

CHAPTER 7

BLASTING

CHAPTER 7

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CHAPTER 7

BLASTING

Introduction

Prior to removal, the overburden and parting material must be fragmented to a size, which can be handled efficiently by excavation equipment. Likewise, the coal must be fragmented prior to loading of coal into haulage trucks for transport to transportation facilities. The majority of the fragmentation is accomplished by the use of explosives. When possible, thin partings and coal seams are fragmented by ripping with a ripper-equipped dozer. Ripping is typically limited to partings and coal seams less than three feet in thickness. The objective of this process is to provide fragmented overburden, parting material and coal ahead of excavation and loading equipment so that production is sufficient to satisfy coal supply obligations. In addition, "blast casting" methods will be utilized to assist the excavator in removal of overburden. Each major excavator is supported by a highwall overburden drill, parting drill, coal drill, ripper dozer and respective crews.

Blasting Procedures

The procedures for drilling overburden and parting material are essentially the same. Vegetation is cleared from the undisturbed surface and useable topsoil is removed prior to drilling overburden. A drill hole pattern is determined on the basis of the thickness and physical characteristics of the material to be fragmented, the size of the excavator or loader and drill bit diameter. Examples of typical patterns are shown in Tables 1, 1A and 1B. Table 1B will be given to the drillers and pit bosses for reference. The burden and spacing of drill holes within typical patterns are contained in charts, which have been developed for the various conditions experienced at Kayenta Mine. Each lead drilling and shooting foreman has a copy of these charts.

Vertical or angle drilling is used at Kayenta Mine. A record of the number and depth of drill holes is kept by the driller (see Figures 1 and 2). Typically, the drilling operations stay ahead of excavators a sufficient distance to prepare enough material to meet production requirements.

Blasting crews consult drilling and loading charts in the manual referred to above to determine the approximate amount of explosive, stemming and decking required for the

Revised 11/10/2010

*Pattern size will vary with types of explosive material used, the material being fragmented, and the explosive manufacturer's recommendation.

DEPTH	PATTERN SIZE*
COAL:	
For 4-3/4" diameter hole:	
3' - 11'	9' X 9'
12' - 15'	9' X 12'
OVERBURDEN & PARTING	
For 5-7/8" diameter hole:	
2' - 10'	9' X 9'
11' - 13'	9' X 12'
14' - 16'	15' X 18'
16'	15' X 18'
For 9-0" diameter hole:	
1' - 9'	9' X 9'
10' - 13'	9' X 12'
14' - 16'	12' X 15'
17' - 20'	15' X 18'
21' - 25'	21' X 24'
For 10-5/8" diameter hole:	
3' - 9'	9' X 12'
10' - 13'	12' X 15'
14' - 16'	15' X 18'
17' - 20'	18' X 21'
21' - 25'	21' X 24'
Over 25'	24' X 27'
For 12-1/4" diameter hole:	
10' - 13'	15' X 18'
14' - 17'	18' X 21'
18' - 21'	21' X 24'
22' - 25'	24' X 27'
26' - 30'	30' X 33'
Over 30'	30' X 33'

Example of Drill Hole Pattern Sizes Utilized at the Kayenta Mine (ANFO)

TABLE 1

TABLE 1A

Example of Drill Hole Pattern Sizes Utilized
at the Kayenta Mine (Emulsion)

DEPTH
EMULSION
PATTERN SIZE*

OVERBURDEN & PARTING

For 5-7/8" diameter hole:

6' - 7'

8' - 12'

10' - 20'

For 9-0" diameter hole:

5' - 9'

10' - 13'

12' - 18'

18' - 23'

22' - 29'

27' - 31'

32' - 35'

For 10-5/8" diameter hole:

12' - 13'

13' - 19'

16' - 25'

20' - 31'

28' - 33'

33' - 35'

35' - 40'

For 12-1/4" diameter hole:

20' - 21'

22' - 30'

25' - 35'

30'

30' - 39'

35' - 39'

39'

12' X 15'
15' X 18'
18' X 21'

15' X 18'
18' X 21'
21' X 24'
24' X 27'
27' X 30'
30' X 33'
33' X 36'
33' X 38'
35' X 40'

21' X 24'
24' X 27'
27' X 30'
30' X 33'
33' X 36'
33' X 38'
35' X 40'

30' X 33'
30' X 35'
33' X 38'
36' X 40'
36' X 42'
38' X 44'
40' X 46'

*Pattern size will vary with types of explosive material used, the material being fragmented, and the explosive manufacturer's recommendation.

TABLE 1B
 Example Drill Hole Pattern Size
 For 9" Diameter Holes In Parting Material

SQUARE PATTERN LOADING CHART - 9" PARTING

DEPTH	PATTERN	YARDAGE	RATIO	STEM	STEM BURDEN
5	15 x 15	42	2.5 / 16#	4.5	$4.5 / 10.6 = .42$
6	15 x 15	50	2.5 / 20#	5.4	$5.4 / 10.6 = .51$
7	15 x 15	58	2.03 / 25#	6.25	$6.25 / 10.6 = .589$
8	18 x 18	96	2.4 / 40#	6.8	$6.8 / 12.7 = .53$
9	18 x 18	108	2.25 / 48#	7.5	$7.5 / 12.7 = .59$
10	21 x 21	163	2.4 / 68#	8.0	$8 / 14.8 = .54$
11	21 x 21	180	2.25 / 80#	8.6	$8.6 / 14.8 = .58$
12	21 x 21	196	2.0 / 98#	9.0	$9 / 14.8 = .61$
13	24 x 24	277	2.4 / 116#	9.5	$9.5 / 17 = .56$
14	24 x 24	299	2.3 / 132#	10.0	$10 / 17 = .59$
15	24 x 24	320	2.0 / 160#	10.2	$10.2 / 17 = .60$
16	27 x 27	432	2.3 / 188#	10.3	$10.3 / 19 = .54$
17	27 x 27	459	2.2 / 208#	10.7	$10.7 / 19 = .56$
18	27 x 27	486	2.1 / 231#	11.0	$11 / 19 = .58$
19	27 x 27	513	2.0 / 256#	11.2	$11.2 / 19 = .59$

blasthole. The charts specify these parameters based upon blasthole diameter, depth, pattern size, and presence of cap rock.

Bulk prell or emulsified products are used in dry blastholes. High density bagged prell or emulsified products are used in wet holes. Primary detonation is by Ensin Bickford noiseless NONEL. Electric blasting caps and primer cord are used for special applications.

Cast blasting, as well as conventional blasting is conducted. Approximately 5 percent of the total material shot at Kayenta Mine is cast blasted. The design procedures for cast blasting are similar to those for conventional blasting. Since cast blasting may fragment and fracture recoverable coal seams more than conventional blasting, and since PWCC desires to maximize the recovery of the coal resource, additional blast planning is undertaken. To minimize adverse fracturing and fragmentation impacts, blasting decks are installed in blast holes that are to be cast blasted. The upper deck in the blast hole is delayed to discharge before the bottom deck in order to reduce the confinement of the fragmentation forces in the bottom of the hole and thereby reduce the impact upon the coal seam minimizing coal loss. The lower decks are typically loaded with substantially less weight of explosives than the upper deck. Due to variability of overburden and parting thickness, decking can occur at any depth. In addition to the stemming placed at the top of the blasthole, stemming-type backfill material is placed in the bottom of the holes to further reduce the effects upon the coal seam and minimize any overbreakage at the toe. When cast blasting is to be conducted above coal seams that have exhibited brittle characteristics, blast hole drilling is terminated before the coal seam is encountered in order to cushion the coal from the effects of blasting.

Coal drilling and blasting procedures are essentially the same as those described above relative to overburden and parting except that no cast blasting is performed. Dirt, rock, and other debris are removed from the exposed coal surface prior to drilling. Electric blasting caps are used to detonate the explosives.

Blasting Limitations

Please refer to Attachment 5, Blast Monitoring Plan, for airblast monitoring and reporting requirements.

Blasting Monitoring Program. Peabody operated a continuous ground vibration and air overpressure monitoring program from April 1994 until August 2011. The locations for the seismograph monitors and threshold trigger levels for the monitoring program were determined in consultation with OSM (see Drawing No. 94700). The trigger levels are 0.50 inches per second peak particle velocity and 132.6 dBL air overpressure. In accordance with 30 CFR 816.67(b)(i), the regulatory limit is 133dB. The current monitoring plan was approved and implemented in February 2012. See Attachment 5 "Blast Monitoring Plan" at the end of this chapter for the details.

Airblast. Electric blasting caps and noiseless NONEL detonating equipment are utilized to reduce air blast effects and noise. Airblast will not exceed the limits in Table 2 at the location of any dwelling, public building, school, church or community or institutional building except at such structures purchased by Peabody. Peabody's Kayenta Mine operation is located in a remote, sparsely populated area. Drawing No. 85100, Land Use Map and Drawing No. 94720, Preblast Survey Site Map, show the locations of structures and dwellings. Further, families who inhabit dwellings within the permit area are located at least one-half mile from blasting areas.

The result of the 1985 airblast monitoring conducted at Kayenta Mine may be found in Attachment 1. The monitoring took place on August 6, 1985 near the J-21 mining area. The dwelling was 3,120 feet from the blast site and the airblast measured 107dB. The applicable maximum level is 129 dB. The more recent results of the airblast monitoring are available for inspection at the mine site office.

Ground Vibration. Peabody will utilize the scale-distance equation given in 30 CFR 816.67(d)(3) to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period. The blasting statement (Figure 1) includes information applicable to seismic monitoring. Please refer to Attachment 5, Blast Monitoring Plan, for vibration monitoring and reporting requirements.

TABLE 2

Airblast Limits

Lower Frequency Limit of Measuring System, in Hz (± 3 dB)	Maximum Level in dB
0.1 Hz or lower - Flat response	134 peak
2 Hz or lower - Flat response	133 peak
6 Hz or lower - Flat response	129 peak
C - Weighted - Slow response	105 dBC

Fly Rock. Adequate stemming of the burden is loaded into blastholes prior to detonation to substantially reduce the occurrence of fly rock. Fly rock which may result from blasting operations will not be cast from the blasting site more than one-half the distance to the nearest dwelling or other occupied structure, beyond the area of control or beyond the permit boundary.

Blasting Schedule

The mining of multiple coal seams and the associated multiple pieces of excavation, loading, and hauling equipment require that the parting material and coal be removed in a strict sequence and timely fashion in order to maintain production, meet coal quality requirements, and maximize coal recovery. Essentially, all parting material and coal must be shot prior to removal. Therefore, blasting of these materials must occur as dictated by the mining plan.

Blasting will be conducted only between sunrise and sunset. Unscheduled blasts are conducted only where public or operator health and safety so require and for emergency blasting actions. When an unscheduled blast occurs, Peabody will document the reason for the unscheduled blast, as well as the conditions of health and safety or emergency that required the blast. This documentation shall be provided in the blasting statement, Figure 1.

