Department of Energy
Washington, DC 20585

JAN 3 1 1997

QA: L

L. D. Foust, Technical Project Officer
for Yucca Mountain Site
Characterization Project
TRW Environmental Safety Systems, Inc.
1180 Town Center Drive, M/S 423
Las Vegas, NV 89134

EVALUATION OF RESPONSE TO DEFICIENCY REPORT (DR) YM-97-D-014 RESULTING FROM OFFICE OF QUALITY ASSURANCE (OQA) AUDIT K/PB-ARC-97-06 OF KIEWIT/PARSONS BRINCKERHOFF (KIEWIT/PB)

The OQA staff has evaluated the response to DR YM-97-D-014. The response has been determined to be unsatisfactory. The DR was written with the intent that identified conditions adverse to quality were not properly documented on Project level documents in accordance with Administrative Procedure 16.1Q, but instead identified on sub-tier Quality Control Inspection Reports.

Response received from Kiewit/PB indicated that "in-house methods of recording, tracking and closing minor in-process documentation errors provides adequate control" are satisfactory and that the DR is considered invalid. Non-compliance with an established Technical Control Procedure is not "considered minor in nature." During the compliance audit Kiewit/PB-ARC-97-06, Kiewit/PB management concurred that this DR was valid.

An amended response is required to be submitted to this office within ten working days of the date of this letter. Send the original of your response to Deborah Sult, OQA/QATSS, P.O. Box 98608, Mail Stop 455, Las Vegas, Nevada 89193-8608. If an extension to the due date is necessary, it must be requested in writing, with appropriate justification, prior to that date.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or John R. Doyle at (702) 794-1465.

Donald G. Horton, Director
Office of Quality Assurance

OQA:JB-0801

Enclosure:
DR YM-97-D-014

NH33 1/1

Recip: NMSS/HLWR

WM-11
102.7

cc w/encl:
T. A. Wood, DOE/HQ (RW-55) FORS
J. O. Thoma, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
B. R. Justice, M&O, Las Vegas, NV
R. A. Morgan, M&O, Las Vegas, NV
R. E. Armstrong, M&O, Las Vegas, NV
Records Processing Center

cc w/o encl:
W. L. Belke, NRC, Las Vegas, NV
J. R. Doyle, OQA/QATSS, Las Vegas, NV
D. G. Sult, OQA/QATSS, Las Vegas, NV
R. W. Clark, DOE/OQA, Las Vegas, NV

OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

☐ Performance Report
☒ Deficiency Report

NO. YM-97-D-014

PAGE 1 OF 2

QA: L

PERFORMANCE/DEFICIENCY REPORT

1 Controlling Document:	2 Related Report No.
Administrative Procedure (AP) 16.1Q, Revision 1	K/PB-ARC-97-06
3 Responsible Organization:	**4 Discussed With:**
Kiewit/Parsons Brinckerhoff	H. Cox, B. Armstrong

5 Requirement/Measurement Criteria:

AP 16.1Q, "Performance/Deficiency Reporting," Revision 1, Paragraph 2.0, "Applicability," states in part:

"...This procedure applies to performance conditions on deficiencies identified in activities subject to quality assurance (QA) program controls and shall be used by Affected Organizations to document and resolve performance conditions or deficiencies..."

6 Description of Condition:

Contrary to the above requirement, Work Package 2.25.4 B Section E, contains a Deficiency Document List and gives reference to Quality Control Inspection Reports (QCIRs), which are generated from QCP-009, "Tracking and Acceptance of Incomplete Construction Items," Revision 4, during the period of September 27, 1996 trough October 16, 1996. The following QCIRs appear to address adverse conditions to quality that are not documented on project recognized deficiency documents.

QCIR No.	Adverse Condition
96-0065	Item 2, as per Technical Control Procedure (TCP) Section 3.3.3, and Plan -012, Revision 1, Section 3.2.2, changes to the approved sketch require Architect/Engineer (A/E) approval in the field. This hold point requires A/E approval.
96-0072	Item I, drill bit sizes and depth of blast holes not shown beside sketch as per TCP-2.17, Paragraph 3.4.4
96-0073	Item 1, drill bit size(s) and depth of round is not noted as required per TCP-2.17, Revision 8, Section 3.4.4
96-0075	Item 6, depth of round is not noted as required per TCP-2.17, Revision 8, Section 3.4.4
96-0076	Item 2, references D&B Plan Sketch Attachment #1, Revision 1..., there is no D&B Plan in the Work Package, nor was it attached to the D&B Record Form.
96-0078, 96-0079, 96-0080	Item 1, references D&B Plan Sketch Attachment #1, Revision 1..., there is not D&B Plan in the Work Package, nor was it attached to the D&B Record Form.

