



Aleksander & Associates, P.A.
Research and Consulting Engineers

September 17, 2001

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Ref: Project Activity Summary
AAPA SSW-IV 010224

Dear Mr. Burnett,

Per your request, we have prepared this letter describing the proposed activities to access the Manshaft at the now abandoned Sunnyside coal mine near Sunnyside UT. This letter reflects the requirements outlined in the Agreement for Property Access, dated July 10, 2001. We have updated the information presented in our earlier letter dated May 14, 2001.

Introduction

The purpose of this project is to determine the feasibility of extracting existing water-rights from the now flooded mine workings. The coal deposits (and mined areas) exist as a single primary seam, dipping at about seven degrees. Mine dewatering (removal of water continuously flooding the mine) at the time of mine closure was approximately 900 gallons per minute. Calculations strongly suggest that water levels in the mine have risen steadily since the closure, and may now be accessible from the surface through deep (1000 ft) vertical mine shafts. The shafts vary from 8 to 16 feet in diameter.

After evaluating the layout of the mine, several access shafts were considered for their flooding potential, the primary candidates being Pole Canyon, Manshaft, and Twin Shafts. At the time of mine closure, the Manshaft was covered by a single concrete slab, about fourteen inches thick, with one two inch pipe vent installed. The vent is closed off by a pipe end cap.

Each of these shafts was subsequently capped by the Utah State Department of Oil, Gas, and Minerals (DOG M) as part of a reclamation project in 1998. The additional caps are in the shape of an octagonal concrete pillbox, reinforced with rebar, and are illustrated in Figures 1 through 6. At the time

of the cap construction, no methane was reported by the reclamation crews. Interviews with miners indicate that there is a high likelihood of methane of unknown concentration in the closed shaft.

Project Phases

This project consists of specific phases which must be sequentially accomplished to determine the feasibility of water extraction.

They are:

- Research
- Planning
- Site Access
- Excavation
- Monitoring
- Cap and Slab Penetration
- Exploration
- Development
- Re-sealing and Reclamation

Research

At this writing, the Research Phase has been completed. We believe that we have identified all available records and documents necessary to characterize the present condition of the shafts. These include drawings, maps, photographs, hydro-geological data, and mine data from city, county, state, and federal agencies, consultants, and Sunnyside Mine engineering drawings. Included in this data are interviews with individuals who have personally witnessed the construction of the caps, have been in the mine workings, and have been in the shafts. The research has also addressed methods of accessing the shafts, methane gas properties and control, safety equipment requirements, and preliminary modeling of shaft gas stratification and behavior.

Planning

The Planning Phase is complete. It is based on a complete engineering schedule and budget prepared earlier this year for project approval. Project planning with selected vendors, consultants and contractors is complete at this writing. A detailed coordination plan for site activities with client, site owner, and contractors, is being prepared.

The remaining Phases are discussed in the following paragraphs to the extent that current planning permits. Further detailed planning and specific site conditions will dictate actual field project work.

Site Access

Site access requirements vary at the different potential shaft sites. Whereas the Pole Canyon and Twin Shaft roads were reclaimed to a very rough condition, the Manshaft road is intact. Access is necessary for excavation equipment, pick-ups, and equipment trucks such as a water supply truck, and the cutting crew equipment truck. A staging and turn around area is desirable, as well as a base office and generator station, well away (150 ft +) from the work site. At the Manshaft location, these conditions are met. The road approach from the city water filtration plant on Grassy Trail Creek provides ample protected parking for these purposes.

A temporary chain-link perimeter fence is included in the scope of work to add security to the site, and help prevent access or tampering with site monitoring equipment overnight or on weekends. Furthermore, while work is in progress, personnel will be limited to areas away from the Manshaft, except for those few with specific assigned functions. Although this is not a confined space or hot-work situation, nevertheless, permit confined space techniques are proposed to heighten safety awareness.

Excavation

Part of the reclamation effort included burying the reclamation cap with soil and boulders. It is estimated that about five feet of fill will need to be removed to expose the top of the cap. An additional area will be excavated immediately adjacent to the cap to allow access to the sides of the cap. As part of the excavation work, sediment barriers (silt fence, straw bales) will be placed to prevent off site soil transfer or carry-over to Grassy Trail Creek. A water impoundment means (barriers, sump, pumps, tank) will be provided if necessary to recover any significant water overflow generated by the hydro-demolition process.