Peabody publishes a blasting schedule in a newspaper having general circulation in the area in which Kayenta Mine is located. Additionally, blasting schedules are delivered to individuals living within one-half mile of the blasting area and to individuals requesting blasting schedules in the vicinity of the blasting area. The blasting schedule is published and distributed every twelve months and at least ten days but not more than 30 days before blasting whenever the area covered by the schedule changes or whenever periods for blasting significantly differ from the prior announcement. A copy of the typical blasting schedule and an affidavit of publication may be found in Attachment 2.

Blasters

All blasting operations are conducted under the direct supervision of competent, trained and experienced personnel with proven work records who understand the hazards involved. Upon promulgation of a Federally-administered blaster certification program, Peabody implemented a certified blaster's program which complies with the requirements contained therein. During the entire drilling, blasting and detonation sequence, the qualified Blaster-in-Charge is solely responsible for directing the Company's employees in all aspects of the drilling, blasting and detonation sequence. Persons responsible for blasting operations at a blasting site are familiar with the blasting plan and applicable performance standards. Prior to the detonation, a Blaster-in-Charge and at least one other qualified person will be present at the firing of a blast. Additional qualified personnel will be present, if required, to visually inspect the potential blast area, and to monitor and control access in the potential blast area. The Blaster-in-Charge will be a certified blaster and his/her name and license number will be recorded on the blasting statement (see Figure 1).

Blast Designs

No site specific blast designs have been included in this plan since Peabody does not anticipate blasting operations to be conducted within 1,000 feet of any building used as a dwelling, public building, school, church, or community or institutional building. Should this situation be expected to occur, a blast design will be developed and submitted to OSM for approval prior to the initiation of such blasting operations.

Preblast Surveys

Kayenta Mine is an existing operation and blasting is being conducted within current mining areas. Therefore, the schedule for preblast surveys contained in 30 CFR 816.62 is not directly applicable as written. Peabody will discuss the application of preblast survey requirements to existing mining areas (J-19, J-21, J21-West, and N-9) with OSM and agrees to negotiate a schedule of activities that will result in the conduct of preblast surveys for residents or owners of dwellings or other structures located

within one-half mile of these active mining areas where such surveys are requested and have not been previously conducted.

Peabody typically relocates residents to an agreed upon location that is more than one-half mile from any anticipated blasting, prior to blasting occurring within one-half mile of the residence. Negotiations with residents are conducted in advance of blasting activities, with direct assistance of Tribal representatives. Improvement assessments are conducted by local commercial assessors to determine an equitable valuation of structures in order to adequately compensate the resident for the relocation. Should relocation not occur, and blasting is to be conducted within one-half mile of the residence, blasting will be conducted in accordance with appropriate sections of this chapter.

Notification was made in writing on January 11, 1985 to all residents or owners of dwellings or other structures located within one-half mile of the J-21 permit area that blasting in that coal mining area would commence on February 13, 1985. A sample copy of the notification and acknowledgement may be found as Attachment 3. No request for surveys was received prior to the initiation of blasting. Peabody obtained written consents to perform blasting surveys from the owners of three dwellings in the vicinity of the J-21 permit area. These surveys were conducted on September 4, 1985. Two were conducted on structures, which were completed after initiation of blasting activities in the J-21 permit area. Since 1985, condition surveys of non-PWCC owned structures located on or within one-half mile of the mine permit areas have been offered to owners and/or residents of the structures as required in 30 CFR 816.62. One hundred ninety structures were inspected in 1994. New structures are offered condition surveys on a periodic basis. The inspections are on file with OSM and PWCC; copies of each inspection are supplied to each structure owner. Condition surveys consist of a written report and still photographs documenting the general condition of the structure inspected. Condition surveys are used for comparative purposes should a damage investigation be required. Drawing No. 94720, Preblast Survey Site Map, shows the location of the surveys and Attachment 6 lists current and historical resident locations.

Peabody will notify in writing at least 30 days before initiation of blasting in the J-19, J-21, J21 West, and N-9 mining areas, all residents or owners of dwellings or other structures located within one-half mile of the blasting area how to request a preblasting survey.

Any surveys requested more than ten days before the planned initiation of blasting will be completed before blasting begins. Surveys will be performed upon written request. A written report will be prepared and a copy will be submitted to OSM and the person requesting the survey.

Blasting Signs, Warnings and Access Control

Blasting warning signs have been placed along the edge of the permit boundary, at points of access that could reasonably be expected to be used by the general public. In addition, around the perimeter of the blasting area, "Blasting Area" signs will be installed along the edge of any blasting area that comes within 100 feet of any public road right-of-way, and at the point where any other road provides access to the blasting area (area of potential flyrock hazard). Many roads entering or traversing the permit area and leasehold are "jeep trails" or light-use roads infrequently used by a very limited number of people and typically these roads will be barricaded, bermed, provided with a locked gate or any appropriate methods to prevent access where these roads enter the potential blast area. Prior to each blast, Peabody personnel will identify the road(s), which remain traversable into the potential blast area, inspect this road(s) and control access into the blast area during the detonation sequence. Blasting area signs are periodically moved to effectively delineate blasting areas. A description of the signs may be found in Chapter 25. The location of the blasting signs will change periodically as indicated above.

Audible warning and all clear signals are given prior to and following a blast, respectively. Warning and all clear signals are explained on the blasting warning signs, the signs located at the main entrances to the mining complex and on bulletin boards in certain buildings, which the general public may frequent. The signals are also explained in the blasting schedule, which is published and distributed as explained above.

Access to the blasting area is controlled by visual inspection and by insuring that all of the blasting area is clear of all livestock, or unauthorized persons. A qualified person, who is familiar with blasting and shooting procedures, is responsible to perform the visual inspection, assessing the presence of unauthorized humans, livestock and property, etc. in the potential blasting area and to block and monitor access, or barricading roads leading into the blasting area. It is Company Policy for all non-Pit Operations personnel to contact the Pit Supervisor, Dragline Operator or the Blaster-in-

Charge prior to entering the Pit area and potential blast area. Once a person is within the potential blast area, this person will continually monitor only the Operation's radio channel frequency applicable to this Pit area. This radio channel frequency will be utilized for all communications during the blasting sequence, so that all company radios are tuned to the proper channel when persons are in the potential blasting area. Fluorescent orange traffic cones and plastic tapes are used to identify blasting areas in which holes have been loaded, charged, and not yet detonated. Boreholes are not considered charged until a surface detonator is introduced into the initiation system. The all clear signal is given only after the potential blast area has been checked to insure that no unusual hazards such as slides or undetonated charges exist.

During the entire drilling, blasting and detonation sequence, the qualified Blaster-in-Charge is solely responsible for directing the Company's employees in all aspects of the drilling, blasting and detonation sequence. When an area is ready to blast, the Blaster-in-Charge will inspect the site. The Blaster-in-Charge will then request the assistance of the appropriate qualified Company employees (i.e. Blockers) to visually inspect the potential blast area and to block and monitor access. The Blaster-in-Charge will inspect the proposed blast area to verify the blast area is clear and to verify the pattern is ready to denotate. If the pattern is ready, the Blaster-in-Charge and all of the Blockers will check for human activities, livestock and property within the potential blast area around the drill pattern. After all of the area is cleared and all of the Blockers and Blaster-in-Charge are in a safe position, the Blaster-in-Charge will request on the Company radio frequency for this Pit area an all clear response from all of the Blockers. If everything is ready, the Blaster-in-Charge will complete the final connection a safe distance away from the shot. Then, the Blaster-in-Charge will call or designate the appropriate Mine personnel, who, over the Mine radio on the radio frequency for this blast area, will identify the type of shot, location, and request radio silence. On the radio, the appropriate Mine personnel will repeat the request for radio silence, repeat the type of shot, and repeat the location of the proposed blast. The Blockers now confirm to the Blaster-in-Charge that the area is cleared and ready for blasting. The Blaster-in-Charge calls to initiate the pre-blast audible signal: five signals on an audible warning signal devices; approximate two minute pause; and then ten audible signals on the audible warning signal devices. The signal will be audible for at least one-half mile from the point of the blast. The primary blasting warning signal devices utilized will be a 100-watt or greater audible speaker warning device(s) and the dragline signal. Portable audible warning devices assigned to qualified Company employees surrounding the perimeter of the blast area, plus the dragline signal will be utilized as backup warning devices or

to assist the primary audible speaker warning device(s); however, in either procedure, the signal will be audible at least one-half mile from the point of the blast. If the shot is still clear, the Blaster-in-Charge will connect the initiating system to the detonating device and wait approximately one additional minute after the end of the ten signals. The Blaster-in-Charge will again contact all of the Blockers to verify all of the blast area is clear. Once all Blockers confirm the area is clear, the Blaster-in-Charge calls over the Mine radio. He says that there is going to be a (type) shot at (gives location) and "Fire in the Hole". The Blaster-in-Charge then charges the initiating system and detonates the blast. The Blaster-in-Charge then calls the Blockers and confirms all personnel are safe and the area is still clear. Once the Blockers respond, the Blaster-in-Charge calls the appropriate Mine personnel and gives the time of the shot, confirms the shot has been fired, and the Mine personnel can resume normal radio communications. The Blaster-in-Charge and the necessary Blockers, then go back into the blast area to check the shot. If everyone confirms the area is safe to reenter, the Blaster-in-Charge requests the audible warning signal devices sound one long signal. Finally, the Blaster-in-Charge calls on the Mine radio the appropriate Mine personnel and informs them the area has been checked, the area is safe to reenter, and the appropriate Mine person repeats this information over the Mine radio.

Records

The blasting forms shown in Figures 1 and 2 are completed for each blast and retained for a period of three years following the date of the blast. Copies of these records are maintained at Kayenta Mine and are made available for inspection. Shot pattern examples are included in this chapter on pages 17 through 20.

Please refer to Attachment 5, Blast Monitoring Plan, for additional record keeping and reporting requirements.

