

THE NAVAJO NATION

JONATHAN NEZ | PRESIDENT MYRON LIZER | VICE PRESIDENT



January 6, 2023

Hon. Otto Tso
Office of the Speaker
Post Office Box 3390
Window Rock, AZ 86515

RE: CD-55-22, *An Act Relating to Budget and Finance, Resources and Development, and Naabik'iyáti' Committees, and to the Navajo Nation Council; Allocating \$10,159,542 from the Sihasin Fund to Replace the Ramah Navajo School Board Drinking Water System; Approving the Related Expenditure Plan*


Dear Speaker Tso,

Thank you to the Navajo Nation Council and Council Delegate Jamie Henio for presenting this critically important resolution. We also appreciate the Ramah Navajo School Board, Inc. (RNSB) for advocating on behalf of their community and securing a comprehensive report that presents the inadequacies of the water service system currently utilized by the community. All of our Navajo Nation communities deserve access to safe, adequate water service.

The repair of RNSB's fifty year old water system fits within the purpose of the Sihasin Fund for infrastructure and waterline development. Currently, water quality testing at RNSB reveals unacceptable levels of arsenic and other contaminants, the capacity of the system was built for half of the population it serves now, and the head start, junior high and high school have inadequate fire suppression systems due to limited pipe size and pressure. These concerns are very troubling and as leaders they must be taken seriously. The use of Sihasin Funds for this project is appropriate and essential for the health, safety and welfare of the Ramah Navajo community.

Pursuant to the authority vested in the Navajo Nation President, I am signing Resolution CD-55-22 into law.

Sincerely,


Jonathan Nez, President
THE NAVAJO NATION


Myron Lizer, Vice President
THE NAVAJO NATION

RESOLUTION OF THE
NAVAJO NATION COUNCIL
24th NAVAJO NATION COUNCIL - FOURTH YEAR, 2022

AN ACT

RELATING TO THE RESOURCES AND DEVELOPMENT, BUDGET AND FINANCE, AND NAABIK'ÍYÁTI' COMMITTEES, AND TO THE NAVAJO NATION COUNCIL; ALLOCATING \$10,159,542 FROM THE SÍHASIN FUND TO REPLACE THE RAMAH NAVAJO SCHOOL BOARD DRINKING WATER SYSTEM; APPROVING THE RELATED EXPENDITURE PLAN

BE IT ENACTED:

SECTION ONE. AUTHORITY

- A. The Resources and Development Committee is a standing committee of the Navajo Nation Council empowered with oversight authority over all 110 Navajo Nation Chapters. 2 N.N.C. § 500(C); 26 N.N.C. § 102.
- B. The Budget and Finance Committee is a standing committee of the Navajo Nation Council with the responsibility to "review and recommend to the Navajo Nation Council the budgeting, appropriation, investment and management of all funds." 2 N.N.C. § 301(B)(2).
- C. The Naabik'íyáti' Committee is a standing committee of the Navajo Nation Council that considers all proposed final actions by the Navajo Nation Council. 2 N.N.C. § 164(A)(9).
- D. The Navajo Nation Council is the governing body of the Navajo Nation. 2 N.N.C. § 102(A). As such, the Council may approve appropriations from the Navajo Nation's Síhasin Fund.
- E. 12 N.N.C. § 2502, as amended by CJA-03-18, states the purpose of the Navajo Nation Síhasin Fund ("Síhasin Fund") as follows:

§ 2502 Purpose

- A. The purposes of this Fund are to provide financial support and/or financing for:
 - 1. The planning and development of economic development and regional infrastructure supporting economic development and community development, including such infrastructure as, but not limited to, housing, commercial and government buildings, waterline, solid waste management development, powerline

projects, and transportation and communication systems, within the Navajo Nation; . . .

- B. For the Purpose in § 2502(A)(1), Fund expenditures for infrastructure shall not be limited by 12 N.N.C. § 1310(F) or TCDCJY-77-99.
- C. Leveraging the Fund by way of guaranteeing loans, match funding, direct funding in part, and other weighted uses of the Fund, including loan financing from the Fund, for the purposes in § 2502(A)(1), shall be favored over direct funding in whole.
- F. The Síhasin Fund provides that "Fund Principal" shall consist of all deposits made to the Síhasin Fund, that "Fund Income" shall consist of all earnings (interest, dividends, etc.) generated and realized by the Fund Principal, and that Síhasin Fund Income shall be deposited in, and added to, the Fund Principal until such time as a Fund Expenditure Plan is duly approved. 12 N.N.C. § 2504 and § 2505(C).
- G. The Síhasin Fund provides that "Fund Principal and Income shall not be expended except pursuant to a Fund Expenditure Plan consistent with the purposes set forth in § 2502 of this Chapter and adopted by a two-thirds (2/3) vote of all members of the Navajo Nation Council." 12 N.N.C. § 2505(A).

SECTION TWO. FINDINGS

- A. The Resolution No. RNSB-EXEC-2022-019, the Ramah Navajo School Board, Inc. ("RNSB") requests Síhasin funds to replace its drinking water system ("Water Project"). **EXHIBIT A.**
- B. RNSB has submitted a cost estimate for the Water Project, showing that \$10,159,542 (rounded up) is needed. **EXHIBIT B.**
- C. The RNSB has prepared an Expenditure Plan for its proposed Water Project. **EXHIBIT C.**
- D. RNSB's engineer has prepared a comprehensive Preliminary Engineering Report, attached hereto as **EXHIBIT D.**
- E. Allocation of the Síhasin funds as requested by the RNSB meets the criteria for Síhasin expenditures because the proposed expenditure involves infrastructure, waterlines, and community development, as described in 12 N.N.C. § 2502(A)(1).

SECTION THREE. ALLOCATING \$10,159,542 FROM THE SÍHASIN FUND TO REPLACE THE RAMAH NAVAJO SCHOOL BOARD DRINKING WATER SYSTEM; APPROVING THE RELATED EXPENDITURE PLAN

- A. Pursuant to 12 N.N.C. § 2505(A), the Navajo Nation hereby approves \$10,159,542 from the Síhasin Fund for the RNSB's Water Project and also approves the Expenditure Plan for the Water Project as set forth in the attached EXHIBITS B, C, and D.
- B. The total amount of Síhasin funds approved in this Act may be further leveraged by bond or loan financing pursuant to the Navajo Nation Bond Financing Act (12 N.N.C. § 1300 et seq., as amended), using Síhasin Fund earnings for repayment and financing costs, upon approval of the Budget and Finance Committee and upon a two-thirds (2/3) approval vote of the full membership of the Navajo Nation Council.
- C. The Controller shall determine whether the source of the Síhasin funds approved in this Act will be Síhasin Fund Principal or Síhasin Fund Income, or a combination of both.
- D. The approved Síhasin funds shall be disbursed to the Navajo Nation Division of Community Development ("DCD") within thirty (30) calendar days after the effective date of this Act. Thereafter, the DCD shall promptly and diligently implement and administer the Water Project through DCD's Capital Projects Management Department, in accordance with all applicable Navajo Nation laws and regulations.
- E. Notwithstanding Section 4(A)(3)(g) of CAP-35-18 or 12 N.N.C. § 820(N), the approved Síhasin funds for RNSB's Water Project shall not lapse at the end of any fiscal year; however, any Síhasin funds not spent or encumbered within thirty-six (36) months of the effective date of this Act shall revert to the Síhasin Fund Principal, unless otherwise approved prior to such reversion by both the Resources and Development Committee and the Naabik'íyáti' Committee.
- F. The Síhasin funds approved herein shall not be comingled with funds from any other sources, for the RNSB's Water Project or otherwise. Any and all savings or unused amounts of the approved Síhasin funds shall be returned to the Síhasin Fund Principal once the Water Project is completed, or upon the reversion deadline in Section 3(E) herein.
- G. The Síhasin Fund may be reimbursed the amount of funds approved herein, from funds available to the Navajo Nation from any and all state, federal, or other sources.

SECTION FOUR. EFFECTIVE DATE

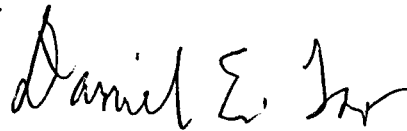
This Act and the Expenditure Plan approved herein shall become effective pursuant to 12 N.N.C. § 2505(A) and 2 N.N.C. § 221(B).

SECTION SIX. SAVING CLAUSE

If any portion of this Act is invalidated by the Supreme Court of the Navajo Nation, or by any Navajo Nation District Court without appeal to the Navajo Nation Supreme Court, the remainder of this Act shall be the law of the Navajo Nation.

CERTIFICATION

I hereby certify that the foregoing resolution was duly considered by the 24th Navajo Nation Council at a duly called meeting in Window Rock, Navajo Nation (Arizona), at which a quorum was present and that the same was passed by a vote of 18 in Favor, and 00 Opposed, on this 19th day of December 2022.



Honorable Daniel E. Tso, Speaker Pro Tem
24th Navajo Nation Council

12/28/22

DATE

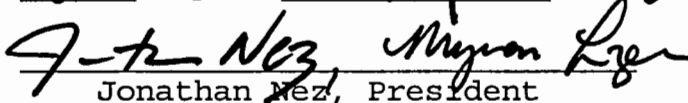
Motion: Honorable Eugene Tso

Second: Honorable Edison J. Wauneka

Speaker Pro Tem Daniel E. Tso not voting

ACTION BY THE NAVAJO NATION PRESIDENT:

1. I, hereby, sign into law the foregoing legislation, pursuant to 2 N.N.C. § 1005 (C)(10), on this 10th day of January, 2023.


Jonathan Nez, President
Navajo Nation

2. I, hereby, veto the foregoing legislation, pursuant to 2 N.N.C. § 1005 (C)(11), on this _____ day of _____, 2022 for the reason(s) expressed in the attached letter to the Speaker.

Jonathan Nez, President
Navajo Nation

3. I, hereby, exercise line-item veto pursuant to the budget line-item veto authority delegated to the President by vote of the Navajo People in 2009, on this _____ day of _____, 2022.

Jonathan Nez, President
Navajo Nation

RAMAH NAVAJO SCHOOL BOARD, INC.