Monitoring

Methane has not been detected during previous work at the site by the reclamation contractor. However, three methane sensor devices, each providing a 4-20 ma signal will be placed at and away from the site. These readings will be continuously recorded. An additional portable four gas detection and alarm unit will be provided to person(s) within a 25 ft vicinity of the cap. The purpose of the monitoring is to detect methane in or near the shaft. It is also desirable to monitor changes in the shaft which can occur with changes in the local barometric pressure.

Photographs and digital imaging will be used to document pre and post project conditions.

Video surveillance will be used to monitor and record site process activity.

Cap and Slab Penetration

A number of techniques have been proposed and evaluated to allow access to the shaft. The principal hazard identified has been the possibility of accumulated methane gas from the mine. Concentrations of methane (coal gas) in the range of 5% to 15%, mixed with air, can explode when ignited by sparks. In order to avoid this occurrence any method which produces a significant potential for ignition has been eliminated. The proposed water-jet technology has been used in the past by a number of hydro-demolition suppliers to cut into vessels containing explosive mixtures. The water is pressurized to 36,000 psi and forced through a very small orifice, usually a sapphire jewel with a 0.050 inch diameter hole.

The first planned cut is an initial penetration into the side of the pillbox cap through one of the concrete blocks. This is a small hole, several inches in diameter, sufficient to place a gas probe into the space between the caps. Two or more concrete blocks will be removed by this method to provide access for venting and for inspection cameras.

The coring will be accomplished utilizing a water immersion circular coring saw, driven by an air motor. The operation will be done remotely, monitored by video cameras. Once the atmosphere within the cap is stable, a six inch core will be removed over the vent pipe. The vent pipe will be opened and sampled. A 24 inch core will then be removed through the top cap. A one inch core will be removed from the lower cap to verify the lower cap thickness. A 12 inch core will then be removed down to the underlying plywood form. The final cut into the Manshaft will be by high pressure water-jet. An overhead portable gantry and chain fall will be used to lift and remove the cores.

A flanged plate and pipe assembly (approx. 10 inches, ID) will be placed and cemented/attached onto the lower slab to serve as a seal. In the event that site management decides to abort this operation for any reason, the pipe sections will be capped and sealed with pre-assembled parts.

Exploration

A single string chalk line will be lowered 1,070 feet, weighed by a lead sinker. If the line is recovered successfully, a water level may be visible on the chalk line. Alternate means may be employed.

When the Manshaft was abandoned the hoist equipment was cut loose and dropped to the bottom of the shaft. A debris field is likely at the bottom of the shaft, with possible torn guiderails at various shaft levels. It is hoped that a) the debris is at the bottom, b) the shaft is otherwise clear, c) water has risen to a level significantly above the debris.

If the methane concentration is absent, or stable at a safe level, a small camera will be lowered, along with a methane detector, a pressure transducer, ph sensor, and water sample recovery bale unit. If this is successful, a final more detailed look will be attempted with a significantly more expensive well logging inspection camera. Multiple water samples are desirable, both at the water surface, and at depth increments of 25 feet. The confirmation of water depth (or lack of water), and recovery of water samples for analysis will complete the exploration phase.

Development

If it is determined that a sufficient quantity and quality of water exists in the Manshaft to justify developing a point of diversion for water right No. 91-231, the client SCA proposes to purchase or lease a well site and pipe line easement from East Carbon City and Sunnyside City at fair market value, and proceed to develop the necessary pumping station and ancillary equipment.

Re-sealing and Reclamation

The flanged pipe structure placed onto the lower slab will allow the sealing of the access port into the shaft. This port may be useful in the future either to check for water depth again, or to access water. The penetrations in the sides of the reclamation cap will be sealed with concrete blocks, as in the original cap. The penetration in the top cap will be covered with a heavy steel plate, attached to the cap. Fill will be used to cover the cap. The site will be returned to the pre-project topography as much as is reasonably possible, using the pre-project photographs as guides.

Elements of Agreement for Property Access

The following ten elements are addressed, as required in paragraph I-B, Contract Terms, of the Agreement. Many of these issues are addressed above, and are repeated here for clarity. In addition, as required in paragraph I-E of the Agreement, proposed contractors are listed.

1. Site Access

Road Improvement

No road improvements are necessary or proposed.