Figure 1. Blasting Statement

PEABODY WESTERN COAL COMPANY KAYENTA MINE BLASTING REPORT

HOT NO. _____ PIT/RAMP _____ DATE _____ TIME _____
 WEATHER _____ TEMP _____ WIND DIRECTION _____ VELOCITY _____

COORDINATES OF BLASTING LOCATION _____
 DIRECTION AND DISTANCE TO NEAREST DWELLING _____
 MAXIMUM ALLOWABLE WT. OF EXPLOSIVE DETONATED PER 8MS _____
 MAXIMUM NUMBER OF HOLES DETONATED PER 8MS _____ SCALE DIST. USED _____

MASTER IN CHARGE _____ CERT. NO. _____ SIGNATURE _____

DRILL NO. _____ BIT SIZE _____

MATERIAL SHOT: _____
 VG. HOLE DEPTH _____ DEPTH RANGE _____ TO: _____
 VG. BURDEN _____ AVG. SPACING _____ NO. OF DECKS _____
 MAXIMUM WT. OF EXPLOSIVE LOADED PER HOLE _____
 MAXIMUM WT. OF EXPLOSIVE DETONATED PER 8 MS _____
 TOTAL NO. OF HOLES _____ TOTAL WT. OF EXPLOSIVE _____
 TYPE OF STEMMING _____ AVG. LENGTH OF STEMMING _____
 INITIATION SYSTEM _____

TYPE OF EXPLOSIVE USED:

AMMONIUM NITRATE	_____	LBS.	EMULSION	_____	LBS.	%	_____
TRIMERS: NO.	@ _____	LBS.	TOTAL WT:	_____	LBS.		_____
TRIMERS: NO.	@ _____	LBS.	TOTAL WT:	_____	LBS.		_____
TRIMER CORD:	_____	FT.					

SURFACE DELAYS:

9MS	_____	17MS	_____	35MS	_____	42MS	_____	67MS	_____
-----	-------	------	-------	------	-------	------	-------	------	-------

DOWN HOLE DELAYS:

00MS	_____	125MS	_____	150MS	_____	175MS	_____	250MS	_____
00MS	_____	400MS	_____	600MS	_____	800MS	_____	1000MS	_____

LASTING CAPS:

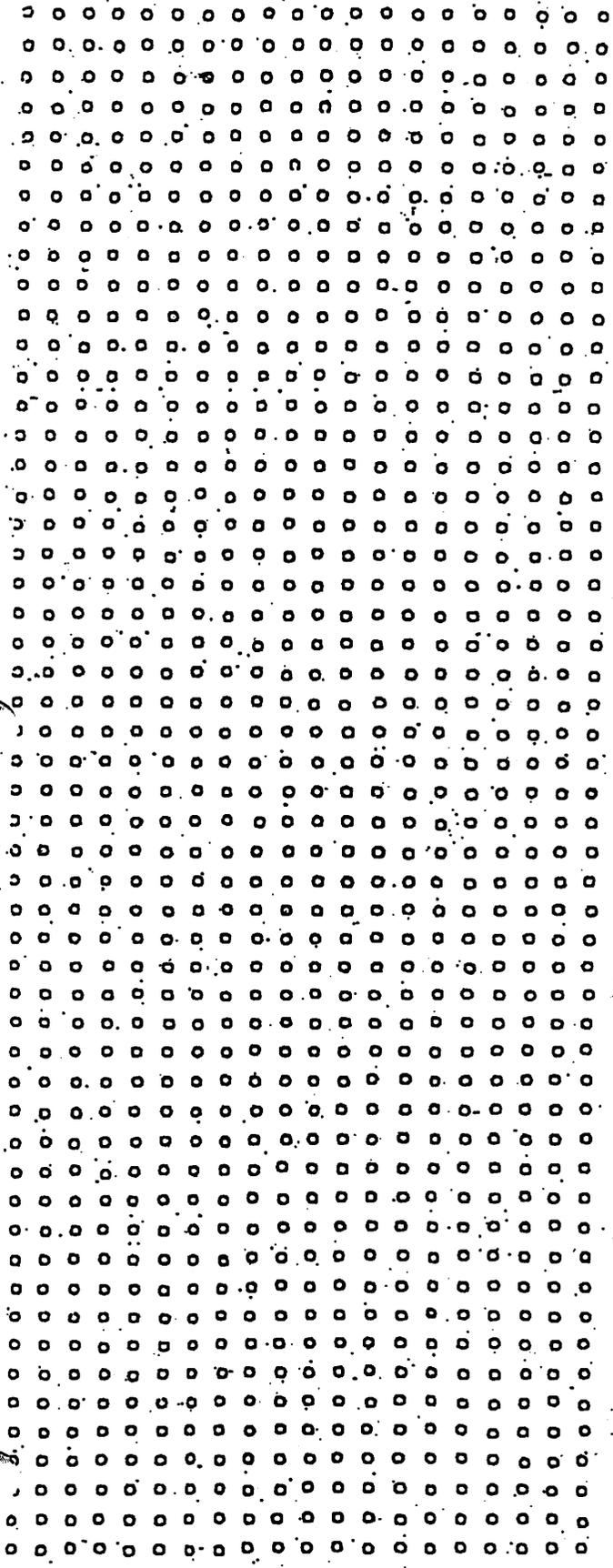
0	_____	1	_____	2	_____	3	_____
---	-------	---	-------	---	-------	---	-------

TYPE OF SEISMOGRAPH _____
 COORDINATES OF INSTRUMENT _____ N/S _____ E/W _____
 SENSITIVITY OF INSTRUMENT _____ CALIBRATION SIGNAL _____
 FT. FROM BLAST _____ VIBRATION LEVEL RECORDED _____ AIR BLAST LEVEL REC _____
 PERSON AND FIRM TAKING READING _____
 ANALYZING PERSON AND FIRM _____

REASONS AND CONDITIONS FOR UNSCHEDULED BLAST _____

 FOOTAGE: _____ CUBIC YARDS: _____

SKETCH OF DRILL PATTERNS



(BLOCKED)

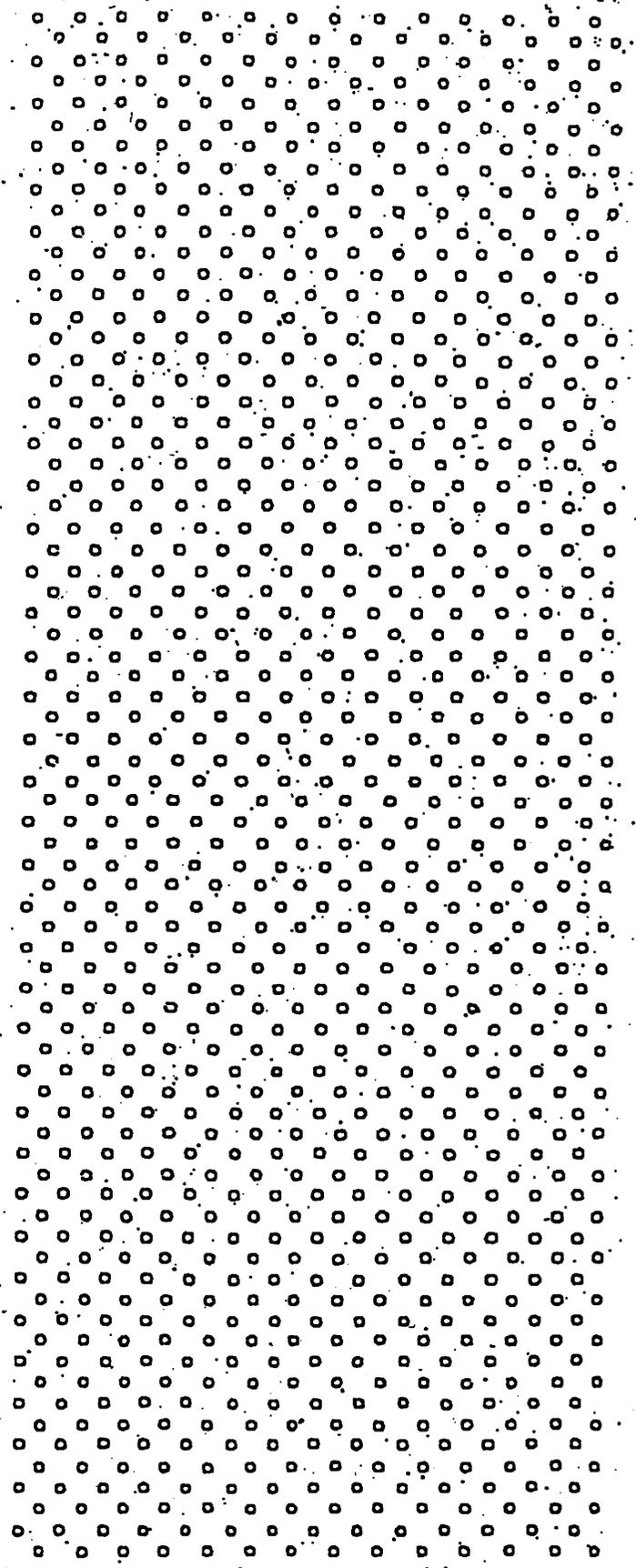


Figure 2 . Blasting Report

Mine LOADING SHEET

Location _____

Drill No. _____

Ramp _____ Coal Part OB/HW Cast

Excavator _____

Date Loaded _____

Shift 1st 2nd 3rd

Date Shot _____

Coal Seam: _____

Blasting Ratio _____

Truck Number: _____

Spacing _____

Percentage of ANFO/Emulsion _____

Number of Holes	Hole Depth	Nitrate Blend 62/38%	ANFO 100%	Other Blend	Boosters	Cord	Column Explosive	Feet Stemming	ITEM	OUT	RETURNED	USED
									Black CAPS/BST			
									LP-12			
									LP-6			
									A-Cord			
									Zap Cord			
									LD Cord			
DELAYS:												
									Blasting Cap			
									17ms40°			
									42ms40°			
									(connectors)			
DOWN HOLE DELAYS												
									150ms			
									175ms			
									250ms			
									300ms			
									400ms			
									450ms			
									600ms			
									800ms			

Shot Pattern Examples:

Parting or Shot to Stand

Cast Shot

Coal Shot

798 ●	-42	840 ●	-42	882 ●	42	824 ●
42	17	17	17	17		
756 ●		815 ●		857 ●		899 ●
42	17	17	17	17		
714 ●		773 ●		832 ●		874 ●
42	17	17	17	17		
672 ●		731 ●		780 ●		849 ●
42	17	17	17	17		
630 ●		689 ●		748 ●		807 ●
42	17	17	17	17		
588 ●		647 ●		706 ●		765 ●
42	17	17	17	17		
546 ●		605 ●		664 ●		723 ●
42	17	17	17	17		
504 ●		563 ●		622 ●		681 ●
42	17	17	17	17		
462 ●		521 ●		580 ●		639 ●
42	17	17	17	17		
420 ●		479 ●		538 ●		597 ●
42	17	17	17	17		
378 ●		437 ●		496 ●		555 ●
42	17	17	17	17		
336 ●		395 ●		454 ●		513 ●
42	17	17	17	17		
294 ●		353 ●		412 ●		471 ●
42	17	17	17	17		
252 ●		311 ●		370 ●		429 ●
42	17	17	17	17		
210 ●		269 ●		328 ●		387 ●
42	17	17	17	17		
168 ●		227 ●		286 ●		345 ●
42	17	17	17	17		
126 ●		185 ●		244 ●		303 ●
42	17	17	17	17		
84 ●		143 ●		202 ●		261 ●
42	17	17	17	17		
42 ●		101 ●		160 ●		219 ●
42	17	17	17	17		
0 ●		59 ●		118 ●		177 ●



All numbers are in milliseconds(ms).
Numbers on lines are surface delays(ms) between holes.