**PINE HILL, NEW MEXICO
RESOLUTION NO. RNSB-EXEC-2022-019**

**A RESOLUTION TO APPROVE THE RESUBMISSION OF A NAVAJO NATION
FEDERAL RECOVERY FUND APPLICATION TO THE NAVAJO NATION DIVISION
OF COMMUNITY DEVELOPMENT PER THE ADVICE OF NNDOJ TO ADD BFS-31-
21 EXHIBIT 5 SECTION (4)(B)(2)(c), IN THE AMOUNT OF \$10,159,542 TO REPLACE
AND UPGRADE THE RAMAH NAVAJO SCHOOL BOARD DRINKING WATER
SYSTEM TO PREVENT, MITIGATE AND RECOVER FROM THE COVID-19
PANDEMIC IN THE RAMAH NAVAJO COMMUNITY**

1. WHEREAS, the Ramah Navajo Chapter of the Navajo Nation established the Ramah Navajo School Board, Inc., on February 6, 1970, through Chapter Resolution No. M75-70-1A; and,
2. WHEREAS, the Ramah Navajo School Board, Inc. (RNSB) was incorporated on February 10, 1970, as a private, not-for-profit organization in the State of New Mexico to provide charitable, benevolent, social, educational and related services as needed by the Ramah Navajo community; and,
3. WHEREAS, the Navajo Nation has received in excess of \$2 Billion in funding for the improvement of critical infrastructure within the Great Navajo Nation; and,
4. WHEREAS, Navajo Nation Legislation CJY-41-21 authorizes funding for infrastructure proposals; and,
5. WHEREAS, RNSB has submitted its application in October 12, 2021 and with the advice by the Navajo Nation Department of Justice to submit a RNSB duly approved resolution to address BFS-31-21 Exhibit 5, Section (4)(B)(2)(c); and,
6. WHEREAS, the RNSB duly approves to abide by the BFS-31-21, Exhibit 5, Section (4)(B)(2)(c) to include a budget line item for contingencies, hereto as Exhibit A and incorporated herein by reference the RNSB Water System Improvements Budget that includes a 20% Contingencies line item; and,
7. WHEREAS, the RNSB will also duly approves to abide by BFS-31-21, Exhibit 5, Section (4)(B)(3) statement:
 - (1) Request for a specific amount of \$10,150,542,
 - (2) The funds will be used for the following Expenditure Categories to satisfy the purpose of the ARPA
 - i. 5.10 Drinking water: Treatment
 - ii. 5.11 Drinking Water: Transmission and Distribution
 - iii. 5.13 Drinking Water: Source
 - iv. 5.14 Drinking Water: Storage
 - v. 5.15 Drinking Water: Other Water Infrastructure
 - (3) RNSB affirms that the awarded funds will be used in compliance with ARPA, the ARPA regulations, and all other applicable Navajo Nation and other federal laws and regulations.

8. WHEREAS, attached hereto as APPENDIX A and incorporated herein by reference is the Navajo Nation Fiscal Recovery Funds Request Form and Expenditure Plan with supporting documents.

NOW, THEREFORE, BE IT RESOLVED THAT THE RNSB BOARD OF TRUSTEES HEREBY: Approves the resubmission of a Navajo Nation Federal Recovery Fund application to the Navajo Nation Division of Community Development per the advice of NNDOJ to add BFS-31-21 Exhibit 5 Section (4)(b)(2)(c), in the amount of \$10,159,542 to replace and upgrade the Ramah Navajo School Board drinking water system to prevent, mitigate and recover from the COVID-19 pandemic in the Ramah Navajo community


Certification

We, the undersigned members of the RNSB Board of Trustees, hereby certify that the foregoing resolution was duly adopted by a vote of 5 in favor, 0 opposing, and 0 abstaining, at an official meeting of the Board of Trustees held in Pine Hill, New Mexico, on March 19, 2022.



MARTHA GARCIA, PRESIDENT, RNSB BOARD OF TRUSTEES

[CORPORATE SEAL]



CAROLYN COHO, SECRETARY-TREASURER, RNSB BOARD OF TRUSTEES

EXHIBIT B

Exhibit A - RNSB-EXEC-2022- 019

RAMAH NAVAJO SCHOOL BOARD PRELIMINARY ENGINEERING REPORT
WATER SYSTEM IMPROVEMENTS

ENGINEER'S OPINION OF PROBABLE COST 4/13/2021 update of 10/3/2021

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
1	Construction staking, compl. (1.5%)	LS	1	\$ 89,891.04	\$ 89,891.04
2	Construction Mobilization and Demobilization, compl. (11.5%)	LS	1	\$ 848,810.80	\$ 848,810.80
3	Flood Protection, compl. (.1%)	LS	1	\$ 5,824.44	\$ 5,824.44
4	Traffic Control (.3%)	LS	1	\$ 18,873.32	\$ 18,873.32
5	Site Clearing and Grubbing, compl.	AC	1	\$ 2,448.00	\$ 2,448.00
6	2" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, cfp.	LF	5,000	\$ 18.00	\$ 90,000.00
7	4" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, cfp.	LF	1,475	\$ 42.00	\$ 61,950.00
8	6" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, cfp.	LF	17,500	\$ 100.00	\$ 1,750,000.00
10	Pressurized waterline connection, all sizes, incl. fittings, compl.	EA	10	\$ 2,400.00	\$ 24,000.00
11	Non-pressurized connection, existing waterline, all sizes, incl. fittings, compl.	EA	6	\$ 3,600.00	\$ 21,600.00
12	Tee or Wye, 4" to 6" waterline, incl. joining material, cfp.	EA	4	\$ 900.00	\$ 3,600.00
14	4" Gate Valve & Valve Box, cfp.	EA	4	\$ 2,100.00	\$ 8,400.00
16	6" Gate Valve & Valve Box, cfp.	EA	53	\$ 4,200.00	\$ 222,600.00
18	Valve Box, Remove & Dispose, compl.	EA	30	\$ 300.00	\$ 9,000.00
19	Fire Hydrant, 4" buy, MJ, incl. blocking & aggregate, cfp.	EA	31	\$ 7,500.00	\$ 232,500.00
20	Fire Hydrant, Existing, Remove & Salvage, compl.	EA	20	\$ 600.00	\$ 12,000.00
24	1" Water Main Tap, Service Saddle & Corp Stop	EA	122	\$ 1,000.00	\$ 122,000.00
25	2" Water Main Tap, Service Saddle & Corp Stop	EA	6	\$ 1,200.00	\$ 7,200.00
26	Residential 3/4" Water Meter & Can Combination w/ Radio Read, incl. concrete pad, cover & loc, cfp.	EA	122	\$ 1,600.00	\$ 195,200.00
29	Bored Crossing 12" Casing (Center Pipe Not Included)	LF	600	\$ 182.00	\$ 88,000.00
30	2" Combination Air Release and Vacuum Valve, cfp.	EA	10	\$ 6,380.00	\$ 63,800.00
31	PRV Vault	EA	2	\$ 60,000.00	\$ 120,000.00
32	Rock excavation	CY	500	\$ 128.00	\$ 64,000.00
33	3/4 or 1" PE service line installation (10 ft per meter)	LF	1,220	\$ 42.00	\$ 51,240.00
34	Thrust blocking	CY	100	\$ 643.00	\$ 64,300.00
35	Overhead Well #2	LS	1	\$ 600,000.00	\$ 600,000.00
38	Water Treatment Facility building and treatment equipment*	LS	1	\$ 980,000.00	\$ 980,000.00
37	Evaluate structural integrity of the 250,000-gallon tank (Alternative 1)	EA	1	\$ 20,000.00	\$ 20,000.00
39	250,000 Gallon Steel Welded Water Storage Tank, including foundation, piping, testing and disinfection. (Alternative 3)	EA	1	\$ 800,000.00	\$ 800,000.00
40	Arterial pavement, Existing Remove and Replace, incl. 2- inch extra asphalt thickness, with machine laydown, & processing existing subbase material, any thickness, cfp.	SY	50	\$ 105.00	\$ 5,250.00

Construction Subtotal	\$ 6,388,187.40
NMGRT (3.8125%)	\$ 435,038.68
Construction Contingency (20%)	\$ 1,277,237.48
Project Survey (7%)	\$ 447,033.12
Geotechnical Services	\$ 17,500.00
Engineering Design (15%)	\$ 957,023.11
Construction Services/Inspection(10%)	\$ 638,818.74
TOTAL	\$ 10,166,841.51

* increased per quote from Culligan
**increased for repair or demo

**THE NAVAJO NATION
FISCAL RECOVERY FUNDS REQUEST FORM & EXPENDITURE PLAN
FOR EXTERNAL ENTITIES**

Part 1. Identification of parties.

External Entity requesting FRF: Ramah Navajo School Board, Inc. Date prepared: 3/11/2022

External Entity's PO Box 10 phone/email: (505) 979-9298/nancy@msb.k12.nm.us
mailing address: Pine Hill, NM 87357 website (if any): www.msb.k12.nm.us

This Form prepared by: Alvin Rafelito phone/email: (505) 979-9243/alvin@msb.k12.nm.us
Alvin Rafelito, HHSD Director alvin@msb.k12.nm.us
CONTACT PERSON'S name and title CONTACT PERSON'S info

Title and type of Project: Upgrade/Replacement of the Drinking Water System for the Ramah Navajo School Board, Inc.

External Entity's CEO (or equivalent): Ms. Nancy R. Martine-Alonzo phone & email: (505) 979-9298 nancy@msb.k12.nm.us

Board President: Ms. Martha H. Garcia phone & email: (505) 713-4007 MarthaG@msb.k12.nm.us

Board Treasurer or Financial Officer: Ms. Carolyn Coho, Board Treasurer phone & email: (505) 303-6333 CarolC@msb.k12.nm.us

Funding Recipient will be working with: Division of Community Development, Dr. Pearl Yellowman on the Project
Indicate name of Director of assisting Division and Division; if none, indicate "N/A" President and CDPVP
and same will be submitting the Funding Request Package for Review, and will have Administrative Oversight over this FRF Expenditure Plan.

List types of Subcontractors or Subrecipients that will be paid with FRF (if known): WH Pacific, an NV5 Company
Water and Wastewater Contractor ☐ document attached

Amount of FRF requested: \$10,159,542 FRF funding period: June 1, 2022 to January 30, 2024
Indicate Project starting and ending/deadline date

Part 2. Expenditure Plan details.

(a) Describe the Program(s) and/or Project(s) to be funded, including how the funds will be used, for what purposes, the location(s) to be served, and what COVID-related needs will be addressed:

The funds will be used for a complete drinking water system replacement from well source to treatment, to storage and distribution on the RNSB campus in Pine Hill, NM. RNSB water infrastructure has reached its useful life and is constantly having to be repaired and/or replacements of worn out parts. When water line repairs are done, the whole water system has to be shut down. This affects the residential, health center and businesses/programs. Sanitation is key in the prevention of COVID and we need a reliable water system to clean and sanitize with.

☐ document attached

(b) Explain how the Program or Project will benefit the Navajo Nation, Navajo communities, or the Navajo People:

Mitigation and prevention of the COVID pandemic needs reliable available water for the health, safety and welfare of the Ramah Navajo community, schools, businesses and health center. Provide safe drinking water for a long term sustainability and prevent the disruptions of our Navajo students' education, businesses and health services due to constant water breaks and repairs.