Grading activities

No road grading is proposed.

Types of Equipment

Equipment may include: backhoe, dozer, water truck, wheel loader, pickup, trailer, equipment trucks, generator, compressor and special tools.

Erosion Precautions

Silt and erosion berms and haybales, located east and below the shaft site.

2. Security

Unauthorized Entry

A continuous six foot chain link fence perimeter, with locked gates will be provided.

During the period when the shaft is exposed and not sealed, personnel will be at the site at all times. Site access to any personnel from any entity for any site activities is to be specifically

approved by CNM and SCA with final authority by the site project manager. A locked gate at the site entry off Grassy Trail Road will remain locked at all times, except when site work is ongoing. A dual lock system will be used to facilitate site access during this project.

Shaft Entry

No shaft entry is permitted or planned. Entry will be limited by the 12 in diameter core diameter, and installed pipe.

Shaft Sealing

A 10 foot long, 12 inch diameter pipe with a seating flange will be lowered into the lower slab penetration. A shut-off valve and cap will close the access pipe. A heavy steel plate will be placed on the top cap, and fastened to the cap, enclosing the site. Concrete sealing blocks will be replaced, and mortared in place.

3. Excavation

Removal of Waste

No waste is proposed to be produced or removed. All natural fill will be retained and used in reclamation of the site.

4. Cap and Slab Penetration

Precautions

The fenced work site will be separated from the work trailer by approximately 200 feet. Entry to the work site will be controlled, and limited only to mission specific elements. At all times, a safety person will be off the work site to act as backup. Personnel remote retrieval equipment is provided, including harnesses, breathing apparatus, and personal protective equipment (PPE).

Site access will be limited to observation and equipment location. While the coring process is underway, the work will be observed by remote video equipment. Personal protective equipment will be provided as necessary.

5. Monitoring

Procedures

The principle hazard at the worksite is gas emission from the Manshaft. A portable gas detector (four gas detector) will be used to establish safe limits at the Manshaft for all operations within 25 ft of the shaft. . An additional 3 sensor methane detection system will monitor methane concentrations, if any, at points at, near, and remote from the site. The output will be monitored and recorded.

A highly qualified site safety officer from Wifred Baker Engineering Inc. (WBE) will control all site activity and procedural protocol based on observed gas concentrations, including methane (LEL), and H₂S, O₂, and CO.

6. Exploration

Water Identification

Water will be detected by lowering and retrieving a collection bale, and by recording pressure transducer and ph transducer signals. Also, a small camera will record the condition of the shaft.

7. Development

Not applicable at this time. A determination will be made based on the results of this effort. If water in significant amounts is identified, the Manshaft will be secured, and the development phase will be initiated.

8. Re-sealing

Sealing and Reclamation

A vertical pipe will be lowered into the 12 inch diameter core hole in the 14 inch thick bottom slab. The pipe will be fitted with a shut-off valve, and locking end cap. A heavy steel plate will be placed on the top of the cap, enclosing the 24 inch core hole. The six holes in the sides of the cap will be filled with concrete blocks, mortared in place. At that time, the cap can be covered with fill.

If there is no water, the cap area will be returned to it's original condition. If development is indicated, only a foot of graded fill will be placed on the cap, and a fence will be installed around the cap pending development planning and approval.

9. Timing

Elapsed time

Site access for completion of the excavation and fencing work is proposed for September 24 through 27, 2001. Site equipment mobilization is proposed for October 10, 2001. Site exploration is proposed for October 15 to October 19, 2001. Site reclamation is proposed for October 22 through 25, 2001.

10. Area of Disturbance

Area to be Disturbed

The area to be disturbed will be concentrated within 35 feet of the cap. A clear fence path will be provided in an irregular perimeter approximately 50 feet from the cap. A cap anchor

excavation will be located approximately 100 ft south of the cap. The overburden from the cap will be located in a berm north of the cap, on existing asphalt roadway. A trench shield will be placed close to the cap.

Location of Stockpiled Materials

Cap overburden will be placed on the north end of the site approximately 100 ft from the cap, on the existing asphalt roadway.

Parking of Vehicles

Vehicles will be parked on the asphalt road surface and adjoining area approximately 200 to 300 feet north of the cap.

Waste Material Storage

No waste material is proposed.