7 Initiator	9 Is condition an isolated occurrence?
John R. Doyle Date 11/22/96	☐ Yes ☒ No ☐ Unknown; Must be Yes if PR

10 Recommended Action: (Not required for PR)

1) Investigate extent of condition.
2) Identify deficient conditions and document on appropriate deficiency document (PR, DR, or CAR).
3) Continue management/QA/QC meetings on bi-weekly basis.

11 QA Review:	12 Response Due Date
QAR John R Doyle Date 11/22/96	20 working days from issuance

13 Affected Organization QA manager Issuance Approval: (QAR for PR)

Printed Name DONALD E HORTON Signature [signature] Date 12/4/96

22 Corrective Action Verified	23 Closure Approved by: (N/A for PR)
QAR Date	AOQAM Date

Exhibit AP-16.1Q.1 Rev. 07/15/96

Enclosure Pg 1 of 14

OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

PR/DR NO. YM-97-D-014
PAGE 2 OF 2
QA:

PERFORMANCE/DEFICIENCY REPORT RESPONSE

14 Remedial Actions:

NOT REQUIRED

15 Extent of Condition: (Not required for PR)

SEE ATTACHED MEMO QC 97-034

16 Root Cause Determination: (Not required for PR) Required ☐ Yes ☒ No

17 Action to Preclude Recurrence: (Not required for PR) Required ☐ Yes ☒ No

18 Corrective Action Completion Due Date:

NOT REQUIRED

19 Response by:
☑ Initial
☐ Amended
Date 1/2/97 Phone 5-5652

20 Response Accepted
QAR Date

21 Response Accepted (N/A for PR):
AOQAM Date

Exhibit AP-16.1Q.2 Rev. 07/15/9

1/8/97 WIGHTMAN TO JUSTICE

KIEWIT/PB
YUCCA MOUNTAIN PROJECT

INTEROFFICE MEMO

Memo: QC 97-034

To: QC File
From: H. R. Cox
Date: January 6, 1997
SUBJECT: Report of investigation- ref.: Deficiency Report (DR) YM-97-D-014

The subject DR expresses a concern that *conditions adverse to quality* appear to be discovered during Quality Control's (QC) monitoring of in-process Construction reports which are not properly documented on Project level deficiency documents even though they are documented and tracked on K/PB Quality Control Inspection Reports (QCIRs) and appropriate Work Package Deficiency Documents Lists (DDLs). The DR lists eight (8) QCIRs as examples of suspected conditions adverse to quality in support of the concern. These 8 QCIRs were investigated by K/PB QC with results as shown below:

Investigation Results

QCIR 96-0065

This QCIR documents that:

> "Sheet 1 approval for Blast Plan Change signature blocks ... were N/A'ed. . . . . This hold point requires A/E signature approval."

This statement apparently lead the Auditor to suspect that a hold point had been violated and a Project DR should have been issued.

Investigation reveals, however, that the hold point was signed off by the A/E (and recorded by the QC Inspector; (see attachment 1 page 1). The A/E's signature was applied to sheet 2 of the Drill & Blast Form (see attachment 1 page 2). This error is considered minor in nature and will be corrected prior to turnover to Records during QC Technical review of the applicable Work Package. This correction is assured by inclusion of this QCIR on the appropriate DDL. Correction may be accomplished via obtaining the A/E's signature (supported by the original buy-off), a notation on the affected report by QC supervision (supported by the evidence

presented above), or by reference to this report and/or DR. No condition adverse to quality has been identified.

QCIR 96-0072

This QCIR documents that:

> "Sheet 3 drill bit sizes and depth of blast holes are not shown, both need to be shown beside sketch as per ...".

This statement apparently lead the Auditor to suspect that pertinent, required information had not been captured thus necessitating issuance of a NCR.