Holes with alpha characters denote groups of the maximum number of holes that fire within 8ms.
Numbers above holes are accumulated times(ms) to detonation.

473 ● 150	17	640 ● 300	17	807 ● 450	17	974 ● 600	0	1174 ● 800	0	1374 ● 1000
17										
456 ● 150	17	623 ● 300	17	790 ● 450	17	857 ● 600	0	1157 ● 800	0	1357 ● 1000
17										
439 ● 150	17	606 ● 300	17	773 ● 450	17	940 ● 600	0	1140 ● 800	0	1340 ● 1000
17										
422 ● 150	17	589 ● 300	17	756 ● 450	17	823 ● 600	0	1123 ● 800	0	1323 ● 1000
17										
405 ● 150	17	572 ● 300	17	739 ● 450	17	906 ● 600	0	1106 ● 800	0	1306 ● 1000
17										
388 ● 150	17	555 ● 300	17	722 ● 450	17	869 ● 600	0	1089 ● 800	0	1289 ● 1000
17										
371 ● 150	17	538 ● 300	17	705 ● 450	17	872 ● 600	0	1072 ● 800	0	1272 ● 1000
17										
354 ● 150	17	521 ● 300	17	688 ● 450	17	855 ● 600	0	1055 ● 800	0	1255 ● 1000
17										
337 ● 150	17	504 ● 300	17	671 ● 450	17	838 ● 600	0	1038 ● 800	0	1238 ● 1000
17										
320 ● 150	17	487 ● 300	17	654 ● 450	17	821 ● 600	0	1021 ● 800	0	1221 ● 1000
17										
303 ● 150	17	470 ● 300	17	637 ● 450	17	804 ● 600	0	1004 ● 800	0	1204 ● 1000
17										
286 ● 150	17	453 ● 300	17	620 ● 450	17	787 ● 600	0	987 ● 800	0	1187 ● 1000
17										
269 ● 150	17	436 ● 300	17	603 ● 450	17	770 ● 600	0	970 ● 800	0	1170 ● 1000
17										
252 ● 150	17	419 ● 300	17	586 ● 450	17	753 ● 600	0	953 ● 800	0	1153 ● 1000
17										
235 ● 150	17	402 ● 300	17	569 ● 450	17	736 ● 600	0	936 ● 800	0	1136 ● 1000
17										
218 ● 150	17	385 ● 300	17	552 ● 450	17	719 ● 600	0	919 ● 800	0	1119 ● 1000
17										
201 ● 150	17	368 ● 300	17	535 ● 450	17	702 ● 600	0	902 ● 800	0	1102 ● 1000
17										
184 ● 150	17	351 ● 300	17	518 ● 450	17	685 ● 600	0	885 ● 800	0	1085 ● 1000
17										
167 ● 150	17	334 ● 300	17	501 ● 450	17	668 ● 600	0	868 ● 800	0	1068 ● 1000
17										
150 ● 150	17	317 ● 300	17	484 ● 450	17	651 ● 600	0	851 ● 800	0	1051 ● 1000

All numbers are in milliseconds(ms). Numbers above holes are accumulated times(ms) to detonation. Numbers below holes are in-hole delays(ms).
 Numbers on lines are surface delays(ms) between holes. Holes with alpha characters denote groups of the maximum number of holes that fire within 8ms.

323	340	357	374	391	408	425		
17	0	0	0	0	0	0		
306	323	340	357	374	391	408		
17	0	0	0	0	0	0		
289	306	323	340	357	374	381		
17	0	0	0	0	0	0		
272	289	306	323	340	357	374		
17	0	0	0	0	0	0		
255	272	289	306	323	340	357		
17	0	0	0	0	0	0		
238	255	272	289	306	323	340		
17	0	0	0	0	0	0		
221	238	255	272	289	306	323		
17	0	0	0	0	0	0		
204	221	238	255	272	289	306		
17	0	0	0	0	0	0		
187	204	221	238	255	272	289		
17	0	0	0	0	0	0		
170	187	204	221	238	255	272	289	
17	0	0	0	0	0	0		
153	170	187	204	221	238	255	272	
17	0	0	0	0	0	0		
136	153	170	187	204	221	238	255	
17	0	0	0	0	0	0		
119	136	153	170	187	204	221	238	
17	0	0	0	0	0	0		
102	119	136	153	170	187	204		
17	0	0	0	0	0	0		
85	102	119	136	153	170	187		
17	0	0	0	0	0	0		
68	85	102	119	136	153	170		
17	0	0	0	0	0	0		
51	68	85	102	119	136	153		
17	0	0	0	0	0	0		
34	51	68	85	102	119	136		
17	0	0	0	0	0	0		
17	34	51	68	85	102	119		
17	0	0	0	0	0	0		
0	17	34	51	68	85	102		

All numbers are in milliseconds(ms).
 Numbers on lines are surface delays(ms) between holes.

Holes with alpha characters denote groups of the maximum number of holes that fire within 8ms.
 Numbers above holes are accumulated times(ms) to detonation.

ATTACHMENT 2

BLASTING SCHEDULE NOTICE

(2012) BLASTING SCHEDULE NOTICE

Peabody Western Coal Company hereby provides notice of its blasting schedule for the Kayenta Complex located approximately 18 miles southwest of Kayenta, Arizona, address being Post Office Box 650, Kayenta, Navajo County, Arizona 86033 (telephone: 928-677-3201). This notice is provided in accordance with Public Law 95-87.

During the calendar year 2012, blasting of overburden, coal, or parting may occur daily between sunrise and sunset. If, in the opinion of authorized personnel, conditions exist which may jeopardize the public or operator's health, safety, or for emergency blasting actions, then emergency blasting may be accomplished at other times. The operator will document the reason and conditions for the emergency nighttime unscheduled blast.

Access to the blasting area is controlled by physically clearing and removing all unauthorized persons and by the location of appropriate barricades, blockers, flags, and blasting area signs prior to a shot being fired. Before each blast, an audible warning signal of five short signals, an approximate two-minute pause, ten continuous blows from an air horn, and then an approximate one-minute pause prior to the blast will be issued. After each blast an audible all-clear signal of one long continuous blow from an air horn will be issued.

Blasting will primarily occur at six potential mining areas. Each blasting area is contained within T35 and 36N-R18 and 19E of Navajo County, Arizona, and more particularly described below. In addition, blasting may occur to fragment materials during construction or excavation activities at the support facilities described below. Initiation of blasting in sections not covered by this notice will require issuance of a new notice.

PIT AREAS

J-19 Pit

Blasting can occur on lands generally located approximately three miles southwest of the J-28 Kayenta Complex Office in portions of Sections 3, 4, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21 and 22, T35N-R19E;

J-21 Pit

Blasting can occur on lands generally located approximately three miles south of the J-28 Kayenta Complex Office in portions of Sections 2, 11, 12, 13, 14, 15, 16, 21, 22, 23, 27, and 28 T35N-R19E;

N-9 Pit

Blasting can occur on lands generally located approximately nine and one-half miles northwest of the J-28 Kayenta Complex Office in portions of Sections 28, 29, 32, 33, and 34, T37N-R18E, and Sections 4, 5, and 8, T36N-R18E.

SUPPORT FACILITIES AREA

**N-6 Scoria
Pit**

Blasting can occur on lands generally located approximately four and one-half miles north/northwest of the J-27 old Black Mesa Mine Facilities Office in portions of Sections 20, 21, and 28, T36N-R18E.

**J-27 Kayenta
Complex
Facilities**

Blasting can occur on lands generally located approximately within portions of Section 15, T35N-R18E surrounding the J-27 old Black Mesa Mine Facilities Office. Since 2006, these facilities are primarily inactive.

**J-28/ N-14
Kayenta
Complex
Facilities**

Blasting can occur on lands generally located approximately within portions of Sections 20, 29, and 34, T36N-R19E surrounding the J-28/ N-14 Kayenta Complex Facilities.

AFFIDAVIT OF PUBLICATION

Inv# L11-1810

I, Duane A. Beyal, Editor of the Navajo Times, a legal newspaper published weekly at Window Rock, Navajo Nation, Arizona, do hereby swear that a legal notice:

2012 Blasting Schedule Notice

was published in said Navajo Times on the following date(s):

December 1, 2011

and that said notice is attached to this Affidavit and is a true and exact copy of said notice as published.

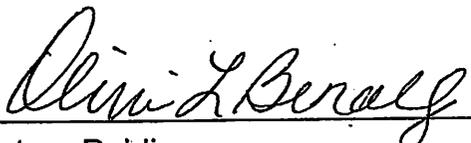

Duane A. Beyal
Editor

STATE OF ARIZONA :}

COUNTY OF APACHE :}

SUBSCRIBED AND SWORN TO before me this

_____ 1st _____ day of _____ December _____, 2011.



Notary Public

My Commission Expires:

_____ April 10, 2014 _____



PUBLIC NOTICES

(2012) BLASTING SCHEDULE NOTICE

Peabody Western Coal Company hereby provides notice of its blasting schedule for the Kayenta Complex located approximately 18 miles southwest of Kayenta, Arizona, address being Post Office Box 650, Kayenta, Navajo County, Arizona 86033 (telephone: 928-677-3201). This notice is provided in accordance with Public Law 95-87.

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Access to the blasting area is controlled by physically clearing and removing all unauthorized persons and by the location of appropriate barricades, blockers, flags, and blasting area signs prior to a shot being fired. Before each blast, an audible warning signal of five short signals, an approximate two-minute pause, ten continuous blows from an air horn, and then

an approximate one-minute pause prior to the blast will be issued. After each blast an audible all-clear signal of one long continuous blow from an air horn will be issued.

Blasting will primarily occur at six potential mining areas. Each blasting area is contained within T35 and 36N-R18 and 19E of Navajo County, Arizona, and more particularly described below. In addition, blasting may occur to fragment materials during construction or excavation activities at the support facilities described below. Initiation of blasting in sections not covered by this notice will require issuance of a new notice.

PIT AREAS

J-19 Pit: Blasting can occur on lands generally located approximately three miles southwest of the J-28 Kayenta Complex Office in portions of Sections 3, 4, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21 and 22, T35N-R19E.

J-21 Pit: Blasting can occur on lands generally located approximately three miles south of the J-28 Kayenta Complex Office in portions of Sections 2, 11, 12, 13, 14, 15, 16, 21, 22, 23, 27, and 28 T35N-R19E.

N-9 Pit: Blasting can occur on lands generally located approximately nine and one-half miles northwest of the J-28 Kayenta Complex Office in portions of Sections 28, 29, 32, 33, and 34, T37N-R18E, and Sections 4, 5, and 8, T36N-R18E.