I-E. Identified Contractors

The following entities have been requested to participate in this project:

Aleksander & Associates, P.A., Boise Id	Project Manager
A-Core Inc. Salt lake City UT	Concrete Cutting
Delco Western, Salt Lake City	Well Sampling & Logging
Hydro-Chem Industrial Services Inc. Draper, UT	Hydro Demolition
Mayo and Associates, Inc. Provo UT	Hydro-Geologists
Nielsen Construction, sub Scamp Excavation, Price, UT	Excavation and Reclamation
Wilfred Baker Engineering Inc. San Antonio TX	Site Safety Specialist

Section End



Illustrations



Fig. 00 General Site Location; Proposed fence line centered on cap, site north to left.

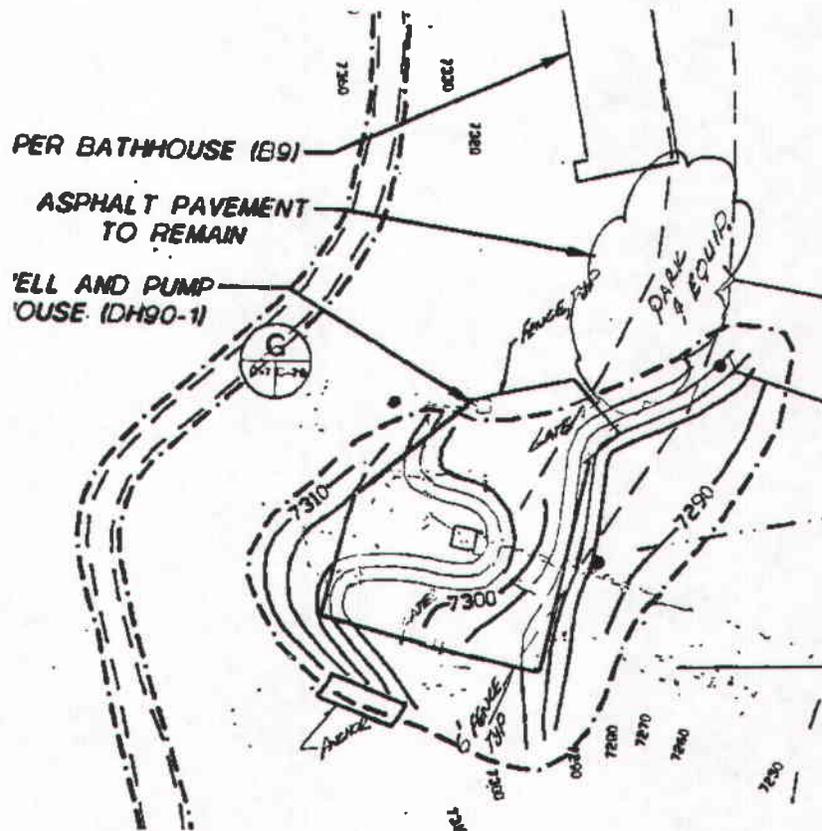


Fig. 000 General Site Location; Proposed fence line centered on cap, site north up.

