, to the extent possible:*

- (i) *The estimated costs of carrying out or preparing the studies, investigations, tests, surveys, maps, plans or specifications identified under paragraph (c) of this section:*

The Applicant anticipates that the costs to develop the project and perform the studies, investigations, tests, surveys, maps, plans or specifications will be approximately \$4,000,000 to \$8,000,000.

- (ii) *The expected sources and extent of financing available to the applicant to carry out or prepare the studies, investigations, tests, surveys, maps, plans, or specifications identified under paragraph (c) of this section.*

The expected sources to prepare the studies, plans, and specifications will be from Project partners that have yet to be identified. The plan for full Project financing will be developed during the course of the feasibility studies planned during the term of the preliminary permit.

### EXHIBIT 3 - PROJECT MAP

18 CFR §4.81(d) Exhibit 3 must include a map or series of maps, to be prepared on graphic quadrangle sheets or similar topographic maps of a State agency, if available. The maps must show.

- (1) *The location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any permanent monuments or objects that can be noted on the maps and recognized in the field:*
- (2) *The relative locations and physical interrelationships of the principal project features identified under paragraph (b) of this section:*
- (3) *A proposed boundary for the project, enclosing:*
  - (i) *All principal project features identified under paragraph (b) of this section, including but not limited to any dam, reservoir, water conveyance facilities, powerplant, transmission lines, and other appurtenances; if the project is located at an existing Federal dam, the Federal dam and impoundment must be shown, but may not be included within the project boundary;*

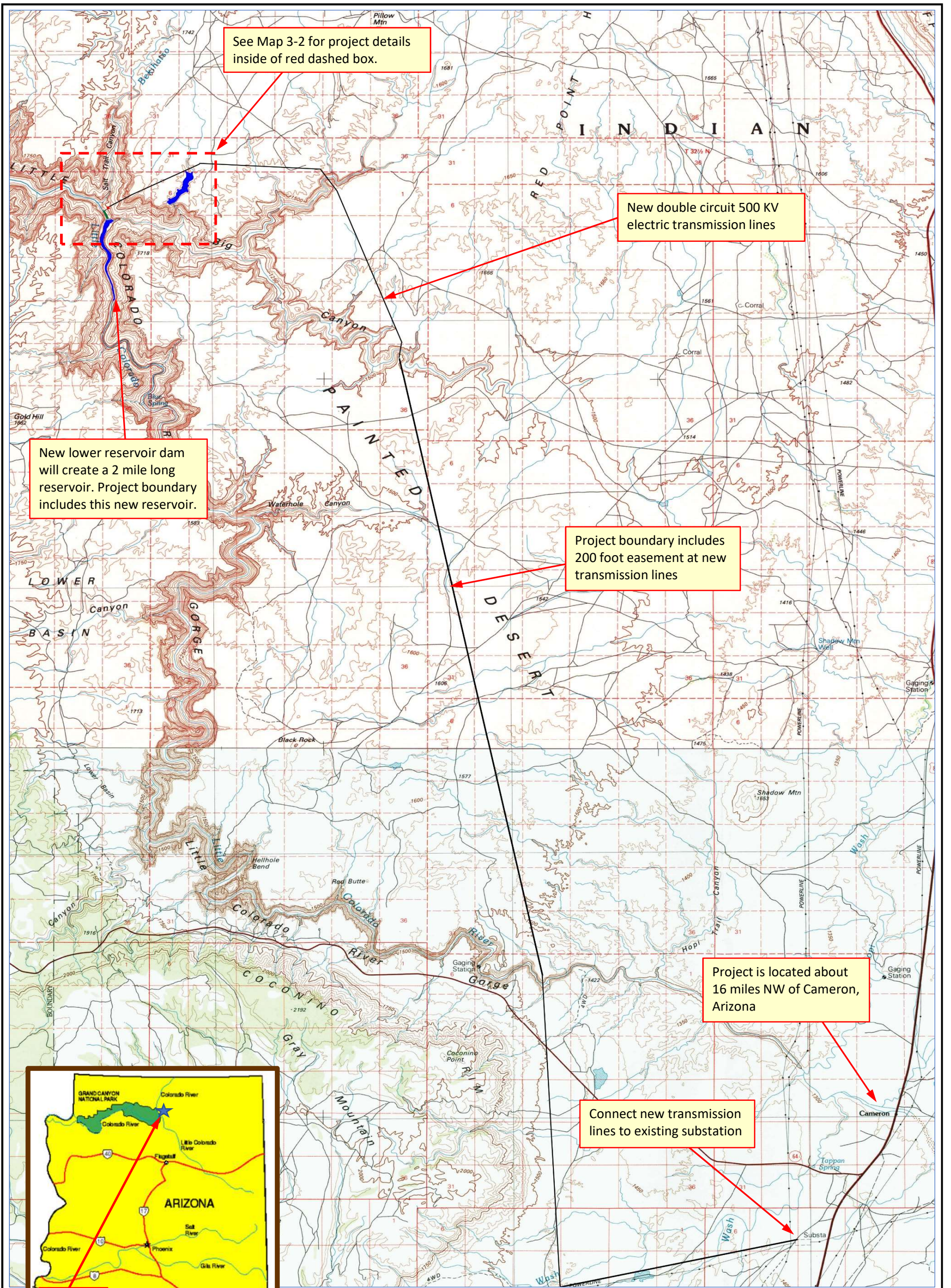
*Any non-Federal lands and any public lands or reservations of the United States necessary for the purposes of the project. To the extent that those public lands or reservations area covered by a public land survey, the project boundary must enclose each of an only the smallest legal subdivisions (quarter-quarter section, lots or other subdivisions, identified on the map by subdivision) that may be occupied in whole or in part by the project.*

Exhibit 3-2 presents the project boundary near the project. Exhibit 3-1 presents the general location of the Project and the approximate location of the proposed Project boundary not shown in Exhibit 3-2.