Investigation reveals, however, that the required information was captured on sheet 1 (see attachment 2 page 1). Additionally, the hole spacing, diameter, and depth was accepted by the QC Inspector (see attachment 2 page 2) as being "per Plan" which is specific as to these requirements. This error is considered minor in nature and will be corrected as outlined in QCIR 96-0065 above. No condition adverse to quality has been identified.

QCIR 96-0073 & 0075

These QCIRs, and investigation results are identical to QCIR 96-0072 above except that QC did not monitor these particular attributes/variables (see attachments 3 & 4).

QCIR 96-0076 & 0078

These QCIRs state:

> "Sheet 1 references D&B plan sketch attachment #1 rev 1, needs to be corrected. There is no such D&B plan in the Work Package nor was ("is" in QCIR 96-0078) it attached to this D&B record form".

This statement apparently lead the Auditor to suspect that no drill & blast documentation was generated for this blast and that a NCR should have been initiated.

Investigation reveals that the problem identified on these QCIRs is that the wrong attachment is referenced. Sheet 1 should have referenced attachment 2. Correction of this identified problem is a simple matter of lining out the incorrect reference and inserting the correct reference which is readily available (see attachment 5). No condition adverse to quality has been identified.

QCIR 96-0079 & 0080

These QCIRs and investigation results are identical to QCIRs 0076 & 0078 above except that the correct attachment reference is "attachment 3". These documents were corrected 10/23/96 (see attachment 6 &7).

Report Summary

The results of the investigation revealed no *conditions adverse to quality* that should have been documented on Project level deficiency documents. It also confirmed that K/PB QC's *in-house* methods of recording, tracking and closing minor *in-process* documentation errors provides adequate control, violates no QARD or programmatic requirement, is in conformance with good industry practice, and is geared toward providing accurate, complete records of construction activities. The minor document errors identified on QCIRs and DDLs during QC monitoring activities are verified as corrected, along with those that are not monitored, during programmatically required QC technical review at Work Package close-out. In addition, generation of documentation errors as well as any other problem area discovered during the process of construction is, and has been, monitored by QC and evaluated at special QA/QC/Construction management meetings as deemed necessary.

It appears to Kiewit/PB that external audits of "in-process documentation" creates confusion resulting in the generation of invalid deficiency documents. Sufficient records have been completed and submitted to provide audit personnel with evidence to establish an adequate level of confidence in the quality of completed construction records.

cy: QC Files
Central
R. E. Armstrong
V. J. Barish
S. F. Schuermann

PART OF WORK PACKAGE
2.25.4B

ITEM # B-7

DRILL AND BLAST MONITOR REPORT

Inspector: Richard T. Noel Richard L. Noel WorkPackage# 2.25.4B Shift: Day Date: 9/16/96
Signature Printed Name

Inspection Requirements	Accept/Reject Status/Operation/Monitored/Comments
ONCE PER WEEK MINIMUM (3.2.1)	
A. No "V" cuts allowed	Accept, Blast ID No. 5C-01
B. Hole spacings, diameters, depth of holes per Plan	Δ Accept, Blast ID No. 5C-01
C. Holes parallel per Plan	Accept, Blast ID No. 5C-01
D. Quantity of explosives per Plan	Δ Accept, Blast ID No. 5C-01
E. Explosives storage period does not exceed manufacturer recommendations	Accept, Blast ID No. 5C-01
F. Delays per Plan/redundant system	Δ Accept, Blast ID No. 5C-01
IF REQUESTED BY A/E: (3.3)	
• Inspect for over break > 300 mm.	
MONITOR CONSTRUCTION RECORDS (3.4.1)	
A. Sketch showing the blast hole spacings, diameters, depth of blast holes, and orientation	
B. Location of the blast denoted by the approximate construction station of the face where the round was drilled.	
C. Drilling records showing any unusual conditions encountered.	
D. Type of explosives, blasting caps, and distribution of delays used for blast holes.	
E. Total explosives loaded per delay number, total lbs. of explosives per round, and calculated powder factor based on "C" line opening dimensions and nominal round depth.	N/A ATTACHMENT 1 PAGE 1 OF 2
F. A blast identification number.	
G. Reference to particular blast plan sketch used for drilling/charging the round.	
H. Comments by blasting supervisor in charge of regarding any misfires, results, or effects of blast.	
I. Date and firing time of blast.	
J. Name of blasting supervisor responsible for loading and firing the round.	
K. Signature of person making record entries and date of drilling/charging the round.	
L. Signature of A/E representative ascertaining conformance with Spec. 02313.	
M. Reports are completely filled out, legible, and devoid of incorrect erasures or crossouts.	
N. Incomplete construction items are reported.	