SUPPORT FACILITIES AREA

N-6 Scoria Pit: Blasting can occur on lands generally located approximately four and one-half miles north/northwest of the J-27 old Black Mesa Mine Facilities Office in portions of Sections 20, 21, and 28, T36N-R18E.

J-27 Kayenta Complex Facilities: Blasting can occur on lands generally located approximately within portions of Section 15, T35N-R18E surrounding the J-27 old Black Mesa Mine Facilities Office. Since 2006, these facilities are primarily inactive.

J-28/N-14 Kayenta Complex Facilities: Blasting can occur on lands generally located approximately within portions of Sections 20, 29, and 34, T36N-R19E surrounding the J-28/N-14 Kayenta Complex Facilities.

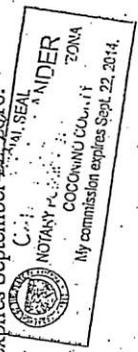
To be Published in The NAVAJO TIMES December 1, 2011

PAGE D-2

D. F. Wells
Douglas F. Wells, Publisher

Subscribed and sworn to before me this 30th day of November 2011.

Carol J. DeLander
Carol J. DeLander, Notary Public
My commission expires September 22, 2010.



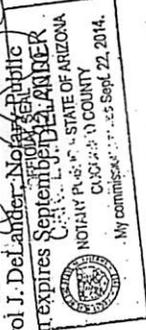
Affidavit of Publication

I, Douglas F. Wells, Publisher of the NAVAJO-HOPI OBSERVER, a newspaper of general circulation published at Flagstaff, Coconino County, Arizona, do solemnly swear that a copy of this notice, as per clipping attached, was published weekly in the regular and entire issue of said newspaper and not in any supplement thereof, one (1) week, commencing with issue dated November 30, 2011 and ending with issue dated November 30, 2011.

D. F. Wells
Douglas F. Wells, Publisher

Subscribed and sworn to before me this 30th day of November 2011.

Carol J. DeLander
Carol J. DeLander, Notary Public
My commission expires September 22, 2010.



2000

Notice
hereby provides notice of its complex located approximately three miles southwest of Kayenta, Arizona 86033 (telephone 928-677-3201). This notice is provided in accordance with Public Law 95-87.

During the calendar year 2012, blasting of overburden, coal, or parting may occur daily between sunrise and sunset. If, in the opinion of authorized personnel, conditions exist which may jeopardize the public or operator's health, safety, or for emergency blasting actions, then emergency blasting may be accomplished at other times. The operator will document the reason and conditions for the emergency nighttime unscheduled blast.

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PIT AREAS
J-18 Pit
Blasting can occur on lands generally located approximately three miles southwest of the J-28 Kayenta Complex Office in portions of Sections 3, 4, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21 and 22, T35N-R19E.

J-21 Pit
Blasting can occur on lands generally located approximately three miles south of the J-28 Kayenta Complex Office in portions of Sections 2, 11, 12, 13, 14, 15, 16, 21, 22, 23, 27, and 28, T35N-R19E.

N-9 Pit
Blasting can occur on lands generally located approximately nine and one-half miles northwest of the J-28 Kayenta Complex Office in portions of Sections 28, 29, 32, 33, and 34, T37N-R18E, and Sections 4, 5, and 8, T96N-R18E.

SUPPORT FACILITIES AREA
N-6 Scoria Pit
Blasting can occur on lands generally located approximately four and one-half miles north/northwest of the J-27 Old Black Mesa Mine Facilities Office in portions of Sections 20, 21, and 28, T36N-R18E.

J-27 Kayenta Complex Facilities
Blasting can occur on lands generally located approximately within portions of Section 15, T35N-R18E surrounding the J-27 Old Black Mesa Mine Facilities Office. Since 2006, these facilities are primarily inactive.

J-28/N-14 Kayenta Complex Facilities
Blasting can occur on lands generally located approximately within portions of Sections 20, 29, and 34, T36N-R19E surrounding the J-28/N-14 Kayenta Complex Facilities.

LEGALS - 2000

(2012) BLASTING SCHEDULE NOTICE

Peabody Western Coal Company hereby provides notice of its blasting schedule for the Kayenta Complex located approximately 18 miles southwest of Kayenta, Arizona, address being Post Office Box 650, Kayenta, Navajo County, Arizona 86033 (telephone 928-677-3201). This notice is provided in accordance with Public Law 95-87.

During the calendar year 2012, blasting of overburden, coal, or parting may occur daily between sunrise and sunset. If, in the opinion of authorized personnel, conditions exist which may jeopardize the public or operator's health, safety, or for emergency blasting actions, then emergency blasting may be accomplished at other times. The operator will document the reason and conditions for the emergency nighttime unscheduled blast.

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Blasting will primarily occur at six potential mining areas. Each blasting area is contained within T35 and 36N-R18 and 19E of Navajo County, Arizona, and more particularly described below. In addition, blasting may occur to fragment materials during construction or excavation activities at the support facilities described below. Initiation of blasting in sections not covered by this notice will require issuance of a new notice.

PIT AREAS

J-18 Pit
Blasting can occur on lands generally located approximately three miles southwest of the J-28 Kayenta Complex Office in portions of Sections 3, 4, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21 and 22, T35N-R19E.

J-21 Pit
Blasting can occur on lands generally located approximately three miles south of the J-28 Kayenta Complex Office in portions of Sections 2, 11, 12, 13, 14, 15, 16, 21, 22, 23, 27, and 28, T35N-R19E.

N-9 Pit
Blasting can occur on lands generally located approximately nine and one-half miles northwest of the J-28 Kayenta Complex Office in portions of Sections 28, 29, 32, 33, and 34, T37N-R18E, and Sections 4, 5, and 8, T96N-R18E.

SUPPORT FACILITIES AREA

N-6 Scoria Pit
Blasting can occur on lands generally located approximately four and one-half miles north/northwest of the J-27 Old Black Mesa Mine Facilities Office in portions of Sections 20, 21, and 28, T36N-R18E.

J-27 Kayenta Complex Facilities
Blasting can occur on lands generally located approximately within portions of Section 15, T35N-R18E surrounding the J-27 Old Black Mesa Mine Facilities Office. Since 2006, these facilities are primarily inactive.

J-28/N-14 Kayenta Complex Facilities
Blasting can occur on lands generally located approximately within portions of Sections 20, 29, and 34, T36N-R19E surrounding the J-28/N-14 Kayenta Complex Facilities.



Peabody Western Coal Company

Date: November 23, 2011
To: Walter Begay, Jr.
From: Jim Schlenvogt
Re: 2012 Blasting Schedule Notice Distribution – Kayenta Mine

Enclosed is the 2012 Blasting Schedule Notice, which has been mailed to the Navajo Times, and the Navajo-Hopi Observer newspapers. In addition, the Blasting Schedule Notice will be mailed to the government agencies and public utilities. Please hand deliver the 2012 Blasting Schedule Notice to the list of local residents who do not have post office box addresses and to any other residents within the coal lease area or within one-half mile of the lease area perimeter.

- Lilly Crank and family
- Bah Begay family
- Earl Kescoli and family
- Harrison Crank and family
- Maxine Kescoli and family
- Ned Yazzie family
- Jacqueline Boyd and family
- Ataid Y. Lake and family
- Kevin Manymules and family
- Mardel Monroe and family

These residents do not receive mail. If you know of any other local residents inside the coal lease area or within one-half mile of PWCC's Coal Lease perimeter, please provide them a copy of this 2012 Blasting Schedule Notice, as needed.

Please have each resident sign the "Receipt of Blasting Schedule" form and return the signed form to me for the central files. If the resident refuses to sign or is unable to sign the form, please sign and date the form acknowledging Peabody's contact with the resident and return the information to me as required. Feel free to make additional copies of the "Receipt of Blasting Schedule" form.

Finally, review the attached resident's distribution list to ensure Peabody has notified all local residents, public utilities, and local government officials within one-half mile of the proposed blasting sites. In addition, anyone within one-half mile of the OSM permit boundary is required to be notified in writing of their right to request a preblasting survey of their structures.

If you have any questions or need any assistance, feel free to contact me.

Jgs
Enclosure(s)

C: Randall Hendrix
G. Coutts
S. Pitman
B. Begay



ADDRESSES FOR BLASTING NOTICE:

Bureau of Indian Affairs
Navajo Area Office
P.O. Box 1060
Gallup, NM 87035
Attn.: Regional Manager

Bureau of Indian Affairs
Hopi Agency
P.O. Box 158
Keams Canyon, AZ 86034
Attn.: Regional Manager

The Navajo Tribe
Minerals Dept.
P.O. Box 1910
Window Rock, AZ 86515
Attn.: Mr. John Stucker

The Hopi Tribe
P.O. Box 123
Kykotsmovi, AZ 86039
Attn.: Mr. Norman Honie, Jr.

Navajo Tribal Utility Authority
P.O. Box 170
Ft. Defiance, AZ 86504

Navajo Communications Telephone Co.
P.O. Drawer 1600
Window Rock, AZ 86515

Frontier Communication Co.
P.O. Box 6000
Window Rock, AZ 86515

Kayenta School District
P.O. Box 337
Kayenta, AZ 86033
Attn.: Transportation Dept.