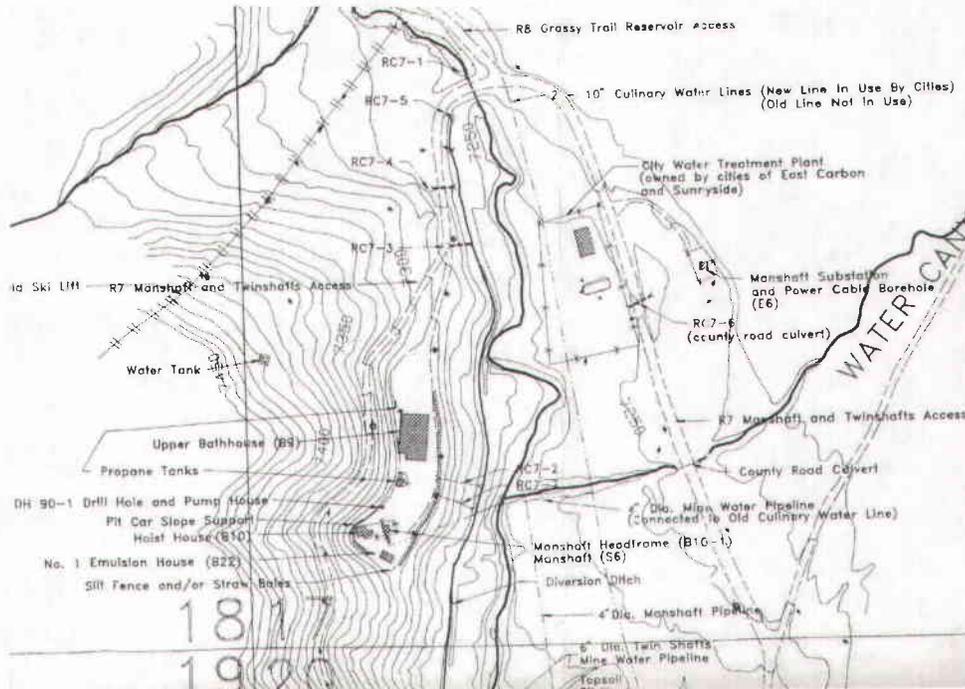


Fig. 01 General Site Location; Proposed shaft exploration target is shown as Manshaft (S-6). Many of the buildings and features have been removed. The remaining structure is the pumphouse, shown as DH 90-1 Drill Hole and Pumphouse.



Fig. 02 Location of Manshaft DOGM marker (at pin) , pumphouse and access road in background, Jan 2001.



Fig. 03 Typical finished reclamation cap, before the temporary WF beams were pulled out.



Fig. 04 Typical cap after the WF beams were removed. Concrete blocks were used to block the holes. A penetration through one of these blocks would be the first cut to determine if methane is present

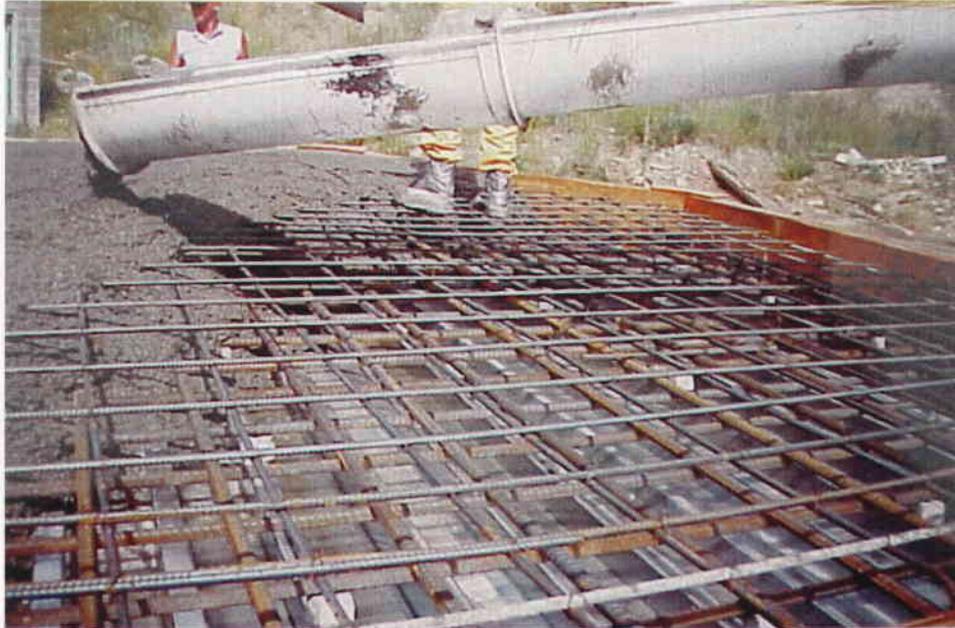


Fig. 05 Typical cap rebar . The second cut would be through the center of the cap, removing a concrete and rebar plug 24 inches in diameter, and a nominal 18 inches thick.



Fig. 06 The third cut would be through the center of the underlying slab, which is estimated to be about 14 inches thick. The cut will be 12 inches in diameter.



Fig. 07 Actual location of project: Manshaft heavy concrete cap under construction over 14 inch concrete shaft cap. Edge of pumphouse visible at left.



Fig. 08 Manshaft finished concrete cap. Buildings and debris were removed, the cap was covered with fill and boulders.



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We trust that this revised summary has assisted the readers in understanding the scope and methods proposed for this project. Please let us know if you have any questions.

ALEKSANDER & ASSOCIATES P.A.

By 

Adam K. Aleksander PhD, PE, CSP

Sr / AKA

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