NOTE: All items meet Specification and Drawing requirements unless otherwise stated.

DRBMONIT.RPT QCP 011 REV 1

Δ Changes to blast pattern concurred with by the A/E Title III Engineer on the Controlled Drilling and Blasting Record, RJN 9/16/96

CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 2 of 3

ATTACHMENT 1
PAGE 2 OF 2

Blast Identification Number 5C-01 AKS 9-23-96

Regular Delays Used

Delay Number	#0	#1	#2	#3	#4			#7
Delays Used	1	1	1	2	2	2	1	4
Explosives Used (kg)	INITIATOR 0	1.4	1.2	2.4	2.4	2.6	5.03	3.35
Explosives Used Per Delay (kg)	N/A	1.4	1.2	1.2	1.2	1.3	1.26	.84
Delay Number	#8	#9	#10	#11	#12	#13	#14	#15
Delays Used	6	4	2	19	9			
Explosives Used (kg)	5.01	3.32	1.66	.985 ~~5.79~~ AKS 9-27-96	5.71		N/A	
Explosives Used Per Delay (kg)	.835 ~~1.25~~	.83	.83	.052 ~~.30~~ AKS 9-27-96	.63			

Note: If millisecond delays are used instead of regular delays, the column headings shall be modified to reflect the delays used.

Approval for Round Firing - To be signed prior to firing

(WITNESS POINT)

K. QUINTANA
Print Name of K/PB Blast Supervisor

SKorsett, Robert A.
Print Name of A/E Representative

9-16-96
Signature of K/PB Blast Supervisor/Date

9/16/96
Signature of A/E Representative/Date

Drilling Operation Comments GROUND EXTREMELY RAVELLY HOLES ARE LOADED AS SHOWN. Burn delays not as shown on drawing. LOADED 10 20 03 03

Blasting Operation Comments 200 AKS 9-24-96 GRAIN LOADED HOLES DID NOT PULL. 400 GRAIN HOLES LOADED PREVIOUSLY PULLED BELIEVE 200 GRAIN LOADED HOLES ARE TOO LIGHTLY LOADED, SHOULD RETURN TO 400 GRAIN LOADED PERIMETER HOLES.

MICHAEL ONEILL Michael ONeill 9-16-96
Print Name/Signature of Shift Engineer/Date

KEN QUINTANA 9-16-96
Print Name/Signature of Blasting Supervisor/Date

PART OF WORK PACK: 2.25.4B

KIEWIT/PB

ITEM # B-22

YUCCA MOUNTAIN PROJECT
CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 1 of 14

@ 10-8-96

General Data

Date Blast Fired: 9-23-96 | Time Blast Fired: 1:40 PM AVS 10-3-96 CONNECTING DRIFT KS 9-24-96

Blast Identification Number: SC-05 | Blast Location: ALCOVE #6 CROSSCUT

Blast Station Location: 0+07.19 | Reference D&B Plan Sketch: ~~EXHIBIT 6~~ PLAN 012 ATTACHMENT 1

Approval for Blast Plan Change - Reason - (Overbreak) (Vibration) (Other)

(HOLD POINT)

KEN QUINTANA
Print Name of K/PB Tunnel Superintendent

R. SKorzeniowski
Print Name of A/E Representative

9-23-96
Signature of K/PB Tunnel Superintendent/Date

9/23/96
Signature of A/E Representative/Date

Drilling

Blast Hole Drilled Length: 2.4 M | Length of Round Pulled: 2.4 M

Total Drilled Holes: 66 | Total Loaded Holes 56

Diameter of Loaded Holes: 2" PERIMETER 1¾ REMAINING | Rock Formation: TSw2 AVS 10-2-96

Approval for Round Loading - Must be signed prior to begin loading

(HOLD POINT)

AVS 10-3-96

KEN QUINTANA
Print Name of K/PB Blast Supervisor

R. SKorzeniowski
Print Name of A/E Representative

9-23-96
Signature of K/PB Blast Supervisor/Date

9/23/96
Signature of A/E Representative/Date

EFF 10/14/96

Blasting

Total Explosives Used: ~~61.63~~ 60.98 AVS 10-3-96 (Kilograms) | Excavated Volume: 43.2 (Cubic Meters)