Black Mesa Review Board
Attn: Chairman
P.O. Box 1088
Kayenta, AZ 86033

Calvin Etsitty & Family
P.O. Box 505
Kayenta, AZ 86033

Eli Crank & Family
P.O. Box 463
Kayenta, AZ 86033

Lilly Crank & Family
P.O. Box 463
Kayenta, AZ 86033
(Hand Deliver)

Paul & Thelma Johnson & Family
P.O. Box 301
Kayenta, AZ 86033

Pauletta Russell & Family
P.O. Box 301
Kayenta, AZ 86033

Billy & Sally Chief & Family
P.O. Box 1332
Kayenta, AZ 86033

Simon & Irene Crank & Family
P.O. Box 93
Kayenta, AZ 86033

Thomas Crank & Family
P.O. Box 93
Kayenta, AZ 86033

Milton Lake & Family
P.O. Box 1006
Kayenta, AZ 86033

Earl & Ancita Kescoli & Family
P.O. Box 1378
Kayenta, AZ 86033
(Hand Deliver)

Lorraine Vandever
P.O. Box 514
Kayenta, AZ 86033

Ben Jim & Family
P.O. Box 93
Kayenta, AZ 86033

Robert Crank & Family
P.O. Box 93
Kayenta, AZ 86033

Phillip Etsitty & Family
P.O. Box 505
Kayenta, AZ 86033

Ophelia & Leslie Etsitty & Family
P.O. Box 505
Kayenta, AZ 86033

Rose Farley & Family
HCR Box 38-1043
Teec Nos Pos, AZ 86514

Priscilla Yazzie & Family
P.O. Box 1657
Kayenta, AZ 86033
(Deceased May,2001)

Sadie Kelly & Family
P.O. Box 1657
Kayenta, AZ 86033

Bah Begay & Family
Rough Rock Trading Post
Chinle, AZ 86503
(Hand Deliver)

Mabel Thomas & Family
P.O. Box 1456
Winslow, AZ 86047

Elsie Vandever & Family
P.O. Box 1428
Kayenta, AZ 86033

Lillie Johnson & Family
P.O. Box 1135
Kayenta, AZ 86033

Harrison Crank & Family
P.O. Box 1942
Kayenta, AZ 86033
(Hand Deliver)

Annie Herrera & Family
P.O. Box 977
Kayenta, AZ 86033

Clarence Lake & Family
P.O. Box 1999
Kayenta, AZ 86033

Daniel Benally & Family
P.O. Box 433
Kayenta, AZ 86033

Ated Lake & Family
P.O. Box 1412
Kayenta, AZ 86033

Maxine Kescoli & Family
P.O. Box 1165
Pinon, AZ 86510
(Hand Deliver)

James & Inez Cody & Family
P.O. Box 1745
Kayenta, AZ 86033

Leonard Honnie, Jr. & Family
P.O. Box 2305
Kayenta, AZ 86033

Mr. & Mrs. Ron Lane & Family
P.O. Box 335
Kayenta, AZ 86033

Mr. & Mrs. Charles Kee & Family
P.O. Box 1657
Kayenta, AZ 86033

H. Blackrock & Family
P.O. Box 461
Tuba City, AZ 86045

John Bahe & Family
P.O. Box 1211
Kayenta, AZ 86033

Betty Crank & Family
P.O. Box 2123
Kayenta, AZ 86033

Irene Becenti & Family
P.O. Box 1506
Kayenta, AZ 86033

Fenae Tallman & Family
P.O. Box 2566
Shonto, AZ 86054

Albert Crank & Family
P.O. Box 3124
Kayenta, AZ 86033

Bessie Luna & Family
P.O. Box 1763
Kayenta, AZ 86033

Alta Rose Albert & Family
P.O. Box 755
Kayenta, AZ 86033

Kornelia & Carol Tallman &
Family
P.O. Box 481
Kayenta, AZ 86033

Anita Lake Yazzie & Family
P.O. Box 846
Kayenta, AZ 86033

Joe Lake & Family
P.O. Box 839
Kayenta, AZ 86033

Joanne Cody & Family
P.O. Box 451
Kayenta, AZ 86033

Lake Family
P.O. Box 644
Kayenta, AZ 86033

Eugene Leonard & Family
P.O. Box 1312
Kayenta, AZ 86033

Rose Yazzie & Family
P.O. Box 1275
Kayenta, AZ 86033

Johnson Crank & Family
P.O. Box 141
Kayenta, AZ 86033

Ned Yazzie & Family
P.O. Box 211
Kayenta, AZ 86033
Hand Delivery

Mrs. Walter Begay, Sr. & Family
P.O. Box 246
Kayenta, AZ 86033

Woodie Anderson/Victoria L. Tso
& Family
P.O. Box 102
Kayenta, AZ 86033

Alice Tso & Family
P.O. Box 1407
Kayenta, AZ 86033

Benny Etsitty & Family
P.O. Box 133
Pinon, AZ 86510

Ned K. Benally & Family
P.O. Box 129
Pinon, AZ 86510

Martha Chee & Family
P.O. Box 1361
Pinon, AZ 86510

Susie Yazzie & Family
P.O. Box 3147
Kayenta, AZ 86033

George & Mae Pulinos & Family
P.O. Box 1907
Kayenta, AZ 86033

Ruby Ralph & Family
P.O. Box 2272
Kayenta, AZ 86033

John Billy Tsosie & Family
P.O. Box 805
Kayenta, AZ 86033

Alice Yazzie & Family
P.O. Box 183
Kayenta, AZ 86033

Billy Austin & Family
P.O. Box 1126
Kayenta, AZ 86033

Julia Jane Russell & Family
P.O. Box 1583
Kayenta, AZ 86033

Edward Begay Sr. & Family
P.O. Box 1017
Winslow, AZ 86047

Jacqueline Boyd & Family
General Delivery
Kayenta, AZ 86033
Hand Delivery

Lucille Benally & Family
Black Mesa S.C.
Tonalea, AZ 86044

Kevin Manymules & Family
3240 W. Brenda Loop
Flagstaff, AZ 86004
(Hand Delivery)

Laurinda Lake & Family
P.O. Box 1102
Flagstaff, AZ 86002

Lavonne Segay & Family
P.O. Box 1998
Kayenta, AZ 86033

Leta Tsosie Williams & Family
P.O. Box 1247
Kayenta, AZ 86033

Nancy M. Yazzie & Family
9600 E. Jesse Dr.
Flagstaff, AZ 86004

Ataid Y. Lake & Family
P.O. Box 1142
Kayenta, AZ 86033
Hand Delivery

Sam Lake & Family
P.O. Box 1412
Kayenta, AZ 86033

Marie Lake & Family
4575 West 1215 South
Cedar City, UT 84720

Darren Bizardi & Family
2054 Juneau St.
San Lendro, CA 94577

Kee Crank & Family
359 N. 3rd W.
Rigby, Idaho 83442

Sarah Kee & Family
144 Granada Dr.
Mtn. View, CA 94043

Francis Lake & Family
P.O. Box 2066
Kayenta, AZ 86033

Jacqueline Piper & Family
155 Beech
Gardner, KS 66030

Mary Begay Gilmore & Family
P.O. Box 1531
Kayenta, AZ 86033

Victoria Lynn Tso & Family
P.O. Box 102
Kayenta, AZ 86033

Lena Lake & Family
P.O. Box 1243
Kayenta, AZ 86033

Esther Lake & Family
P.O. Box 2026
Kayenta, AZ 86033

Molita Lake & Family
P.O. Box 1693
Kayenta, AZ 86033

Lena Sansosie & Family
P. O. Box 2572
Kayenta, AZ 86033

Mardel Monroe & Family
P.O. Box 1077
Kayenta, AZ 86033
Hand Delivery

Perry & Corraine Roan & Family
P.O. Box 1353
Pinon, AZ 86510

Willis K. Begay & Family
P.O. Box 927
Pinon, AZ 86510

Kee John Kescoli & Family
P.O. Box 1941
Kayenta, AZ 86033

Mary Ann Sherlock & Family
P.O. Box 2144
Kayenta, AZ 86033

Alice J. Begay & Family
P.O. Box 1362
Kayenta, AZ 86033



RECEIPT OF BLASTING SCHEDULE

I, _____,
have received a 2012 Blasting Schedule for the Kayenta
Mine Complex.

Resident's Signature: _____

Date: _____

Peabody's Representative: _____

ATTACHMENT 5

BLAST MONITORING PLAN

BLAST MONITORING PLAN

PWCC will adhere to OSM regulation 30 CFR 816.67 for seismic monitoring requirements. PWCC utilizes the scaled-distance formula at 30 CFR 816.67(d) (3) for determining the maximum pounds of explosives detonated per delay. PWCC will monitor airblast and ground vibration for all shots exceeding the scaled distance equation, as well as any required by the regulatory authority at their requested location(s).

Ground motion measurements will include the highest peak particle velocity and critical frequency for each direction of motion. The seismograph used to record those measurements will be set at a trigger level of not greater than 0.05 inches per second particle velocity. Airblast measurements will be recorded with the results given in decibels (dBL). The airblast trigger level will be no greater than 128 dBL air overpressure. The record of the seismic monitoring will be printed and attached to the corresponding blast report which will be filed at the mine office for a period of three years and available for inspection.

For the periodic airblast monitoring requirement, twice a year in June and December, PWCC will monitor one blast for airblast in the J19 pit at the nearest monitoring location specified immediately below which will be closer than the nearest residence. Additionally, note that J19 was selected for the periodic airblast monitoring because the other active pits are more likely to be monitored throughout the year due to the proximity of residences and increased likelihood of exceeding the scaled distance equation.

All seismic monitoring will be done at locations closer in distance than any residence to the actual blast as detailed below. The specific locations are away from occupied residences, on the leasehold, and accessible during inclement weather. Drawing No. 94700 shows each monitoring location in relationship to the blast areas. Monitoring locations were determined in consultation with OSM. Drawing No. 94720 shows the residence locations.

Following are the approximate coordinates for each monitoring location:

N09 West: 6536N 16706E
N09 East: 6469N 28473E
J19 North: -29813N 53976E
J19/21 South: -50099N 63703E
J19/21 SE: -45461N 66573E
J19/21 SW: -47186N 56003E

Except as provided immediately below, blasting will be restricted to the daytime hours between sunrise and sunset. PWCC may blast at times other than during daytime hours (unscheduled blasts) where required for public or operator health and safety and for emergency blasting actions. When an unscheduled blast occurs, PWCC will document the reasons for the unscheduled blast, as well as the conditions of health and safety or emergency that required the blast. This documentation shall be provided in the blasting statement, Figure 1.