☐ document attached

(c) Provide a prospective timeline showing the estimated date of completion of the Project and/or each phase of the Project. Disclose any challenges that may prevent you from incurring costs for all funding by December 31, 2024 and/or fully expending funds and completing the Program(s) or Project(s) by December 31, 2028:

APPENDIX A

The Ramah Navajo Chapter declared an Stage of Emergency by Resolution No. 022003. We are addressing our water system repairs/replacement as an emergency project. The challenge would be receiving supplies in a timely manner due to COVID. Timeline attached

☐ document attached

(d) Identify who will be responsible for implementing the Program or Project:

Ms. Nancy R. Martine-Alonzo, RNSB Executive Director, Mr. Wylie Clawson, RNSB Facilities Management Director and WH Pacific

☐ document attached

(e) Explain who will be responsible for operations and maintenance costs for the Project once completed, and how such costs will be funded prospectively:

The RNSB Facilities Management Department will be responsible for the operation and maintenance cost of the completed project. O & M cost is charged to RNSB programs that uses the water.

☐ document attached

(f) State which of the 68 Fiscal Recovery Fund expenditure categories in the attached U.S. Department of the Treasury Appendix 1 listing the proposed Program or Project falls under, and explain the reason why:

5. Infrastructure

5.10 Drinking Water: Treatment - Our treatment water plant is over 45 years old and parts for it have been breaking down.

5.11 Drinking Water: Transmission and Distribution - Our water distribution is made from ductile iron pipes and they are rusting away causing multiple water leaks

5.13 Drinking Water: Source - One of our wells is off-line due to radionuclide reading above the MCL we need to install vault meters on our water wells to blend the water and it needs its pump, motor, drop pipes replaced.

5.14 Drinking Water: Storage - We need an elevated drinking water storage tank, currently our drinking water storage tank is off site for community distribution. We also need another raw water storage tank for fire suppression and landscaping.

☐ document attached

Part 3. Additional documents.

List here all additional supporting documents attached to this FRF Expenditure Plan (or indicate N/A):

RNSB Resolution RNSB-EXEC-2022-019 Approve to submit a Navajo Nation ARPA (FRF)
The Ramah Navajo Chapter Resolution No. 022003 Declared an "acute Stage of Emergency"
The Navajo Nation Program Budget Summary - Appendix B
Preliminary Engineer Report - Emergency Water System Improvement & Cost Update

☐ Board Resolution attached

Part 4. Affirmation by Funding Recipient.

Funding Recipient affirms that its receipt of Fiscal Recovery Funds and the implementation of this FRF Expenditure Plan shall be in accordance with Resolution No. CJY-41-21, the ARPA, ARPA Regulations, and with all applicable federal and Navajo Nation laws, regulations, and policies:

External Entity's
Preparer:


signature of External Entity's CONTACT PERSON

Approved by:


signature of Board Chairman or President (or Vice-President)

Approved by:


signature of External Entity's CEO (or equivalent)

Approved to submit
for Review:

signature of Director of existing Division

-OR- Approved to submit
for Review:

signature of NNI President

Ramah Navajo School Board,
Inc., Emergency Water System
Improvements
Preliminary Engineering Report

September 24, 2020

Prepared for:

Ramah Navajo School Board, Inc.

Prepared By:

WHPacific

AN **N|V|5** COMPANY

6501 Americas Parkway Northeast, Suite 400

Albuquerque, New Mexico 87110

I, Russell R. Rodke, Registered New Mexico Professional Engineer No. 10659, hereby certify that the material contained in this document was prepared by me, or directly under my supervision, and is true and correct to the best of my knowledge and belief.

Russell R. Rodke

9-24-2020

Russell R. Rodke, P.E.
N.M.P.E. License No. 10659

Date

WHPacific
AN NIVIS COMPANY



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1. Introduction

The School needs emergency help. The School is out of water. Both wells are not working, and the only water is being supplied by the neighboring Jacob's Well system. The pipes in the ground are 45 years old and need replacing. The water tank needs repair. Water samples have exceeded the EPA Maximum Contaminant Levels for arsenic, lead, radionuclides and endocrine disrupting phthalates. The system has grown over the years and served the Indian Health Service Clinic and other facilities that are especially needed by the community as it fights the COVID-19 virus.

Steps for Clean Water:

- Sources- Well #1 and Well # 2, BOTH NOT WORKING
- Connection to neighboring system- Jacob's Well (off campus)
- Hilltop Tank and School Tank Raw Water Storage
- Optimized Treatment- removes arsenic, lead, phthalates, and radionuclides
- Out to distribution- pump supplies pressure
- Lines to buildings

The Ramah Navajo School Board, Inc., ("School") is a private, self-governing 501(c)(3) nonprofit corporation which runs a complex of Head Start, Elementary, Junior High and High Schools, and other services at Pine Hill, New Mexico. While the School cooperates with the Ramah Navajo Chapter of the Navajo Nation, it is a separate entity. In 1970, the Board established the Ramah Navajo High School in Ramah, NM, one of the first Indian community schools governed by an all-Indian, locally controlled school board. By 1975, the current Pine Hill Elementary and High Schools were under construction at their present site 12 miles south of the town of Ramah and the students began learning there even before the buildings were completed. The local efforts were a model for the groundbreaking federal 1975 Indian Self-Determination and Educational Assistance Act, PL 93-638, which provided similar educational opportunities across the country to Indian students. The 50th anniversary of the Board's founding was celebrated in February 2020 just before the Coronavirus (COVID-19) pandemic became a national health crisis. Federal funds, under the Coronavirus Aid, Relief, and Economic Security (CARES) Act, are available for addressing immediate health and safety needs related to the pandemic but need to be expended by the end of 2020. The water system is 45 years old and deficient and inadequate for the additional demands on the system for sanitation and prevention of the spread of the virus. The Navajo Nation including the Ramah Navajo community has been disproportionately negatively impacted by the virus. A contributing factor to the COVID-19 impact on the Navajo Nation is the lack of running water for sanitation purposes. On an emergency back-up basis, the School's system occasionally supplies water to much of the southern half of the Ramah Navajo Chapter, including the school complex, Jacob's Well, unit 3, unit 5 and the Hilltop tank's systems.

The School has contracted with WHPacific for the preparation of a Preliminary Engineering Report (PER), to evaluate the present condition of the School's water system and determine the suitability for continued use and recommended improvements. A PER is a planning document required as part of the process of obtaining financial assistance for the development or improvement of drinking water projects. The PER describes the proposed project from an engineering perspective, analyzes alternatives to the proposal, defines project costs, and provides information critical to the underwriting process.



United States Department of Agriculture (USDA) Rural Development Bulletin 1780-2, *Preliminary Engineering Reports for the Water and Waste Disposal Program*, has been adopted by many state and federal agencies as the template for the development of the PER required for the funding application process. As such, RD Bulletin 1780-2 was used as the guide for the preparation of the document.

2. Project Planning

a) Location

The proposed project is in the unincorporated community of Pine Hill in Cibola County in the heart of the Ramah Chapter of the Navajo Nation on a property of about 240 acres owned by the School. It is about 35 miles southwest of Grants, NM, on Indian Service Route ("Route") 125, about 22 miles south of the town of Ramah. The Pine Hill School is near the Intersection of Routes 125 and 140. A Location map is shown in Figure 1.

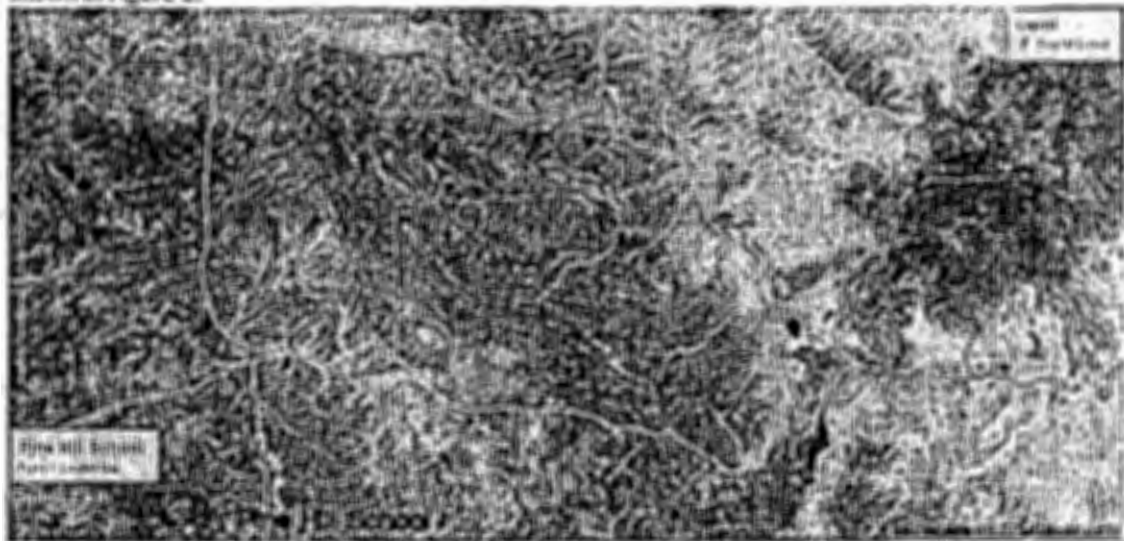


Figure 1. Location Map

The project water system is the oldest part of a larger system "NN3500250 Pinehill Community and School RNUA". RNUA is the Ramah Navajo Utility Authority, a separate for-profit part of the Ramah Navajo Chapter government. This PER deals with the "campus" community served by the School's water system including Pine Hill Schools (Head Start, Elementary, Junior High and High School and administration buildings), 70 residences for teachers and staff and dormitories for residential students, the School Farm and Fairgrounds, as well as the related entities of KTDB 89.7 Radio Station, Pine Hill Volunteer Fire Department and Emergency Medical Services, United States Post Office, Pine Hill Health Center and Pharmacy, and Pine Hill Behavioral Health. The small shopping center of Pine Hill Market and Gas Station, a branch of the First Financial Credit Union and a formerly operating laundromat are served by the School's water and wastewater lines. Nearby "off-campus", in the Pinehill community are the RNUA yard - located off Indian Route 122 near the intersection with Indian Route 184, Jacob's Well - located on Indian Service Route 139, the Ramah Navajo Department of Transportation office and patrol yard - located approximately one mile south of the intersection of 125 and 122 and abutting 125, and four Navajo Housing Administration developments - located just east across 184 and at the intersection of 182 and

122. Figure 4 shows the relative location of the off-campus entities and the tanks and wells mentioned in this report.

The elevation of the project site ranges from 7402 at the wastewater plant discharge to the arroyo to 7500 feet in the north side of the campus at the top of the hill. The elevation at the bottom of the existing water tank is approximately 7499 feet. Located on a low hill above flat terrain, the service area is bound by Route 125 on the West and Route 184 on the east, for a West-East distance of about 3,500 feet and is about 2,800 feet north to south. To the east, the Continental Divide, with an average elevation about 7800 feet, meanders as close as six miles away and El Morro National Monument and the Zuni Mountains are to the northeast. The terrain slopes southwestward toward tributaries of the Zuni River and the Little Colorado River.