Powder Factor 1.43 (Kilograms/Cubic Meter)

Explosives	Manufacturer	Brand Name
Trim Explosive	ICI	XACTEX
Nitroglycerin AVS 10-3-96	ICI	GELDYNE
Primacord 200 grain	ICI	CORDTEX
Primacord 18 grain	ICI	CORDTEX
Trunk Line w/Detonator	N/A	N/A
Long Period Delays	ICI	EXEL LP
Millisecond Delays	N/A	N/A

ATTACHMENT 2

PAGE 1 OF 2

DRILL AND BLAST MONITOR REPORT

Inspector: Richard J. Noel Richard L. Noel WorkPackage# 2.25.4B Shift: Day Date: 9/23/96

Signature Printed Name

Inspection Requirements	Accept/Reject Status/Operation/Monitored/Comments
ONCE PER WEEK MINIMUM (3.2.1)	
A. No "V" cuts allowed	Accept, Blast ID No. SC-05
B. Hole spacings, diameters, depth of holes per Plan	Accept, Blast ID No. SC-05
C. Holes parallel per Plan	Accept, Blast ID No. SC-05
D. Quantity of explosives per Plan	Accept, Blast ID No. SC-05
E. Explosives storage period does not exceed manufacturer recommendations	Accept, Blast ID No. SC-05
F. Delays per Plan/redundant system	Accept, Blast ID No. SC-05
IF REQUESTED BY A/E: (3.3)	
• Inspect for over break > 300 mm.	
MONITOR CONSTRUCTION RECORDS (3.4.1)	
A. Sketch showing the blast hole spacings, diameters, depth of blast holes, and orientation	
B. Location of the blast denoted by the approximate construction station of the face where the round was drilled.	
C. Drilling records showing any unusual conditions encountered.	
D. Type of explosives, blasting caps, and distribution of delays used for blast holes.	
E. Total explosives loaded per delay number, total lbs. of explosives per round, and calculated powder factor based on "C" line opening dimensions and nominal round depth.	N/A
F. A blast identification number.	
G. Reference to particular blast plan sketch used for drilling/charging the round.	
H. Comments by blasting supervisor in charge of regarding any misfires, results, or effects of blast.	
I. Date and firing time of blast.	
J. Name of blasting supervisor responsible for loading and firing the round.	
K. Signature of person making record entries and date of drilling/charging the round.	
L. Signature of A/E representative ascertaining conformance with Spec. 02313.	
M. Reports are completely filled out, legible, and devoid of incorrect erasures or crossouts.	
N. Incomplete construction items are reported.	

ATTACHMENT 2

PAGE 2 OF 2

NOTE: All items meet Specification and Drawing requirements unless otherwise stated.

PART OF WORK PACKAGE 2.25.4B

ITEM # B-9

D&BMONIT.RPT QCP-011 REV. 1

1 of 2

PART OF WORK PACK 2.25.4B

KIEWIT/PB

ITEM # B-23

YUCCA MOUNTAIN PROJECT
CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 1 of 34

Pg 10-3-96

General Data

Date Blast Fired: 9-24-96 | Time Blast Fired: 1:55PM AKS 10-3-96

Blast Identification Number: 5C-06 | Blast Location: ALCOVE #5 ~~CROSS CUT~~ Connecting

Blast Station Location: 0+10.65 | Reference D&B Plan Sketch: ~~EXHIBIT G PLAN 012~~ ATTACHMENT I PLAN 012 REV I

Approval for Blast Plan Change - Reason - (Overbreak) (Vibration) (Other) 9-23-9

(HOLD POINT) See D/B Sketch

K. QUINTANA
Print Name of K/PB Tunnel Superintendent

R. SKorseth
Print Name of A/E Representative 9/24/96

9-24-96
Signature of K/PB Tunnel Superintendent/Date

10/4/96 EFF
Signature of A/E Representative/Date

Drilling

Blast Hole Drilled Length: 2.4 | Length of Round Pulled: 2.4

Total Drilled Holes: 67 | Total Loaded Holes 57

Diameter of Loaded Holes: ~~2" PERIMETER~~ 1 3/4" REMAINING | Rock Formation: TSW 2