ATTACHMENT 6

PRE-BLAST SURVEY SITES MAP DRAWING 94720 RESIDENT LIST

**Attachment 6
Impoundments Hazard Map Drawing # 94720
Residential List**

Last Name	First Name	Status	Resident ID	Old Resident ID	PWCC Easting	PWCC Northing	Navajo Chapter	Rank Status
Albert	Earlene	Occupied	2.0	71.0	17,322.0	-11,246.0	Kayenta	Primary
Albert	Oliver	Occupied	1.0	78.0	18,163.0	-10,886.0	Kayenta	Primary
Albert	Alta Rose	Occupied	1.1	203.0	14,561.0	-14,862.0	Kayenta	Primary
Albert	Oliver	Occupied	118.0	0.0	17,909.0	-10,989.0	Kayenta	Secondary
Anderson	Woody	Occupied	11.1	156.0	44,832.0	-21,484.0	Kayenta	Primary
Anderson	Roland Kobe	Occupied	3.0	323.0	44,900.0	-21,378.0	Kayenta	Primary
Austin	Billy	Vacated	117.0	0.0	31,857.0	10,818.0	Kayenta	Secondary
Austin sr.	Billy	Occupied	4.0	303.0	31,600.0	8,800.0	Kayenta	Secondary
Bahe	Fabian	Occupied	5.0	150.0	36,749.0	-15,670.0	Kayenta	Primary
Becenti	Irene and Keevin	Occupied	6.0	181.1	21,870.0	-14,806.0	Kayenta	Primary
Becenti	Irene and Keevin	Occupied	6.1	181.2	21,901.0	-14,879.0	Kayenta	Primary
Becenti	Irene and Keevin	Vacated	6.2	83.0	20,356.0	-16,059.0	Kayenta	Secondary
Begay	Anita	Occupied	83.0	153.0	18,448.0	-11,590.0	Kayenta	Primary
Begay	Bessie	Occupied	8.3	155.0	36,343.0	-23,479.0	Kayenta	Primary
Begay	George and Lena	Occupied	12.0	73.0	37,837.0	-11,453.0	Kayenta	Secondary
Begay	Bessie	Occupied	8.1	0.0	36,215.0	-23,368.0	Kayenta	Secondary
Begay	Bessie	Occupied	8.4	0.0	32,122.0	-24,673.0	Kayenta	Secondary
Begay	Edward	Vacated	133.0	0.0	43,835.0	-8,651.0	Kayenta	Secondary
Blackhat	Nelson	Occupied	20.0	118.0	20,247.0	-35,979.0	Kayenta	Primary
Blackrock	Steven and Helena	Vacated	119.0	0.0	17,895.0	-9,941.0	Kayenta	Primary
Chief	Lillian	Occupied	120.0	0.0	19,197.0	-25,326.0	Kayenta	Primary
Chief	Bill and Sally	Occupied	24.0	50.0	60,590.0	-15,465.0	Kayenta	Primary
Chief	Jack	Occupied	25.1	99.0	20,779.0	-24,344.0	Kayenta	Primary
Chief	Paul	Occupied	28.0	104.0	19,144.0	-25,521.0	Kayenta	Primary
Chief	Bill and Sally	Occupied	24.2	49.0	60,453.0	-15,514.0	Kayenta	Secondary
Chief	Jack	Occupied	25.0	100.0	20,855.0	-24,380.0	Kayenta	Secondary
Chief	Lilly	Occupied	26.0	102.0	19,123.0	-25,441.0	Kayenta	Secondary
Chief	Nephi	Occupied	27.0	103.0	19,506.0	-25,176.0	Kayenta	Secondary
Chief	Bill and Sally	Occupied	24.1	0.0	59,440.0	-10,863.0	Kayenta	Secondary
Church		Occupied	301.0	86.0	21,035.0	-16,355.0	Kayenta	Secondary
Cody	Tommy	Occupied	30.0	0.0	45,822.0	-1,217.0	Kayenta	Primary
Cody	Vondernick	Occupied	29.1	208.0	50,731.0	1,221.0	Kayenta	Primary
Cody	Myrata	Occupied	29.0	0.0	50,672.0	1,356.0	Kayenta	Primary
Cody sr.	James	Occupied	31.0	62.0	50,224.0	2,295.0	Kayenta	Primary
Cody sr.	James	Occupied	31.1	0.0	50,111.0	2,608.0	Kayenta	Primary
Crank	Lilly	Occupied	38.0	61.1	52,827.0	-14,605.0	Kayenta	Primary
Crank	Albert	Occupied	32.1	80.0	20,242.0	-15,736.0	Kayenta	Primary
Crank	Harrison	Occupied	35.0	166.0	53,070.0	-14,631.0	Kayenta	Primary
Crank	Thomas	Occupied	42.0	171.0	60,792.0	-15,680.0	Kayenta	Primary
Crank	Simon	Occupied	41.2	192.0	60,682.0	-16,278.0	Kayenta	Primary
Crank	Michael and Natasha	Occupied	39.0	194.0	61,211.0	-15,756.0	Kayenta	Primary
Crank	Alice	Vacated	112.2	0.0	59,407.0	-10,970.0	Kayenta	Primary
Crank	Eli	Occupied	34.1	0.0	52,886.0	-14,411.0	Kayenta	Primary
Crank	Robert and Linda	Occupied	40.1	170.2	60,749.0	-15,959.0	Kayenta	Secondary
Crank	Robert and Linda	Occupied	40.0	170.1	60,755.0	-15,960.0	Kayenta	Secondary
Crank	Simon	Occupied	41.0	190.0	64,503.0	-18,593.0	Kayenta	Secondary
Crank	Simon	Vacated	41.1	193.0	60,881.0	-16,136.0	Kayenta	Secondary
Crank	Johnston	Vacated	36.0	196.0	59,522.0	-13,883.0	Kayenta	Secondary
Crank	Albert	Occupied	32.0	0.0	20,585.0	-15,874.0	Kayenta	Secondary
Crank jr.	Simon and Tabby	Occupied	43.0	195.0	61,578.0	-15,164.0	Kayenta	Primary

**Attachment 6
Impoundments Hazard Map Drawing # 94720
Residential List**

Last Name	First Name	Status	Resident ID	Old Resident ID	PWCC Easting	PWCC Northing	Navajo Chapter	Rank Status
Crank.	Ben	Occupied	44.0	200.0	53,664.0	-13,773.0	Kayenta	Primary
Etsitty	Calvin and Anna	Occupied	45.2	72.1	38,102.0	-10,416.0	Kayenta	Primary
Etsitty	Laura	Occupied	46.0	113.0	22,247.0	-33,065.0	Kayenta	Primary
Etsitty	Leslie	Occupied	47.1	0.0	37,259.0	-10,233.0	Kayenta	Primary
Etsitty	Steven and Irene	Occupied	49.1	0.0	38,364.0	-9,702.0	Kayenta	Primary
Etsitty	Calvin	Occupied	45.1	72.2	38,063.0	-11,031.0	Kayenta	Secondary
Etsitty	Phillip	Occupied	48.0	74.0	37,666.0	-11,343.0	Kayenta	Secondary
Etsitty	Phillip	Occupied	48.1	75.0	37,704.0	-11,297.0	Kayenta	Secondary
Etsitty	Steven and Irene	Vacated	49.0	89.0	20,657.0	-15,658.0	Kayenta	Secondary
Etsitty	Calvin	Occupied	45.0	110.0	30,200.0	-27,906.0	Kayenta	Secondary
Etsitty	Leslie	Occupied	47.2	111.0	30,148.0	-27,958.0	Kayenta	Secondary
Etsitty	Leslie	Occupied	47.0	112.0	30,216.0	-27,922.0	Kayenta	Secondary
Farley	Cornelius and Grace	Vacated	50.0	90.0	20,756.0	-15,657.0	Kayenta	Secondary
Harvey	Leman and Jean	Occupied	121.0	0.0	16,839.0	14,254.0	Kayenta	Primary
Herrera	Annie	Occupied	53.1	79.0	18,802.0	-10,533.0	Kayenta	Primary
Herrera	Stephanie	Vacated	53.0	91.0	21,229.0	-15,083.0	Kayenta	Primary
Herrera	Annie	Occupied	53.3	0.0	18,719.0	-10,290.0	Kayenta	Secondary
Jim	Mabel and Bennie	Occupied	55.0	51.0	62,235.0	-15,923.0	Kayenta	Primary
Jim	Mabel and Bennie	Vacated	58.0	316.0	62,189.0	-15,980.0	Kayenta	Secondary
Johnson	Franado	Occupied	59.1	52.0	60,721.0	-15,011.0	Kayenta	Primary
Johnson	Milton and Lily	Occupied	57.1	165.0	52,998.0	-14,132.0	Kayenta	Primary
Johnson	Paul and Thelma	Occupied	58.1	198.0	60,219.0	-15,449.0	Kayenta	Primary
Johnson	Grace	Occupied	56.0	0.0	59,358.0	-14,608.0	Kayenta	Primary
Johnson	Bert	Occupied	129.0	0.0	53,098.0	-14,195.0	Kayenta	Primary
Johnson	Milton and Lily	Vacated	57.0	92.0	20,638.0	-15,918.0	Kayenta	Secondary
Johnson	Spencer	Occupied	59.0	0.0	60,762.0	-15,145.0	Kayenta	Secondary
Johnson	Paul and Thelma	Occupied	58.2	0.0	59,857.0	-11,128.0	Kayenta	Secondary
Johnson jr.	Paul	Occupied	122.0	0.0	60,286.0	-15,584.0	Kayenta	Primary
Kee	Charie and Sarah	Occupied	60.0	149.0	66,658.0	-25,391.0	Kayenta	Primary
Kelly	Sadie and Preston	Occupied	61.0	44.0	67,362.0	-26,023.0	Kayenta	Primary
Lane	Ronald and Thelma	Occupied	75.0	0.0	58,454.0	-15,119.0	Kayenta	Primary
Leonard	Fannie	Occupied	125.0	0.0	13,515.0	13,088.0	Kayenta	Primary
Leonard	Lillie	Occupied	114.0	0.0	13,420.0	13,293.0	Kayenta	Primary
Little	Jimmie and Teresa	Occupied	79.0	168.0	60,515.0	-13,905.0	Kayenta	Primary
Little	Robert	Vacated	80.0	93.0	20,514.0	-15,792.0	Kayenta	Secondary
Little	Amy	Vacated	77.0	197.0	60,618.0	-13,890.0	Kayenta	Secondary
Luna	Bessie	Occupied	83.1	76.0	16,286.0	-7,739.0	Kayenta	Primary
Luna	Darryl	Occupied	83.2	0.0	16,224.0	-7,935.0	Kayenta	Primary
Nelson	Edcitty	Occupied	86.0	88.0	21,102.0	-15,650.0	Kayenta	Primary
Peaches	Daniel	Occupied	115.0	0.0	16,176.0	18,299.0	Kayenta	Primary
Peaches	Wesley	Vacated	0.0	26.0	21,860.0	11,104.0	Kayenta	Secondary
Russell	Keith and Pauletta	Occupied	91.0	53.0	60,094.0	-15,314.0	Kayenta	Primary
Russell	Keith and Pauletta	Vacated	91.1	54.0	60,147.0	-14,977.0	Kayenta	Secondary
Seaton	Evelyn	Vacated	95.1	0.0	53,763.0	-14,702.0	Kayenta	Secondary
Smith	Fred	Occupied	99.2	116.0	17,181.0	-32,658.0	Kayenta	Primary
Smith	Bessie	Occupied	98.0	119.0	19,498.0	-36,976.0	Kayenta	Primary
Smith	Ambrose	Occupied	97.0	164.0	19,085.0	-36,257.0	Kayenta	Primary
Smith	Fred	Occupied	99.0	115.0	17,101.0	-32,252.0	Kayenta	Secondary
Smith	Fred	Occupied	99.1	117.0	17,302.0	-32,618.0	Kayenta	Secondary
Sneddy	Norman and Locita	Occupied	100.0	305.0	50,356.0	2,346.0	Kayenta	Primary