Plants and trees native to the region include grasses, chamisa, sagebrush, Ponderosa pine, piñon, and juniper. Elk, deer, turkeys and eagles are often seen near the site. Data from the nearest weather station at Grants indicates the climate is semi-arid with summer thunderstorms common in July and August. Snow is possible from November through March and has occurred as late as May. Average monthly summer temperatures range from 49° to 89° F and in the winter from 15° to 51° F. The record high and low are 98.1 degrees F July 3, 2007, and -23.1 degrees F on February 3, 2011.

b) Environmental Resources Present

The project area is rural with considerable development around the School for which the project provides water. Area agriculture activities are centered on livestock and farming in the form of traditional vegetable gardens supplements store bought groceries. Ranching includes mostly sheepherding or cattle ranching. Multigenerational families live in clustered housing developments or scattered isolated homes in the area. Most of the population are members of the Navajo Nation and consists of families from small children to elders, with a majority employed at the school or the above related entities.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 35006C1000C dated August 15, 2020, the project area, categorizes the flood risk as Zone D which indicates the flood risk has not been quantified. The project sits on the top of Pine Hill which should remove it from any floodplain.

The building site for the school and support buildings was determined by the people of Ramah Navajo. The site has been extensively used for 50 years and staff have encountered no artifacts. It is unknown if an archaeological survey has been completed for the site, previous ancestral uses for the land were minimal and it is unlikely that any cultural resources are present in the specific project site. Cliff dwellings and pueblo ruins, like the site on top of El Morro National Monument, are known in the area, but it is disrespectful to visit or build on them.

Since 1975, during the construction of the school and other community buildings, or since then during the installation and maintenance of water distribution or sewage collection lines, no cultural resources were encountered. In future water and sewer line construction no disruption of natural or historical resources are anticipated.

No endangered species are known to be present.

c) Population Trends

Population Trends. The 2017 Regional Water Plan for Northwest New Mexico prepared for the Interstate Stream Commission indicates a projection of little growth for Cibola County. Estimates from the US Census American Community Survey for 2010-2016 for the Ramah Chapter show a down and up fluctuation between 1247 and 1401 total population for a net projection of about 0.5% growth. The water use at the School depends on many factors such as the current COVID-19 pandemic, new school and community programs, and alternative education opportunities. The Ramah Navajo Department of Transportation performed another study in 2015 which indicated that population was closer to 4000 registered Ramah Navajo Band members who live within the reservation boundary.

The Pine Hill School, New Mexico, is an unincorporated community in Cibola County within the Navajo Nation census tract 2430. It is not a Census Designated Place and Census Data for this community is not readily available. The approximate student population of the school is 316. The school is not limited to students from the immediate community and has dormitory facilities to better serve students from more remote areas. Public Water System Permit NN3500250 for Pinehill Community and School RNUA has the system serving 1007 people. Attendance at the school and the size of the staff at the school and associated facilities are expected to remain steady.

The current 2020 census will give more current data when it is complete. The closest towns in New Mexico, such as Gallup, Grants and Zuni report reasonably stable populations as shown by University of New Mexico Bureau of Business & Economic Research. Gallup and Grants have shown a small decrease in population over the 2000 to 2010 period, while Zuni has shown a small population increase. Cibola County has a 2010 population of 32,900, showing a growth pattern over the previous ten years. The population of the RNSB community is expected to have about 0.5 % annual growth.

Archeologists date the presence of Navajo people in the area back to 600 AD. According to the Ramah Navajo Chapter profile on enavajo.org, seven Navajo families returned in 1868 from the Long Walk to their traditional homeland of Tlochin, "Wild Onion". The chapter was certified by the Navajo Nation in 1957, a chapter house was built in 1964. The Ramah Navajo School Board, Inc., was established 1970 and just in February 2020 celebrated its 50th anniversary.

d) Community Engagement

Due to the tight timetable of funding, community engagement by the consultant will be limited to a summary of project status delivered to RNSB staff and RNSB Board. The RNSB conducts Board of Director meetings as deemed necessary to communicate to the public ongoing events or projects. The organizational documents require monthly meetings open to all system users and residents. The contract for the PER for Water System Improvements was approved on August 12, 2020.

3. Existing Facilities

a) Location Map



Figure 2. Campus Area Layout

b) History

The Pine Hill Schools and community were built in stages. In 1975, two wells were drilled to a depth of 3,500 feet, cased, equipped with sand screens and the bottoms were gravel packed. The static water level is at 800 feet. Most of the water distribution and wastewater collection lines were put in with the initial construction of the school in 1975 and have exceeded their design life. The current water treatment plant operation and maintenance manual indicates the Culligan treatment system was put in place in 1990 and consists of water softening, filtration, chlorination and fluoridation. Equipment includes 2 water softeners, 2 pressure filters, and chemical feeding equipment for fluoride and chlorine supplied by Southwest Water Conditioning, Inc., a Culligan representative. There are two raw water storage tanks, one 250,000-gallon tank on the schools' campus and a second is the Hilltop tank, a 500,000-gallon tank located 2 miles to the northwest operated by the RNUA but occasionally receiving water from the School system. A booster pump is used to obtain distribution pressure after treatment. A Fire Suppression pump is also part of the system.

Over the years, additional buildings were constructed on the School campus. The following is a brief history of the growth of the campus.

1. On September 26, 1975 the Pine Hill High School and Elementary Schools were dedicated. They were originally built to accommodate 248 students.
2. In 1976, the Kindergarten and gymnasium buildings were completed. A Health Center was built in Pine Hill and operates under contract by the Indian Health Service.
3. In 1981, the Library and Media Center were built, and the North Central Association officially accredited the schools.
4. In 1989, The Middle School and Multi-Purpose buildings were completed.
5. In 1992, the Pine Hill Market was built.
6. In 1993, the Child Care Center opened.
7. In 1995, the 66-unit staff housing project was completed.

8. By 1997, the Behavioral Health Center, Parent Resource Center, and the Volunteer Fire Department and Emergency Medical Services building were completed.
9. In 2007, the new Pine Hill School Dormitory was completed.

c) Condition of Existing Facilities

Operator

The Board employs Ron Francis, Water Operator Level 2 for treatment and Level 1 for distribution. While there are some meters on the system, the school buildings are not charged separately for water and the staff housing and other users are charged a flat rate, so there is no meter reader on staff.

Water Rights

The Navajo Nation has extensive but unquantified water rights under the Winters Doctrine (1908). The Zuni River Adjudication is currently underway. The Zuni portion of the adjudication has been rescheduled to allow the Zuni Pueblo to work cooperatively with the Navajo Nation and the Ramah Band of Navajos. In the San Juan River basin, the adjudication process resulted in a negotiated settlement that quantified the Navajo Nation's Federally Reserved water rights for that basin. The Navajo Nation intervened in the Zuni adjudication in 2002 and continues to be involved. The groundwater withdrawals for the school and community should be considered in any settlement.

This Preliminary Engineering Report evaluates the water system of the Board for the planning period 2020-2040. Current water demands are approximately 133 acre-feet per year, based on the 1,007 users on the water permit, and at a 0.5% growth rate would increase to 1,113 users and 147 acre-feet by 2040.

Water Quality

Recent water quality testing show exceedances of EPA Maximum Contaminant Levels regulations in phthalates, arsenic and radionuclides as well as non-compliance violations on submittal of various sampling results. The water treatment building and equipment needs replacing. The chlorine fumes have eaten holes in the door frames. The arsenic and radionuclides violations show the need for more extensive treatment. Blending water between the wells to dilute the arsenic and radionuclides helps and requires additional methods for a long-term solution.

Water Supply

The two wells are 3,500 feet deep with a static water level of 800 feet. Well 1 was recently overhauled and has been producing all the water for the system, until it recently went offline due to clay chunks interfering with the operation. Well 2 urgently needs an overhaul to correct electrical problems that shut the well off, as well as to replace worn and corroded parts. Well 1 produces 80 gallons per minute. Well 2 produces 40 gallons per minute when it is functioning. Additional equipment such as a properly equipped service truck would improve response time to line breaks. With both wells inoperable the system is relying on the water from Jacob's Well and the Hilltop Tank. Repairs of both Wells 1 and 2 are underway.

Water Distribution

The School's system within the campus includes approximately 3.2 miles of 6-inch cast iron and galvanized steel water distribution line, and 1.2 miles of 4-inch and 2-inch as shown in Figure 4, located throughout the service area. Since the School owns all the property, there are no private easements or public permits for the waterlines, except where the lines cross IR 125 and IR 140. The exact location of these lines and the wastewater collection system were mapped as well as abandoned-in-place water lines from an old trailer park that sat on part of the campus.

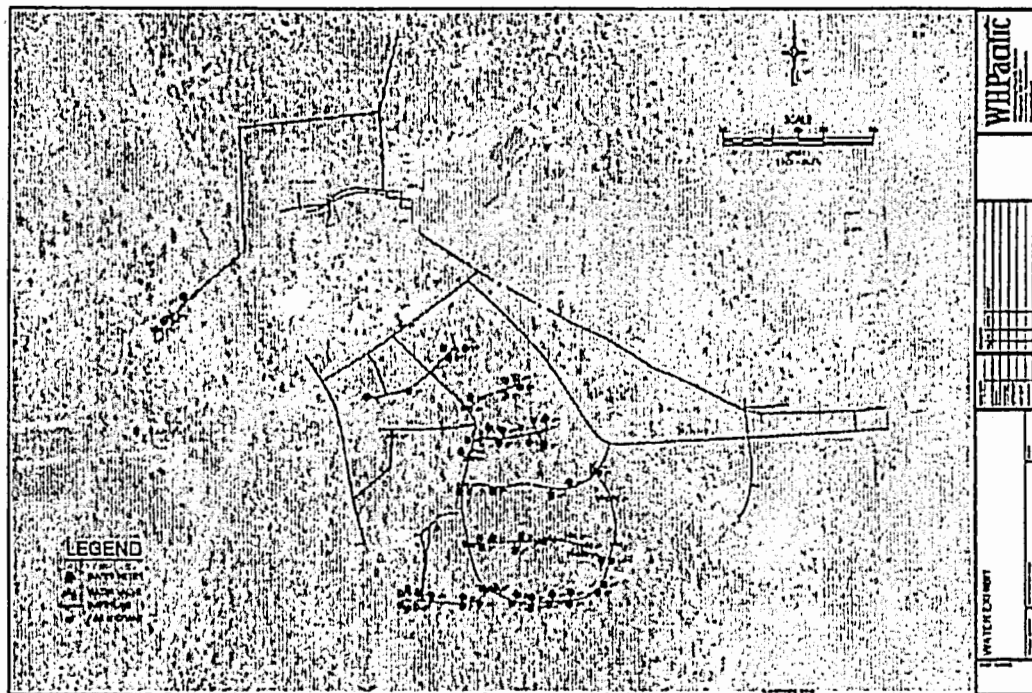


Figure 3. Existing Water System Layout

A general schematic layout and general service maps of the existing water system are included in Figure 3. The existing lines were surveyed and located to aid in construction but the records of the construction of the lines are not available. Additionally, the consultant used Ground Penetrating Radar (GPR) to locate lines. Due to materials, some lines are approximate as no trace wire or other commonly used locating tags were identifiable.