Approval for Round Loading - Must be signed prior to begin loading

(HOLD POINT)

K. QUINTANA
Print Name of K/PB Blast Supervisor

R. SKorseth
Print Name of A/E Representative

9-24-96
Signature of K/PB Blast Supervisor/Date

9/24/96
Signature of A/E Representative/Date
EFF 10/4/96

Blasting

66.14 AKS 10-3-96

Total Explosives Used: ~~148.27~~ (Kilograms) Excavated Volume: 43.2 (Cubic Meters)

Powder Factor ~~3.43~~ AKS 10-3-96 1.63 (Kilograms/Cubic Meter)

Explosives	Manufacturer	Brand Name
Trim Explosive	ICI	XACTEX
Nitroglycerin AKS 10-3-96	ICI	GELDYNE
Primacord 200 grain	ICI	CORDTEX
Primacord 100 grain	ICI	CORDTEX
Trunk Line w/Detonator	N/A	N/A
Long Period Delays	ICI	EXEL - LP
Millisecond Delays	N/A	N/A

ATTACHMENT 3

PART OF WORK PACKAG 2.25.4B

ITEM # B-31

Pg 1 of 3

KIEWIT/PB

YUCCA MOUNTAIN PROJECT
CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 1 of 3

General Data

Date Blast Fired:	9-26-96	Time Blast Fired:	2:00 PM AKS 10-9-96
Blast Identification Number:	SC-07	Blast Location:	ALCOVE #5 ~~CROSS CUT~~ Connecting Dr.
Blast Station Location:	0+12.45	Reference D&B Plan Sketch:	Exh. 6, 16 Plan 12 Rev 1

Approval for Blast Plan Change - Reason - (Overbreak) (Vibration) (Other)

(HOLD POINT) See Sketch

KEN QUINTANA	R. SKORSETH
Print Name of K/PB Tunnel Superintendent	Print Name of A/E Representative
9-26-96	AKS 10-9-96 9/26/96
Signature of K/PB Tunnel Superintendent/Date	Signature of A/E Representative/Date

Drilling

Blast Hole Drilled Length:	2.4 m	Length of Round Pulled:	2.4 m
Total Drilled Holes:	78	Total Loaded Holes	65
Diameter of Loaded Holes:	2" PERIMETER 1 3/4" REMAINING	Rock Formation:	TSw2

Approval for Round Loading - Must be signed prior to begin loading

(HOLD POINT)

KEN QUINTANA	R. SKORSETH
Print Name of K/PB Blast Supervisor	Print Name of A/E Representative
9-26-96	9/26/96
Signature of K/PB Blast Supervisor/Date	Signature of A/E Representative/Date

Blasting

LSA 10-10-96

Total Explosives Used:	64.71 AKS 10-9-96 ~~64.73~~ (Kilograms)	Excavated Volume:	43.2 (Cubic Meters)
Powder Factor	1.50		(Kilograms/Cubic Meter)

Explosives	Manufacturer	Brand Name
Trim Explosive	ICI	YACTEX
Nitroglycerin AKS 10-9-96	ICI	GELDYNE
Primacord 200 grain	ICI	Cordtex
Primacord, 18 grain MWO 9-26-96	~~ICI~~ ICI	CORDTEX
Trunk Line w/Detonator	N/A	N/A
Long Period Delays	ICI ~~EXCEL~~ AKS 10-9-96 LP	Excel LP
Millisecond Delays	N/A	N/A