- (4) *Areas within or in the vicinity of the proposed project boundary which are included in or have been designated for study for inclusion in the National Wild and Scenic Rivers System:*

None.
- (5) *Areas within the project boundary that, under the provisions of the Wilderness Act, have been:*
  - (i) *Designated as wilderness area;*
  - (ii) *Recommended for designation as wilderness area; or*
  - (iii) *Designated as wilderness study area.*

None.



See Map 3-2 for project details inside of red dashed box.

New double circuit 500 KV electric transmission lines

New lower reservoir dam will create a 2 mile long reservoir. Project boundary includes this new reservoir.

Project boundary includes 200 foot easement at new transmission lines

Project is located about 16 miles NW of Cameron, Arizona

Connect new transmission lines to existing substation

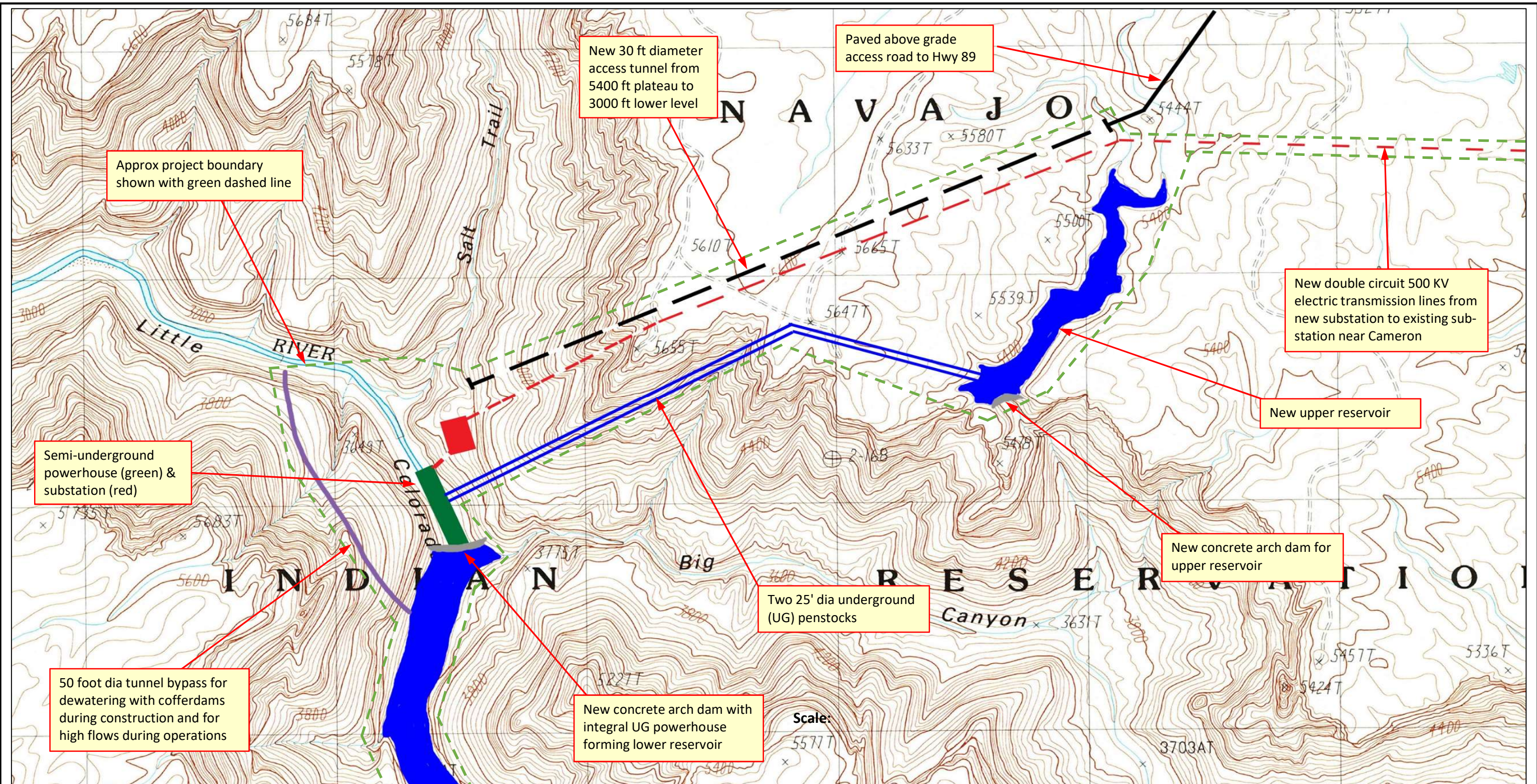


**Location Map**

**Exhibit 3-1 - Navajo Nation Pumped Storage Project Conceptual Design Map 1**







**Exhibit 3-2 - Navajo Nation Pumped Storage  
Project Conceptual Design Map 2**

Notes -

1. The improvements shown above are entirely within the Navajo Nation (NN) boundaries.
2. Preliminary design is for 1,500 MW of capacity for eight hours of duration, with a minimum of 6,000 ac-ft of storage in each reservoir.
3. Both reservoir and dam locations are remote desert with the nearest occupied structure about seven miles from the upper dam.