Raw water from the School's two wells is pumped into the 250,000-gallon School tank. Water needed for local demand is treated by the RNSB treatment facility and treated water is piped to the campus and the shopping center users. Excess raw water is pumped to the Hilltop 0.5 million-gallon tank about 2 miles northwest of the campus where it is mixed with raw water from Jacob's Well. Jacob's Well is 2.5 miles north of the campus and was completed in 2009. Jacob's Well has only a small storage tank at the site, so water is pumped to the Hilltop Tank 2.4 miles to the west and returns to Jacob's Well for treatment at Jacob's Well. The Jacob's Well treatment facility treats water for the off-campus Pinehill Community and the water fill station at Jacob's Well. Jacob's Well, the Hilltop Tank and the School tank roughly form an equilateral triangle. The Hilltop tank is at elevation 7606 feet, the highest elevation for several miles in any direction, about 100 feet higher than the School tank. The School system and the Jacob's Well system

are owned and operated independently but regionally connected for mutual support. While this 'regionalization' of the two entities benefits both in times of well failure or infrastructure upgrades, meter readings and monthly reports to establish a water accounting between the two entities are recommended to improve operations.

Water Storage

The School system includes one deteriorated 250,000-gallon galvanized steel raw water storage tank. A 500,000-gallon tank is connected to the system and may be able to supply water during rehabilitation of the 250,000-gallon tank.

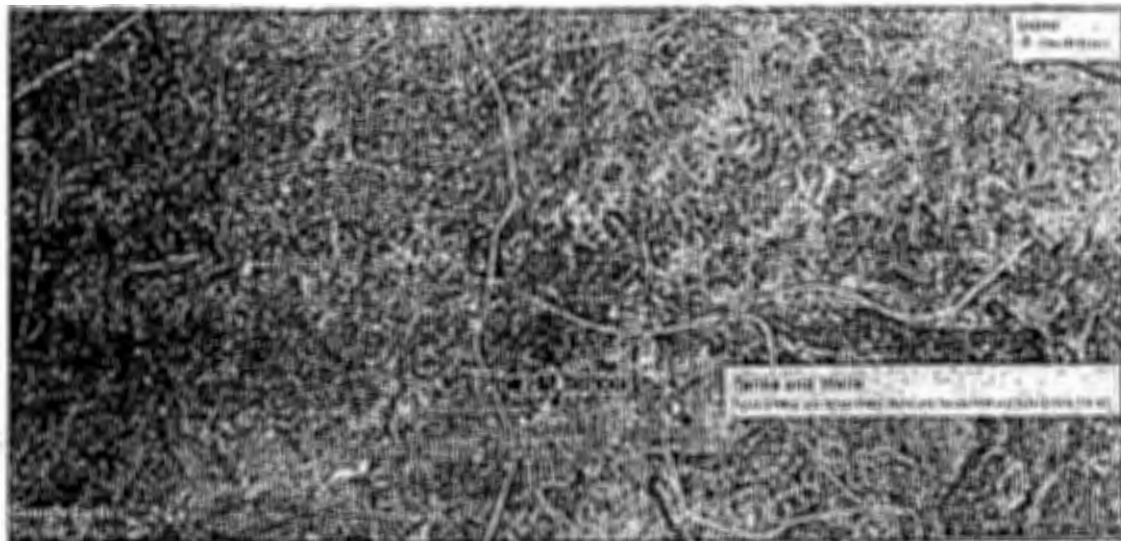


Figure 4. Tanks and Wells

The USDA Rural Development design standard recommends 2 days of emergency storage as follows:

- 100 gallons per person
- 1007 persons
- 201,400 gallons emergency storage.

As noted above, the system has only one storage facility on campus, the 250,000-gallon storage tank which barely has the minimum requirements for emergency storage. The existing School system is limited in both capacity and system pressure. The ground level raw water 250,000-gallon tank is the only storage and it is before the water treatment. The booster pump and existing 6 and 4-inch water lines provide limited flow throughout the system. An additional 60,000-gallon elevated or pressurized pneumatic tank for treated water would allow for more operational flexibility and emergency response capacity.

Fire Hydrants

Fire hydrants are located throughout the campus and residential areas, but these will also need to be replaced. The Volunteer Fire Department at the School is not in operation. Fire response and prevention support is currently dependent on the Candy Kitchen Volunteer Fire Station, or the El Morro Volunteer Station located about 20 miles north and east of Pine Hill. The School facilities staff expressed a willingness

during their hiring interviews to be part of the response to fires but have not received fire-fighting training. Additional equipment such as a truck to respond to brushfires would increase the department's capabilities. If the Volunteer Fire Department could be affiliated with the county, volunteers may be eligible through the Public Employees Retirement Association for a pension of \$125 per month after ten years of active service with the department at retirement at age of 55 or more. For 25 years of active service the pension is \$250 per month. Coordinating the School water system maintenance needs of flushing hydrants periodically according to the hydrant maintenance plan could be coordinated with fire-fighting practice and using the water productively for landscape needs.

d) Financial Status of Any Existing Facilities

The School's water system is not effectively metered, and a flat rate of \$14.00 per month is charged for residential service. Some commercial connections are metered and charged a minimal amount based on usage. Funding for operation and maintenance of the system comes from a variety of sources, each with its rules and limits for use of funds. Employees charge their time to different accounts depending on whether they are working on a water leak in the main line or doing building maintenance by replacing a leaking faucet. The Facilities Management Division has a staff of one administrative and four field staff of which about half of their time is devoted to water and wastewater duties. An Operating Budget for a similarly sized system might have annual revenues of approximately \$180,000. New service lines and meters to all residences are included in the proposed improvements outlined in the PER.

e) Water/ Energy/ Waste Audits

No water, energy, or waste audits have ever been conducted for the RNSB system.

4. Need for Project

a) Health, Sanitation, and Security

The COVID-19 virus has taken a disproportionate toll on the Navajo Nation and the Ramah chapter. Providing safe clean water needed to support the schools will take extraordinary efforts. The fifty-year old current system, built for less than half of the demand of the accumulated expansion of the campus and surrounding community, is inadequate for the current demand, much less for the additional health demands of the government mandated protocols for reopening the schools.

Adequate fire protection is not currently available for many of the buildings on the school campus. There is a Fire Suppression pump, but it only serves the Elementary School and the Dormitory. The Gymnasium is scheduled to be demolished and rebuilt with a fire suppression system included. The fire suppression capability of the water distribution system is also limited by pipe size and water pressure. Larry Barker with Albuquerque's KRQE Channel 13 News in 2014 described the Pine Hill School as the "most dangerous school in America". While his report focused on dysfunctional fire alarm systems which have since been fixed, this project will address many other safety issues raised.

b) Aging Infrastructure

The system has been in use continuously since 1975. The 6-inch and 4-inch galvanized steel pipes were not installed with cathodic protection or the protection was disrupted with line breaks and repairs. Some of the pipes were laid directly on the sandstone layer that is as close as four feet below ground level and pipe vibration through use has caused repeated repairs in some areas. The School has been



fortunate to receive grants for construction of facilities but obtaining funding for operation and maintenance has been more difficult. Line repairs have been costly. The water treatment building has deteriorated with use and does not have room for the expanded filtration required to achieve compliance with regulations. Dead end lines at the dormitory and the farm should be connected to form a loop.

c) Reasonable Growth

While the current population growth rate is projected to be minimal, the history of the schools and community show a far-sighted trend of expansion to try to solve all the problems of the community from education to mental health. Response to the Covid-19 pandemic might result in improved medical facilities, expanded greenhouse production of local food, a revived vocational curriculum or other infrastructure improvements. Water system capacity to handle at least a 0.5% percent annual growth rate in infrastructure should be included in planning for the twenty-year period.

5. Alternatives Considered

a) Alternative 1

1. Description

The major distribution system components of Alternative 1 are shown on Figure 2 and include:

Abandon existing waterlines in-place and replace with new larger capacity lines. Ensure that the new lines are laid out in loops to avoid dead end lines including connecting the dormitory to the farm to eliminate two dead end lines. Repair or replace the sprinkler system in the football field. Provide for fire suppression flow to all buildings. Install meters for each building and line. Install isolation valves, pressure relief valves and air release valves as needed to operate the system.

Conduct a thorough overhaul of Well #2 and address issues with well #1. Replace the water treatment building with a structure large enough to accommodate more equipment for controlling arsenic and radionuclides. Upgrade the water treatment process to remove arsenic, phthalates and radionuclides. Service lines and water meters will be coordinated with the upcoming gym replacement to ensure smooth connection.

The survey of the existing system was used to estimate the replacement system. Approximately 17,020-feet of 8-inch and 1475-feet of 4-inch and 5,000 feet of 2-inch water lines will be constructed to connect the system. Also needed are 48 water valves, 24 hydrants, and 128 water meters. Water system modeling during the design phase may refine these numbers.

Evaluate the structural integrity, internal coating and cathodic protection system of the 250,000-gallon School tank.

2. Design Criteria

Based on freezing temperatures it is suggested that main water lines should be installed with at least 5 feet of cover.

Water treatment and distribution will have to meet the requirements of the federal Safe Drinking Water Act (SDWA) under which the EPA delegated enforcement to the Navajo Nation.

The USDA Rural Development design standard of 100 gpd per person were reviewed for this project. The water permit indicates the system serves 1007 people. Reasonable growth of 0.5% per year would add 113 more people which would result in 1120 people and 112,000 gallons per day x 2 days = 224,000 gallons. Emergency storage is required for a minimum of two days, or a minimum of 224,000 gallons.

3. Map

A map of new water lines, water treatment building and tank is shown in Figure 5.

4. Environmental Impacts

Flood Insurance Rate Maps gathered from FEMA shows the area has not been surveyed for flood risk, but Pine Hill campus is located on a hill so flooding should not be an issue. All waterlines, building and tanks will be installed in previously disturbed areas, and no environmental issues anticipated.

5. Land Requirements

All land involved in the project is owned by the School, so no easements or rights-of way are needed.

6. Permits Required

All waterline construction will be located on the School's land, so no permits are needed except where lines will cross Indian Service routes or roadways, chiefly Route 140 and 125. The proposed new water treatment building will be located near the existing 250,000-gallon tank. Navajo Nation EPA will need to approve final design of the treatment process.