ATTACHMENT 4

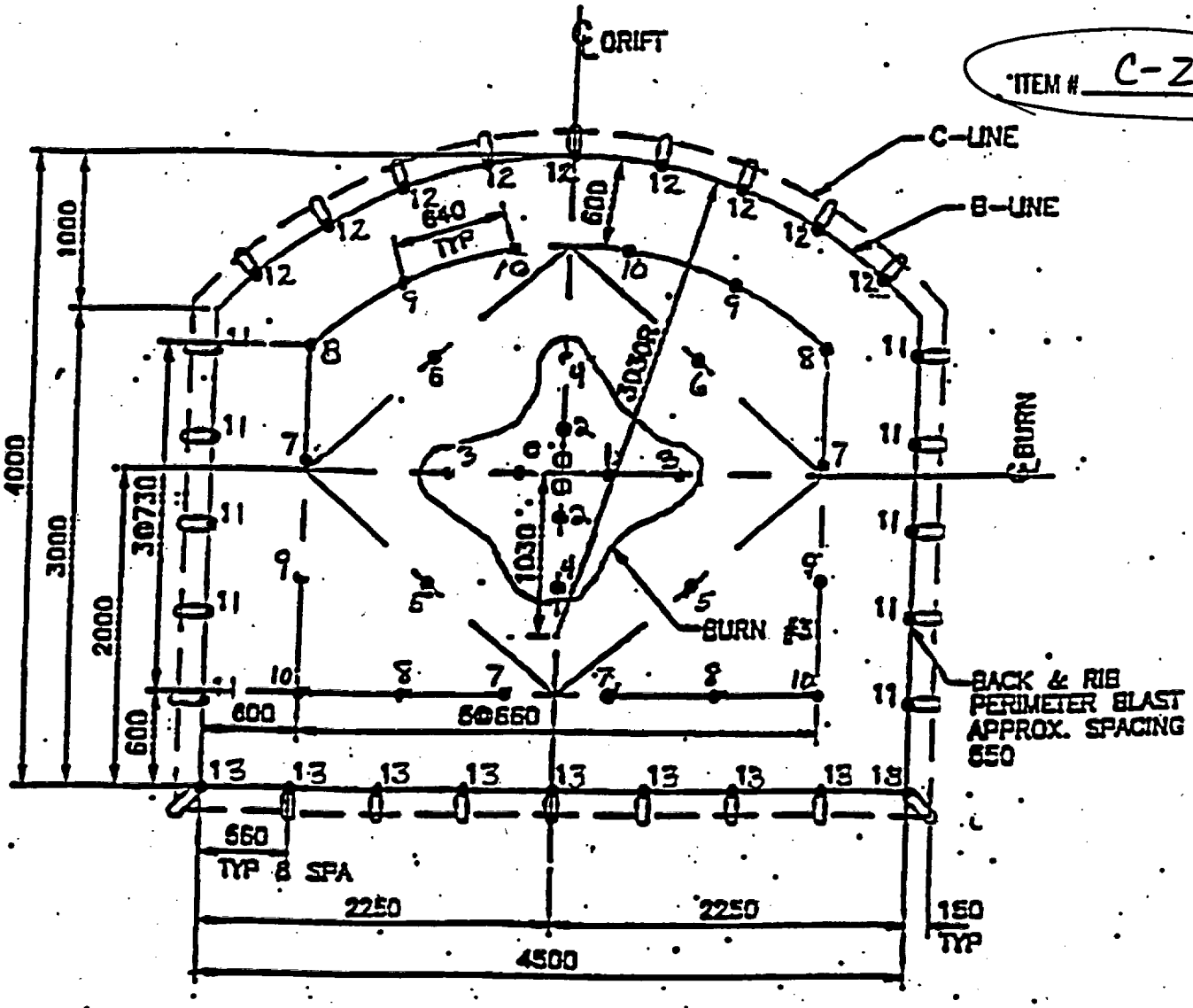
Pg 11 of 14

Crown perimeter holes - 1 Xactex and single strand 2r Detcord
Perimeter right & left sides - Xactex traced with 18gr Detcord.
Lifters - Xactex traced with Attachment II PLAN-012 Detcord
T cushion holes - 1 geldyne, 3 Xactex, 1 geldyne
Left cushion holes - 1 geldyne, 2 Xactex, 1 geldyne

Attachment II. Plan-012
~~Page 1 of 5~~
Pg 10.1.96
0

PART OF WORK PACKAGE
2.25.4B

ITEM # C-25



BLASTING PATTERN – TSw2

SECTION 5
SKETCH 40231SK2.FCR

ATTACHMENT 5

Concurrence: [signature]
A/E Representative

Date: 9/23/96

PART OF WORK PACKAG 2.25.4B

ITEM # ~~Bull~~ B-74

Pg 1 of 4

KIEWIT/PB

YUCCA MOUNTAIN PROJECT

CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 1 of 3

General Data

Date Blast Fired: 10/4/96 — Time Blast Fired: 2:41 PM

Blast Identification Number: SC-12 — Blast Location: ALCOVE 5 CONNECTING DRIFT

Blast Station Location: 0+25.28 — Reference D&B Plan Sketch: ~~EXHIBIT G-PLAN 12-B~~ ATTACHMENT 3