Attachment 6
Impoundments Hazard Map Drawing # 94720
Residential List

Last Name	First Name	Status	Resident ID	Old Resident ID	PWCC Easting	PWCC Northing	Navajo Chapter	Rank Status
Tallman	Fanae and Stanley	Occupied	101.0	95.0	20,401.0	-16,321.0	Kayenta	Primary
Tso	Roy and Alice	Occupied	102.0	48.0	44,745.0	-21,570.0	Kayenta	Primary
Tso	Victoria	Occupied	11.0	322.0	44,856.0	-21,441.0	Kayenta	Primary
Tso	Roy and Alice	Vacated	102.1	47.0	44,927.0	-21,578.0	Kayenta	Secondary
Tso	Roy and Alice	Occupied	102.2	157.0	45,000.0	-21,470.0	Kayenta	Secondary
Tsosie	Stanley and Connie	Vacated	103.0	302.0	16,438.0	6,750.0	Kayenta	Secondary
Vandever	Elsie	Occupied	104.0	154.1	36,542.0	-23,295.0	Kayenta	Primary
Vandever	Elsie	Occupied	104.1	154.2	36,673.0	-23,320.0	Kayenta	Primary
Williams	George and Leta	Vacated	106.0	301.0	15,757.0	7,012.0	Kayenta	Secondary
Yazzie	Larry	Occupied	111.1	45.0	65,880.0	-25,559.0	Kayenta	Primary
Yazzie	Marilyn	Occupied	111.0	46.0	66,022.0	-25,379.0	Kayenta	Primary
Yazzie	Rose	Occupied	112.3	57.0	60,522.0	-13,570.0	Kayenta	Primary
Yazzie	Alice	Occupied	107.0	66.0	28,650.0	6,429.0	Kayenta	Primary
Yazzie	Etta Mae	Occupied	33.1	85.0	20,448.0	-15,964.0	Kayenta	Primary
Yazzie	Etta Mae	Vacated	37.0	87.0	21,169.0	-15,342.0	Kayenta	Primary
Yazzie	Rena	Vacated	95.0	94.0	20,814.0	-15,319.0	Kayenta	Primary
Yazzie	Etta Mae	Occupied	33.5	98.0	19,423.0	-19,958.0	Kayenta	Primary
Yazzie	Linda	Occupied	110.0	114.0	22,387.0	-32,954.0	Kayenta	Primary
Yazzie	James	Occupied	109.0	152.0	18,776.0	-10,734.0	Kayenta	Primary
Yazzie	Rose	Occupied	112.5	55.0	60,433.0	-13,457.0	Kayenta	Secondary
Yazzie	Rose	Occupied	112.4	56.0	60,519.0	-13,375.0	Kayenta	Secondary
Yazzie	Alice	Vacated	107.2	0.0	29,465.0	10,017.0	Kayenta	Secondary
Yazzie	Alice	Vacated	107.1	65.0	28,579.0	6,491.0	Kayenta	Secondary
Yazzie	Etta Mae	Occupied	33.4	81.0	20,001.0	-16,199.0	Kayenta	Secondary
Yazzie	Etta Mae	Occupied	33.3	82.0	20,197.0	-16,050.0	Kayenta	Secondary
Yazzie	Etta Mae	Occupied	33.2	84.0	20,399.0	-16,006.0	Kayenta	Secondary
Yazzie	Rose	Occupied	112.6	169.0	60,665.0	-14,310.0	Kayenta	Secondary
Yazzie	Alice	Vacated	107.4	207.0	22,989.0	4,195.0	Kayenta	Secondary
Yazzie	Rose	Occupied	34.0	317.0	60,500.0	-13,570.0	Kayenta	Secondary
Yazzie	James	Vacated	109.1	0.0	28,980.0	7,615.0	Kayenta	Secondary
Yazzie jr.	Silas	Occupied	128.0	0.0	77,919.0	-26,046.0	Kayenta	Secondary
Begay	Harvey	Occupied	7.1	188	77960	-34868	Forest Lake	Primary
Begay	Bah	Occupied	7.1	188	77794	-40198	Forest Lake	Primary
Begay	Kee Z.	Occupied	116	0	20031	-55229	Forest Lake	Primary
Begay	Raythaniel	Occupied	131	0	79093	-38606	Forest Lake	Primary
Begay	John d.	Occupied	130	0	77455	-39421	Forest Lake	Primary
Begay	Bilta	Occupied	9.4	1.2	73106	-52281	Forest Lake	Primary
Begay	Denny	Occupied	10.1	2	73245	-52382	Forest Lake	Primary
Begay	Lena	Occupied	9.1	1.1	73156	-52277	Forest Lake	Primary
Begay	Phillip	Occupied	15	175	72853	-52119	Forest Lake	Primary
Begay	Martha	Occupied	82	174	72840	-52016	Forest Lake	Primary
Begay	Leo	Occupied	13	176	72905	-52044	Forest Lake	Primary
Begay	Danny	Occupied	10	3	73212	-53065	Forest Lake	Secondary
Begay	Bah	Occupied	7	318	77300	-40380	Forest Lake	Secondary
Begay	Lenora	Occupied	127	0	69786	-44063	Forest Lake	Secondary
Begay	Harvey	Occupied	7	318	78023	-34779	Forest Lake	Secondary
Begay	Teddy	Vacated	17	205	21657	-52071	Forest Lake	Primary
Begay	Bilta	Vacated	9.3	8	55399	-52434	Forest Lake	Secondary
Begay	Bilta	Vacated	9	9	55431	-52299	Forest Lake	Secondary

Attachment 6
Impoundments Hazard Map Drawing # 94720
Residential List

Last Name	First Name	Status	Resident ID	Old Resident ID	PWCC Easting	PWCC Northing	Navajo Chapter	Rank Status
Begay	Raymond	Vacated	16	185	78043	-38612	Forest Lake	Secondary
Begay	Bah	Vacated	7.2	187	77936	-38947	Forest Lake	Secondary
Benally	Elsie	Occupied	14	120	29195	-33814	Forest Lake	Primary
Benally	Daniel and Mabel	Occupied	18.2	204	29578	-34504	Forest Lake	Primary
Benally	Daniel and Mabel	Occupied	18.3	126	28133	-38685	Forest Lake	Secondary
Benally	Lucille b.	Vacated	19	306	32450	-53875	Forest Lake	Secondary
Boyd	Mary	Occupied	21	137	21568	-48444	Forest Lake	Primary
Boyd	Mary	Vacated	21.1	141	33931	-55862	Forest Lake	Secondary
Charley	Katie	Occupied	23.1	40	77708	-31786	Forest Lake	Primary
Charley	Katie	Occupied	23	41	77720	-31740	Forest Lake	Primary
Charley	Alferd	Occupied	22	0	77282	-31708	Forest Lake	Primary
Charley	Edison	Occupied	126	0	78055	-31498	Forest Lake	Secondary
Charley	Ardan	Occupied	132	0	77967	-31586	Forest Lake	Secondary
Charley	Katie	Occupied	23.2	0	78064	-31594	Forest Lake	Secondary
Church		Occupied	63.4	0	67622	-46949	Forest Lake	Secondary
Honie	Leonard and Marie	Occupied	54	162	71004	-43493	Forest Lake	Secondary
Honie	Leonard and Marie	Occupied	54.1	186	77408	-39264	Forest Lake	Secondary
James	Joe	Vacated	113	0	20789	-50758	Forest Lake	Primary
Kescoli	Earl and Ancita	Occupied	62	129	37377	-45380	Forest Lake	Primary
Kescoli	Maxine	Occupied	63.2	0	67598	-47100	Forest Lake	Primary
Kescoli	Kee John	Occupied	64.1	5	57025	-52381	Forest Lake	Secondary
Kescoli	Kee John and Helen	Vacated	64	4	56972	-52497	Forest Lake	Secondary
Kescoli	Maxine	Vacated	63.1	6	58003	-52045	Forest Lake	Secondary
Kescoli	Maxine	Vacated	63.3	308	55300	-52480	Forest Lake	Secondary
Lake	Dzanh	Occupied	68	123	36144	-33589	Forest Lake	Primary
Lake	Sam	Occupied	74	0	37238	-31188	Forest Lake	Primary
Lake	Dwayne	Occupied	71.1	133	36524	-46184	Forest Lake	Primary
Lake	Clarence	Occupied	72	134	36418	-46276	Forest Lake	Primary
Lake	Molita	Occupied	73	159	38283	-31423	Forest Lake	Primary
Lake	Milton	Occupied	67.1	180.2	36726	-46379	Forest Lake	Primary
Lake	Clarence	Occupied	72.1	180.3	36475	-46337	Forest Lake	Primary
Lake	Joe	Occupied	69.1	0	36489	-32596	Forest Lake	Primary
Lake	Mary	Occupied	70	132	36314	-46098	Forest Lake	Secondary
Lake	Sam	Occupied	69	125	37063	-31361	Forest Lake	Secondary
Lake	Ated	Vacated	65.3	127	31271	-39701	Forest Lake	Secondary
Laughter	Derrick	Occupied	52.1	0	66534	-50099	Forest Lake	Primary
Leonard	Eugene	Occupied	76	148	20932	-49461	Forest Lake	Primary
Leonard	Eugene	Occupied	76.1	147	20927	-49505	Forest Lake	Secondary
Little	Jimmie and Teresa	Vacated	79.1	7	57058	-52478	Forest Lake	Secondary
Little	Ben and Ida	Vacated	78	139	32238	-54407	Forest Lake	Secondary
Little	Sam and Ella	Vacated	81	140	32223	-54464	Forest Lake	Secondary
Manymules	Daughter	Occupied	123	0	36501	-46462	Forest Lake	Secondary
Pulinos	George and Mae	Occupied	88	0	61563	-51485	Forest Lake	Primary
Pulinos	George and Mae	Vacated	88.1	14	55144	-49446	Forest Lake	Secondary
Russel	Jerry	Vacated	89	10	55340	-52545	Forest Lake	Secondary
Russell	Kee and Julia	Occupied	90	11	55418	-52613	Forest Lake	Secondary
Savage	Linda	Occupied	92	124	36254	-33426	Forest Lake	Secondary
Savage	Sarah	Occupied	93	143	35519	-32618	Forest Lake	Secondary
Schmitt	Henry	Vacated	94	145	39208	-51331	Forest Lake	Secondary
Segay	Lavonne	Occupied	124	0	36411	-46581	Forest Lake	Primary

**Attachment 6
Impoundments Hazard Map Drawing # 94720
Residential List**

Last Name	First Name	Status	Resident ID	Old Resident ID	PWCC Easting	PWCC Northing	Navajo Chapter	Rank Status
Sherlock	Tom and Julia	Occupied	96	15	55981	-49459	Forest Lake	Secondary
Vandever	Lorraine	Occupied	105	178	36887	-46202	Forest Lake	Primary
Yazzie	Arlene	Occupied	108	307	21736	-51652	Forest Lake	Primary
Yazzie	Alice	Occupied	107.3	18	54941	-49982	Forest Lake	Secondary
Freeman	Irene	Occupied	51	97	9125	-24125	Shonto	Secondary
Freeman	Irene	Occupied	51.1	0	11480	-17868	Shonto	Secondary
Freeman	Irene	Occupied	51.2	0	12336	-21247	Shonto	Secondary