7. Potential Construction Problems

The project site is subject to freezing weather so installation of the waterlines before winter is needed. Construction of the concrete foundation slab for the building will need to take place within the months of March through October to provide adequate curing temperatures and acceptable weather conditions. Previous construction projects were not carried through to completion so houses did not receive a certificate of occupancy and the Elementary school could not be used until completed by a second contractor two years later.

8. Sustainability Considerations

The new water line will be PVC pipe which poses no environmental hazards and has a long service life with little maintenance issues when installed properly. Financial sustainability might be improved by tracking the actual costs of the water and wastewater operations and maintenance to improve budgeting and accrue an O&M fund to handle inevitable line breaks, well problems and emergencies without having to tap into other funds.

9. Estimate

The estimate below represents the engineer's opinion of probable cost for design and construction of the project. Annual operation and maintenance costs, over the life of the improvement, need to be considered when estimating a lifetime cost. Operation and maintenance costs over a 20-year period are shown in Section 6 in the Life Cycle Costing Section for the alternatives. Budgeting information is shown in the Appendix and may be used to estimate operation and maintenance costs.



RAMAH NAVAJO SCHOOL BOARD PRELIMINARY ENGINEERING REPORT
WATER SYSTEM IMPROVEMENTS
ENGINEER'S OPINION OF PROBABLE COST
9/22/2020

Alternative 1 Cost Estimate

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
1	Construction Staking, compl.	%		1.50	\$39,461
2	Construction Mobilization and Demobilization, compl.	%		16.00	\$420,913
3	Flood Protection, compl.	%		0.37	\$0
4	Traffic Control	LS	1	\$10,000.00	\$10,000
5	Site Clearing and Grubbing, compl.	AC	1.00	\$1,725	\$1,725
6	2" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	5,000	\$15	\$75,000
7	4" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	1,475	\$35	\$51,625
8	6" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	0		
9	8" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	17,500	\$40	\$700,000
10	Pressurized waterline connection, all sizes, incl. fittings, compl.	EA	10	\$1,200	\$12,000
11	Non-pressurized connection, existing waterline, all sizes, incl. fittings, compl.	EA	6	\$3,000	\$18,000
12	Tee or Wye, 4" to 8" waterline, incl. jointing material, c/p.	EA	4	\$700	\$2,800
13	2" Gate Valve & Valve Box, c/p.	EA	0	\$1,000	\$0
14	4" Gate Valve & Valve Box, c/p.	EA	4	\$1,150	\$4,600
15	6" Gate Valve & Valve Box, c/p.	EA	0		
16	8" Gate Valve & Valve Box, c/p.	EA	63	\$2,340	\$147,420
17	Gate Valve, 4" to 10", Remove & Salvage, compl.	EA	0		\$0
18	Valve Box, Remove & Dispose, compl.	EA	33	\$200	\$6,600
19	Fire Hydrant, 4" buy, MJ, incl. blocking & aggregate, c/p.	EA	31	\$4,700	\$145,700
20	Fire Hydrant, Existing, Remove & Salvage, compl.	EA	20	\$500	\$10,000
21	3/4" Service Line Replacement & Transfer, incl. tapping saddle & tubing, c/p.	EA			\$0
22	3/4" Service Line Transfer at waterline, incl. tapping saddle & tubing, c/p.	EA	0	\$0	\$0
23	3/4" Water Main Tap, Service Saddle & Corp Stop	EA	0	\$0	\$0
24	1" Water Main Tap, Service Saddle & Corp Stop	EA	122	\$450	\$54,900
25	2" Water Main Tap, Service Saddle & Corp Stop	EA	6	\$560	\$3,360
26	Residential 3/4" Water Meter & Can Combination w/ Radio Read, incl. concrete pad, cover & let, c/p.	EA	122	\$983	\$119,926
27	3/4" Water Meter Box, 3/4" to 1", incl. concrete pad, cover & let, c/p.	EA	0	\$0	\$0
28	Remove & Replace 1" Meter Install w/ AMR	EA	0		
29	Bored Crossing 12" Casing (Carrier Pipe Not Included)	LF	500	\$160	\$80,000
30	2" Combination Air Release and Vacuum Valve, c/p.	EA	10	\$5,300	\$53,000
31	PRV Vault	EA	2	\$2,500	\$5,000
32	Rock excavation	CY	500	\$107	\$53,500
33	3/4" or 1" PE service line installation (10 ft per meter)	LF	1,220	\$35	\$42,700
34	Thrust blocking	CY	100	\$536	\$53,600
35	Overhaul Well #2	LS	1	\$500,000	\$500,000
36	Water Treatment Facility building and treatment equipment	LS	1	\$400,000	\$400,000
37	Evaluate structural integrity of the 250,000-gallon tank (Alternative 1)	EA	1	\$100,000	\$100,000
38	Repair 250,000-gallon tank (Alternative 2)	EA	0	\$0	\$0
39	250,000 Gallon Steel Welded Water Storage Tank, including foundation, piping, testing and disinfection. (Alternative 3)	EA	0	\$0	\$0
40	Artificial pavement, Existing Remove and Replace, incl. 2-inch extra asphalt thickness, with machine laydown & processing existing subbase material, any thickness, c/p.	SY	50	\$85	\$4,250

\$2,630,707.00

Construction Subtotal \$3,091,001
 MACORT (8.8125%) \$210,530
 Construction Contingency (20%) \$618,216
 Geotechnical Services \$3,000
 Project Survey (8%) \$247,286
 Engineering Design (15%) \$463,662
 Construction Services/Inspection (10%) \$203,108
Total \$4,648,000

Ramah Navajo School Board, Inc., Water System Improvements
 Preliminary Engineering Report



b) Alternative 2

1. Description

The major distribution system components of Alternative 2 are identical to alternative 1 with the addition of repairing the 250,000-gallon tank as shown in Figure 6. Repair may include draining the tank, sandblasting the interior, coating the interior with an epoxy lining, and repairing or replacing the cathodic protection system.

2. Design Criteria

The design criteria are identical to Alternative 1.

3. Map

Figure 6 gives an overview of water lines and tank.

4. Environmental Impacts

The environmental impacts are identical to Alternative 1.

5. Land Requirements

The land requirements are identical to Alternative 1.

6. Permits Required

The permit requirements are identical to Alternative 1.

7. Potential Construction Problems

The potential construction problems are identical to Alternative 1.

8. Sustainability Considerations

The sustainability considerations are identical to Alternative 1.

9. Cost Estimate

The estimate shown on the following page represents the engineer's opinion of probable cost for design and construction of the project. Annual operation and maintenance costs, over the life of the improvement, need to be considered when estimating a lifetime cost. Operation and maintenance costs over a 20-year period are shown in Section 6 in the Life Cycle Costing Section for the alternatives. Budgeting information is shown in the Appendix and may be used to estimate operation and maintenance costs.

RAMAH NAVAJO SCHOOL BOARD PRELIMINARY ENGINEERING REPORT
WATER SYSTEM IMPROVEMENTS
ENGINEER'S OPINION OF PROBABLE COST
9/22/2020

ITEM NO.	ITEM DESCRIPTION	UNIT	Alternative 2 Cost Estimate		
			QUANTITY	UNIT COST	COST
1	Construction Staking, compl.	%		1.50	\$39.461
2	Construction Mobilization and Demobilization, compl.	%		18.00	\$420.913
3	Flood Protection, compl.	%		0.00	\$0
4	Traffic Control	LS	1	\$10,000.00	\$10,000
5	Site Clearing and Grubbing, compl.	AC	1.00	\$1,726	\$1,726
6	2" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	5,000	\$15	\$75,000
7	4" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	1,475	\$35	\$51,625
8	6" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	0	\$0	
9	8" Waterline Pipe incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	17,500	\$40	\$700,000
10	Pressurized waterline connection, all sizes, incl. fittings, compl.	EA	10	\$1,200	\$12,000
11	Non-pressurized connection, existing waterline, all sizes, incl. fittings, compl.	EA	6	\$3,000	\$18,000
12	Tee or Wye, 4" to 8" waterline, incl. jointing material, c/p.	EA	4	\$700	\$2,800
13	2" Gate Valve & Valve Box, c/p.	EA	0	\$1,000	
14	4" Gate Valve & Valve Box, c/p.	EA	4	\$1,150	\$4,600
15	6" Gate Valve & Valve Box, c/p.	EA	0	\$0	
16	8" Gate Valve & Valve Box, c/p.	EA	63	\$2,340	\$147,420
17	Gate Valve, 4" to 10", Remove & Salvage, compl.	EA	0	\$0	
18	Valve Box, Remove & Dispose, compl.	EA	33	\$200	\$6,600
19	Fire Hydrant, 4" bury, M.I. incl. blocking & aggregate, c/p.	EA	31	\$4,700	\$144,700
20	Fire Hydrant, Existing, Remove & Salvage, compl.	EA	20	\$500	\$10,000
21	3/4" Service Line Replacement & Transfer, incl. tapping saddle & tubing, c/p.	EA	0	\$0	
22	3/4" Service Line Transfer at waterline, incl. tapping saddle & tubing, c/p.	EA	0	\$0	
23	3/4" Water Main Tap, Service Saddle & Corp Stop	EA	0	\$0	
24	1" Water Main Tap, Service Saddle & Corp Stop	EA	122	\$450	\$54,900
25	2" Water Main Tap, Service Saddle & Corp Stop	EA	6	\$500	\$3,000
26	Residential 3/4" Water Meter & Can Combination w/ Radio Read, incl. concrete pad, cover & let, c/p.	EA	122	\$983	\$119,926
27	3/4" Water Meter Box, 3/4" to 1", incl. concrete pad, cover & let, c/p.	EA	0	\$0	
28	Remove & Replace 1" Meter Install w/ AMR	EA	0	\$0	
29	Bored Crossing 12" Casing (Carrier Pipe Not Included)	LF	500	\$180	\$90,000
30	2" Combination Air Release and Vacuum Valve, c/p.	EA	10	\$5,300	\$53,000
31	PRV Vault	EA	2	\$2,500	\$5,000
32	Rock excavation	CY	500	\$107	\$53,500
33	3/4" or 1" PE service line installation (10 ft per meter)	LF	1,220	\$35	\$42,700
34	Thrust Blocking	CY	100	\$536	\$53,600
35	Overhead Wall #2	LS	1	\$500,000	\$500,000
36	Water Treatment Facility building and treatment equipment	LS	1	\$400,000	\$400,000
37	Evaluate structural integrity of the 250,000-gallon tank (Alternative 1)	EA	1	\$100,000	\$100,000
38	Repair 250,000-gallon tank (Alternative 2)	EA	1	\$300,000	\$300,000
39	250,000 Gallon Steel Welded Water Storage Tank, including foundation, piping, testing and disinfection. (Alternative 3)	EA	0	\$0	\$0
40	Arterial pavement, Existing Remove and Replace, incl. 2-inch extra asphalt thickness, with machine laydown, & processing existing subbase material, any thickness, c/p.	SY	50	\$65	\$3,250

\$2,924,707.00

Construction Subtotal	\$3,385,081
NGJRT (6.8125%)	\$230,609
Construction Contingency (20%)	\$677,016
Geotechnical Services	\$8,000
Project Survey (8%)	\$270,806
Engineering Design (15%)	\$507,782
Construction Services/Inspection (10%)	\$338,508
Total	\$5,417,800

Ramah Navajo School Board, Inc., Water System Improvements
Preliminary Engineering Report



c) Alternative 3

1. Description

The major distribution system components of Alternative 3 is identical to alternative 1 with the addition of replacing the 250,000-gallon tank as shown in Figure 6.