Approval for Blast Plan Change - Reason - (Overbreak) (Vibration) (Other)

(HOLD POINT)

KEN QUINTANA — Print Name of K/PB Tunnel Superintendent

EDWARD F. FITCH — Print Name of A/E Representative

K QA 10-4-96 — Signature of K/PB Tunnel Superintendent/Date

Edward F Fitch 10/4/96 — Signature of A/E Representative/Date

Drilling

Blast Hole Drilled Length: 2.4 M — Length of Round Pulled: 2.4 M

Total Drilled Holes: 64 — Total Loaded Holes 62

Diameter of Loaded Holes: 44mm & 51mm — Rock Formation: TSW2

Approval for Round Loading - Must be signed prior to begin loading

(HOLD POINT)

KEN QUINTANA — Print Name of K/PB Blast Supervisor

EDWARD F. FITCH — Print Name of A/E Representative

K QA 10-4-96 — Signature of K/PB Blast Supervisor/Date

Edward F Fitch 10/4/96 — Signature of A/E Representative/Date

CRG 10/15/96

Blasting .09 AK 10-15-96

Total Explosives Used: 69.08 (Kilograms) — Excavated Volume: 43.2 (Cubic Meters)

Powder Factor 1.60 (Kilograms/Cubic Meter)

Explosives	Manufacturer	Brand Name
Trim Explosive	IC1	XACTEX
Nitroglycerin	IC1	GELDYNE
Primacord. 50 grain	IC1	CORDTEX
Primacord 200 grain	IC1	CORDTEX
Trunk Line w/Detonator	IC1	EXCEL
Long Period Delays	IC1	EXCEL
Millisecond Delays	—	—

ATTACHMENT 6

Pg 13 of 14

[redacted] OF WORK PACKA 2.25.4B

ITEM # ~~B.40~~ B.73

Pg 1 of 4

KIEWIT/PB

YUCCA MOUNTAIN PROJECT

CONTROLLED DRILLING AND BLASTING RECORD FORM

Sheet 1 of 3

General Data 10/3/96 JHE 10/3/96

Date Blast Fired: ~~10/2/96~~ Time Blast Fired: 10:45AM

Blast Identification Number: SC-11 Blast Location: ALCOVE 5 CONNECTING DRIFT

Blast Station Location: 0+22.30 Reference D&B Plan Sketch: ~~EXHIBIT C-PLAN 12 R~~ 10/23/96 ATTACHMENT 3

Approval for Blast Plan Change - Reason - (Overbreak) (Vibration) (Other) Improved results 10/2

(HOLD POINT)

KEN QUINTANA
Print Name of K/PB Tunnel Superintendent

K/A 10-3-96
Signature of K/PB Tunnel Superintendent/Date

Edward F. Fitch
Print Name of A/E Representative

Edward F Fitch 10/2/96
Signature of A/E Representative/Date
CRL 10/15/96

Drilling

Blast Hole Drilled Length: 2.4M Length of Round Pulled: 2.4M

Total Drilled Holes: 64 Total Loaded Holes 62

Diameter of Loaded Holes: 44MM & 51MM Rock Formation: TSW2

Approval for Round Loading - Must be signed prior to begin loading

(HOLD POINT)

KEN QUINTANA
Print Name of K/PB Blast Supervisor

K/A 10-3-96
Signature of K/PB Blast Supervisor/Date

EDWARD F. FITCH
Print Name of A/E Representative

Edward F Fitch 10/3/96
Signature of A/E Representative/Date
CRL 10/15/96

Blasting AHS 10-3-96

Total Explosives Used: 5843 (Kilograms) Excavated Volume: 43.20 (Cubic Meters)

Powder Factor 1.35 (Kilograms/Cubic Meter)

Explosives	Manufacturer	Brand Name
Trim Explosive	ICI	YACTEX
Nitroglycerin	ICI	GELDYNE
Primacord. ~~50~~ 18 grain JHE 10/3/96	ICI	CORDTEX
Primacord. 200 grain	ICI	CORDTEX
Trunk Line w/Detonator	ICI	EXCEL
Long Period Delays	ICI	EXCEL
Millisecond Delays	—	—

ATTACHMENT 7

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