2. Design Criteria

The design criteria are identical to Alternative 1.

3. Map

Figure 6 gives an overview of water lines and tank.

4. Environmental Impacts

The environmental impacts are identical to Alternative 1.

5. Land Requirements

The land requirements are identical to Alternative 1.

6. Permits Required

The permit requirements are identical to Alternative 1.

7. Potential Construction Problems

The potential construction problems are identical to Alternative 1.

8. Sustainability Considerations

The sustainability considerations are identical to Alternative 1.

9. Cost Estimate

The estimate shown on the following page represents the engineer's opinion of probable cost for design and construction of the project. Annual operation and maintenance costs, over the life of the Improvement, need to be considered when estimating a lifetime cost. Operation and maintenance costs over a 20-year period are shown in Section 6 in the Life Cycle Costing Section for the alternatives. Budgeting information is shown in the Appendix and may be used to estimate operation and maintenance costs.

RAMAH NAVAJO SCHOOL BOARD PRELIMINARY ENGINEERING REPORT
WATER SYSTEM IMPROVEMENTS
ENGINEER'S OPINION OF PROBABLE COST
9/22/2020

			Alternative 3 Cost Estimate		
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
1	Construction Staking, compl.	%		1.50	\$39,461
2	Construction Mobilization and Demobilization, compl.	%		10.00	\$420,813
3	Flood Protection, compl.	%		0.00	\$0
4	Traffic Control	LS	1	\$10,000.00	\$10,000
5	Site Clearing and Grubbing, compl.	AC	1.00	\$1,720	\$1,700
6	2" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	5,000	\$15	\$75,000
7	4" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	1,475	\$35	\$51,625
8	6" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	0	\$0	
9	6" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	17,500	\$40	\$700,000
10	Pressurized waterline connection, all sizes, incl. fittings, compl.	EA	10	\$1,200	\$12,000
11	Non-pressurized connection, existing waterline, all sizes, incl. fittings, compl.	EA	6	\$3,000	\$18,000
12	Tee or Wye, 4" to 8" waterline, incl. jointing material, c/p.	EA	4	\$700	\$2,800
13	2" Gate Valve & Valve Box, c/p.	EA	0	\$1,000	
14	4" Gate Valve & Valve Box, c/p.	EA	4	\$1,150	\$4,600
15	8" Gate Valve & Valve Box, c/p.	EA	0	\$0	
16	5" Gate Valve & Valve Box, c/p.	EA	53	\$2,340	\$124,020
17	Gate Valve, 4" to 10", Remove & Salvage, compl.	EA	0	\$0	
18	Valve Box, Remove & Dispose, compl.	EA	30	\$200	
19	Fire Hydrant, 4" bury, M.J. Incl. blocking & aggregate, c/p.	EA	31	\$4,700	\$145,700
20	Fire Hydrant, Existing, Remove & Salvage, compl.	EA	20	\$500	\$10,000
21	3/4" Service Line Replacement & Transfer, incl. tapping saddle & tubing, c/p.	EA	0	\$0	
22	3/4" Service Line Transfer at waterline, incl. tapping saddle & tubing, c/p.	EA	0	\$0	\$0
23	3/4" Water Main Tap, Service Saddle & Corp Stop	EA	0	\$0	\$0
24	1" Water Main Tap, Service Saddle & Corp Stop	EA	122	\$450	\$54,900
25	2" Water Main Tap, Service Saddle & Corp Stop	EA	6	\$500	\$3,360
26	Residential 3/4" Water Meter & Can Combination w/ Radio Read, incl. concrete pad, cover & let, c/p.	EA	122	\$980	\$119,920
27	3/4" Water Meter Box, 3/4" to 1", incl. concrete pad, cover & let, c/p.	EA	0	\$0	\$0
28	Remove & Replace 1" Meter Install w/ AMR	EA	0	\$0	
29	Bored Crossing 12" Casing (Carrier Pipe Not Included)	LF	500	\$160	\$80,000
30	2" Combination Air Release and Vacuum Valve, c/p.	EA	10	\$5,300	\$53,000
31	PRV Vault	EA	2	\$2,500	\$5,000
32	Rock excavation	CY	500	\$107	\$53,500
33	3/4" or 1" PE service line installation (10 ft per meter)	LF	1,220	\$35	\$42,700
34	Thrust Blocking	CY	100	\$536	\$53,600
35	Overhaul Well #2	LS	1	\$500,000	\$500,000
36	Water Treatment Facility building and treatment equipment	LS	1	\$400,000	\$400,000
37	Evaluate structural integrity of the 250,000-gallon tank (Alternative 1)	EA	1	\$100,000	\$100,000
38	Repair 250,000-gallon tank (Alternative 2)	EA	0	\$0	\$0
39	250,000 Gallon Steel Welded Water Storage Tank, including foundation, piping, testing and disinfection. (Alternative 3)	EA	1	\$910,000	\$910,000
40	Asphalt pavement, Existing Remove and Replace, incl. 2-inch extra asphalt thickness, with machine laydown, & processing existing subbase material, any thickness, c/p.	SY	50	\$65	\$3,250

\$3,534,681.00

Construction Subtotal	\$3,995,055
RMQRT (6.8125%)	\$272,103
Construction Contingency (20%)	\$799,011
Project Survey (5%)	\$319,604
Engineering Design (15%)	\$599,258
Construction Services/Inspector (10%)	\$399,508
Total	\$6,384,600

Ramah Navajo School Board, Inc., Water System Improvements
Preliminary Engineering Report

d) Alternative 4

1. Description

Alternative No. 4 -No Change

If no change is made to the current facility, the Board will continue to experience deteriorated water lines and hydrants, one dysfunctional well, low pressure water service, inadequate fire protection and insufficient water treatment.

All infrastructure installed in 1975 has exceeded its design life. They will remain in use, continuing to age. It is critical to note all infrastructure requires maintenance and becomes a cost burden for the community. Maintenance costs would most likely increase.

Water meters would not be installed, and the current flat rate billing would remain in effect. Water quality standards would not be met for phthalates, arsenic and radionuclides.

2. Design Criteria

Design criteria are not applicable to this alternative; however, the existing system does not meet the needs of the community or the recommended standards set by USDA Rural Development, the Navajo Nation and EPA.

3. Map

A map of the existing system is shown in Figure 3.

4. Environmental Impacts

Potential human illness and environmental impacts may occur if the existing system were unable to provide safe and adequate water service to the community in the future.

5. Land Requirements

No land acquisition is required for this alternative.

6. Potential Construction Problems

This alternative does not require any construction.

7. Sustainability Considerations

Sustainability will not be considered in this alternative.

8. Cost Estimate

No costs are associated with this alternative. Operation and maintenance costs are likely to increase due to ageing infrastructure.

6. Selection of an Alternative

a) Life Cycle Cost Analysis

The Life Cycle Cost Analysis used the projected present worth of the three alternatives, Alternative 1 System-wide Improvements, Alternative 2 System-wise Improvements plus repair of the 250,000-gallon School tank, and Alternative 3 System -wide Improvements plus replacement of 250,000-gallon School tank. Alternative 4 is a no build option and is not included in the Life Cycle Cost Analysis. The Salvage Value for the alternatives was assumed to be \$0.

To determine the present value of a future cost, the following equation was used:

$$PV = \frac{F}{(1 + d)^t}$$

Where:

PV = Present Value

F = Amount of one-time cost at time t

d = Real Discount Rate

t = Time (expressed in number of years)

To determine the present value of a recurring cost such as the O&M costs, the following equation was used:

$$PV = \frac{A_0[(1 + d)^t - 1]}{d(1 + d)^t}$$

Where:

PV = Present Value

A = Amount of one-time cost at time t

d = Real Discount Rate

t = Time (expressed in number of years)

Notes:

1. Project Cost includes construction items.
2. Real Discount Rate = 0.5%
3. Planning Period assumed to be 20 years.
4. Project Costs are assumed to realize in year 1.
5. O&M costs are assumed to realize in year 1.
6. Salvage Value assumed to be \$0.

Table 7. Detailed Life Cycle Cost Analysis

Planning period (yr)	20					
discount rate (%)	1.5 (20 year planning period)					
discount rate (%)	1.3 (short term planning period)					
Year	Alternative 1		Alternative 2		Alternative 3	
	Project Cost	O&M Cost	Project Cost	O&M Cost	Project Cost	O&M Cost
1	\$ 4,948,000	\$ 180,000	\$ 5,417,800	\$ 160,000	\$ 6,384,600	\$ 140,000
2	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
3	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
4	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
5	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
6	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
7	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
8	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
9	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
10	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
11	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
12	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
13	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
14	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
15	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
16	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
17	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
18	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
19	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
20	\$ -	\$ 180,000	\$ -	\$ 160,000	\$ -	\$ 140,000
Present Worth	\$ 4,948,000	\$ 3,090,355	\$ 5,417,800	\$ 2,746,982	\$ 6,384,600	\$ 2,403,609
Net Present Worth	\$ 8,038,355		\$ 8,164,782		\$ 8,788,209	
Salvage Value						
Present Worth	\$ -		\$ -		\$ -	
Net Present Value	\$ 8,038,355		\$ 8,164,782		\$ 8,788,209	

7. Proposed Project (Recommended Alternative)

a) Preliminary Project Design

Alternative 1 is the recommended alternative. The evaluation of the tank integrity would determine if Alternative 2 or 3 would be needed.

Alternate 1 is shown in Figure 3 and proposes the following improvements:

Abandon existing waterlines in-place and replace with new larger capacity lines. Ensure that the new lines are laid out in loops to avoid dead end lines. Repair or replace the sprinkler system in the football field. Provide for fire flow to all buildings. Install meters for each building and line.

Conduct a thorough overhaul of Well #2 and address issues with well #1. Replace the water treatment building with a structure large enough to accommodate more equipment for controlling arsenic and

radionuclides. Upgrade the water treatment process to remove arsenic, phthalates and radionuclides. Service lines and water meters will be coordinated with the upcoming gym replacement to ensure smooth connection.

The survey of the existing system was used to estimate the replacement system. Approximately 17,020-feet of 8-inch and 1475-feet of 4-inch and 5,000 feet of 2-inch water lines will be constructed to connect the system. Also needed are 48 water valves, 24 hydrants, and 128 water meters. Water system modeling during the design phase may refine these numbers.

Evaluate the structural integrity, the internal coating and the cathodic protection system of the 250,000-gallon School tank.

1. Design Criteria

Based on freezing temperatures it is suggested that main water lines should be installed with at least 5 feet of cover.

Water treatment and distribution will have to meet the requirements of the federal Safe Drinking Water Act (SDWA) under which the EPA delegated enforcement to the Navajo Nation.

The USDA Rural Development design standard of 100 gpd per person were reviewed for this project. The water permit indicates the system serves 1007 people. Reasonable annual growth of 0.5% would add 113 more people which would result in 1120 people and 112,000 gallons per day x 2 days = 224,000 gallons needed for fire protection. Emergency storage is required for a minimum of two days, or a minimum of 224,000 gallons.

b) Design Criteria

Nominal system design criteria used to plan and implement the proposed water system for the School are presented in Table 8 below.

Table 8: Design Criteria for the Recommended Alternative 1

Water System Design Criteria Item	Recommended Value
Average day per capita demand	100 GPCD
Peak day per capita demand	220 GPCD
Fire storage volume	Maintain 120 minutes at a fire flow rate of 1,000 GPM
Distribute system static pressures	Maintain static pressure in system between 45 and 90 psi to all customers served
Distribution pressures, combined Peak Day plus Fire Demand conditions	Maintain at least 20 psi residual at locations of Fire Demand and at all points in system

USDA Rural Development recommended design criteria includes a value of 100 GPCD water consumption for rural water systems. RD recommended storage for rural systems is based on a two (2) days emergency storage of 700 gallons per Equivalent Dwelling Unit (EDU), and distribution system static pressures between 20 and 90 pounds per square inch (psi) to all customers served. The water usage at the school is difficult to estimate based on EDU's, so 100 gallons per capita per day was used.

EPANET, a water distribution system modeling software package developed by the United States Environmental Protection Agency (USEPA) Water Supply and Water Resources Division, will be used to model the Board's water system. An assumption was made that the Board's service area adapted to a general pattern of water consumption, in which there is a peak of consumption in the morning, where approximately 60% of the water is consumed in 3 hours and a second peak in the afternoon, with 25% in two hours. The remaining 15% is used the remaining hours. Water usage data, shown in the appendix were used to develop the demand using the pattern just described. Project Schedule

Covid-19 funds are available in August 2020. Construction is estimated to commence in October 2020.

c) Permit Requirements

All waterline construction will be located within private and tribal rights-of-way. Coordination with the Navajo Nation tribal authorities should commence as soon as possible.

d) Sustainability Considerations

The new water line will be PVC pipe which poses no environmental hazards and has a long service life with little maintenance issues when installed properly. Financial sustainability might be improved by tracking the actual costs of the water and wastewater operations and maintenance to improve budgeting and accrue an O&M fund to handle inevitable line breaks, well problems and emergencies without having to tap into other funds.

e) Short Lived Assets for Recommended Alternative

ITEM	REPLACEMENT COST	ANNUAL RESERVE AMOUNT
1 Pressure Reducing Valve	\$2,500/20 years	\$ 125.00
30 2-inch Gate Valve	\$750/20 years x 30	\$ 112.50
12 4-inch Gate Valve	\$1,150/20 years x 12	\$ 690.00
6 8-inch Gate Valves	\$1,460 EA/20 years x 6	\$ 438.00
24 Fire Hydrants	\$4,700 EA/20 years x 24	\$5,640.00
4 Master Meters	\$1,570 EA/20 years x 4	\$ 314.00
128 Water Meters	\$840 EA/20 years x 128	\$5,376.00

f) Total Project Cost Estimate (Engineer's Opinion of Probable Cost)

RAMAH NAVAJO SCHOOL BOARD PRELIMINARY ENGINEERING REPORT
WATER SYSTEM IMPROVEMENTS
ENGINEER'S OPINION OF PROBABLE COST
9/22/2020

			Alternative 1 Cost Estimate		
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
1	Construction Staking, compl.	%		1.50	\$39,461
2	Construction Mobilization and Demobilization, compl.	%		16.00	\$420,513
3	Flood Protection, compl.	%		0.37	\$2
4	Traffic Control	LS	1	\$10,000.00	\$10,000
5	Site Clearing and Grubbing, compl.	AC	1.00	\$1,720	\$1,720
6	2" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	5,000	\$15	\$75,000
7	4" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	1,475	\$35	\$51,625
8	6" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	0		
9	8" Waterline Pipe Incl. bends, fittings, restrained joints, trench & compacted backfill to 6' depth, c/p.	LF	17,500	\$40	\$700,000
10	Pressurized waterline connection, all sizes, incl. fittings, compl.	EA	10	\$1,200	\$12,000
11	Non-pressurized connection, existing waterline, all sizes, incl. fittings, compl.	EA	6	\$3,000	\$18,000
12	Tee or Wye, 4" to 6" waterline, incl. joining material, c/p.	EA	4	\$700	\$2,800
13	2" Gate Valve & Valve Box, c/p.	EA	0	\$1,000	\$0
14	4" Gate Valve & Valve Box, c/p.	EA	4	\$1,150	\$4,600
15	6" Gate Valve & Valve Box, c/p.	EA	0		
16	8" Gate Valve & Valve Box, c/p.	EA	53	\$2,340	\$124,020
17	Gate Valve, 4" to 10", Remove & Salvage, compl.	EA	0		\$0
18	Valve Box, Remove & Dispose, compl.	EA	30	\$200	\$6,000
19	Fire Hydrant, 4" bory, W.I. Incl. blocking & aggregate, c/p.	EA	31	\$4,700	\$145,700
20	Fire Hydrant, Existing, Remove & Salvage, compl.	EA	20	\$500	\$10,000
21	3/4" Service Line Replacement & Transfer, incl. tapping saddle & tubing, c/p.	EA			\$0
22	3/4" Service Line Transfer at waterline, incl. tapping saddle & tubing, c/p.	EA	0	\$0	\$0
23	3/4" Water Main Tap, Service Saddle & Corp Stop	EA	0	\$0	\$0
24	1" Water Main Tap, Service Saddle & Corp Stop	EA	122	\$450	\$54,900
25	2" Water Main Tap, Service Saddle & Corp Stop	EA	6	\$560	\$3,360
26	Residential 3/4" Water Meter & Can Combination w/ Radio Read, incl. concrete pad, cover & let, c/p.	EA	122	\$983	\$119,926
27	3/4" Water Meter Box, 3/4" to 1", incl. concrete pad, cover & let, c/p.	EA	0	\$0	\$0
28	Remove & Replace 1" Meter install w/ AMR	EA	0		
29	Barrel Crossing 12" Casing (Camber Pipe Not Included)	LF	500	\$160	\$80,000
30	2" Combination Air Release and Vacuum Valve, c/p.	EA	10	\$5,300	\$53,000
31	PRV Vault	EA	2	\$2,500	\$5,000
32	Rock excavation	CY	500	\$107	\$53,500
33	3/4" or 1" PE service line installation (10 ft per meter)	LF	1,220	\$35	\$42,700
34	Thrust blocking	CY	100	\$536	\$53,600
35	Overhaul Well #2	LS	1	\$500,000	\$500,000
36	Water Treatment Facility building and treatment equipment	LS	1	\$400,000	\$400,000
37	Evaluate structural integrity of the 250,000-gallon tank (Alternative 1)	EA	1	\$100,000	\$100,000
38	Repair 250,000-gallon tank (Alternative 2)	EA	0	\$0	\$0
39	250,000 Gallon Steel Welded Water Storage Tank, including foundation, piping, testing and disinfection, (Alternative 3)	EA	0	\$0	\$0
40	Arterial pavement, Existing Remove and Replace, incl. 2-inch extra asphalt thickness, with machine laydown, & processing existing subbase material, any thickness, c/p.	SY	50	\$65	\$3,250

\$2,630,707.00

Construction Subtotal	\$3,091,081
PMGR (0.8125%)	\$210,560
Construction Contingency (20%)	\$618,216
Geotechnical Services	\$5,000
Project Survey (8%)	\$247,280
Engineering Design (15%)	\$463,662
Construction Services/Inspection (10%)	\$309,108
Total	\$4,948,000

Ramah Navajo School Board, Inc., Water System Improvements
Preliminary Engineering Report



g) Annual Operating Budget

Water and wastewater operations and maintenance are funded from a complex of funding sources and are not itemized out separately. The following method is proposed to allow for more specific budget. If the School had water use like a small town, assuming 4 people per home x 100 gallons per day per person x 30 days per month = 12,000 gallons per month per home. 12,000 gallons per month x \$5.00 per 1000 gallons = \$60.00 per month bill per home. \$60 x 250 homes = \$15,000 per month x 12 months = \$180,000 per year. That amount would need to cover the costs of the water treatment chemicals, electricity for pumping, staff salaries, resin disposal, line breaks, pump and equipment replacement every 20 years, etc. Current funding methods may be preferred, but this method shows that providing drinking water is a substantial part of the school's budget.

8. Conclusion and Recommendations

The recommended alternative will complete substantial water system improvements for the School's system. This option will provide safe drinking water and reduced maintenance costs to the School's community. Life cycle cost analysis indicates the differences in cost between the alternatives.

Using 2020 CARES Act funding to replace the water system and components would generally be an allowable expense under the Act as it directly applies to public health and the mitigation of the spread of COVID-19 and other viruses. This Report should provide a major part of the documentation that the Ramah Navajo School Board would need to submit for COVID-19 funding of a request for \$5.0 to 6.4 million from the 2020 CARES Act for the water system improvements.

References

New Mexico Environment Department Drinking Water Programs and Regulatory Information,
<https://www.env.nm.gov/water/>, accessed September 2020.

United States Department of Agriculture Rural Development, New Mexico, regulations and guidelines,
Navajo Water Public Water System Compliance reports, August 2020

New Mexico Interstate Stream Commission Regional Water Plan, accessed August 2020

Ramah Navajo Chapter profile on enavajo.org, accessed August 2020

NAVAJO NATION

1239

12/19/2022

Navajo Nation Council Special Session

05:51:44 PM

Amd# to Amd#

Legislation 0176-22: Allocating

PASSED

MOT Tso, E

\$10,159,542 from the Sihasin

SEC Wauneka, E

Fund to Replace the Ramah Navajo
School Board Drinking Water....

Yeas : 18

Nays : 0

Excused : 2

Not Voting : 3

Yea : 18

Begay, E

Crotty

James, V

Walker, T

Begay, K

Daniels

Nez, R

Wauneka, E

Begay, P

Freeland, M

Slater, C

Yazzie

Brown

Halona, P

Stewart, W

Yellowhair

Charles-Newton

Henio, J

Nay : 0

Excused : 2

Tso

Damon

Not Voting : 3

Tso, C

Tso, E

Smith

Presiding Speaker: Tso, D